BIELEFELD UNIVERSITY

The quality of home-based parental involvement

Antecedents and consequences in German and Thai families

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Declaration of Originality

I hereby declare that I have not submitted the dissertation entitled *“The quality of home-based parental involvement: Antecedents and consequences in German and Thai families”* either in terms of this current version or another version to any other faculty.

I have written this submitted dissertation by myself and in this process, I have used no other sources than those expressly indicated.

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ABSTRACT

Doktor der Philosophie

The quality of home-based parental involvement: Antecedents and consequences in German and Thai families

By Sittipan Yotyodying

Parental involvement in schooling has long been considered a key factor promoting a wide range of desired academic outcomes in pupils. Among the different aspects of parental involvement, *home-based parental involvement* (i.e. non-formal learning and teaching practices in relation to school that take place at home) is proposed as the most important aspect that directly fosters pupils' learning and achievement. Most previous empirical research has investigated the linkages between *the quantity* of parental involvement (*how often do parents become involved*) and its impact on pupils' achievement and school success. In recent years, however, there has been an increase in empirical studies on the *quality* of home-based parental involvement (*how and in which ways do parents become involved*) showing the crucial importance of the kinds of parental instruction. Taking the perspective of self-determination theory (SDT), parental instruction may be functional to the extent that it fulfils *three basic needs* (for autonomy, relatedness, and competence) in the children. Therefore, the quality of home-based parental involvement can be characterized operationally by *four dimensions of parental instruction*, namely, autonomy-support, responsiveness, control, and structure. Numerous studies inspired by SDT have suggested that authoritative kinds of parental instruction (highly autonomy-supportive and responsive) are more likely to foster a variety of pupils' *academic functioning* *outcomes*. The present study particularly emphasizes academic functioning in terms of self-determined versus non-self-determined forms of learning motivation, academic well-being (i.e. school satisfaction, positive learning emotions), and academic self-regulation competencies (i.e. motivation regulation, emotion regulation). In contrast to authoritative kinds of parental instruction, authoritarian kinds of parental instruction (highly controlling and structuring) are more likely to promote non-self-determined (controlled) forms of learning motivation while providing no strong support for other positive pupils' academic outcomes. Despite the fact that authoritative kinds of parental instruction seem to be more beneficial for children compared to authoritarian kinds of parental instruction, little is known about the reasons why parents adopt different dimensions of instruction.

To find out what kinds of parental factors influence the quality of parental instruction, this study focused particularly on Hoover-Dempsey and Sandler's theoretical model of the parental involvement process. Interestingly, this theoretical model proposes three key predictor constructs for parent involvement in their child's education, namely, motivational beliefs (i.e. conceptions of responsibility, efficacy beliefs), perceived specific invitations to involvement, and the parents' life context. The present study examined these and two further predictor constructs, namely, parents' role conceptions in learning situations, as defined by process versus product-oriented goals (Renshaw & Gardner, 1990) and the family SES.

To date, there have still been no empirical investigations of the complex linkages between the antecedents of the quality of home-based parental involvement and the effects on pupils' academic functioning outcomes measured in terms of learning motivation, academic well-being, and academic self-regulation competencies. Therefore, this is the first study to develop and empirically validate a conceptual model that describes these complex linkages. This study also explores cross-cultural differences between *German* and *Thai families* in order to investigate how far the process of home-based parental involvement depends on culture.

The main aims of this research are (a) to develop and empirically validate the conceptual model for describing the linkages between antecedents of the quality of home-based parental involvement and its impact on pupils' learning motivation, academic well-being, and academic self-regulation competencies; and (b) to test the invariance of the conceptual model empirically across two distinct cultural settings—Germany and Thailand. The total sample consisted of 782 parent–child dyads—288 from Germany and 494 from Thailand. The German sample was recruited from eight schools in the State of North Rhine-Westphalia (NRW); the Thai sample, from eight schools in Bangkok Metropolitan Area and Chonburi Province. The research instruments are parent and pupil questionnaires containing *a wide range of subscales*. The questionnaires were first compiled in German and then translated into Thai by a Thai scholar who is fluent in German. Afterwards, the Thai questionnaires were back-translated into German by another Thai–German bilingual colleague. In both samples, the internal consistency of each (parent and pupil) subscale was greater than .50. The internal consistency of a whole parent questionnaire (for all subscales combined; 59 items) was .86 for the German sample and .87 for the Thai sample. The internal consistency of the whole pupil questionnaire (for all subscales combined; 108 items) was .95 for the German sample and .94 for the Thai sample. This indicated that the internal consistencies of parent and pupil questionnaires in German and Thai were quite similar. A multi-sample confirmatory factor analysis revealed that all subscales achieved configural invariance (equal factor structure) and metric invariance (equal factor loadings)/or at least partial metric invariance (most of factor loadings are equal) across German and Thai samples. This confirmed that it was acceptable to perform a German–Thai comparison of the conceptual model describing the relationships among parent and pupil variables. The conceptual model was validated empirically with structural equation modelling (SEM). Finally, a multiple group analysis (MGA) was performed with *LISREL* to test the invariance of the conceptual model across the German and Thai samples.

Overall, the results of the SEM analysis revealed that the data from both samples supported the conceptual model. In German family settings, the empirically validated conceptual model seemed to place greater emphasis on *protective factors* that enable

an authoritative parental involvement. The results underlined that parental teaching efficacy in the specific domain of mathematics and the availability of time and energy were the *key protective factors* prompting German parents to adopt authoritative kinds of instruction, and this, in turn, facilitated high scores on all kinds of academic functioning in their children. In addition, parents' own past experiences at school also prompted them to be authoritative in their involvement and this, in turn, particularly enabled their children to utilize motivational regulation strategies. Vice versa, parents' use of performance goals when framing their child's learning situations was the *key risk factor* prompting parents to be more controlling and strict in their involvement, and this, in turn, impeded the child's academic well-being as well as the child's ability to develop a motivational regulation competency.

In the Thai family settings, the empirically validated conceptual model appeared to emphasize *risk factors* that promote parental authoritarianism in home-based involvement. Results suggested that parents' achievement orientation, general teaching efficacy, and family SES were the *key risk factors* prompting parents to be controlling and strict when becoming involved in their child' education, and this, in turn, fostered controlled learning motivation in the child, although—surprisingly—still enhancing competencies for regulating academic emotion. Moreover, pupils of authoritarian parents may experience the use of motivational regulation strategies− particularly in low-SES parents. In contrast, the *key protective factor* prompting authoritative instruction in parents was invitations from their children. That is, parents were prompted to be authoritative in their involvement to the extent that their children showed them that their support was needed and requested this support from them. This, in turn, encouraged the children to be much more competent in their motivational regulation.

In addition, the results of a multiple group analysis revealed that the empirically validated conceptual model was invariant across the German and Thai samples in terms of model structure, whereas all parameter estimates for the model (e.g. factor loadings, causal paths) varied across the two samples. Therefore, it could be concluded that culture (country-of-origin) has a moderating effect on the complete

structural model and that the relationships between research variables are moderated by cultural background.

In sum, it can be concluded that parents from different cultures adopt different kinds of instructional strategies due to variations in their motivational beliefs, role conceptions, interpersonal conditions, and family SES. However, authoritative parents from both cultures help their children to achieve positive learning outcomes more than authoritarian parents do. These findings contribute to a better understanding of pupils' unequal opportunities to succeed in learning and suggest that intervention programmes designed to increase parental involvement should also show parents how to be less authoritarian and more authoritative.

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Chapter I

Introduction

1.1. Research Rationale

It has long been believed that parental involvement in schooling is the key factor promoting a variety of pupils' academic outcomes including school achievement and performance (e.g. Bronstein et al., 2005; Desforges & Abouchaar, 2003; Eamon, 2005; Epstein et al., 2002; Fan & Chen, 2001; Hill & Tyson, 2009; Hoover-Dempsey et al., 2001), emotional well-being (e.g. Epstein, 2005; Gutman & Feinstein, 2008), educational attainment (e.g. Barnard, 2004; Lall, Campbell, & Gillborn, 2004), and self-efficacy for school success (e.g. Fan & Williams, 2010; Hoover-Dempsey & Sandler, 1995; 1997).

However, past research has suggested that parental involvement is both a complex (Fan & Chen, 2001) and multi-dimensional concept (Grolnick & Slowiaczek, 1994). It is typically defined as a wide range of parents' activities in relation to their child's schooling that take place either at school (school-based involvement) or outside of school (home-based involvement) (e.g. Hoover Dempsey & Sandler, 1997; Walker et al., 2005).

Among the different aspects of parental involvement, *home-based parental involvement* is, however, considered to be the most important aspect that strongly fosters pupils' learning and achievement (Desforges & Abouchaar, 2003; Sacher, 2008). Some empirical support for this statement can be found in PISA 2009, which revealed that "fifteen-year-old students whose parents often read books with them during their first year of primary school show markedly higher scores in PISA 2009 than students whose parents read with them infrequently or not at all" (OECD, 2011, p. 1). However, the present study focuses particularly on the role of home-based parental involvement in pupils' academic lives.

Home-based parental involvement refers to all kinds of non-formal learning and teaching practices in relation to school that take place at home. These include parents' assistance with the child's school-related tasks (e.g. helping with homework, helping prepare for future examinations), how parents respond to their child's academic achievements (e.g. test results), and parent–child communication on school-related issues (e.g. discussing what happened at school as well as problems that may occur at school) (Hoover-Dempsey & Sandler, 2005; Sacher, 2008; Wild & Lorenz, 2010).

When it comes to the child's educational benefits from parental involvement, most empirical research has focused on the links between pupils' school performance and the *quantity* of parental involvement. This means, *how often* do parents become involved in such school-related activities (e.g. Bronstein et al., 2005; Eamon, 2005; Green et al., 2007; Shumow & Lomax, 2002; Shumow & Miller, 2001). However, a greater amount of parental involvement may *not* always be *better* for pupils. Not only may parents become involved in their children's education in various ways, but also children may react to their parents' involvement in different ways. Accordingly, the benefits of parental involvement for the child may *depend on* the way the child interacts with parents (Pomerantz, Moorman, & Litwack, 2007).

In line with this caveat, there has been, however, an increase in the amount of research emphasizing the *quality* of parental involvement: in other words, *how and in which way* parents become involved in their child's schooling in general (e.g. Darling & Steinberg, 1993; Hoover-Dempsey & Sandler, 2005; Pomerantz et al., 2005) and the quality of parental instruction in particular (e.g. Exeler & Wild, 2003; Grolnick, Ryan, & Deci, 1991; Knollmann & Wild, 2007a, 2007b; Lorenz & Wild, 2007; Wild & Remy, 2002).

In this context, the quality of parental involvement has been operationalized by using *self-determination theory* (SDT), an approach to human motivation and well-being. This theoretical approach proposes that *support from parents* may be functional to the extent that it fulfils *three basic needs* of their children: the *needs for autonomy*, *relatedness*, and *competence* (Grolnick, 2009). When basic needs are satisfied, children may internalize such uninteresting *but socially prescribed* activities as completing homework into personally important behaviours. This internalization process, in turn, nurtures children's performance, psychological health, and well-being (see, for more information, Deci & Ryan, 2000).

By applying SDT to research on parental involvement in education, the *quality* of home-based parental involvement can be operationally characterized by four dimensions of *parental instruction*. These dimensions are (a) *autonomy-support* (e.g. encouraging the child's self-initiated action, providing rationales),

(b) *responsiveness* or involvement (e.g., taking the child's perspectives, dedicating resources and time), (c) *structure* (e.g. providing clear expectations and rules), and (d) *control* (e.g. pressurizing the child to behave in particular ways) (see, for reviews, Grolnick, Ryan, & Deci, 1991; Grolnick & Slowiaczek, 1994; Gurland & Grolnick, 2005; Lorenz & Wild, 2007).

The consequences of the quality of parental instruction (e.g. more autonomy-support or more control) seem to contribute to differences in pupils' optimal functioning and well-being in learning contexts (Zhou, Ma, & Deci, 2009). Empirical results support the core hypothesis of SDT that parents' provision of autonomy-support and responsiveness increase the extent to which the child's regulation of his/her learning behaviours is autonomous rather than controlled (e.g. Exeler & Wild, 2003; Grolnick & Ryan, 1989; Grolnick, Ryan, & Deci, 1991; Lorenz & Wild, 2007; Soenens & Vansteenskiste, 2005).

However, the findings from a meta-analysis by Reeve (2009) have indicated that autonomy-support in the teaching context impacts on six categories of a pupil's academic outcomes, namely motivation (e.g. intrinsic motivation, competence), engagement, development (e.g. self-esteem, preference for optimal challenge), learning (e.g. conceptual understanding, learning strategies), performance (e.g. grades, task performance), and well-being (e.g. psychological well-being, school/life satisfaction).

With respect to these categories of pupils' outcomes, the majority of research has highlighted the role of autonomy-support in pupils' autonomous motivation (as the central hypothesis of SDT) and school performance. In contrast, much less research has paid attention to how the provision of autonomy-support impacts on pupils' development of other proximal outcomes as measured in terms of *well-being* and *learning strategies*.

According to the *two unemphasized outcomes* mentioned above, a further review has shown that some previous studies have examined the relationships between parental autonomy-support and general well-being. The term general well-being has been defined typically in terms of positive affect (and absence of negative affect), life satisfaction, vitality, and so forth (e.g. Chirkov & Ryan, 2001; Niemiec et al. 2006). Yet, only a few studies have focused on *child well-being in academic settings*; in other words, on pupils' evaluations of their psychological characteristics relevant to schooling issues such as the emotional states they experience in learning situations (e.g. Knollmann & Wild, 2007a; 2007b; Pekrun, Goetz, Titz, & Perry, 2002) or their satisfaction with school (e.g. Baker et al., 1993; Huebner, 1994). The linkages between the quality of parental instruction and their children's well-being in their academic lives are still unclear. Thus, a further investigation of these linkages is needed.

Self-regulated learning is a requirement for effective learning (Zimmerman, 1989a). As for the role of autonomy-support in pupils' learning strategies use, past research has typically tested how parents' autonomy-support relates to broadly emphasized aspects of learning strategies, that is, to the regulation of cognition and metacognition (e.g. Vansteenskiste, Zhou, Lens, & Soenens, 2005).

To date, there is a lack of empirical evidence indicating whether and how parents' provision of autonomy-support is associated with unemphasized aspects of learning strategies such as the regulation of academic motivation (e.g. Schwinger, Steinmayr, & Spinath, 2009; Wolters, 2003) and the regulation of academic emotion (e.g. Knollmann & Wild, 2007b).

The quality of parental instruction provided to pupils in a more authoritarian setting (i.e. high control and structure) has been found to result in negative outcomes. For instance, when parental involvement becomes controlling, their children are more likely to experience negative learning moods such as feeling angry or bored (e.g. Glaeser-Zirkuda & Fuss, 2004; Knollmann & Wild, 2007a) and even tend to avoid completing their assignments (Flett et al., 1995; Vahedi, Mostafafi, & Mortazanajad, 2009). However, prior research has not taken these negative outcomes into account.

Although the differences in the quality of home-based parental involvement may contribute to either an enhancement or a discouragement of pupils' learning outcomes, *little is known* about the factors that influence or motivate the parents' decision to adopt different dimensions of home-based instruction. The present study differentiated between *protective factors* that encourage parents to become more authoritative (i.e. highly autonomy-supportive and responsive) in their involvement and *risk factors* that encourage their authoritarian conceptions of instruction (i.e. highly controlling and structured).

Prior studies have found that the quality of parental instruction can be altered through parent training programmes designed to improve parental attitudes and skills (e.g. Wild & Gerber, 2009; Wittler, 2009). Therefore, it is assumed that the expected findings on this research aspect may contribute to interventions aimed at enhancing the quality of parental instruction.

To theoretically explore factors that may contribute to the quality of parental instruction, the theoretical model of the *parental involvement process* proposed by Hoover-Dempsey and Sandler (1995, 1997) was taken into account. This theoretical concept addresses three main questions: (a) Why do parents become involved in their children's education? (b) What forms does their involvement take? (c) How does parental involvement influences pupils' learning attributes and achievement?

Utilizing the Hoover-Dempsey and Sandler's model to find out, what factors would presumably predict the quality of home-based parental involvement, the present study focused on the first question. The model proposes that parents become involved in their children's education due to three key predictor constructs:

- *Motivational beliefs.* These include two types of belief: (a) parents' beliefs about what they should do in the context of the child's education (*parental role construction*) and (b) parents' beliefs about how much they can improve their child's outcomes (*parental self-efficacy for helping the child succeed in school*).
- *Perceived specific invitations to involvement.* These include two sources of invitations: (a) *invitations from the child* and (b) *invitations from the teacher and the school.* Both types of invitation are concerned with parents' perceptions that their involvement is sought, welcomed, and valued by the child, the child's teacher, and the child's school.
- *Life context.* This refers to the contexts that allow or encourage involvement, including *parents' knowledge and skills* for involvement as well as *time and energy* for involvement.

Empirical findings from past research using the Hoover-Dempsey and Sandler's model have indicated that in older pupils, the significant predictor constructs were more likely to predict the amount of home-based parental involvement rather than school-based involvement (Green et al., 2007). To extend the Hoover-Dempsey and Sandler's model, the present study assumed that *variations* in the model's predictor constructs may also contribute to a promising explanation of the differences in the quality of home-based parental involvement.

Prior research has indicated that parents becoming engaged in learning situations may utilize different instructional strategies due to variations in their *role conceptions*, as guided by two distinct goals—learning versus achievement. Renshaw and Gardner (1998) found that *process-oriented parents* who interpreted their child's learning task as having a *learning goal* were *less directive*. In contrast, *product-oriented parents* who interpreted a learning task as having an *achievement goal* were *more directive and controlling*.

In addition, earlier empirical research has confirmed that the quantity and quality of parental involvement may differ according to family socio-economic status (e.g. Chen & Berdan, 2006; Heymann & Earle, 2000; Hoff-Ginsberg & Tardif, 1995; Lee & Bown, 2006; Wild & Gerber, 2007). In the present research, I was interested in the impact of family SES on the quality of parental instruction, because the expected findings on this aspect may contribute to a better understanding of pupils' unequal opportunities to learn at home that, in turn, *discourage* or *encourage* them to perform better in school. Hence, family SES was taken into consideration as a *control variable.*

The current research was conducted within the framework of SDT and is concerned with the operationalization of the multidimensional conceptions of parental instruction. However, there has been an increasing awareness that many theoretical concepts and approaches conducted in the sense of *individualistic western psychology* may not be applicable within other cultures (Chirkov & Ryan, 2001). Therefore, it would be worth gaining a deeper insight into the process of home-based parental involvement between cultural settings in more depth. The current research used two distinct settings: Germany and Thailand. The former has been viewed as a *more individualistic* culture, whereas the latter has been viewed as being *more collectivistic* (Gouveia & Ros, 2000; Guess, 2004; Hofstede 2001, as cited in Burn & Thongprasert, 2005). This is the first cross-cultural comparison of this aspect of research in both countries.

To summarize, it may be assumed that parents adopt different instructional strategies (e.g. more highly autonomy-supportive or more controlling) due to *variations* in their attitudes and motivational beliefs, interpersonal conditions, and socio-familial contexts. As a consequence, pupils may also differ in their learning motivation, well-being, and self-regulated competencies.

To date, there is still a lack of empirical data on the *complex linkages* between antecedents of the quality of home-based parental involvement and its consequences. Therefore, this study empirically examines these linkages in more depth. It also takes the role of culture in moderating these linkages into consideration.

1.2. Research Aims

The aims of the present study were:

1] To develop and empirically validate the conceptual model for describing the linkages between antecedents of the quality of home-based parental involvement and its effects on pupils' learning motivation, academic well-being, and academic self-regulation competencies.

2] To test the invariance of the conceptual model across two distinct cultural settings—Germany and Thailand—representing *individualistic* versus *collectivistic* cultures.

1.3. Research Questions

Three research questions were addressed in this research. There were:

1] What are the significant predictors of the quality of home-based parental involvement in German and Thai family contexts?

2] How does the quality of home-based parental involvement influence pupils' academic functioning as measured in terms of learning motivation, academic well-being, and academic self-regulation competencies in German and Thai family contexts?

3] Does culture moderate at least some linkages between antecedents and impacts of the quality of home-based parental involvement?

1.4. Research Scope

1] In the present study, the term "*parents*" refers to biological parents (father and mother), adoptive parents, step-parents, and primary caregivers (e.g. grandparents, relatives) who live together with the pupils and who play the most important role in home-based parental involvement. Each parent was asked to provide information about his/her attitudes, motivational beliefs, interpersonal conditions, and family background relevant to his/her child's education. Each pupil provided the information about his/her perceptions on the quality of parental instruction and self-reports of his/her academic functioning. Therefore, in a unit of analysis, a participant refers to a *parent–child dyad*.

2] Previous studies have found that the amount of parental involvement *decreases* in higher grade levels as children grow older (e.g. Eccles & Harold, 1996; Green et al., 2007; Grolnick & Slowiaczek, 1994). There are different possible explanations for this. For instance, older pupils are more likely to take personal responsibility for their homework. Therefore, these pupils may need less support from their parents or gain more support from another kind of homework assistance (Wild & Yotyodying, 2012). Accordingly, the current research underlined home-based parental involvement for pupils at earlier ages, that is, those attending primary schools and/or lower secondary schools in particular.

3] Home-based parental involvement in the *specific domain of mathematics* was taken into account for several reasons. For instance, mathematics is regarded as an essential tool for the foundation of education (Asiedu-Addo & Yidana, 2004). Mathematics is considered to be one of main school subjects in almost every country because of its central status in the school curriculum (Quadling, 1982).

1.5. Expected Contributions

Overall, the present study was expected to make the following contributions:

1] It should deliver empirical findings on cultural differences in the complex linkages between antecedents of the quality of home-based parental involvement and its effects on a variety of aspects of pupils' academic functioning that have not yet been investigated clearly.

2] The anticipated empirical findings will be used for two purposes: (a) to offer constructive information to teachers, educational scientists, and policymakers in Germany and Thailand; and (b) to create effective parent training interventions designed to improve the quality of home-based involvement.

Chapter II
Literature Review

This chapter addresses the theoretical conceptions and related empirical findings underlying the current study. The *first section* (2.1) presents Hoover-Dempsey and Sandler's theoretical model of the parental involvement process in order to determine which factors presumably predict the quality of home-based parental involvement. The *second section* (2.2) concerns how the quality of home-based parental involvement is defined and measured from the perspective of self-determination theory (SDT). The *third section* (2.3) clarifies the linkage between parental role conceptions in the learning situation and the quality of parental involvement. The *fourth section* (2.4) discusses how family SES is associated with the quality of parental involvement. The *fifth section* (2.5) reviews consequences of the quality of home-based parental involvement, and the *sixth section* (2.6) examines the role of culture in parental involvement. On the basis of this literature review, the *last section* (2.7) presents the conceptual model and research hypotheses.

2.1. Why Do Parents Become Engaged in Their Child's Education: A Review on the Theoretical Model of Parental Involvement Process by Hoover-Dempsey and Sandler

Hoover-Dempsey and Sandler (1995, 1997) proposed a theoretical model describing the full dynamic of the parental involvement process. The model takes a psychological perspective to answer three main questions: (a) Why do parents become engaged in their child's education? (b) What forms of involvement are taken? (c) How does parental involvement influence the child's academic outcomes?

Hoover-Dempsey and Sandler's original model proposed that the process of parental involvement can be described by five sequential levels: (a) the parental involvement decision, (b) the parents' choice of involvement forms, (c) the mechanisms through which parental involvement influences pupils' outcomes, (d) mediating variables, and (e) the pupils' outcomes.

Some preliminary empirical findings led to revisions to this model (see Hoover-Dempsey & Sandler, 2005, for more detail). The present study is based on the *revised model* (see Figure 2.1) containing the following five sequential levels:

- *The first level* marking the beginning of the process identifies three important constructs as contributors to the parents' decision to become involved in their child's education. These are the parents' motivational beliefs, perceived invitations to involvement, and perceived life context.
- *The second level* focuses on the involvement behaviours of parents. Parental involvement behaviours can be defined by *two forms of involvement*: home-based and school-based involvement; and by *four types of involvement mechanism*: parents' encouragement, modelling, reinforcement, and instruction.
- *The third level* focuses on children's perceptions of their parents' involvement in terms of the four types of involvement mechanism.
- *The fourth level* focuses on a set of children's attributes that lead to school achievement, namely, academic self-efficacy, intrinsic motivation, self-regulatory strategy use, and social self-efficacy for relating to teachers.
- *The fifth level* focuses on pupils' achievement as the end of the process.

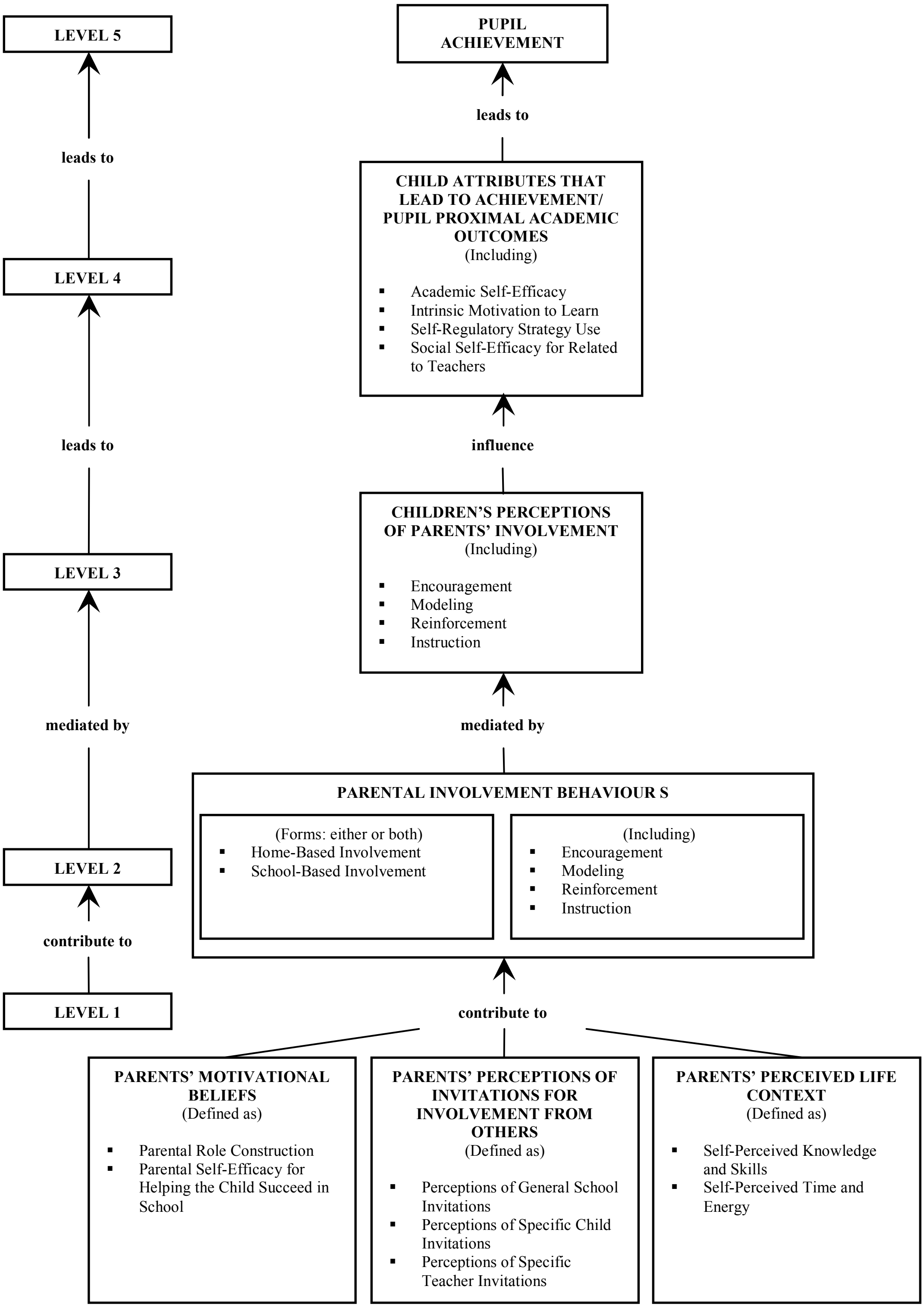

Figure 2.1.
The Revised Version of Hoover-Dempsey and Sandler's Model of the Parental Involvement Process (adapted from Hoover-Dempsey & Sandler, 2005, p. 74, Figure 2).

This revised model was applied to ascertain which factors might predict the quality of home-based parental involvement by focusing on the first main question "*Why do parents become engaged in their child's education*"? The revised model proposes that parents *become involved* on the basis of *three key predictor dimensions*, namely, parents' motivational beliefs, parents' perceived specific invitations to involvement in the child's education, and parental life context. These are discussed in detail in the following.

Motivational Beliefs

Motivational beliefs are reflected by parental role construction and parental self-efficacy for helping the child succeed in school.

Parental role construction. The early work of Hoover-Dempsey and her colleagues (see Hoover-Dempsey, Wilkins, Sandler, & O'Connor, 2004, for greater detail) proposed that parental role construction can be operationally characterized by three major patterns that explain "who should be primarily responsible for the child's school success"; in other words, parents' beliefs about who should take responsibility for their child' education. The scales assessing each pattern of role construction contain two types of item—belief items and behaviour items. Scales assessing the following three patterns were tested on parents of 877 6th-grade public school pupils (see also Hoover-Dempsey & Sandler, 2005):

- *Parent-focused construction* refers to parental beliefs and behaviours suggesting that parents alone should be responsible for their child's school success (8 items; e.g. belief item: "It's my job to explain tough assignments to my child"; behaviour item: "It's my job to make sure my child understands his or her assignments"; alpha = .62).
- *Partnership-focused role construction* refers to parental beliefs and behaviours suggesting that parents and school together should be responsible for the child's school success (7 items; e.g. "I like to spend time at my child's school when I can", "I exchanged phone calls or notes with my child's teacher", alpha = .72).
- *School-focused role construction* refers to parental beliefs and behaviours suggesting that school alone should be responsible for the child's academic success (7 items; e.g. "I assume my child is doing all

right when I don't hear anything from the school, "I expect the school to notify me if my child has had a problem", alpha = .63).

According to the three patterns of role construction mentioned above, parent-focused and partnership-focused role constructions indicate that parents are active in their roles, whereas school-focused role construction indicates that parents are much more passive. The measure of role construction was subsequently modified by focusing particularly on active role beliefs. The active role beliefs scale consisted of 10 items (alpha = .80). This scale was tested on 358 fourth- and 6th-graders. Parents were asked to report the degree to which they believe they are responsible for 10 statements (e.g. "to volunteer at the school", "to communicate with my child's teacher regularly"). The higher the scores on these statements, the more parents are actively responsible for the child's education (see Hoover-Dempsey & Sandler, 2005).

To identify whether parents are *active* and *passive* in their role constructions, the scale of *valence towards school* was also developed (see Hoover-Dempsey & Sandler, 2005). This scale measures the extent to which parents' attraction or general disposition towards school relates to their prior personal experiences with schools. The 6-item scale was tested on the same group of pupils who had completed the role active beliefs scale. The scale response was on a continuum between two poles marking negative experience and positive experience. Sample items are " I disliked versus liked my school", "My teachers were mean versus nice" (alpha .84).

Parental self-efficacy for helping the child succeed in school refers to the extent to which parents believe that their involvement will make a difference for the child—in other words, parents' beliefs in their own competencies to help the child succeed in learning. The present study focused on the original scale as reported in Hoover-Dempsey, Bassler, and Brissie (1992). This 12-item scale (alpha = .81) was given to 390 parents of 4th-grade pupils. Sample items are "I know how to help my child do well in school" and "I feel successful about my efforts to help my child learn".

Parents' Perceived Specific Invitations to Involvement in the Child's Education

Parents' perceptions of invitations to involvement include three patterns of perceptions—general invitation from school, specific invitation from the teacher, and specific invitation from the child. The development of these three subscales is reported in Hoover-Dempsey and Sandler (2005) and Walker et al. (2005). The subscales were given to 495 parents of 1st- to 6th-grade pupils. More information on each subscale is given below:

- *General invitation from the school* refers to the extent to which parents perceive that school staff and school surroundings make the parents feel welcomed and crucial in supporting the child's education. This subscale consists of 6 items (alpha = .88). Sample items are "I feel welcome at this school", and "Teachers at this school are interested and cooperative when they discuss my child with me".
- *Specific invitation from the teacher* refers to the extent to which parents perceive that the teacher directly requests them to become involved in their child's education. This subscale consists of 6 items (alpha = .81). Sample items are "My child's teacher asked me or expected me to help my child with homework", and "My child's teacher asked me to talk with my child about school day".
- *Specific invitation from the child* refers to the extent to which parents perceive that their child directly requests them to become involved in his or her education. This subscale consists of 6 items (alpha = .70). Sample items are "My child asked me to help explain something about his or her homework", and "My child talked with me about the school day".

Parental Life Context

Life context is concerned with the parents' personal conditions that allow them to become involved in their children's education, including parents' perceived knowledge and skills as well as the available time and energy for involvement (see Hoover-Dempsey & Sandler, 2005; Walker et al., 2005, for greater detail on the scale development). Overall, two subscales measuring parental life contexts were tested on 495 parents of 1st- to 6th-grade pupils. Greater detail of each subscale is as follows:

- *Parents' self-perceived knowledge and skills* for involvement refers to the extent to which parents perceive their personal skills and knowledge when it comes to engagement in their child's education (9 items, alpha = .83). Sample items are "I know about volunteering opportunities at my child's school", and "I know how to explain things to my child about his or her homework".
- *Parents' self-perceived time and energy* for involvement refers to the extent to which parents perceive the availability of time and energy for possible involvement (6 items, alpha = .84). Sample items are "I have enough time and energy to communicate effectively with my child about the school day", and "I have enough time and energy to help out at my child's school".

Previous Empirical Findings on the Hoover-Dempsey and Sandler's Model

Since Hoover-Dempsey and Sandler proposed their model, numerous studies have tested it empirically. Some specific empirical results on the relative contributions of the psychological constructs (i.e. motivational beliefs, specific invitations, life context) hypothesized to predict parental involvement behaviours are shown in the following.

Hoover-Dempsey and Sandler (2005) conducted a series of four studies to test the parental involvement process model empirically. Study 1 tested the effects of three predictor constructs (i.e. parental role construction, parental self-efficacy, parents' perceived general invitations to involvement from the school and from the child) on the parents' decision to become involved in their children's education at home and in school. Participants were 877 parents of 6th graders. Findings revealed that parental role construction was the strongest predictor of the total amount (quantity) of parental involvement (combining home-based and school-based involvement together). Among three patterns of parental role construction, the strongest predictor was partnership-focused role construction, followed by school-focused role construction, and parent-focused role construction, respectively. A separate examination of parents' reports on home-based and school-based involvement revealed that school-based involvement was predicted significantly by partnership-focused role construction and school-focused role construction. On the other hand, home-based involvement was predicted significantly by partnership-focused role construction, school-focused role construction, and parental self-efficacy.

Green et al. (2007) tested the revised version of the Hoover-Dempsey and Sandler's model empirically by focusing on the linkages between Level 1 (predictor constructs) and Level 2 (parents' reports on school-based vs. home-based involvement practices). Their sample consisted of 853 parents of school-age children in elementary and middle schools (1st through 6th grade). Hierarchical multiple regressions were performed. Overall, the findings revealed that parental self-efficacy, child invitations, and parents' availability of time and energy were significant predictors of parents' reports on both home-based and school-based involvement. In contrast, parental role activity beliefs and teacher invitations contributed only to school-based involvement. The predictor constructs accounted for a greater variance in school-based involvement compared to home-based involvement. The contributions of these predictor constructs were robust, and even SES (e.g. parents' income, parental education) was controlled in the analysis. When taking the differences by school type into account, it was found that model constructs accounted for a greater amount of the variance in school-based involvement at elementary school level (Grades 1–4). In contrast, model constructs of middle school group (Grades 5–6) accounted for a greater amount of variance in home-based involvement.

Applying Hoover-Dempsey and Sandler's Model to the Present Study

In light of the above-mentioned empirical findings, it could be assumed that parents' predictor constructs are more likely to predict home-based involvement than school-based involvement at higher grade levels. Applying these findings to support the conceptualization of the present research framework led to the adjustment of the following four main points in the model.

The first point: The present study relied on the predictor construct of parental role construction. Nevertheless, it focused on the original measure of role construction by assessing three patterns of role construction (i.e. parent-focused, partnership-focused, and school-focused) separately. This construct was assessed by combining parent-focused and partnership-focused role constructions together as a measure of *active role construction*, whereas school-focused role construction was used only as a measure of *passive role construction*. Apart from this, the

Hoover-Dempsey and Sandler's model defines the construct of role construction mainly in terms of *responsibility for the child's education*. To address this terminology directly, parental role construction was renamed as *parental conceptions of responsibility*.

The second point: The present study included the predictor construct of parental (teaching) efficacy beliefs. It distinguished between parental efficacy beliefs in the *general domain* and in the *specific domain*. The latter was operationalized by using *the German Parental Self Efficacy in Mathematics Homework Supervision Questionnaire* (Fragebogen zum elterlichen Kompetenzerleben bezüglich der Hausaufgabenbetreuung)[1] developed by Wild et al. (2001). The current study focused particularly on the mathematic domain because it is one of the main school subjects.

The third point: The present study took into account the predictor construct of parents' perceived invitations for involvement. Originally, this construct included three patterns of perceived invitations (i.e. general invitation from the school, specific teacher invitation, and specific child invitation). However, results of previous research indicated that the specific invitation from school *is not a significant predictor* of parental involvement (Green et al., 2007). Therefore, the two patterns of perceived invitations from the school and the teacher were combined.

The fourth point: The present study mainly considered *parents' self-perceived time and energy* under the predictor construct of parental life context. Otherwise, it did not take *parents' self-perceived knowledge and skills* into account. According to Green et al. (2007), parental knowledge and skills was not a significant predictor of the two types of parental involvement. However, the present study included the construct of *valence towards school* that was not included as a predictor in Hoover-Dempsey and Sandler's original model. This construct was actually used to identify the categories of parental role construction by active or passive beliefs (as mentioned above). Taylor et al. (2004) pointed out that parents' own school experiences may influence parental behaviours relevant to the child's education. For instance, parents whose school experiences

[1]This scale was used in the Bielefeld longitudinal study. It consists of 4 items (no report for internal consistency). Sample items are "I feel that I am competent enough to help my child with his/her mathematics homework" and "I think I have enough educational skills to help my child with his/her homework".

were warm and supportive may view their child's school as a positive place. In contrast, parents who experienced their own schools as hostile or rejecting may frame their child's school as a negative place. Therefore, the present study included valence towards school as one of antecedent factors in parental life contexts.

Short Summary

An overview of the revised model by Hoover-Dempsey and Sandler explains the process of parental involvement in more depth. However, the model rather focuses on the amount of parental involvement and other kinds of involvement that do not refer to differences in the quality of parental involvement (Level 2 and Level 3). Therefore, to extend the implementation of Hoover-Dempsey and Sandler's model, the present study assumed that predictor constructs (as proposed in this model) would also contribute to differences in the quality of home-based parental involvement. However, in the next section, the operationalization of the quality of home-based parental involvement needs to be clarified on the basis of theoretical conceptions in more depth.

2.2. The Quality of Home-Based Parental Involvement From the Perspective of Self-Determination Theory

In the present study, the operationalization of the quality of home-based parental involvement was strongly inspired by *self-determination theory* (SDT), an approach to human motivation and well-being developed by Edward L. Deci and Richard M. Ryan. SDT suggests that when people are self-determined (intrinsically motivated), they become involved in such activities as parental involvement because they feel that they are interesting, challenging, and satisfying. However, people who are extrinsically motivated to do such things (e.g. expecting to get rewards, avoiding feeling guilty) can also become self-determined through the processes of *internalization* and *integration* (see Deci & Ryan, 2000; Deci, Ryan, & Williams, 1996, for an overview). Internalization is a proactive process through which an individual transforms regulation by external contingencies into regulation by internal processes (Schafer, 1968, as cited in Deci, Ryan, & Williams, 1996). When external contingencies are internalized and, in turn, assimilated to individual's self, then the integration is completed (Ryan, 1993, as cited in Deci, Ryan, & Williams, 1996).

In line with SDT, it is proposed that individuals have *three basic needs*, namely: need for autonomy, competence, and relatedness. Niemiec and his colleagues defined the three needs as follows:

> "*The need for autonomy* is conceptualized in terms of experiencing a sense of choice, endorsement, and volition with respect to initiating, maintaining, and terminating behavioural engagement. *The need for competence* concerns the feeling of effectiveness in interacting with the social or physical world. *The need for relatedness* refers to the warmth and caring received from interactions with others, resulting in a general sense of belonging". (Niemiec et al., 2006, p. 763)

The central hypothesis of SDT highlights the role of *social contexts*, (e.g. socializing agents such as parents and teachers) in satisfying individual's basic needs. This is critical for the facilitation of individuals' intrinsic motivation and the internalization of extrinsically motivated (uninteresting) behaviours. In other words, when basic needs are satisfied, individuals may internalize uninteresting but socially prescribed activities (e.g. children need to complete homework assignments) into personally important behaviours. This internalization process, in turn, nurtures an individual's performance, psychological health, and well-being (Deci & Ryan, 2000).

To dig deeper into human motivation (see Deci, Ryan, & Williams, 1996, for greater detail), SDT differentiates between human behaviours that are guided by intrinsic motivation and extrinsic motivation. Behaviours guided by intrinsic motivation (intrinsic regulation) represent the prototype of *self-determination or autonomy*. That is, when people are intrinsically motivated, they are fully autonomous and experience a sense of volition in their behaviour. In contrast, extrinsically motivated behaviour is more controlled (less autonomous). In SDT, extrinsic motivation can be distinguished by the following four types of extrinsically behavioural regulation:

- *External regulation*, the *very low* degree of self-regulation, represents a behaviour that is controlled by demands or external contingencies of the person (e.g. doing such things to receive a reward or avoid punishment).

- *Introjected regulation*, the *moderately low* degree of self-regulation, represents a behaviour that is controlled by demands or contingencies inside the person such as guilt or threats to self-esteem (e.g. doing such things to avoid feeling guilty or to feel proud of oneself).
- *Identified regulation*, the *moderately high* degree of self-regulation, represents a behaviour that is chosen because the person identifies with the importance of the activity.
- *Integrated regulation*, the very high degree of self-regulation, represents a behaviour that is experienced as "fully free" because the regulation has been integrated into the person's sense of self.

Intrinsic regulation and four types of extrinsically behavioural regulation are located along a continuum (see Figure 2.2) on which an individual's behavioural regulation is *less* (on the left-hand side) or *more* fully *internalized* (how much the value has been taken in) to the sense of self. This means, the more an individual internalizes a behavioural regulation, the more that individual experiences a sense of self-determination (autonomy); in other words, the more a behavioural regulation is placed (or integrated) closer to the self. Ultimately, an individual may experience a true sense of volition and willingness (Deci, Ryan, & Williams, 1996; Ryan, Connell, & Deci, 1985).

THE SELF-DETERMINATION CONTINUMM
Levels of Individual's Self-Determination in Behaviour al Regulation

Type of Motivation	EXTRINSIC MOTIVATION				INTRINSIC MOTIVATION
Type of Regulation	External Regulation	Introjected Regulation	Identified Regulation	Integrated Regulation	Intrinsic Regulation
Level of Self-Determination	Very Low	Moderately Low	Moderately High	Very High	Self-Determined

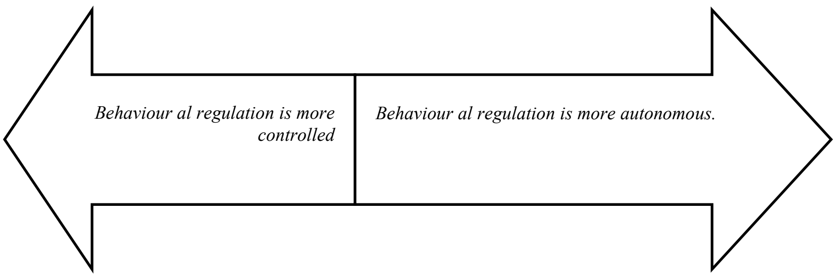

Figure 2.2.
The Self-Determination Continuum (adapted from Deci & Ryan, 2000, p. 237).

2.2.1. Multidimensional Conceptions of Parental Instruction

When applying SDT to educational settings, the concern is how to foster children's interest in learning, in the value of education, and in the development of their own competencies (Deci et al., 1991). Therefore, when it comes to parental involvement in the child's education, the basic concern is with the role of support from parents *as important socializing agents* in fostering self-determination in the learning and school success of their children. In the literature, it has been assumed that *the quality of parental support* in relation to school-related activities (e.g. how parents help their children with homework) may be functional (i.e. be able to enhance school motivation) to the extent that the three basic needs of their children for autonomy, competence, and relatedness are fulfilled (Grolnick, 2006).

From the perspective of SDT, the *quality* of home-based parental involvement can be characterized operationally by *four dimensions* of parental instruction, that is, *autonomy-support, responsiveness, structure,* and *control* (see Grolnick, 2009; Grolnick, Ryan, & Deci, 1991; Grolnick & Slowiaczek, 1994; Gurland & Grolnick, 2005; Lorenz & Wild, 2007, for reviews). Synthesizing the above-mentioned reviews, four parents' dimensions can be defined as follows:

- The first dimension, *autonomy-support*, refers to parents' encouragement of the child's self-initiated expression and action, provision of opportunities to make choices, and acknowledgement of the child's feelings and ideas.
- The second dimension, *responsiveness* (or involvement), refers to parents' readiness to take the child's perspectives, acknowledgement of the child's feelings, dedication of resources and time, interest in the child's behaviours, provision of consolation, and encouragement of continuous self-regulation in failure situations.
- The third dimension, *structure*, refers to how parents guide their child's life by providing clear and consistent guidelines as well as expectations and rules.
- The fourth dimension, *control*, refers to parents' attempts to change the child by pressuring him/her to do, think, feel, or behave in particular ways.

From a theoretical point of view, the context of home-based parental involvement in which parents provide support to the child in the form of self-initiated task solving, give the child an opportunity to make choices, and take into account the child's perspective should therefore help to satisfy the child's *need for autonomy*. The context of home-based parental involvement in which parents provide the child with warmth, emotional support, and resources, should therefore help to satisfy the child's *need for relatedness*. The context of home-based parental involvement in which parents provide clear expectations and rules, should help to satisfy the child's *need for competence*, because expectations and rules would enable the child to understand how to perform better in school. As an opposite of autonomy-support, the context of home-based parental involvement in which parents pressure their child's thoughts, feelings, and behaviour would rather undermine the child's feeling of autonomous well-being and also produce non-optimal forms of internalization and poorer performance (Deci et al., 1991; Grolnick, 2009; Grolnick & Ryan, 1989; Ryan, Deci, Grolnick, & La Guardia, 2006).

The most frequently discussed dimension of parental instruction is the role of parents' provision of *structure* in the child's learning situations. In the literature, it has been noted that children's self-regulation is not necessarily fostered by parents providing structure, even though a high level of structure might either encourage or diminish children's autonomy (Grolnick & Ryan, 1989). In addition, children may occasionally perceive the high level of parental provision of structure as *parental control*, for instance, when children do not agree with their parents' expectations and rules. Nevertheless, this depends on the child's ability to distinguish the difference between these two dimensions (Lorenz & Wild, 2007).

Up to this point, it can be assumed that parents' use of the structure strategy may enhance children's experience of competence only when it is provided to older children and at an *optimal level* (e.g. not too much or not too little). Children in higher grade levels appear to perceive a *high degree* of parents' structure as *controlling* due to their increasing need for *autonomy*. This means that older children may acquire abilities to make more appropriate choices in their learning by themselves over time (Sheldon, Houser-Marko, & Kasser, 2006). Therefore, older children may *not always* agree with the expectations and rules imposed by their parents in line with their home-based parental involvement (Lorenz & Wild, 2007).

2.2.2. Measuring Multidimensional Conceptions of Parental Instruction

An early product of work on the measurement of the SDT-based parental support dimensions is *the Children's Perceptions of Parents Scale* (POPS) developed by Grolnick, Ryan, and Deci (1991). This scale was designed for use with primary school pupils. It assesses the extent to which pupils perceive their parents (both mothers and fathers) as being autonomy-supportive and responsive in *general domains*. To complete the POPS, pupils are first asked to think about their mothers as well as their fathers. Afterwards, they should compare their mothers (or fathers) with descriptions of four types of parents of other people. Then, they have to select the one out of four choices that fits their parents best. Sample items include: autonomy-support (12 items; e.g. "Some mothers/fathers *always explain* to their children about the way they should behave", "Some mothers/fathers *sometimes make* their children behave because they're the boss"); involvement (10 items; e.g. "Some mothers *never have enough time* to talk to their children", "Some mothers/fathers *always have enough time* to talk to their children"). The internal consistencies (alpha) of the subscales were .53 on mothers' autonomy-support; .56 on mother's involvement; .67 on father's autonomy-support; and .64 on fathers' involvement (see Grolnick, Ryan, & Deci, 1991, for more detail on the scale development).

To focus on pupils' perceptions of their parents in home-based involvement in particular, the current research applied *the German Parental Help in Home Learning Questionnaire* (Fragebogen zur elterlichen Hilfe beim häuslichen Lernen) developed by Wild (1999). This questionnaire was designed for use with primary school and lower secondary school pupils. Although partially based on the POPS, the questionnaire also included two further parental help dimensions (control and structure). Moreover, the questionnaire focuses on parental involvement in the *specific domain of mathematics* as one of the major school subjects.

Lorenz and Wild (2007)[2] revised this scale and employed it in a longitudinal analysis that tested the internal consistencies (alpha) of four subscales over time. A total of 200 parent–child dyads from Germany participated annually over 4 years at five measurement times. The analyses of internal consistencies over time was based on three measurement times—the second (4th grade), the third (5th grade), and the fifth (7th grade). Sample items included:

- *Autonomy-support* (5 items; e.g. "When I get a bad grade in math, my parents ask how they can help me", "When I get a bad grade in math, my parents try to find out the reason together with me"; alpha ranged from .63 to .78).
- *Responsiveness* (3 items; e.g. "My parents ask how things were at school", "My parents are interested in what I learn at school"; alpha ranged from .77 to .85).
- *Control* (6 items; e.g. "When I get a bad grade in maths, my parents scold me and request that I study more", "When I get a bad grade in math, my parents give me a hard time"; alpha ranged from .73 to .78).
- *Structure* (5 items; e.g. "When I study for a test in math, I know exactly how much effort my parents expect", "When I take a test result home, I know in advance, whether my parents will be disappointed"; alpha ranged from .57 to .56).

2.3. Parents' Role Conceptions in Learning Situations Associated With the Quality of Home-Based Parental Involvement

The present study distinguished conceptually between *parental role conceptions of responsibility* and *parental conceptions in learning situations*. The former is concerned with parents' beliefs about who (e.g. parents or schools) should take responsibility for the child's school success (Hoover-Dempsey, Wilkins, Sandler, & O' Connor, 2004).

[2] This was part of the research project entitled "Fostering Self-Determined Forms of Learning Motivation at Home and in School, funded by a grant to Elke Wild by the German Research Foundation (WI 1607/1-1, 1-2). Further research in this project referred to in the current research also includes Exeler and Wild (2003), Knollmann and Wild (2007a, 2007b), Wild and Gerber (2009), Wittler (2009).

The latter refers to the extent to which parents *frame* such learning situations as opportunities to either develop the child's *self-regulated learning* or to improve the child's *school achievement.* That is, when parents become involved in the child's education either at home or in school, they may adopt different practices due to variations in their *role conceptions*, as guided by two distinct goal orientations—learning versus performance.

Renshaw and Gardner's (1990) examined the relationships among parental task interpretations and parental teaching strategies (directive versus indirective). Twenty three parent–child dyads participated in this study. First of all, parents were supposed to help their children complete two kinds of matching task. Parents were allowed to help their children when it was necessary. During the tasks, parent–child interactions were videotaped. After finishing the tasks, parents were interviewed about how they interpreted their tasks. In this study, task interpretations were coded by using the distinction between *learning goal* (emphasizing the process of learning) and *achievement goal* (emphasizing the product of learning). Parental teaching strategies were categorized as direct strategies (e.g. parent completing parts of the task, giving verbal directives, pointing to the correct answers) or as indirect strategies (e.g. little or no task completion, questioning, and information-giving. The findings indicated that *process-oriented* parents, who typically interpreted their children's learning assignments as having *learning goals*, were *less directive* in their involvement (e.g. they left the responsibility for completing assignments with their children). In contrast, *product-oriented* parents who typically interpreted learning assignments of their children as having *achievement goals*, were *much more directive* and *controlling* in their involvement (e.g. they took the responsibility for completing assignments away from their children).

Measuring Parental Goal Orientations Towards Learning Versus Achievement

Renshaw and Gardner (1990), did not use measures of parental goal orientations because their study had a qualitative design. Therefore, the current work operationalized parental goal orientations towards learning versus achievement, by drawing on *the German Product and Process Orientation Questionnaire* (Fragebogen zur Produkt-und Prozessorientierung) developed by Wild et al. (2001). These scales were used in the above-mentioned Bielefeld longitudinal study. Their internal consistencies over time were tested at four measurement times (i.e. t2, t3, t4, t5). The scale taps two constructs:

- *Parental goal orientation towards learning* refers to the extent to which parents evaluate their child's educational success by focusing on learning process. The scale contains seven items (alpha ranged from .64 to .76). It begins with the question: "Parents may have different attitudes towards school. What is your attitude towards school?" This is followed by the list of items. Sample items include: "I think it is good when my child tries something out at home that he/she has learned in school", and "I think it is important for my child to ask a question when he/she does not understand something".
- *Parental goal orientation towards achievement* refers to the extent to which parents evaluate their child's educational success by focusing on achievement outcomes. The scale contains seven items (alpha ranged from .55 to .67). The stem question is similar to the process goal orientation scale. Sample items include: "I would be disappointed if my child were to get a bad grade in math" and "I expect good performance from my child, no matter how hard he/she has to work for it".

2.4. Family Socio-Economic Status (SES) Associated With the Quality of Home-Based Parental Involvement

> "Most parents know, instinctively, that spending more time with their children and being actively involved in their education will give their children a good head-start in life. But as many parents have to juggle competing demands at work and at home, there never seems to be enough time. Often, too, parents are reluctant to offer to help their children with school work because they feel they lack some of the skills and that would make a difference to their children's success in school" (OECD, 2011, p. 1).

In line with the statement of OECD written above, some studies have revealed that differences in family SES (e.g. in parental education, parental occupation, or family income) may result in variations of parental involvement. For example, compared to better-off families, poor families may not have the same opportunities for parental participation at school due to inflexible work schedules, lack of child care, and lack of transportation (Heymann & Earle, 2000). Maternal occupation was found to be a good predictor of differences in the quantity and quality of parental help with homework assistance (Wild & Gerber, 2007). Low educated parents may be less able to help their children with homework or to search for available educational resources in their communities (Lee & Bowen, 2006). Furthermore, low SES parents appear to be *authoritarian*, *controlling*, or *restrictive* with their children compared to higher SES parents (Chen & Berdan, 2006; Hoff-Ginsberg & Tardif, 1995).

The present study was interested in the impact of family SES on the quality of home-based parental involvement, because a study on this aspect may contribute to a better understanding of how pupils' unequal opportunities to learn at home *encourage* or *discourage* them to perform better in school.

Therefore, family SES was included as a *control variable.* This means, the study aimed to examine the predictabilities of other predictor constructs relative to the influence of SES. In addition, it recruited equal numbers of research participants from various SES classes, so that the validity of the expected findings would not be restricted to specific SES classes.

Measuring Family SES

In the current research, family SES was assessed in terms of the *social and cultural resources* of families that had been taken to be important SES indicators in the PIRLS Study[3] (see Bellin, Dunge, & Gunzenhauser, 2010, for more detail). This study operationalized social and cultural resources in terms of *the highest level of parents' education* and *home literacy resources* (e.g. number of books in household, number of children's book in household).

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[3] Progress in Reading Literacy Study (visit http://timss.bc.edu/#, for more information)

2.5. Consequences of the Quality of Home-Based Parental Involvement

As mentioned earlier, the present study operationally characterized the quality of home-based parental involvement through four dimensions of parental instruction. Previous research has shown that the quality of parental instruction (e.g. more autonomy-support or control) seems to contribute to differences in pupils' optimal functioning and well-being in learning contexts (e.g. Zhou, Ma, & Deci, 2009).

The SDT literature on academic settings reveals that numerous studies have focused on the role of *teachers' provision of autonomy-support versus control* in pupils' positive academic functioning. To gain an insight into this, Reeve (2009) conducted a meta-analysis 44 empirical studies guided by SDT on pupils' educational benefits from the provision of autonomy-support in the school context. About one-half of these studies (23 of 44) employed a questionnaire research design, whereas another one-half (21 of 44) were experimental. Results showed that all studies yielded similar conclusions that pupils are more likely to benefit from receiving autonomy-support and suffer from provision of control. Overall, there were six categories of pupils' academic outcome as a consequence of teachers' autonomy-support. These six categories are:

1] *Motivation* (e.g. intrinsic motivation, perceived competence, autonomy).

2] *Engagement* (e.g. engagement, positive/negative emotion, class attendance).

3] *Development* (e.g. self-esteem, self-worth, creativity).

4] *Learning* (e.g. conceptual understanding, self-regulated learning strategies).

5] *Performance* (e.g. grades, task performance).

6] *Well-being* (e.g. psychological well-being, life/school satisfaction).

When considering these pupils' outcomes, most research has focused on the linkage between teachers' autonomy-support and *pupils' motivation*, thereby addressing a core hypothesis of SDT. In contrast, much less research has investigated pupils' outcomes in terms of *school well-being* and *self-regulation strategies*.

When applying these findings to the current work, it would seem rational to assume that pupils may also benefit from these outcomes when *their parents* adopt the role of *teacher at home* (e.g. when helping with homework). Therefore, the present study aimed to gain an insight into the relations between the quality of home-based parental involvement and pupils' academic outcomes, as measured particularly in terms of learning motivation, well-being, and self-regulated learning strategies. The following section presents further reviews on these linkages.

2.5.1. Autonomous Versus Controlled Learning Motivation

Autonomous (vs. controlled) learning motivation is a *continuum* describing the extent to which pupils' regulation of their learning behaviours is autonomous (self-determined) versus controlled (non-self-determined) (Deci, Ryan, & Williams, 1996).

Measuring Autonomous (Versus Controlled) Learning Motivation

In the SDT literature, *the Academic Self-Regulation Questionnaire* (ASRQ) has been widely used to measure pupils' self-regulation in the academic domain (see Ryan & Connell, 1989, for greater information). The ASRQ uses four subscales to measure intrinsic motivation and three types of extrinsic regulation (i.e. identified, introjected, external). However, the ASRQ does not measure integrated regulation, because it is designed for use in middle childhood, and integrated regulation is a more developmentally advanced form of self regulation than children would typically display at this age (Deci, Ryan, & Williams, 1996). While completing the questionnaire, pupils are asked about the reasons for doing several academic behaviours (e.g. "Why do you do your homework?" and "Why do you revise your class work?"). Then they are asked to rate the degrees to which possible reasons are *true* or *not true*. The ASRQ was administered to three samples of 3rd- to 6th-grade pupils in the US (N_1 = 112, N_2 = 156, N_3 = 450). The internal consistency of each subscale ranges from .62 to .82. Sample items include:

- *External regulation* (9 items; e.g. "Because I'll get trouble if I don't", "Because that's what I'm supposed to do").
- *Introjected regulation* (9 items; e.g. "Because I'll feel ashamed of myself if it doesn't get done", "Because I'll feel bad about myself if I don't do it").

- *Identified regulation* (7 items; e.g. "Because I want to understand the subject", "Because it is important for me to do my homework).
- *Intrinsic regulation* (7 items; e.g. "Because it's fun", "Because I enjoy doing my homework").

In addition, Ryan and Connell (1989) introduced *the Relative Autonomy Index* (RAI) to combine the subscales of four types of regulation into an overall *autonomy score*: the higher RAI score, the more pupils are autonomous in their self-regulation of learning.

RAI can be obtained by weighting the subscales with respect to the following formula:

RAI = 2 x (average of intrinsic regulation subscale) + (average of identified regulation subscale) – (average of introjected regulation subscale) – 2 x (average of external regulation subscale)

Related Empirical Findings

Previous studies on the relations between the quality of home-based parental involvement and autonomous versus controlled forms of pupils' learning motivation are presented in the following.

Grolnick and Ryan (1989) conducted a survey of 66 children and 114 parents in the US. The study examined the linkages between three dimensions of parent style (i.e. autonomy-support, involvement, structure) and academic self-regulation of their children, as one amongst other child academic outcomes. Three parent styles were assessed by conducting in-depth interviews. It was found that the more parents were autonomy-supportive, the more their children were autonomous in their academic self-regulation. In contrast, no significant linkage was found between parental provision of involvement, provision of structure, and autonomous academic self-regulation.

Grolnick, Ryan, and Deci (1991) conducted a cross-sectional survey of 456 American 3rd- to 6th-grade children. The study examined their self-regulation in the academic domain as a motivational variable amongst other variables mediating children's perceptions of support from their parents and school performance. In this study, the POPS was first used to assess children's perceptions of their parents. Findings revealed that autonomy-support from mothers and fathers as well as paternal involvement (responsiveness) were associated significantly with children's autonomous self-regulation. In turn, children's autonomous self-regulation significantly predicted their school performance.

Soenens and Vansteenskiste (2005) conducted two empirical studies on the impact of three sources of autonomy-support (i.e. teachers, mother, father) on adolescents' outcomes in three life domains (i.e. school, social competence, and job-seeking behaviours) as mediated by self-determination (autonomous self-regulation). Only the first study on the school domain is relevant in the present context. In the first study, participants were 328 Belgian adolescents drawn from secondary schools. Overall, it was found that autonomy-support from both teachers and mother contributed to a good prediction of self-determination in school (e.g. reasons for doing school work) with slightly different probabilities. That is, autonomy-support from teachers yielded a higher path coefficient than maternal autonomy-support. As mediated by pupils' self-determination in school, it was found that maternal autonomy-support showed significant indirect effects on pupils' grade point average and scholastic competence.

Exeler and Wild (2003) analysed longitudinal data from 215 German grammar school pupils. Data were collected at five measurement times (from 3rd to 7th grade). This study examined the causal effects of various kinds of parental teaching strategies on pupils' motivational orientations (i.e. identified regulation, external regulation). To assess pupils' motivation, this study employed a German version of ASRQ (ASRQ-G) adapted by Wild and Krapp (1995). The ASRQ-G consisted of 21 items with alpha reliabilities ranging from .62 to .75. The findings revealed that pupils who reported high degrees of perceived parental autonomy-support and emotional support (responsiveness) in *3rd grade* were more likely to report a high degree of identified motivation in the following years as well. In contrast, the higher pupils' perceived parental provision of achievement-oriented pressure (parental control) in *3rd grade*, the lower the pupils' reports of identified regulation in the following years.

Lorenz and Wild (2007) examined the intercorrelations over time among multi-dimensional conceptions of pupils' perceived parental instructional strategies (i.e. autonomy-support, responsiveness, structure, control) and two types of learning motivation—a more autonomous learning motivation (identified regulation) and a more controlled learning motivation (external regulation). Pupils' motivation was also measured with the ASRQ-G in this study. Findings revealed that pupils' perceived parents' provision of autonomy-support, responsiveness, and structure, *as reported at 4th grade*, correlated significantly positively with pupils' identified learning motivation in the following year (5th grade).

However, pupils' perceived parental autonomy-support and responsiveness, *as reported in 4th grade*, yielded a non-significant correlation with two types of pupils' learning motivation over the following 3 years (*at 7th grade*). Pupils' perceived parental structure and control, *as reported in 4th grade*, correlated with external regulation *in 5th grade* and *7th grade*. Parental control yielded a non-significant correlation with identified learning motivation over three measurement times.

2.5.2. Academic Well-Being

The focus of the present study was on the impact of need support from parents on the child's *subjective well-being*. The concept of *subjective well-being* focuses on *three specific outcomes*, namely, (a) the attainment of positive affect, (b) absence of pain (negative affect), and (c) life satisfaction. Whereas the first two outcomes address emotional aspects, the third refers to a cognitive-judgmental aspect (Diener, 1984).

Measuring Subjective Well-Being

To operationalize subjective well-being, the first two indicators, *occurrence of positive affect* and *absence of negative affect*, have frequently been assessed with *the Positive and Negative Affect Schedule* (PANAS) constructed by Watson, Clark, and Tellegen (1988). The PANAS consists of 20 items—10 items for positive affect and 10 items for negative affect. It has been used to assess positive and negative affect in various time intervals, for instance, right at the moment, today, over the past few days, and so forth. To complete the scale, a person is asked to rate his/her emotional experiences at a *specified time period* in terms of two types of moods, namely: positive moods (e.g. happy, cheerful, joyful) and negative moods (e.g. afraid, sad, guilty). The scale was first administered to a sample of undergraduate students and also to other adult participants. Overall, the internal consistencies of the PANAS reported at different periods ranged from .86 to .90 for positive affect and .84 to .87 for negative affect.

Laurent et al. (1999) developed a much more appropriate version of this scale for use with children (PANAS-C). Twenty items were derived from the PANAS for adults. Overall, the PANAS-C consists of 30 items—15 items for positive affect (e.g. interested, alert, excited) and 15 items for negative affect (e.g. sad, frightened, ashamed). The scale was administered to 100 school-age children from 4th to 8th grade in the US. The internal consistencies of the positive and negative affect subscales were .91 and .88, respectively.

The third indicator, *life satisfaction*, has long been assessed using *the Satisfaction with Life Scale* (SWLS) created by Diener et al. (1985). The SWLS contains five items (alpha = .87). It was first tested on American undergraduate students (*N* = 176). To score on the SWLS, pupils are asked to rate their agreements or disagreements on five statements. Sample items are "In most ways, my life is close to my ideal", "The conditions of my life are excellent").

Related Empirical Findings

Numerous studies guided by SDT have empirically confirmed significant linkages between parents' provision of autonomy-support and responsiveness in the *general life domain* and *subjective well-being indicators* (i.e. life satisfaction, positive/negative affect).

Chirkov and Ryan (2001) performed a cross-cultural comparison between Russia and the US. Their sample consisted of 120 high school pupils from Russia and 116 high school pupils from the US. They examined the correlations between *autonomy-support* from parents and teachers and pupils' *life satisfaction* as one amongst other well-being indicators (i.e. self-actualization, self-esteem, low depression). Results indicated that autonomy-support from parents and teachers yielded positive significant correlations with pupils' life satisfaction and other well-being indicators in both samples. In addition, the analyses validated the structural equation model (SEM) describing the linkages between parents' and teachers' provision of autonomy-support and the latent construct of pupils' well-being. The SEM model showed that autonomy-support from parents was positively associated with most well-being indicators in both samples, with the exception of depression in the US sample. In addition, it was found that parental provision of autonomy-support related more strongly to well-being indicators than autonomy-support provided by teachers.

Niemiec et al. (2006) conducted two empirical studies of the relationships among pupils' perceived need support for autonomy and relatedness from parents (mothers vs. fathers), autonomous self-regulation for academics, and psychological health (well-being vs. ill-being).

- The aim of the first study was to test the impact of need support from mothers and fathers on pupils' well-being (i.e. positive affect, life satisfaction) versus ill-being (i.e. negative affect, depressive symptoms). The sample consisted of 231 American high-school juniors and seniors. Results showed that need support from both mothers and fathers contributed to higher levels of pupils' well-being but lower levels of pupils' ill-being. The relationship between need support from mothers and their pupils' well-being was significantly stronger than the relationship for fathers.
- The aim of the second study was to test the impact of need support from parents (combining both mothers and fathers) on pupils' well-being (perceived vitality, life satisfaction) versus ill-being (externalizing problems, depressive symptoms) as mediated by autonomous self-regulation for academics (autonomous reasons for going on to college). The sample consisted of 201 Belgian pupils in their final year of technical high school who intended to pursue further education. The findings revealed that pupils who perceived their parents as providing more need support were more likely to experience *greater well-being* and *less ill-being*. Need support from parents was a significant predictor of their children's autonomous regulation for going on to college. Pupils' autonomous self-regulation partially mediated the relationship between need support from parents and pupils' well-being. In other words, need support from parents prompted the development of autonomous self-regulation in their adolescents, which in turn supported pupils' well-being.

However, the linkage between parental need support and child well-being is still unclear when it comes to the *academic domain*: in other words, the extent to which pupils positively evaluate their *psychological characteristics* that are relevant to school-related issues such as *school satisfaction* and *positive academic emotions* as well as *absence of negative academic emotions*. Further reviews on the operationalization of both well-being indictors and other related findings are presented below:

School Satisfaction

School satisfaction refers to the "subjective, cognitive appraisal of the perceived quality of school life" (Baker et al., 2003, p. 206). The development of the concept of school satisfaction is theoretically grounded in Huebner's work on children's life satisfaction (Huebner, 1994). This served as the basis for constructing the *Multidimensional Life Satisfaction Scale for Children* (MSLSS) in order to measure children's life satisfaction in five specific areas—family, friends, school, living environment, and self. The MSLSS was validated in the American context with 312 third- to 8th grade children. The subscale focusing on the children's life satisfaction in the area of school includes items measuring their cognitive appraisal of school satisfaction (8 items; e.g. "I look forward to going to school", "I like being in school"; alpha = .78). Pupils have to rate how strongly they agree or disagree with each item.

Even though far less research has studied the role of parental autonomy-support versus control in pupils' school satisfaction, the few available studies have underlined that family contexts play a significant role in children's school satisfaction.

For instance, *parental support*[4] (e.g. "My parents express pride in me", "My parents give me good advice") was found to be strongly associated with school satisfaction in adolescents (De Santis-King, Huebner, Suldo, & Valois, 2006). In this study, parental support was defined similarly to autonomy-support and responsiveness. Furthermore, results showed that the quality of family life, in other words, pupils' satisfaction with their family life (e.g. "I enjoy being at home with my family", "My family gets along well together") also influenced children's satisfaction with school.

[4] Parental support was measured with *the Child and Adolescent Social Support Scale* (CASSS) developed by Malecki and Demaray (2002).

Elmore and Huebner (2010) found that *parent attachment*[5] (e.g. "My mother respects my feelings", "My mom helps me understand myself better") correlated positively with school satisfaction and that this correlation was consistent over time.

Accordingly, it is reasonable to assume that the higher the degree of parental autonomy-support and responsiveness, the higher the degree of school satisfaction.

Positive Versus Negative Academic Emotion

In learning situations occurring either at home or in school, pupils may experience a variety of emotional states such as being afraid of exams, angry with teachers, or disappointed with test results (Knollmann & Wild, 2007b; Pekrun, Goetz, Titz, & Perry, 2002). For this reason, there has been an increase in the amount of research on pupils' experiences of positive and negative emotions in learning contexts. When it comes to the quality of parental instruction at home, past research has assumed that autonomy-support and responsiveness play an important role in encouraging the child's emotional well-being; contrariwise, high degrees of structure and controlling behaviour appear to be linked to negative academic emotions (Glaeser-Zirkuda, & Fuss, 2004; Patrick, Skinner, & Connell, 1993).

To gain a deeper insight into these linkages, the following presents some interesting related findings from a series of studies conducted by Knollmann and Wild .

Knollmann and Wild (2007a) conducted an empirical study exploring whether pupils' motivational orientations (intrinsic vs. extrinsic) moderate the linkages between the quality of parental instruction (autonomy-supportive versus directive and highly structured) and academic emotions (negative vs. positive), when controlling for self-concept. German 6th graders participated in two studies (N_1 = 181, N_2 = 38). In the first study, pupils reported the emotions they would experience from reading two vignettes concerning two opposite types of parental instruction in mathematics homework. After each of 21 homework sessions, pupils reported their motivation orientations, perceived quality of parental support, and emotions. Results showed that extrinsically motivated pupils

[5] Parent attachment was measured with the Inventory of Parent and Peer Attachment (IPPA) developed by Armsden and Greenberg (1987).

reported significantly more anxiety under autonomy-supportive conditions than intrinsically motivated pupils did. In contrast, intrinsically and extrinsically motivated pupils tended to report more boredom when parents appeared to be directive.

Knollmann and Wild (2007b) examined the intercorrelations among three dimensions of parental instruction at home (i.e. autonomy-support, emotional support, and support for competence) and four types of academic emotions (i.e. anger, disappointment, anxiety, and joy). This study did not take into account the moderating effects of motivational orientations. Participants were 181 German pupils. Results indicated that the more parents were autonomy- and emotionally supportive, the more pupils reported intensity of joy. Furthermore, pupils reported a high degree of intensity of anger when they perceived their parents as less autonomy- and competence supportive.

Up to this point, it may be inferred that parents' provisions of autonomy-support and responsiveness not only impact directly on pupils' positive academic emotion, but that these relations are also moderated by pupils' motivation for learning.

2.5.3. Academic Self-Regulation Competencies: Investigating Unemphasized Aspects of Self-Regulated Learning

The concept of academic self-regulation competencies has long been considered as one of the important competencies in pupils' academic functioning. For example, Zimmerman (1989a) has suggested that *effective learning* requires pupils' to be self-regulated in their cognition, motivation, and behaviour in their own learning situations. Pupils' utilizations of self-regulated learning strategies (e.g. metacognition regulation, cognition regulation, motivation regulation) for task attainment are associated positively with their academic achievement (e.g. Wolters, 2003; Zimmermann, 1989b).

The literature on parental involvement documents that parents do play a significant role in their child's use of self-regulatory strategies in learning situations.

Hoover-Dempsey and Sandler (2005) conducted a series of four studies to test the parental involvement process model empirically. One of these studies (Study

3) analysed the bivariate correlations between parent reports on *four types* of involvement mechanisms (i.e. parental encouragement, parental use of modelling, parental reinforcement, parental instruction) and pupils' reports on their proximal academic outcomes (i.e. academic self-efficacy, intrinsic motivation, self-regulatory strategy use, social self-efficacy for relating to teachers). The sample consisted of 421 American parents and their children (elementary and middle school pupils in Grades 4–6). Interestingly, all four types of parental involvement mechanisms yielded the strongest relations to pupils' use of self-regulatory style in learning (e.g. "I go back over things I don't understand") compared to other proximal academic outcomes.

Xu (2008) examined the relationships between the quantity of parental engagement in six school-related activities (i.e. parent-child communication, school involvement, TV rules, homework, education expectations, and extracurricular activities), three types of self-regulated learning (i.e. self-motivation, self-control, and self-reaction), and 5th-grade reading achievement. The analysis was based on the database of the Early Childhood Longitudinal Study, Kindergarten Class of 1998–1999 (ECLS-K), in which approximately 22,000 US kindergarten children participated. Results revealed that the degree to which parents become involved in all school-related activities, with the exception of parent–child communication, yielded significant direct effects on self-regulated learning. Moreover, self-regulated learning, in turn, mediated the relationship between parental involvement and reading achievement.

In the SDT literature, however, much less empirical research has investigated the role of autonomy-support versus control in pupils' self-regulated learning strategies. The relevant findings from SDT research on self-regulated learning are as follows.

Yamauchi, Kumagai, and Kawasaki (1999) examined the relationships between *two types* of self-regulated learning strategies (i.e. cognitive strategy use and self-regulation) and *the quality* of academic motivation in determining the reasons why pupils go to school. The quality of academic motivation included three types of intrinsic motivation (to know, to accomplish things, and to experience stimulation), three types of extrinsic motivation (i.e. identification, introjection, external regulation), and amotivation. Participants were 228 junior high school and 306 senior high school pupils in Japan. Findings revealed significant linkages between self-determined extrinsic motivation and cognitive strategy use (e.g. “When I study for a test, I try to put together the information from class and from the book”). For instance, the more junior high school pupils used cognitive strategies in their learning, the more they reported introjected regulation. In contrast, the more senior high school pupils reported identified regulation, the more they used cognitive strategies in their learning. Furthermore, both junior and senior high school pupils were more likely to use self-regulation techniques (e.g. “I ask myself questions to make sure I know the material I have been studying”) when they were intrinsically motivated to accomplish things and reported less amotivation.

Vansteenskiste, Zhou, Lens, and Soenens (2005) conducted a series of analyses on the role of parental autonomy support versus psychological control in students’ optimal learning and well-being in Eastern cultural settings in particular. The sample was 153 Chinese students attending a special English training program. This study used a multiple regression analysis to test the impact of autonomous versus controlled academic motivation on four types of learning strategies (i.e. information processing, concentration, time management, and performance anxiety). Results showed that autonomous academic motivation had significantly positive effects on the three types of learning strategies apart from performance anxiety. In contrast, controlled academic emotion appeared to undermine time management (as indicated by a negative relation). In addition, *autonomous to controlled* academic motivation (as operationalized in terms of RAI autonomy score) was taken into account as a mediator of the relationship between parental autonomy-support versus psychological control and the latent construct of composite learning strategies. Interestingly, RAI fully mediated parental support and learning strategies.

The above-mentioned review has shown that self-determined academic motivation seems to mediate the linkages between parental autonomy-support and self-regulatory strategy use. Hence, it may be reasonable to assume that parental autonomy-support should also contribute directly to students’ self-regulated learning strategies. However, these linkages still need to be examined systematically.

Furthermore, students’ abilities to utilize strategies to regulate their *motivation* and *emotion* have received less attention. Reviewing the self-regulated learning literature so far has not revealed sufficient empirical findings on the linkages between the quality of home-based parental involvement and students' motivational and emotional regulation strategies use. Thus, the current research sought to extend the previous findings on whether parents play an important role in the development of students' self-regulation competencies relevant to motivation and emotion within the context of home-based parental involvement.

Defining Regulation of Academic Motivation

Pupils' regulation of motivation has been considered as another important aspect of self-regulated learning (Wolters, 2003). In general terms, regulation of motivation is defined as "the activities through which individuals purposefully act to initiate, maintain, or supplement their willingness to start, to provide work towards, or to complete a particular activity or goal (i.e. their level of motivation)" (Wolters, 2003, p. 190). When it comes to the learning domain, motivational regulation strategies can be described as "the various actions or tactics that pupils use to maintain or increase their effort or persistence at a particular academic task" (Wolters, 1999, p. 283). Nevertheless, pupils may exclusively use a motivational strategy when they experience problems due to the level of their continuous level of motivation. A motivational strategy use seems to have an impact on their learning and achievement (Wolters, 2003).

Measuring Regulation of Academic Motivation

The pioneer work on the operationalization of motivational regulation strategies was conducted by Wolters (1999). He proposed five strategies: two strategies relevant to intrinsic motivation (i.e. interest enhancement and mastery self-talk) and three strategies based on extrinsic motivation (i.e. self-consequating, performance self-talk, and environmental control). A scale for measuring five motivational regulation strategies was developed and administered to 88 American high school pupils. The five strategies are as follows:

- *Interest enhancement* refers to the extent to which pupils make the task into a game, or, more generally, make it more immediately relevant, enjoyable, or fun to complete (8 items; e.g. "I make studying more enjoyable by turning it into a game"; alpha = .90).

- *Mastery self-talk* refers to the extent to which pupils focus or make salient their desire to learn or master task materials in order to increase their level of motivation (5 items; e.g. "I persuade myself to work hard just for the sake of learning"; alpha = .85).
- *Self-consequating* refers to the extent to which pupils utilize self-provided extrinsic rewards to reinforce their desire to finish academic tasks (5 items; e.g. "I tell myself I can do something I like later if right now I do the work I have to get done"; alpha = .87).
- *Performance self-talk* refers to the extent to which pupils utilize sub-vocal statements or thoughts designed to increase their desire to complete the task by intensifying their focus on performance goals such as getting good grades (5 items; e.g. "I remind myself about how important it is to get good grades"; alpha = .84).
- *Environmental control* refers to the extent to which pupils avoid or reduce distractions as a means of ensuring their completion of academic tasks (e.g. "I change my surroundings so that it is easy to concentrate on the work"; alpha = .73);

Related Empirical Findings

As well as developing this scale, Wolters (1999) tested the impact of the five strategies of motivational regulation on other learning outcomes, namely: *six strategies* of cognition and metacognition regulation (i.e. rehearsal, elaboration, organization, planning, monitoring, and regulation); *effort*; *persistence* on academic tasks; and *grade point average* (GPA). Results revealed that mastery self-talk was a positive predictor of all six cognition and metacognition strategies. In addition, only mastery self-talk contributed significantly to pupils' effort. The strongly significant predictabilities for mastery self-talk were found on planning and monitoring. Apart from this, performance self-talk was the only strategy to influence pupils' GPA significantly.

Gonzalez, Dowson, Brickman, and McInerney (2005) empirically validated the measurement model of motivational regulation strategies and examined the influences of these strategies on academic achievement in university students. This work developed the *Self-Regulation of Academic Motivation Survey* (SRAM-S) based theoretically on Wolters' concept of motivation regulation (e.g. Wolters, 1999, 2003). Unlike the scale developed by Wolters (1999), they proposed two more strategies of motivational regulation. That is, the study distinguished between performance "relative ability" self-talk (i.e. "think about doing better than others") and performance "extrinsic" self-talk (i.e. "think about getting good grades"). Moreover, relevance enhancement (i.e. focusing on the material's personal relevance or utility value) was included as one of the strategies. Overall, the scale had 35 items. The test sample consisted of 383 freshmen recruited from an Australian university. The scale was valid, reliable (alpha ranged between .75 and .92), and invariant across gender groups. Findings revealed that seven strategies were significant indicators of the composite measure of motivational regulation. Moreover, all strategies yielded significantly direct effects on students' academic achievement. Regarding the first three important predictors of academic achievement, it was found that performance extrinsic self-talk was the strongest predictor, followed by performance ability self-talk and self-consequating respectively. Findings were in line with those reported by Wolters (1999), who also found that motivational strategies contributed significantly to academic achievement.

According to the review in the section above, students' use of certain motivational regulation strategies not only intercorrelates empirically with other emphasized aspects of self-regulated learning (e.g. cognition, metacognition) but also contributes to academic achievement.

With regard to the explanation above, it may be reasonable to assume that regulation of academic motivation should be included as an important aspect of self-regulated learning. In addition, because not only parental involvement but also self-regulated learning seems to enhance pupils' academic achievement, hence, it may be reasonable to assume that parental involvement should also relate positively to pupils' self-regulated learning strategies.

Apart from this, the construct of motivational regulation strategies can be measured by multiple indicators. The present study focused on the measurement instrument of Wolters (1999), because it was developed for use in the school context. However, when including this construct in the present study, only two strategies were taken into account: interest enhancement and self-consequating. This is because these two subscales yielded the highest alpha coefficients compared to other sub-scales.

Defining Regulation of Academic Emotion

Wolters (2003) synthesized the definition of emotional regulation and defined it as "students' ability to regulate their emotional experience to ensure that they provide effort and complete academic tasks" (Wolters, 2003, p. 199).

Knollmann (2005) stated that emotional regulation could not be considered separately from regulation of motivation and cognition. Instead, it is assumed that individual's use of self-regulated strategies regarding motivation, cognition, and emotion are just as functional as the extent to which a self-regulated strategy use is primarily conceived as cognitional regulation, motivational regulation, or emotional regulation. Ultimately, it depends on what process (cognition, motivation, or emotion) is currently in the foreground of the learner's consciousness and what kind of interference is thereby intended.

Prior work on the role of the regulation of emotion has focused typically on *the concept of coping* with test anxiety and school-related stress—in other words, strategies for regulating negative emotion (e.g. Boekaerts & Röder, 1999; Hampel & Petermann, 2005). However, much less research has addressed the strategies regulating positive emotion (Pekrun et al., 2002b, as cited in Knollmann & Wild, 2007b). The present study focused on pupils' regulation of both positive and negative academic emotion.

Measuring Regulation of Positive Academic Emotion

To operationalize pupils' regulation of positive emotion, the current research focused on *the German Regulation of Positive Emotions Questionnaire* (Fragebogen zur aktuellen Regulation positiver Emotionen: RPE 36-ak) proposed by Manfred Holodynski, Eva Regine Bartsch, and Christine Ullmann in 1995 (see Holodynski, 1995, Bartsch, 1996; Ullmann, 1996, for reviews). Bartsch (1996) administered this questionnaire to 195 German undergraduate students. Overall, the questionnaire assesses six dimensions of regulating positive emotion—three adaptive styles and three maladaptive styles. However, Hampel and Petermann concluded from reviewing past research that maladaptive styles of emotion regulation seem to be the risk factors for a child's psychological development (Hampel & Petermann, 2005). Therefore, the present study took into account only the following three *adaptive styles*:

- *Self-reinforcement* refers to the extent to which pupils promise to give a reward to themselves to recompense for a pleasant learning situation (7 items; e.g. “I would like to make a leap into the air”, “I will treat myself to something nice”; alpha = .83).
- *Seeking social affirmation* refers to the extent to which pupils attempt to obtain confirmations from others that they are experiencing a pleasant learning situation (4 items; e.g. “I would love to tell others, how successful I was”, “I am thinking again and again back to the moment when I experienced my success”; alpha = .80).
- *Self-affirmation* refers to the extent to which pupils think of doing certain things to confirm to themselves that they are experiencing a pleasant learning situation (7 items; e.g. “I will think that I have done well”, “I will praise myself”; alpha = .82).

Measuring Regulation of Negative Academic Emotion

To operationalize pupils’ regulation of negative academic emotion, the present study applied *the German Coping Questionnaire for Children and Adolescents* (Stressverarbeitungs-fragebogen für Kinder und Jugendliche: SVF-KJ) developed by Hampel, Petermann, and Dickow (2000). The scale has been validated with 1,123 German children and adolescents ranging in age from 8 to 14 years. Overall, this scale assesses nine dimensions of regulation strategies. However, the present study emphasized only the following three adaptive strategies:

- *Situation control* refers to the extent to which pupils take control of a difficult learning situation (4 items; e.g. “I am making a plan to fix the problem!”, “I am wondering what to do!”; alpha = .82).
- *Positive self-instructions* refers to the extent to which pupils use vocal statements to encourage themselves that a difficult learning situation can be managed (4 items; e.g. “I say to myself: I know, I can solve the problem!”, “I tell myself: I will get that under control!”; alpha = .84).
- *Seeking social support* refers to the extent to which pupils attempt to obtain concrete advice about how to handle a difficult learning situation and make an effort to discuss their feelings about it with others (4 items; e.g. “I let somebody help me”, “I talk to somebody about that”; alpha = .89).

Related Empirical Findings

To date, the measures on the regulation of academic emotion (i.e. RPE 36-ak and SVF-KJ) reported above have not been used in any research addressing the quality of parental instruction and its impact on the pupils' regulation of emotion.

However, a further search of the literature revealed some interesting results from a study of 181 German school-age children by Knollmann and Wild (2007b). The main purpose of this research was to propose and empirically validate the working model describing the proximal determinants of the genesis of pupils' regulation of academic emotion. In this model, the proximal determinants included the quality of instruction (i.e. autonomy-support, emotional support, competence-support), motivational orientations (i.e. intrinsic motivation, goal orientation, willingness to exert effort), and self-concept. Adaptive and maladaptive styles of emotional regulation as well as academic emotion were the outcomes. In this study, the pupils' regulation of emotion was assessed with the *German Questionnaire of Emotional Regulation in Mathematics Learning Context* (Fragebogen zur Emotionsregulation im Lernkontext Mathematik: FERL-M[6]) developed by Knollmann (2006). The main findings revealed that the quality of instruction at home and in school influenced pupils' emotional regulation strategies indirectly through the mediation of their motivational orientations. This indicates that the learning environment may influence pupils' regulation of emotion only when pupils' learning motivation is fostered.

Up to this point, it may be inferred that motivational orientations appear to be the significant *mediator* between the quality of instruction and emotional regulation strategies. These linkages have also been found in other aspects of self-regulated learning (e.g. Vansteenskiste, Zhou, Lens, & Soenens, 2005). Because prior research provides relatively little evidence on the direct impact of the quality of home-based instruction on pupils' emotional regulation strategies, the current study sought to investigate this linkage in more depth, because it would be

[6] The FERL-M consists of four vignettes describing two common learning situations in mathematics at home and in school. To complete this questionnaire, pupils need to imagine themselves being in those learning situations and specify what kind of emotion (with forced choice: anger, fear, disappointment, joy) they would experience and how intense these emotional states would be. Afterwards, pupils need to answer questionnaire items on the regulation of positive and negative emotion. The stem begins with "What would you do if you were to experience the emotional states mentioned previously?" Overall, there are 13 items on the regulation of positive emotion (7 for adaptive, 6 for maladaptive) and 16 items on the regulation of negative emotion (6 for adaptive, 10 for maladaptive).

interesting to know whether the differences between authoritative kinds of parental instruction (e.g. autonomy-support, responsiveness) and authoritarian kinds of parental instruction (e.g. control, high structure) contribute to the development of emotional regulations strategy use. Apart from this, the present study did not take use FERL-M to assess the regulation of emotion, because it is much more complex to administer with pupils, and takes much more time than the RPE 36-ak or the SVF-KJ.

2.6. The Role of Culture in Parental Involvement

Numerous research studies on parental involvement have indicated that parents of different ethnicities may differ in how they define the meaning of parental involvement as well as the motivation for involvement (e.g. Hill & Craft, 2003; Lynch & Stein, 1987). Therefore, it would be interesting to understand the process of home-based parental involvement across cultural settings in more depth.

In cross-cultural psychology, the most strongly emphasized aspect of cultural value is *individualism* and *collectivism* (Hofstede, 2000). The literature documents that *western culture* is viewed as following an *individualistic* construct focusing on self-reliance and independence, whereas the rest of the world (eastern culture, such as Asian) is viewed as *less individualistic* but *more collectivistic* or group-oriented (Markus & Kitayama, 2003).

Furthermore, previous study has confirmed that parents in collectivistic cultures are more likely to adopt *authoritarian* practices, because they see these as normative and necessary to support the optimal development of their children. In contrast, an *authoritative* parenting style is much more appropriate for individualistic cultures (e.g. Rudy & Grusec, 2006).

With respect to the current research, the operationalization of home-based parental involvement was derived theoretically from self-determination theory (SDT). According to SDT, a set of basic needs—especially *need for autonomy* (e.g. volition) and *need for relatedness* (e.g. sense of belonging)—are universal and critical for optimal learning and well-being in both western and eastern cultural settings (Deci & Ryan, 2000). That is, when both basic needs are satisfied, pupils will not only achieve higher levels of psychological health but also be more effective in their learning contexts (Zhou, Ma, & Deci, 2009).

In recent decades, SDT scholars have questioned how the SDT perspective on autonomy-support versus control generalizes across cultural settings (e.g. Chirkov, 2009; Chirkov & Ryan, 2001; Chirkov et al., 2003). For instance, in eastern countries, the value of autonomy may typically not be considered to be important (e.g. Markus, Kitayama, & Heiman, 1996). If a culture places less value on autonomy, one may argue that autonomy should not contribute to significantly predicting well-being or motivation (Chirkov & Ryan, 2001). In addition, Miller (1997) has pointed out that, in collectivistic cultural settings (e.g. non-Western nations), being externally controlled is considered to be culturally normative. Consequently, it might be assumed that being raised in a controlling environment may not yield the negative impact on individuals' functioning found in western cultures.

Past studies using SDT have confirmed empirically that the role of autonomy-support is critical for optimal functioning and well-being across individualistic and collectivistic cultures. For instance, the cross-cultural research conducted by Chirkov and Ryan (2001) revealed that Russian pupils, whose cultural setting has been viewed as authoritarian or controlling, perceived their teachers and parents as more controlling than pupils from the United States (viewed as democratic). However, in both countries, pupils' perceptions of autonomy-support from teachers and parents contributed to greater academic motivation and well-being.

By specifying the role of autonomy-support in collectivistic cultures, Zhou, Ma, and Deci (2009) found that Chinese primary school pupils in rural areas, whose teaching environment was highly controlled, seemed to achieve higher autonomous academic motivation as a result of teachers providing autonomy-support. Moreover, autonomously motivated Chinese pupils appeared to experience higher degrees of adjustment-related, self-perceived competence, as well as interest and choice.

However, the role of autonomy-support versus control and optimal functioning in learning contexts still needs to be investigated in more depth, particularly the *antecedents* of autonomy-support versus control in different cultural settings.

Taking the explanation above together with the present research framework, it may be assumed that parents from different cultural settings adopt different instructional strategies (e.g. more autonomy-supportive or more controlling) due to variations in their motivational beliefs, interpersonal conditions, and family contexts. As a consequence, pupils may also differ in their motivation, well-being, and self-regulated competencies across cultural groups.

Up to this point, the present research aimed to study the antecedents and impacts of the quality of home-based parental involvement in two distinct cultural settings—Germany and Thailand. As a western country, Germany was chosen because its culture has been viewed as having individualistic value orientations (Guess, 2004). In contrast, Thailand was chosen for the current study because it is recognized as collectivist rather than individualist, as strongly indicated by, for instance, living in extended families (Hofstede 2001, as cited in Burn & Thongprasert, 2005).

Proof for the statement above can be found in the study of Gouveia and Ros (2000), who utilized Hofstede's model to classify individualism in 20 countries. They operationally defined individualism as "a preference for closed social surroundings in which it is understood that individuals must care for themselves and only their closest relations as opposed to a dependence on groups of which individuals form part" (Gouveia & Ros, 2000, p. 26). Rankings of individualism scores (IDV; M_{IDV} = 53.10; *SD* = 23.32) revealed that Germany ranked 8th out of 20 countries with an *IDV* of 67, whereas Thailand ranked 19th with an *IDV* of 20. That is, German culture appears to be more individualistic than Thai culture. To date, no cross-cultural comparison of this research aspect has been performed in these two countries.

2.7. The Conceptual Model of the Study and Research Hypotheses

2.7.1. The Conceptual Model of the Study

The literature review is used as a basis to propose *the conceptual model* in the present study that illustrates the linkages between predictor constructs and the quality of home-based parental involvement, and, in turn, the linkages between the quality of home-based parental involvement and pupils' academic functioning outcomes.

To simplify the complex measurement of the quality of home-based parental involvement, it was first necessary to reduce the dimensions of parental instruction. On the basis of intercorrelations among four dimensions of parental instruction, autonomy-support was found to correlate highly with responsiveness, whereas parental control correlated highly with structure. Therefore, the present study differentiated between *authoritative kinds of instruction* (i.e. demanding, responsive, and encouraging self-regulated behaviour) and *authoritarian kinds of instruction* (i.e. highly demanding and directive, but not responsive). That is, on one hand, parents who provide *high levels of autonomy-support* and *responsiveness* are considered to be *authoritative* in their involvement. On the other hand, parents who provide *high levels of control* and *structure* are considered to be *authoritarian* in their involvement.

Six dimensions (two predictor constructs per each dimension) of antecedents of the quality of home-based parental involvement were proposed:

- The first dimension, *parental conceptions of responsibility*, distinguishes between *active* and *passive* responsibility. Active parents believe that parents and school together should be responsible for their child's education, whereas passive parents place the responsibility on the school and teacher.
- The second dimension, *parental role conceptions in learning situations*, is concerned with the way in which parents frame the child's learning situations, as guided by *two distinct goals*—learning goal versus performance goal. The former refers to parents' interpretation of the child's learning situations as chances to promote the child's *self-regulation learning* (process-oriented). The latter refers to parents' interpretation of the child's learning situations as chances to better *school performance* (product-oriented).
- The third dimension, *teaching efficacy beliefs,* distinguishes between parents' beliefs about their own competencies in teaching skills in *general* and in a *specific domain*.
- The fourth dimension, *specific invitations for involvement*, comprises two sources of invitations to involvement—from *the child* and from *the school staff*.
- The fifth dimension, *life context*, refers to the amount of *time and energy* that parents dedicate to involvement in their child's home-based learning activities as well as valence towards school in terms of the *parents' own previous school experiences*.
- The sixth dimension, *family SES,* is indicated by parents' education and home literacy resources.

The review of relevant literature suggests that the quality of home-based parental instruction is associated with *four dimensions* of pupils' academic functioning outcomes:

- The first dimension, *learning motivation*, distinguishes between self-determined forms (autonomous) of learning motivation (i.e. intrinsic regulation, identified regulation) and non-self-determined forms (controlled) of learning motivation (i.e. introjected regulation and external regulation).
- The second dimension, *academic well-being*, comprises two subjective well-being indicators in relation to the school domain. These are school satisfaction and positive academic emotion–absence of negative academic emotion.
- The third dimension, *regulation of academic motivation*, consists of two strategies used to influence the level of academic motivation, namely, interest enhancement and self-consequating.
- The fourth dimension, *regulation of academic emotion*, comprises six adaptive self-regulated strategies that pupils use to maintain their academic emotion as well as to cope with their negative emotion in learning situations. The six strategies are self-reinforcement, seeking social affirmation, self-affirmation, situational control, positive self-instructions, and seeking social support.

To test the conceptual model empirically, the present study performed a structural equation modelling analysis (SEM). SEM is a statistical technique for testing and estimating measurement models and causal relationships. Overall, SEM techniques comprise two characteristics: (a) "estimation of multiple and interrelated dependence relationships" and (b) "the ability to represent unobserved concepts in these relationships and account for measurement error in the estimation process" (Hair, Anderson, Tatham, & Black, 1995, p. 622). The present study employed the well-known statistical software package LISREL version 8.53 (Jöreskog & Sörbom, 2002) to perform SEM analysis.

Figure 2.3 shows the conceptual model of the study as depicted in terms of SEM. As can be seen, the quality of home-based parental involvement can be operationalized by *two latent constructs*—authoritative and authoritarian kinds of parental instruction. The latent construct of authoritative parental instruction (depicted as ovals) is measured by two *manifest indicators*, namely, parents' provision of autonomy-support and control. In contrast, the latent construct of authoritarian kinds of parental instruction is measured by two manifest indicators, namely, parents' provision of control and structure.

Eleven predictor constructs are assumed as antecedents of the quality of home-based parental instruction. Family SES is especially included as a control variable. All predictor constructs serve as *manifest variables* (depicted by boxes) that yield direct causal paths (depicted by arrows) to both latent constructs of authoritative versus authoritarian parental instruction.

The two distinct kinds of parental instruction are conceptualized as *mediators* between the predictor constructs and pupils' academic functioning outcomes, which are expected to mediate at least some causal paths of predictor constructs and five latent constructs of pupils' outcomes (i.e. learning motivation, academic well-being, regulation of academic motivation, and regulation of academic emotion). As for the pupil's learning motivation, the conceptual model distinguishes between *autonomous* and *controlled* forms of learning motivation. The former is measured by intrinsic regulation and identified regulation, whereas the latter comprises introjected regulation and external regulation.

Last of all, culture (country of origin) was supposed to be a *moderator* of the mechanisms (e.g. linkages among variables) within the empirical model.

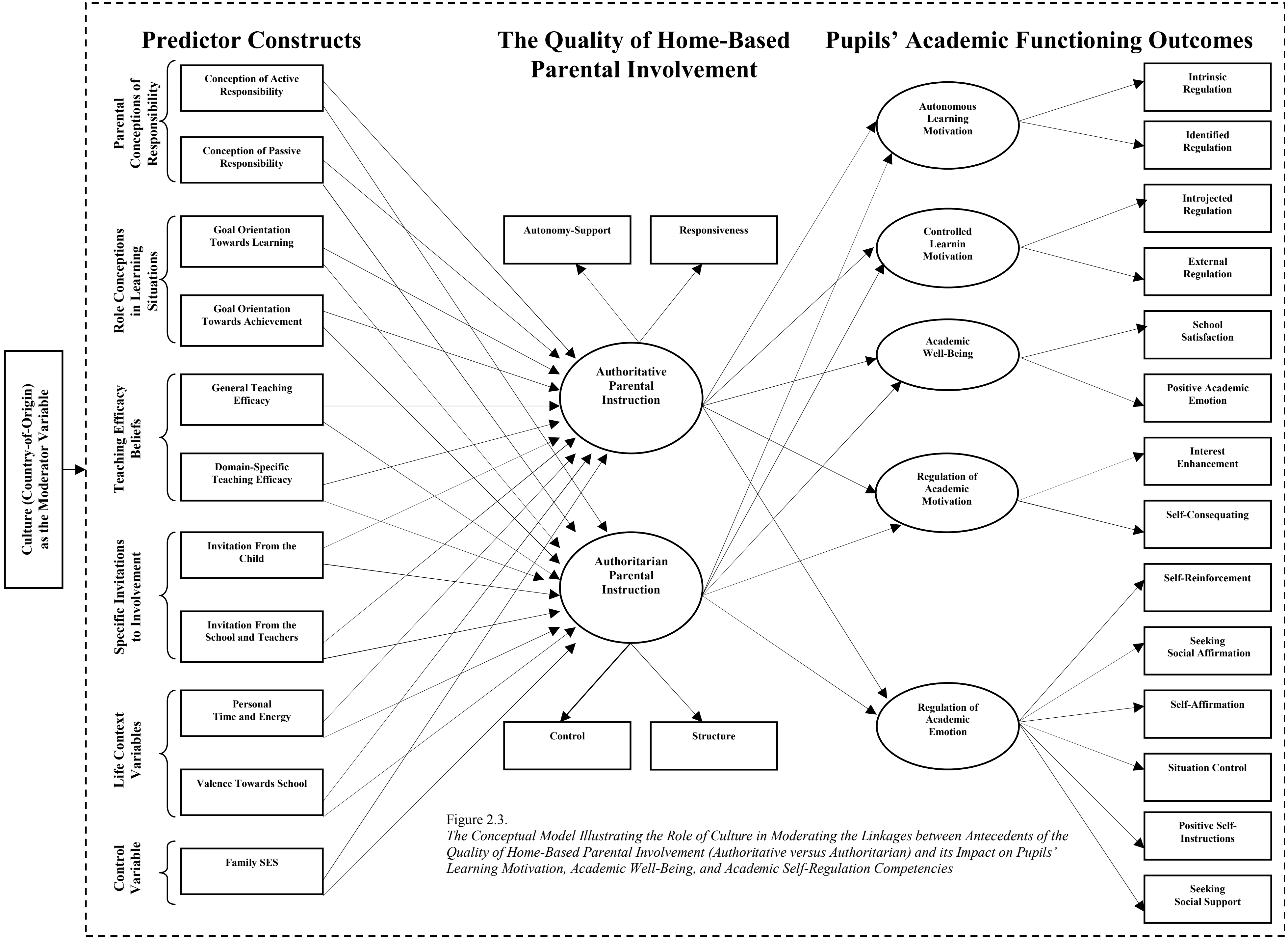

Figure 2.3.
The Conceptual Model Illustrating the Role of Culture in Moderating the Linkages between Antecedents of the Quality of Home-Based Parental Involvement (Authoritative versus Authoritarian) and its Impact on Pupils' Learning Motivation, Academic Well-Being, and Academic Self-Regulation Competencies

2.7.2. Research Hypotheses

In line with the conceptual model, it was hypothesized that:

1] Parents are more likely to adopt authoritative kinds of parental instruction (*high levels of autonomy-support and responsiveness*) the more they hold an active view of their responsibility for the child's education, frame the child's learning situations as opportunities to develop their self-regulated learning (process-oriented), report high teaching efficacy beliefs (either in general or in a specific domain), feel invited by the child and school staff to become involved, have time and energy to take care of the child's school-related issues, evaluate their own school experiences in a positive way, and report high family SES.

2] Parents may create home-based learning situations in an authoritarian manner (*high levels of control and structure*) the more they hold a passive view of their responsibility and evaluate the child's learning situations as opportunities to strive for school performance (product-oriented). Moreover, parents may be less likely to adopt authoritarian kinds of instruction the more they are confident in their teaching skills, feel invited by the child and school staff, have time and energy, report their own school experiences in a positive way, and have high family SES.

3] Authoritative kinds of parental instruction appear to be *functional instructional strategies* that encourage pupils to be self-determined (autonomous) in their learning, to experience such positive emotions in learning situations, to be satisfied with their school lives, and to be able to utilize such motivationally and emotionally regulated strategies that allow them to learn effectively. In contrast, authoritarian kinds of parental instruction seem to be *dysfunctional instructional strategies* that encourage pupils to be non-self-determined (controlled) in their learning but do *not strongly foster* other academic functioning or may even impair these academic outcomes.

4] Authoritative versus authoritarian kinds of parental instruction may *mediate* at least some of the linkages between predictor constructs and pupils' academic functioning outcomes.

5] Culture (country of origin; Germany vs. Thailand) may *moderate* at least some linkages between antecedents of the quality of home-based parental instruction and its impact on pupils' academic functioning outcomes. Nevertheless, the model pattern remains the same for both cultures.

Chapter III
Research Methodology

This chapter presents the research procedures and methods used in this study. It is divided into four parts, namely: (3.1) the pilot study on the characteristics of home-based parental involvement in Thailand, (3.2) sampling procedures, (3.3) sample characteristics, and (3.4) instrumentation.

3.1. The Pilot Study on the Characteristics of Home-Based Parental Involvement in Thailand

The purpose of the present study was to investigate cross-cultural differences in the antecedents of the quality of home-based parental involvement and its impact on pupils' academic functioning outcomes across German and Thai samples. Before conducting the main research, it is necessary to ensure that the explanation of the *characteristics* of home-based parental involvement is similar in both countries. That is, *parents* are mostly responsible for home-based parental involvement, and the main focus of home-based parental involvement is on the subject of *mathematics*. Previous studies have indicated that it is mainly parents who are responsible for the home-based learning and instruction of German pupils (e.g. Gerber & Wild, 2009; Wild & Lorenz, 2010). However, it has yet to be confirmed who plays the most important role in home-based involvement for Thai pupils. In this pilot study, home-based parental involvement was operationally defined as *parental help with homework*.

The aims of this pilot study were to find out (a) who is mostly involved in homework assistance for Thai pupils, and (b) in which main school subject do Thai pupils spend the most time completing their homework. The pilot study in Thailand was conducted in August 2009.

3.1.1. Participants and Their Demographic Characteristics

Participants were school pupils recruited from three schools in Bangkok. The questionnaire survey was administered by classroom teachers. Pupils were asked to complete the questionnaires in their regular classrooms. The survey took approximately 10–15 min. The total sample consisted of 200 school pupils aged 9 to 14 years (M = 11.54, SD = .97).

Overall, it was found that the majority of pupils were boys (62%), were in 6th grade (41%), and lived with their parents (82%). Furthermore, the majority of pupils (52%) reported that their parents had completed only secondary education or lower (see Table 3.1).

Table 3.1
Demographic Characteristics of the Thai Sample

	Demographic characteristic	*N*
Gender	Boy	123 *61.50%*
	Girl	77 *38.50%*
	Total	200 *100.00%*
Grade level	Grade 5	67 *33.50%*
	Grade 6	82 *41.00%*
	Grade 7	51 *25.50%*
	Total	200 *100.00%*
Family status	Living with parents (including step-parents)	164 *82.40%*
	Living with single parent	26 *13.10%*
	Living with relatives	9 *4.50%*
	Total	199 *100.00%*
Parents' education	Secondary education (or lower)	82 *50.60%*
	Undergraduate studies	44 *27.20%*
	Postgraduate studies	36 *22.20%*
	Total	162 *100.00%*

Note. The grey shading indicates the majority.

3.1.2. Research Instrument

The research instrument in the pilot study was the pupil questionnaire. This pupil consisted of two parts: (a) demographic survey questions (e.g. pupil's age, family status, parents' education) and (b) questions on the characteristics of homework assistance. The latter were adapted from *the German Parental Help with Learning at Home Questionnaire* (Fragebogen zur elterlichen Hilfe beim häuslichen Lernen) used in the Bielefeld longitudinal study “Fostering self-determined forms of learning motivation at home and in school” by Wild and colleagues (see Wild, Rammert, & Siegmund, 2003, 2006).

3.1.3. Characteristics of Homework Assistance for Thai Pupils

Who Mostly Gets Involved in Homework Assistance for Thai Pupils?

Overall, the majority of pupils (48%) reported that their parents were mostly responsible for their homework assistance, 27% mostly received homework support their siblings or relatives, and 26% reported that institutions (e.g. teacher, private tutor) helped them most (see Table 3.2).

Table 3.2

The Person Most Responsible for Homework Assistance for Thai Pupils

The most responsible person for homework assistance	*N*
Parents	89 *47.60%*
Siblings/relatives	50 *26.70%*
Teacher/private tutor/ homework assistant/classmate	48 *25.70%*
Total	187 *100.00%*

Note. The grey shading indicates the majority.

On Which Main Subject Did Thai Pupils Spend the Most Time Completing Their Homework?

In this part of analysis, pupils were asked to estimate the amount of time *per week* they spent on homework assignments in four main subjects, namely, mathematics, science, Thai, and English. Overall, the majority of pupils spent *more than half an hour* per week completing homework assignments in mathematics (62%) and English (53%). In contrast, the majority reported spending *less than half an hour* per week on science homework (57%) and Thai homework (57%). Details are shown in Table 3.3.

Table 3.3
Amount of Time Thai Pupils Spend on Homework by Main School Subjects

The amount of time (per week)	Main school subject			
	Mathematics	Science	Thai	English
	N	*N*	*N*	*N*
0 – 30 min	70	102	102	84
	38.10%	*57.00%*	*56.70%*	*47.20%*
31 – 60 min	72	55	51	58
	39.10%	*30.70%*	*28.30%*	*32.60%*
More than 1 hr	42	22	27	36
	22.80%	*12.30%*	*15.00%*	*20.20%*
Total	184	179	180	178
	100.00%	*100.00%*	*100.00%*	*100.00%*

Note. The grey shading indicates the majority.

3.1.4. Summary

The results of the pilot study reveal that the majority of Thai pupils received the most homework assistance from their parents. As expected, this was consistent with findings from previous studies conducted in Germany (see Gerber & Wild, 2009; Wild & Lorenz, 2010). Hence, it may be concluded that parents play the most important role in homework assistance for Thai pupils as well. Looking at homework in the main school subjects, the largest proportion of Thai pupils reported spending more than half an hour per week on mathematics homework. This indicates that mathematics seems to be the most time-consuming homework subject. This empirical finding supports the decision to focus on home-based parental involvement in mathematics as an important school subject in both Germany and Thailand.

THE MAIN RESEARCH

3.2. Sampling Procedures

In the main research, participants were sampled by using multi-stage sampling design. The details of sampling procedures are described into four parts, namely: (3.2.1) determination of sample size, (3.2.2) multi-stage sampling procedure, (3.2.3) data collection procedure, and (3.2.4) number of participants and response rate of questionnaires.

3.2.1. Determination of the Sample Size

The present study employed structural equation modelling (SEM) to validate and test the invariance of the hypothesized structural models across cultural groups. Therefore, the sample size was determined according to Hair et al. (1998), who suggested that an appropriate sample size for SEM analysis should be in a range of 5 to 10 participants for each parameter estimate. The present research model had approximately 50 parameter estimates (by considering only factor loadings and causal paths). Hence, an appropriate sample size would be in a range of 250 to 500 participants.[1] However, the present study required two samples due to its cross-cultural research design. Therefore, each sample required at least 250 participants.

3.2.2. Multi-Stage Sampling Procedures

After an adequate sample size was determined, participants were recruited using multi-stage sampling based on the following three sampling units: region, school type, and grade level..

Region

The State of North-Rhine-Westphalia (NRW) in Germany, and the Bangkok Metropolitan Area and Chonburi Province in Thailand, were selected purposely.

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[1] In the current research, parents provided information about their motivational beliefs, interpersonal conditions, and family contexts. Pupils provided information about their perceptions on the quality of home-based parental involvement and academic functioning outcomes. The conceptual model empirically investigated the linkages between parent variables and pupil variables. Therefore, in one unit of analysis, one participant referred to one parent–child dyad.

School Type

In the present study, family SES was a crucial research variable. To recruit a variety of participants with different SES, *school type* was used as one of sampling units. The German school system begins with primary education (Grades 1 to 4), followed by lower secondary education (Sekundarstufe I; Grades 5 to 9 or 10) and upper secondary education (Sekundarstufe II; Grades 11 to 12 or 13). At the level of primary education, pupils are taught together. To pursue their secondary education (at 5th grade), they are sent to four different school tracks depending on their school performances and the recommendations of their primary school teachers. The four school types are *Hauptschule*, *Realschule*, *Gymnasium*, and *Gesamtschule*.

The *Hauptschule* is the *lowest school track*. This school type provides secondary education until the 9th or t10th grade (*Hauptschulabschluss*). The *Realschule* is *the middle school track*. This school type provides secondary education until 10th grade (*Realschulabschluss*). The *Gymnasium* is *the highest school track*. This school type provides secondary education until 13th grade. After completing 13th grade, pupils receive the higher education entrance qualification (*Abitur*). The *Gesamtschule* combines all three school tracks mentioned above (see Rosebrock, 2006, for greater detail on the German school system). Generally, each track in the German school system takes pupils from different social backgrounds (Baumert & Schümer, 2001; Rekus et al., 1998, as cited in Rosebrock, 2006). Therefore, the present study recruited German participants from all four school types.

The Thai school system begins with primary education (Grades 1 to 6) followed by lower secondary education (Grades 7 to 9) and upper secondary education (Grades 10 to 12). The upper secondary school is divided into academic and vocational tracks. Unlike the German school system, Thai pupils are not split into different school tracks after 4th grade on the basis of their achievement. Therefore, school types in Thailand were classified by the jurisdictions of the schools—in other words, the governmental institutions that administer, control, and promote them. Schools are under the control of four governmental institutions, namely, the Local Administration Organizations (LAO),[2] the Office

[2] LAO = municipality school with a small number of pupils. The LAO schools are normally located in temples.

of the Basic Education Commission (OBEC),[3] the Office of Higher Education Commission (OHEC),[4] and the Office of the Private Education Commission (OPEC).[5] Basically, schools under the administration of different governmental institutions vary in terms of the number of pupils, the number of teaching staff, the size of the administrative budget, and so forth. Therefore, it could be assumed that the four school types in Thailand represented pupils from different social backgrounds.

Grade Level

Cotton and Wikelund (1989) stated that parental involvement in their child's education might have more powerful effects on children during the earlier educational process. Furthermore, previous studies have found that the levels of parental involvement *decrease* in higher grade levels as children grow older (e.g. Eccles & Harold, 1996; Green et al., 2007; Grolnick & Slowiaczek, 1994). There may be several reasons for decreases in the levels of parental involvement. For instance, older pupils are more likely to take personal responsibility for their homework. Therefore, pupils may need less support from their parents or profit more from other kinds of homework assistance (Wild & Yotyodying, 2012).

As a result, the current research, therefore, focused on home-based parental involvement for pupils in earlier stages. It purposely recruited pupils from the 5th and the 6th grades because, in Germany, the pupils' transition to the four school types first begins at 5th grade.

3.2.3. Data Collection Procedures

Data were collected from participants in Germany and Thailand. The details of data collection procedures are divided into two phases: (a) data collection in Germany and (b) data collection in Thailand.

Data Collection in Germany

Data collection started in Germany and proceeded from March to May 2010. One year before the data collection, participants were recruited by contacting schools

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[3] OBEC = public school with a large number of pupils.

[4] OHEC = laboratory school or demonstration school of public universities with a large number of pupils. Most of the children of university staff attend this school type.

[5] OPEC = private schools with a large number of pupils. A high tuition fee is normally required.

taking part in the PARS Study.[6] The present study was officially presented to the principal or representative of each school at the first meeting of PARS on May 27, 2009. The meeting took place at the Institute for School Development Research (IFS), TU Dortmund University. The aim of the first PARS meeting was to inform school principals about the aims and working procedures of the longitudinal study being carried out by the International NRW-Research School "Education and Capabilities". Apart from this, doctoral students receiving scholarships at the Research School, who needed schools to participate in their own dissertation projects, were invited to give small talks. School principals were informed that participation in each dissertation project is voluntary.

The plan was to recruit participants from eight schools (two schools for each school track). Only seven schools agreed (one *Hauptschule*, two *Realschule*, two *Gymnasium*, and two *Gesamtschule*). Because of the need to obtain pupils and parents from one more *Hauptschule*, the principal of the last Hauptschule was contacted directly. To inform school principals about the project in greater detail, an information sheet was sent to them by post afterwards. Moreover, the principal of each school was asked to distribute parental consent forms to parents via their children.

Overall, eight schools (16 classrooms; eight classrooms per 5th and 6th grade) were visited, and pupils were asked to complete the questionnaires. Every school gave permission to administer the questionnaires in pupils' regular classrooms during pupils' regular class periods. First of all, pupils were told about the different types of questions they would find inside the questionnaire (e.g. yes–no question, rating scale) and told that all of their responses would remain confidential. After the pupils had completed both questionnaires, they were given the parent questionnaires with a stamped and addressed envelope. Pupils were asked to deliver these to their parents[7] by hands when reaching home. They were told to give the parent questionnaire to the parent who was most often responsible for their homework and school activities. To retain confidentiality, parents could

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[6] The panel Study at the International NRW-Research School "Education and Capabilities" is a longitudinal study in the German federal state of North Rhine-Westphalia (NRW). The PARS study is being implemented by the Institute of School Development Research (IFS) as a source of empirical data for the Research School. The PARS study aims to investigate pupil academic development (secondary school) in relation to personality characteristics, families, and schools.

[7] *Parents* refer to biological parents (father and mother), adoptive parents, step-parents, and primary caregivers (e.g. grandparents, relatives) with whom pupils live and who play the most important role in home-based parental involvement.

decide to send the completed parent questionnaires back to us either by post or via the classroom teachers. School principals and classroom teachers reminded their pupils about the need to return the completed questionnaires.

Data Collection in Thailand

After finishing the first data collection in Germany, the second data collection was carried out from July to August 2010 in Thailand. To request participation, official letters from the Research School were sent to the principals of the eight schools. All schools agreed to participate. Before starting the data collection, information sheets about the study and parental consent forms were distributed to parents.

Eight schools were visited in the Bangkok Metropolitan Area and Chonburi Province (16 classrooms, eight 5th-grade classes, eight 6th-grade classes). Pupils were asked to complete the questionnaires during regular class periods and in their regular classrooms. The test administration procedures were the same as those applied in Germany.

3.2.4. Number of Participants and Response Rates of the Parent and Pupil Questionnaires

Table 3.4 shows the number of participants and response rates of pupil and parent questionnaires by school type. For the data collection in Germany, 386 pupil questionnaires were distributed and all of them were returned at the end of testing (response rate = 100%). Of the 386 parent questionnaires distributed via pupils, 288 were returned (response rate = 75%). For the data collection in Thailand, 535 pupil questionnaires were distributed and returned at the end of each testing session (response rate = 100%). Of the 535 parent questionnaires distributed via pupils, 494 were returned (response rate = 92%). Overall, the response rate for the parent questionnaire in the Thai sample was higher than that in the German sample. In the German sample, the highest response rate for the parent questionnaire was from parents of *Gymnasium* pupils (83%) followed by parents of *Gesamtschule* pupils (77%) and parents of *Realschule* pupils (68%). In the Thai sample, the highest response rate for the parent questionnaire was in the parents of the OHEC pupils (100%) followed by parents of the OPEC pupils (94%), parents of the LAO pupils (89%), and parents of the OBEC pupils (88%). Therefore, to cope with the issue of missing data, only data from complete parent–child dyads were analysed. This resulted in complete databases for 288 German parent–child dyads and 494 Thai parent–child dyads.

Table 3.4
Number of Participants and Response Rates on Pupil and Parent Questionnaires by School Type

School type	Pupil			Parent		
	Number of questionnaires distributed *N*	Number of questionnaires returned *N*	Response rate %	Number of questionnaires distributed *N*	Number of questionnaires returned *N*	Response rate %
Germany						
Hauptschule	84	84	100.00	84	59	70.20
Realschule	107	107	100.00	107	73	68.20
Gymnasium	99	99	100.00	99	82	82.80
Gesamtschule	96	96	100.00	96	74	77.10
Total	386	386	100.00	386	288	74.60
Thailand						
Local Admin	113	113	100.00	113	101	89.40
Basic education	241	241	100.00	241	218	87.90
Higher education	89	89	100.00	89	89	100.00
Private education	92	92	100.00	92	86	93.50
Total	535	535	100.00	535	494	92.30

A multiple group analysis was performed in order to test the measurement invariance of the empirical models across two samples. Ideally, the number of participants in each group should be equal. However, hardly any research has indicated whether unequal sample sizes impact on the findings when performing multiple group analysis (Division of Statistics and Scientific Computation, 2011). In this study, the number of participants in each sample was sufficient for the parameter estimation (greater than 250 participants). Hence, unequal sample sizes should not be problematic.

3.3. Characteristics of the Samples

Overall, there were 1,564 participants**.** The German sample comprised 576 participants (288 parent–child dyads; 131 girls, 157 boys, 247 mothers, 41 fathers). The Thai sample comprised 988 participants (494 parent–child dyads; 237 girls, 257 boys, 363 mothers, 131 fathers). Characteristics of the German sample will be described first followed by the Thai sample.

3.3.1. Characteristics of the German Sample

3.3.1A. General Demographic Characteristics

The German sample consisted of 576 participants—288 pupils and 288 parents. Overall, pupils ranged in age from 9 to 14 years (M = 11.37, SD = .77). Mothers ranged in age from 28 to 57 years (M = 40.96, SD = 5.10); fathers, from 28 and 67 years (M = 43.68, SD = 5.75). The number of family members living in the household ranged between 2 and 13 (M = 4.15, SD = 1.35). The number of children living in the household ranged between 1 and 11 (M = 2.41, SD = 1.27). Details are shown in Table 3.5.

Table 3.5
Descriptive Analysis of General Demographic Characteristics of the German Sample

Demographic characteristic	*Min*	*Max*	*M*	*SD*
Pupil age	9	14	11.37	0.77
Mother age	28	57	40.96	5.10
Father age	28	67	43.68	5.75
Number of family members living in the household	2	13	4.15	1.35
Number of children living in the household	1	11	2.41	1.27

Table 3.6 presents the cross-tabulation analysis on demographic characteristics of the German sample by school type. Overall, the majority of pupils were boys (55%), attended 6th grade (52%), and lived with their parents (79%). The majority of parent respondents (86%) were mothers. In addition, pupils' gender, grade level, parent response, and family status did not vary across school types (no significant correlation was found). This means that the majority of pupils from every school type were boys (58% of the *Hauptschule*, 55% of the *Gesamtschule*, 55% of the *Realschule*, 51% of the *Gymnasium*). In every school type, the majority of pupils lived with their parents (82% of the *Gymnasium*, 81% of the *Gesamtschule*, 74% of the *Hauptschule*, 73% of the *Realschule*). Furthermore, the majority of parent respondents from every school type were mothers (90% of the *Realschule*, 88% of the *Hauptschule*, 87% of the *Gymnasium*, 78% of the *Gesamtschule*). The majority of pupils from every school type (except the *Gesamtschule*) were in 5th grade (54% of the *Gymnasium*, 53% of the *Realschule*, 53% of the *Hauptschule*).

Table 3.6

Demographic Characteristics of the German Sample by School Type

	Demographic characteristic	School type				
		Hauptschule	*Realschule*	*Gymnasium*	*Gesamtschule*	Overview
Gender of pupil	Girl	25	33	40	33	131
		42.40%	*45.20%*	*48.80%*	*44.60%*	*45.50%*
	Boy	34	40	42	41	157
		57.60%	*54.80%*	*51.20%*	*55.40%*	*54.50%*
	Total	59	73	82	74	288
		100.00%	*100.00%*	*100.00%*	*100.00%*	*100.00%*
	Φ_c with school type	.46	*p*	.89		
Grade level	Grade 5	31	39	44	35	149
		52.50%	*53.40%*	*53.70%*	*47.30%*	*51.70%*
	Grade 6	28	34	38	39	139
		47.50%	*46.60%*	*46.30%*	*52.70%*	*48.30%*
	Total	59	73	82	74	288
		100.00%	*100.00%*	*100.00%*	*100.00%*	*100.00%*
	Φ_c with school type	.05	*p*	.85		
Parent	Mother	52	66	71	58	247
		88.10%	*90.40%*	*86.60%*	*78.40%*	*85.80%*
	Father	7	7	11	16	41
		11.90%	*9.60%*	*13.40%*	*21.60%*	*14.20%*
	Total	59	73	82	74	288
		100.00%	*100.00%*	*100.00%*	*100.00%*	*100.00%*
	Φ_c with school type	.13	*p*	.18		
Family status	Living with parents (including stepparents)	43	53	67	60	223
		74.10%	*72.60%*	*81.70%*	*81.10%*	*77.70%*
	Living with single parent	11	14	13	13	51
		19.00%	*19.20%*	*15.90%*	*17.60%*	*17.80%*
	Living with parents and relatives	4	6	2	1	13
		6.90%	*8.20%*	*2.40%*	*1.40%*	*4.50%*
	Total	58	73	82	74	287
		100.00%	*100.00%*	*100.00%*	*100.00%*	*100.00%*
	Φ_c with school type	.11	*p*	.39		

Note. Φ_c = Cramér's V correlation coefficient. The grey shading indicates the majority.

3.3.1B. Migration Background

The present study explored migration backgrounds in the German sample and their link to school types. In the Thai sample, migration background was not taken into account because all participants were native Thais. Migration background was identified by parents' places of birth as used to operationalize pupils' migration backgrounds in the PIRLS[8] study (see Bellin, Dunge, & Gunzenhauser, 2010, for greater detail). That is to say, when, at least, one parent was not born in

[8] PIRLS refers to the Progress in International Reading Literacy, which is being conducted by the International Association for the Evaluation of Educational Achievement (IEA) and surveys children in 4th grade (see http://timss.bc.edu/#)

Germany, this *parent–child dyad* was considered to have a migration background. Overall, 27% of the German sample was parent–child dyads with a migration background. Migration background did not vary across school types (Φ_c = .14, $p > .05$). That is, parent–child dyads with a migration background were a minority in every school type (37% of *Gesamtschule*, 31% of *Hauptschule*, 22% of *Gymnasium*, 22% of *Realschule*). Details are shown in Table 3.7.

Table 3.7
Migration Background of the German Sample by School Type

	School type				
Migration background	*Hauptschule*	*Realschule*	*Gymnasium*	*Gesamtschule*	Overview
Native	41	57	64	47	209
	69.50%	*78.10%*	*78.00%*	*63.50%*	*72.60%*
Migrant	18	16	18	27	79
	30.50%	*21.90%*	*22.00%*	*36.50%*	*27.40%*
Total	59	73	82	74	288
	100.00%	*100.00%*	*100.00%*	*100.00%*	*100.00%*
Φ_c with school type	.14	*p*	.13		

Note. Φ_c = Cramér's V correlation coefficient.

3.3.1C Family SES of the German Sample

In the present study, family SES was included in the empirical model as a *control variable*. That is, it was assumed that family SES might play a role in parental attitudes and practices in home-based parental involvement. Family SES was operationalized in terms of the *social and cultural resources* of families defined in the PIRLS study as the highest level of parents' education and home literacy resources (i.e. number of books in household, number of children's book in household) (see Bellin, Dunge, & Gunzenhauser, 2010, for greater detail). However, the present study did not take parents' income into consideration because living costs and economy are not comparable between Germany and Thailand. With respect to GDP,[9] Germany currently ranks 17thth out of 180 countries whereas Thailand ranks 88th (see World Bank, 2010).

Family SES was included in the empirical model by empirically validating the measurement model of family SES and calculating the family SES index. To get the first impression of how family SES variables vary across school types, the cross-tabulation analyses on the highest level of parents' education and home

[9] Gross Domestic Product at Purchasing Power Parity per Capita.

literacy resources by school type were performed. Afterwards, the measurement of family SES was validated empirically.

The Highest Level of Parents' Education

The majority of German parents (61%) reported having completed vocational training or secondary education. In addition, the highest level of parents' education varied significantly across school types ($\Phi_c = .34$, $p < .01$). The majority of *Gymnasium* parents (61%) had university degrees. The majority of *Realschule* parents (65%) as well as the majority of *Gesamtschule* parents (59%) had vocational training or had completed upper secondary education. Amongst all school types, the *Hauptschule* had the largest proportion of parents who completed secondary education or lower (55%). Details are shown in Table 3.8.

Table 3.8
The Highest Level of Parents' Education in the German Sample by School Type

Highest educational level of parents (in terms of number of years attended)	School type				
	Hauptschule	*Realschule*	*Gymnasium*	*Gesamtschule*	Overview
No educational degree	7 *12.10%*	1 *1.30%*	0 *0.00%*	3 *4.10%*	11 *3.90%*
Secondary education I – *Hauptschule* (ninth grade) [*Hauptschulabschluss*]	15 *25.90%*	11 *15.30%*	0 *0.00%*	10 *13.50%*	36 *12.60%*
Secondary education I – *Realschule* (tenth grade) [*Realschulabschluss*]	10 *17.20%*	19 *26.40%*	9 *11.00%*	18 *24.30%*	56 *19.60%*
Vocational diploma (*Fachabitur*)/vocational training degree (*Berufsabschluss*)	17 *29.30%*	28 *38.90%*	12 *14.60%*	26 *35.10%*	83 *29.00%*
Certificate for entry to higher education (*Abitur*)	3 *5.20%*	2 *2.80%*	11 *13.40%*	5 *6.80%*	21 *7.30%*
University degrees (*e.g. Diploma, Magister, State Examination, Doctorate*)	6 *10.30%*	11 *15.30%*	50 *61.00%*	12 *16.20%*	79 *27.60%*
Total	58 *100.00%*	72 *100.00%*	82 *100.00%*	74 *100.00%*	286 *100.00%*
Φ_c with school type	.34	*p*	.00		

Note. Φ_c = Cramér's V correlation coefficient. The grey shading indicates the majority.

Home Literacy Resources

The present study explored the home literacy resources of German participants' families as one indicator of family SES. Home literacy resources were characterized in terms of the number of *general books* and *children's book*s (excluding school books) in the household. Parents were asked to estimate how many they had in their household. As shown in Table 3.9, the majority of German parents reported having less than 100 general books in the household (53%) and less than 50 children's books at home (60%).

In addition, the number of general books as well as children's book at home varied across school types ($\Phi_{c\ general\ book}$ = .32, p < .01; $\Phi_{c\ children's\ book}$ = .31, p < .01). That is, the majority of *Gymnasium* parents (77%) reported having *more than 100 general books* in the household, whereas the majority of parents from other school types had *less than 100 general books* (76% of *Hauptschule*, 60% of *Realschule*, 59% of *Gesamtschule*). Furthermore, the majority of *Gymnasium* parents (74%) reported having *more than 50 children's books* at home, whereas parents from other school types had *less than 50 children's books* in the household (80% of *Hauptschule*, 74% of *Realschule*, 68% of *Gesamtschule*).

Table 3.9
Home Literacy Resources in the German Sample by School Type

Number of books in household		School type				
		Hauptschule	*Realschule*	*Gymnasium*	*Gesamtschule*	Overview
General books	0–10 books	3 *5.20%*	4 *5.50%*	1 *1.20%*	5 *6.70%*	13 *4.50%*
	11–25 books	18 *31.00%*	9 *12.30%*	1 *1.20%*	11 *14.90%*	39 *13.60%*
	26–100 books	23 *39.60%*	31 *42.50%*	17 *20.70%*	28 *37.80%*	99 *34.50%*
	101–200 books	7 *12.10%*	15 *20.50%*	10 *12.30%*	19 *25.70%*	51 *17.80%*
	More than 200 books	7 *12.10%*	14 *19.20%*	53 *64.60%*	11 *14.90%*	85 *29.60%*
	Total	58 *100.00%*	73 *100.00%*	82 *100.00%*	74 *100.00%*	287 *100.00%*
	Φ_c with school type	.32	*p*	.00		
Children's books	0–10 books	4 *6.70%*	7 *9.60%*	1 *1.20%*	8 *10.70%*	20 *6.90%*
	11–25 books	22 *37.30%*	19 *26.00%*	3 *3.70%*	21 *28.40%*	65 *22.60%*
	26–50 books	21 *35.60%*	28 *38.40%*	17 *20.70%*	21 *28.40%*	87 *30.20%*
	51–100 books	9 *15.30%*	12 *16.40%*	27 *32.90%*	21 *28.40%*	69 *24.00%*
	More than 100 books	3 *5.10%*	7 *9.60%*	34 *41.50%*	3 *4.10%*	47 *16.30%*
	Total	59 *100.00%*	73 *100.00%*	82 *100.00%*	74 *100.00%*	288 *100.00%*
	Φ_c with school type	.31	*p*	.00		

Note. Φ_c = Cramér's V correlation coefficient. The grey shading indicates the majority.

Measurement Model of Family SES for the German Sample

The *family SES index (FSES)* was obtained by validating the measurement model of family SES. The measurement model was a latent construct measured by three indicators—the highest level of parents' education (HEDU), number of books in household (NBOOK), and number of children's books in household (NCBOOK).

First, the correlations among three indicators were tested (see Table 3.10). All correlations were statistically significant and ranged between .56 ($p < .01$) and .81 ($p < .01$). Bartlett's test of sphericity yielded a χ^2 of 428.58 with *df* of 3 ($p = .00$). This showed that the correlation matrix for three indicators was not the *identity matrix* (all off-diagonal elements were zero). The Kaiser-Meyer-Olkin measure of sampling adequacy (KMO) for the correlation matrix was greater than .50 (KMO = .68). This showed that three indicators correlated highly with each other. Therefore, the data were appropriate for confirmatory factor analysis (CFA).

Table 3.10
Means, Standard Deviations, and Correlation Matrix for Three Indicators Measuring Family SES for the German Sample

Indicator	1	2	3
1. HEDU	—		
2. NBOOK	.60**	—	
3. NCBOOK	.56**	.81**	—
M	12.36	3.54	3.20
SD	4.05	1.18	1.17
Bartlett's Test of Sphericity [χ^2 (3, N = 288) = 428.58, p = .00]			
KMO = .68			

* $p < .05$. ** $p < .01$.

Afterwards, CFA was performed to validate the measurement model of family SES with the empirical data. Table 3.11 shows standardized parameter estimates and model fit indices. Model fit was evaluated with the chi-square test and four fit indices—the goodness of fit index (GFI), the comparative fit index (CFI), the standardized root mean square residual (SRMR), and the root mean square error of approximation (RMSEA). The criteria for acceptable model fit were taken from Schreiber et al. (2006)—a non-significant chi-square, a GFI value of .95 or higher, a CFI value of .95 or higher, a SRMR value of .08 or lower, and a RMSEA value of .06 or lower.

The measurement model fitted the data well [χ^2 (1, N = 288) = .51, χ^2/df = .51, p = .48, CFI = 1.00, GFI = 1.00, SRMR = .01, RMSEA = .00]. All indicators yielded significant factor loadings on family SES. The factor loadings ranged between .64 ($p < .01$) and .95 ($p < .01$). Among the three indicators, the number of general books in household yielded the highest factor loading. Figure 3.1 shows the path diagram of the empirically validated measurement model. The FSES index of each participant was calculated by using the factor score. The factor score equation could be expressed as follows:

$FSES_{German\ Sample} = .08(HEDU) + .71(NBOOK) + .24(NCBOOK)$.

Table 3.11
Standardized Parameter Estimates for the Measurement Model of Family SES for the German Sample

Indicator	β	*SE*	*t*	R^2	Factor score regression
1. HEDU	.64**	.05	11.73	.41	.08
2. NBOOK	.95**	.04	21.56	.90	.71
3. NCBOOK	.86**	.05	17.78	.73	.24
Model fit indices	χ^2 (1, *N* = 288) = .51, χ^2/df = .51, *p* = .48, CFI = 1.00, GFI = 1.00, SRMR = .01, RMSEA = .00				

* $p < .05$. ** $p < .01$.

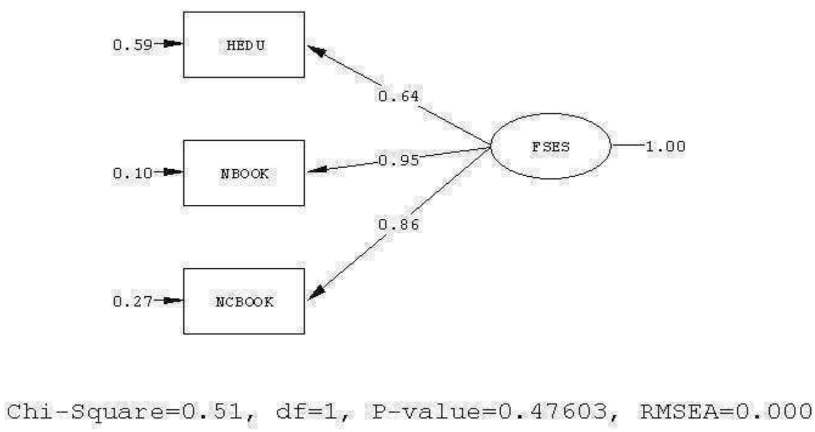


Figure 3.1. Empirically Validated Measurement Model of Family SES for the German Sample

Table 3.12 shows a descriptive analysis of the family SES index (factor score) for the German sample. The index was categorized into three groups using percentile ranking. Cut-off points for three equal groups were estimated. The percentile rank of the index of less than 33.33 was classified as the *lower middle group*, whereas the percentile rank of the index ranging between 33.33 and 66.66 was classified as *the middle group*. The percentile rank of the index greater than 66.66 was classified as *the higher middle group*. As Table 3.12 shows, the lower middle group represented parents and pupils from the *Hauptschule*, whereas the middle group represented parents and pupils from the *Realschule* and

Gesamtschule. The upper middle group represented parents and pupils from the *Gymnasium*.

Table 3.12
Descriptive Analysis of the Family SES Index for the German Sample

	School type	*N*	*Min*	*Max*	*M*	*SD*	Group belonged
Family SES index	Hauptschule	59	0.95	5.79	3.58	1.15	Lower middle group
	Realschule	73	1.67	6.19	3.99	1.10	Middle group
	Gymnasium	82	1.99	6.51	5.33	1.01	Higher middle group
	Gesamtschule	74	0.95	6.19	3.93	1.16	Middle group
	Total	288	0.95	6.51	4.27	1.29	Middle group
	Range of Percentile rank (PR)	Range of factor score	Interpretation				
	< 33.33	.95–3.64	Lower middle group				
	PR 33.33–PR 66.66	3.65–4.84	Middle group				
	> PR 66.66	4.85–6.51	Upper middle group				

3.3.2. Characteristics of the Thai Sample

3.3.1A. General Demographic Characteristics

The total Thai sample consisted of 988 participants—494 pupils and 494 parents. The results of descriptive analysis showed (Table 3.13) that pupils ranged in age from 9 to 13 years (M = 10.83, SD = .71). Mothers ranged in age from 23 to 64 years (M = 41.14, SD = 5.56), and fathers ranged in age from 25 to 72 years (M = 43.63, SD = 6.02). The number of family members living in the household ranged between 2 and 19 (M = 4.91, SD = 1.92). The number of children living in the household ranged between 1 and 10 (M = 2.00, SD = 0.97).

Table 3.13
Descriptive Analysis of Demographic Characteristics of the Thai Sample by School Type

Demographic characteristic	*Min*	*Max*	*M*	*SD*
Pupil age	9	13	10.83	0.71
Mother age	23	64	41.14	5.56
Father age	25	72	43.63	6.02
Number of family members living in household	2	19	4.91	1.92
Number of children living in household	1	10	2.00	0.97

The results of the cross-tabulation analysis of demographic characteristics of the Thai sample by school type (see Table 3.14) revealed that the majority of pupils were boys (52%), were in 5th grade (51%), and lived with their parents (56%). The majority of parent responses (86%) were from mothers. Additionally, grade level and parent response did not vary across school types—that is, the majority of pupils from every school type (except the LAO) were in 5th grade (55% of OBEC, 52% of OHEC, 50% of OPEC). In every school type, the majority of parent responses were mothers (79% of OPEC, 75% of OHEC, 71% of OBEC, 65% of LAO). However, pupils' gender and family status varied slightly across school types: the majority of OPEC pupils (68%) were boys, whereas the majority of their peers in the other three school types were girls (62% of LAO, 54% of OBEC, 53% of OHEC). The majority of OHEC pupils (45%) lived in extended families (including relatives), whereas the majority of pupils from other school types lived with their parents (65% of OPEC, 58% of LAO, 50% of OBEC).

Table 3.14
Demographic Characteristics of the Thai Sample by School Type

	Demographic characteristic	School type: *Local Admin* (LAO)	*Basic Education* (OBEC)	*Higher Education* (OHEC)	*Private Education* (OPEC)	Overview
Gender of pupil	Girl	63	72	47	55	237
		62.40%	*53.70%*	*52.80%*	*32.40%*	*48.00%*
	Boy	38	62	42	115	257
		37.60%	*46.30%*	*47.20%*	*67.60%*	*52.00%*
	Total	101	134	89	170	494
		100.00%	*100.00%*	*100.00%*	*100.00%*	*100.00%*
	Φ_c with school type	.24	*p*	.00		
Grade level	Grade 5	49	73	46	85	253
		48.50%	*54.50%*	*51.70%*	*50.00%*	*51.20%*
	Grade 6	52	61	43	85	241
		51.50%	*45.50%*	*48.30%*	*50.00%*	*48.80%*
	Total	101	134	89	170	494
		100.00%	*100.00%*	*100.00%*	*100.00%*	*100.00%*
	Φ_c with school type	.04	*p*	.81		
Parent response	Mother	66	95	67	135	363
		65.30%	*70.90%*	*75.30%*	*79.40%*	*73.50%*
	Father	35	39	22	35	131
		34.70%	*29.10%*	*24.70%*	*20.60%*	*26.50%*
	Total	101	134	89	170	494
		100.00%	*100.00%*	*100.00%*	*100.00%*	*100.00%*
	Φ_c with school type	.12	*p*	.07		
Family status	Living with parents (including stepparents)	59	67	38	110	274
		58.40%	*50.00%*	*42.70%*	*64.70%*	*55.50%*
	Living with single parent	17	16	6	12	51
		16.80%	*11.90%*	*6.80%*	*7.10%*	*10.30%*
	Living with parents and relatives	14	37	40	37	128
		13.90%	*27.60%*	*44.90%*	*21.70%*	*25.90%*
	Living with single parent and relatives	5	8	3	2	18
		5.00%	*6.00%*	*3.40%*	*1.20%*	*3.60%*
	Living with relatives	6	6	2	9	23
		5.90%	*4.50%*	*2.20%*	*5.30%*	*4.70%*
	Total	101	134	89	170	494
		100.00%	*100.00%*	*100.00%*	*100.00%*	*100.00%*
	Φ_c with school type	.16	*p*	.00		

Note. Φ_c = Cramér's V correlation coefficient. The grey shading indicates the majority.

3.3.2B Family SES of the Thai Sample

The Highest Level of Parents' Education

The majority of the Thai parents (55%) had completed higher education (holding university degrees). Furthermore, the highest level of parents' education varied across school types (Φ_c = .38, p < .01). That is, the majority of OHEC parents (84%) as well as the majority of OPEC parents (77%) had university degrees. The majority of OBEC parents (53%) had completed higher vocational training or secondary education. Amongst all school types, the LAO school type had the largest proportion of parents who had completed only lower secondary education or primary education (54%). Details are shown in Table 3.15.

Table 3.15
Highest Level of Parents' Education in the Thai Sample by School Type

The highest level of parents' education (by the order of years attended)	School type				
	Local Admin (LAO)	*Basic Education* (OBEC)	*Higher Education* (OHEC)	*Private Education* (OPEC)	Overview
None of educational degree	2 *2.00%*	0 *0.00%*	0 *0.00%*	0 *0.00%*	2 *0.40%*
Primary education (*Grade 6*)	30 *30.60%*	7 *5.20%*	0 *0.00%*	4 *2.50%*	41 *8.40%*
Lower secondary education (*Grade 9*)	23 *23.50%*	15 *11.30%*	2 *2.20%*	7 *4.10%*	47 *9.60%*
Upper secondary education (*Grade 12*)/ lower vocational degree	23 *23.50%*	32 *24.10%*	7 *7.90%*	12 *7.10%*	74 *15.20%*
Higher vocational degree	9 *9.20%*	23 *17.30%*	5 *5.60%*	15 *8.90%*	52 *10.70%*
University degree (*e.g. Bachelor's degree, Master's degree, Doctorate degree*)	11 *11.20%*	56 *42.10%*	75 *84.30%*	130 *77.40%*	272 *55.70%*
Total	98 *100.00%*	133 *100.00%*	89 *100.00%*	168 *100.00%*	488 *100.00%*
Φ_c with school type	.38	*p*	.00		

Note. Φ_c = Cramér's V correlation coefficient. The grey shading indicates the majority.

Home Literacy Resources

Overall, results revealed that the majority of Thai pupils had less than 100 general books at home (51%) and less than 50 children's books at home (64%). Moreover, the number of general books as well as children's book at home varied across school types ($\Phi_{c\ general\ book}$ = .34, p < .01; $\Phi_{c\ children's\ book}$ = .34, p < .01). That is, the majority of OHEC pupils (85%) and the majority of OPEC pupils (65%) had *more* *than 100 general books* in the household, whereas the majority of their peers from other school types had *less than 100 general books* (88% of LAO, 69% of OBEC). In addition, the majority of OHEC pupils (69%) and the majority of OPEC pupils (53%) had *more than 50 children's books* at home, whereas their peers from other school types had *less than 50 children's books* in the household (98% of LAO, 82% of OBEC). Details are shown in Table 3.16.

Table 3.16
Home Literacy Resources of the Thai Sample by School Type

Number of books in household		School type: *Local Admin* (LAO)	*Basic Education* (OBEC)	*Higher Education* (OHEC)	*Private Education* (OPEC)	Overview
General books	0–10 books	11	14	1	1	27
		11.10%	*10.60%*	*1.10%*	*0.60%*	*5.50%*
	11–25 books	41	33	4	13	91
		41.40%	*25.00%*	*4.50%*	*7.70%*	*18.60%*
	26–100 books	35	44	8	46	133
		35.30%	*33.30%*	*9.00%*	*27.20%*	*27.20%*
	101–200 books	5	21	15	28	69
		5.10%	*15.90%*	*16.90%*	*16.60%*	*14.10%*
	More than 200 books	7	20	61	81	169
		7.10%	*15.20%*	*68.50%*	*47.90%*	*34.60%*
	Total	99	132	89	169	489
		100.00%	*100.00%*	*100.00%*	*100.00%*	*100.00%*
	Φ_c with school type	.34	*p*	.00		
Children's books	0–10 books	43	35	5	18	101
		43.90%	*26.70%*	*5.60%*	*10.60%*	*20.70%*
	11–25 books	42	44	7	28	121
		42.90%	*33.60%*	*7.90%*	*16.60%*	*24.90%*
	26–50 books	11	29	16	34	90
		11.20%	*22.10%*	*18.00%*	*20.10%*	*18.50%*
	51–100 books	0	16	24	36	76
		0.00%	*12.20%*	*27.00%*	*21.30%*	*15.60%*
	More than 100 books	2	7	37	53	99
		2.00%	*5.40%*	*41.50%*	*31.40%*	*20.30%*
	Total	98	131	89	169	487
		100.00%	*100.00%*	*100.00%*	*100.00%*	*100.00%*
	Φ_c with school type	.34	*p*	.00		

Note. Φ_c = Cramér's V correlation coefficient. The grey shading indicates the majority.

Measurement Model of Family SES for the Thai Sample

First of all, the correlations among three indicators were examined (see Table 3.17). It was found that all correlations were statistically significant and ranged between .49 ($p < .01$) and .77 ($p < .01$). Bartlett's test of sphericity yielded a χ^2 of

575.44 with *df* of 3 (p = .00), indicating that all off-diagonal elements of the correlation matrix were not equal to zero. The KMO of the correlation matrix was greater than .50 (KMO = .66), indicating that the three indicators correlated highly with each other. These findings, hence, confirmed that the data were appropriate for performing confirmatory factor analysis (CFA).

Table 3.17
Means, Standard Deviations, and Correlation Matrix for Three Indicators Measuring Family SES for the Thai Sample

Indicator	1	2	3
1. HEDU	—		
2. NBOOK	.49**	—	
3. NCBOOK	.51**	.77**	—
M	14.06	3.54	2.90
SD	3.84	1.28	1.43
Bartlett's Test of Sphericity = χ^2 (3, N = 494) = 575.44, p = .00, KMO = .66			

* $p < .05$. ** $p < .01$.

The results of CFA (see Table 3.18) revealed that the measurement model yielded acceptable model fit indices [χ^2 (1, N = 494) = 1.22, χ^2/df = 1.22, p = .27, CFI = 1.00, GFI = 1.00, SRMR = .01, RMSEA = .00]. All indicators were significantly important for the component of family SES. The factor loadings ranged between .56 (p < .01) and .92 (p < .01). Among the three indicators, the number of children's book in the household yielded the highest factor loading. Figure 3.2 shows the path diagram of the empirically validated measurement model. The FSES index of each participant was calculated by using the factor score. The factor score equation could be expressed as follows:

$FSES_{\text{Thai Sample}}$ = .09(HEDU) + .30(NBOOK) + .65(NCBOOK).

Table 3.18
Standardized Parameter Estimates for the Measurement Model of Family SES for the Thai Sample

Indicator	β	*SE*	*t*	R^2	Factor score regression
1. HEDU	.56**	.04	12.96	.32	.09
2. NBOOK	.84**	.04	22.17	.70	.30
3. NCBOOK	.92**	.03	26.69	.85	.65
Model fit indices	χ^2 (1, N = 494) = 1.22, χ^2/df = 1.22, p = .27, CFI = 1.00, GFI = 1.00, SRMR = .01, RMSEA = .00				

* $p < .05$. ** $p < .01$.

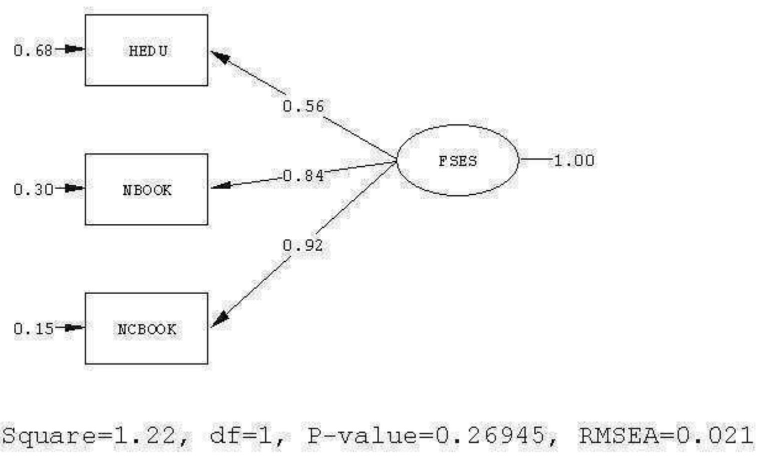


Figure 3.2. Empirically Validated Measurement Model of Family SES for the Thai sample

Table 3.19 presents a descriptive analysis of the family SES index (factor score) for the Thai sample. The index was categorized into three groups using percentile ranking. Cut-off points were estimated for three equal groups. The percentile rank of the index of less than 33.33 was classified as the *lower middle group*, whereas the percentile rank of the index ranging between 33.33 and 66.66 was classified as the *middle group*. The percentile rank of the index greater than 66.66 was classified as the *higher middle group*. As Table 3.19 shows, schools under *the Local Administration Organizations* (LAO) represented parents and pupils from the lower middle group, whereas parents and pupils recruited from schools under *the Office of the Basic Education Commission* (OBEC) and *the Office of the Private Education Commission* (OPEC) represented the middle group. Schools under *the Office of the Higher Education Commission* (OHEC) represented the upper middle group.

Table 3.19
Descriptive Analysis of the Family SES Index for the Thai Sample

	School type	*n*	*Min*	*Max*	*M*	*SD*	Group belonged
Family SES index	Local Admin (LAO)	101	1.25	6.19	2.88	0.92	Lower middle group
	Basic Education (OBEC)	134	1.49	6.37	3.66	1.13	Middle group
	Higher Education (OHEC)	89	2.33	6.73	5.35	1.07	Upper middle group
	Private Education (OPEC)	170	2.06	6.73	4.86	1.24	Middle group
	Total	494	1.25	6.73	4.22	1.44	Middle group
	Range of percentile rank (PR)	Range of factor score	Interpretation				
	< 33.33	1.25–3.30	Lower middle group				
	PR 33.33–PR 66.66	3.31–4.99	Middle group				
	> PR 66.66	5.00–6.73	Upper middle group				

3.3.3. Summary

The aim of this part of the analysis was to take a closer look at the characteristics of the German and Thai samples. Overall, the findings of descriptive analysis reveal that the general demographic characteristics of both samples were quite similar. That is, in both samples, the average age of pupils was 11 years, the average age of their mothers was 41 years, and the average age of their fathers was 44. There were approximately two children and four to five family members living in the household. The majority of pupils in both samples were boys, they were in 5th grade, and they lived with their parents. The majority of parent respondents in both samples were mothers.

The results of the descriptive analysis of family SES variables revealed, it was found that the highest level of parents' education differed across the samples. The majority of German parents had completed vocational training or secondary education, whereas the majority of Thai parents held university degrees. In addition, the availability of general and children's books in the household (home literacy resources) was also similar in both samples. That is, the majority of pupils had less than 100 general books and less than 50 children's books at home.

The findings of CFA on the family SES revealed that two indicators of home literary resources in both samples were more important than the highest level of parents' education. Furthermore, school types for both samples appeared to represent a variety of parent–child dyads from different social backgrounds. That is, the higher SES group is represented by the highest school track Gymnasium in

Germany and the university demonstration school OHEC in Thailand. The middle SES group is represented by two German school types—Realschule and Gesamtschule. As for the Thai sample, the middle SES group is represented by the private school (OPEC) and the basic education school (OBEC). Similarly, the lowest German school track Hauptschule and the Thai municipality school (LAO) represent the lower family SES group.

Taken together, the findings indicated that the German and Thai samples were quite homogeneous in general demographic characteristics. Moreover, they also confirmed that there was a diversity of family SES in both samples.

3.4. Instrumentation

The measurement instruments were parent and pupil questionnaires. Each questionnaire consisted of two parts: (a) demographic survey questions/participant background and (b) a wide range of scales measuring research variables.

To complete the questionnaire, pupils and parents were asked to enter their answers into the blank spaces (for the first part) or give their answers by crossing every item (for the second part). Scale responses were made on a 4-point Likert scale ranging from 1 (*strongly disagree*) to 4 (*strongly agree*). Only responses for the valence towards school were on a continuum: one end was anchored by negative experience and the other by positive experience (e.g. 1 = *bad*, 4 = *good*).

Parent and pupil questionnaires were written in German and Thai languages, so that German participants took the German version and Thai participants took the Thai version. The questionnaires were first constructed in German. Afterwards, the German version was translated into Thai by a Thai university lecturer holding a German doctorate degree (Dr.phil.) in modern German literature who is fluent in German. A back-translation from Thai into German was done by another Thai-German bilingual colleague. Finally, the dissertation supervisor compared *the content similarities* between the original German version and back-translated version.

Particularly for the second part of each questionnaire, the internal consistencies of the scales were checked to ensure that the scales were reliable and valid across cultures, and the construct validity of the scales was examined across the German and Thai samples. The following describes the parent and pupil questionnaires in greater detail.

3.4.1. Parent Questionnaire

The first part of the parent questionnaire comprised demographic survey questions for parents (e.g. parent age, marital status, migration background); questions concerning family SES (e.g. parental education, family income, home learning resources); and parent scales. Some demographic survey questions and questions on family SES were adapted from the *PARS questionnaires* (Research School "Education and Capabilities", 2010).

The second part of the parent scales assessed parent reports on a set of predictor constructs of the quality of home-based parental involvement, namely: their motivational beliefs (i.e. parental conceptions of responsibility, parental role conceptions in learning situations, parental teaching efficacy beliefs); interpersonal conditions (i.e. invitations from the child, invitations from the school and teachers); and family contexts (e.g. time and energy, valence towards school, SES). The following section describes the scale construction (e.g. what specific scales are used and where were they taken from), the internal consistencies of the parent scales for both samples, and the cross-culturally construct validity of the parent scales.

3.4.1A. Construction of the Parent Scales

Parental Conceptions of Responsibility for Involvement in the Child's Education

Three subscales were administered, namely: parent-focused (7 items), partnership-focused (4 items), and school-focused responsibility (4 items). All items were adapted from *the Categorical Role Construction for Involvement Questionnaire* (Hoover-Dempsey, Wilkins, Sandler, & O' Connor, 2004). Details of subscales are explained as follows:

- *The subscale of parent-focused responsibility* assesses the extent to which parents believe that parents alone should be actively responsible for their child's education. Sample items are "*I see it as my duty to be informed about what is happening in school*", and "*It is my job to help my child with tough assignments*".
- *The subscale of partnership-focused responsibility* assesses the extent to which parents believe that parents and school together should be

actively responsible for the child's education. Sample items are "*I think a close cooperation between home and school would be ideal for pupils*", and "*I am the first to become involved when the school or teachers are interested in collaboration with parents*".

- *The subscale of school-focused responsibility* assesses the extent to which parents believe that school alone should be actively responsible for the child's schooling. Sample items are "*It is the teacher's duty to formulate assignments that my child can understand*", and "*It is the teacher's responsibility to ensure that no pupil in the class falls behind in a lesson*".

Afterwards, the subscales of parent-focused and partnership-focused responsibility were combined into *the scale of parental conception of active responsibility,* whereas school-focused responsibility was identified as *parental conception of passive responsibility.*

Parental Role Conceptions in Learning Situations

Two subscales were administered, namely: goal orientation towards learning (5 items) and goal orientation towards achievement (10 items). All items were adapted from *the German Product and Process Orientation Questionnaire* (Fragebogen zur Produkt-und Prozessorientierung) constructed by Wild et al. (2001) and used in the Bielefeld longitudinal study "Fostering self-determined forms of learning motivation at home and in school". Details of subscales are explained as follows:

- *The subscale of goal orientation towards learning* assesses the extent to which parents focus on the learning process when evaluating their child's education. Sample items are "*I think it is good if my child tries something out at home, which he/she has learned in school*", and "*I encourage my child to ask questions in the classroom if he/she does not understand something*".
- *The subscale of goal orientation towards achievement* assesses the extent to which parents focus on their child's achievement outcomes as indicative of the parents' or the child's adequacy. Sample items are "*I expect a good performance from my child, no matter how much*

he/she has to work hard for it", and "*It is important for me that my child hands in homework that is 100 per cent correct as possible*".

Parental Teaching Efficacy Beliefs

Two subscales were administered, namely: parental general teaching efficacy beliefs in the general domain and in the specific domain. The former consists of five items while the latter consists of four items.

- *The subscale of general teaching efficacy belief* assesses the extent to which parents believe in their abilities to help the child succeed in learning. Five items were adapted from *the Scale of Parent Efficacy for Helping the Child Succeed in School* by Hoover-Dempsey, Bassler, and Brissie (1992). Sample items are "*I know exactly how to motivate my child to learn*", and *"I think, I am successful in helping my child in learning"*.
- *The subscale of domain specific teaching efficacy belief* assesses the extent to which parents believe in their abilities to help the child specifically with learning mathematics. These four items were adapted from *the German Parental Self Efficacy in Mathematics Homework Supervision Questionnaire* (Fragebogen zum elterlichen Kompetenzerleben bezüglich der Hausaufgabenbetreuung) by Wild et al. (2001). Sample items are "*I feel that I am competent enough to help my child with his/her mathematics homework*", and "*I am often in doubt whether I am competent enough to help my child with his/her math homework*".

Specific Invitations for Involvement

The following two subscales were administered, namely: invitation from the child (6 items) and invitation from the school and teachers (4 items).

- *The subscale of invitation from the child* assesses the extent to which parents perceive that the child encourages them to get involved in his/her education. Overall, this subscale consists of six items. Three items were adapted from *the Specific Invitations to Involvement from the Child Questionnaire* by Hoover-Dempsey and Sandler (2005). Another three items were specially developed. Sample items are "*My* *child always ask me to explain his or her homework*", and "*My child expects me to have an interest in what is happening at his/her school*".

- *The subscale of invitation from the school and teachers* assesses the extent to which parents perceive that their engagement in the child's education is requested, expected, or wanted by the school and teachers. Four new items were developed on the basis of the two scales of invitations from the school and teacher (see Hoover-Dempsey & Sandler, 2005; Walker et al., 2005). Sample items are "*Everybody can feel that parents are welcome in this school*", and "*The school always provides activities that parents and teachers can do together*".

Parental Life Context

The following two subscales were administered, namely: personal time and energy (3 items) and valence towards school (7 items).

- *The subscale of personal time and energy* assesses the extent to which parents perceive how much time and energy they have for engaging in the child's schooling. Three items were adapted from *the Parental Time and Energy for Involvement Questionnaire* (see Hoover-Dempsey & Sandler, 2005; Walker et al., 2005). Sample items are "*I have enough time to talk with my child about the school day*", and "*I do often not have enough time and energy to help my child with his/her homework*".
- *The subscale of valence towards school* assesses the parents' attraction to or general disposition towards schools, based on their prior personal experiences with past schools. Seven items were adapted from *the Valence toward School Scale* by Hoover-Dempsey and Sandler, (2005). Sample items are "*In the past, I think my school was bad (1) versus good (4)*" and "*In the past, I think my teacher was unfriendly (1) versus friendly (4)*".

3.4.1B. Internal Consistencies of the Parent Scales for the German and Thai Samples

To examine whether parent scales for both samples are reliable, Cronbach's alpha coefficient was calculated for each subscale (see Table 3.20). For the German sample, the alphas ranged between .63 and .88; for the Thai sample, between .50 and .83. As an overview, the alpha of a whole parent questionnaire (59 items) was .86 for the German sample and .87 for the Thai sample. This indicated that the internal consistencies of the parent questionnaires of German and Thai were quite similar.

Table 3.20

Internal Consistencies of the Parent Subscales for the German and Thai Samples

Parent scale	Number of items	German Sample (N = 288)	Thai Sample (N = 494)
		alpha	alpha
1. Parental conception of active responsibility			
1.1. Parent-focused responsibility	7	.75	.70
1.2. Partnership-focused responsibility	4	.72	.64
2. Parental conception of passive responsibility			
2. 1. School-focused responsibility	4	.63	.70
3. Parental role conceptions			
3.1. Goal orientation towards learning	5	.65	.72
3.2. Goal orientation towards achievement	10	.80	.80
4. Parental teaching efficacy beliefs			
4.1. General sense of teaching efficacy	5	.81	.79
4.2. Domain-specific sense of teaching efficacy	4	.88	.69
5. Specific invitations for involvement			
5.1. Invitation from the child	6	.64	.71
5.2. Invitation from the school and teachers	4	.75	.66
6. Parental life context			
6. 1. Personal time and energy	3	.63	.50
6. 2. Valence towards school	7	.83	.83
Total	59	.86	.87

3.4.1C. Cross-Cultural Measurement Invariance of the Parent Scales Across the German and Thai Samples

The aim of this part of the analysis was to examine whether the German and Thai versions of the parent scales yielded cross-cultural measurement invariance. Milfont and Fisher (2010) stated that when comparing individuals' reports on psychological variables across groups, it is important to test the assumption that one's instrument measures the same psychological construct in all groups. When this assumption is met, the comparisons on the psychological instrument between groups are valid. That is, differences or similarities between groups can be interpreted meaningfully.

First, it was examined whether the parent scales were equal in terms of factor structure (model form) and parameter estimates for different matrices (e.g. factor loadings, measurement error variances-covariances) across the two cultural groups. A multi-sample confirmatory factor analysis (MCFA) with *LISREL* program version 8.53 (Jöreskog & Sörbom, 2002) was performed to examine cross-cultural measurement invariance.

In the present study, there were *11 parent subscales* specified under six parent scales. The six parent scales included parental conceptions of responsibility, parental role conceptions in learning situations, parental teaching efficacy beliefs, specific invitations to involvement, and parental life context.

Overall, there were three steps of data analyses. These were:

Step 1

To initially ensure that the data were appropriate for MCFA, *correlations between questionnaire items* were examined for each scale in both German and Thai samples. In addition, *Bartlett's test of sphericity* was used to ensure that a correlation matrix of questionnaire items on each scale is not an *identity matrix* (all correlations *except for the main diagonal* are equal to zero). Furthermore, the *Kaiser-Meyer-Olkin measure of sampling adequacy* (KMO) was computed to test whether questionnaire items on each scale correlated highly with each other (KMO > .50). After appropriate data criteria had been met, it was possible to move on to the second step of analysis.

Step 2

The measurement model of each subscale for each sample was specified. The measurement model is the model specifying the relationship between manifest indicators (a variable that can be measured or observed directly) and the latent construct (a variable that cannot be measured directly). Overall, most of subscales were specified in terms of the *first-order measurement model*—a latent construct measured by multiple manifest indicators (questionnaire items). The subscales specified under the same scale were validated together.

Figure 3.3 illustrates *the first–order measurement model*. As can be seen, the first and the second subscales were latent constructs that could be measured, for example, by six items (three items for each subscale). These six items served as manifest indicators of latent constructs. Overall, the first–order measurement models comprised three matrices of parameter estimates.

From the left to the right, *the TD matrix* represents the measurement error variances-covariances of items measuring two subscales. *The LX matrix* represents factor loadings of items measuring two subscales. *The PH matrix* represents factor variances and covariances of two subscales (relationships between two subscales).

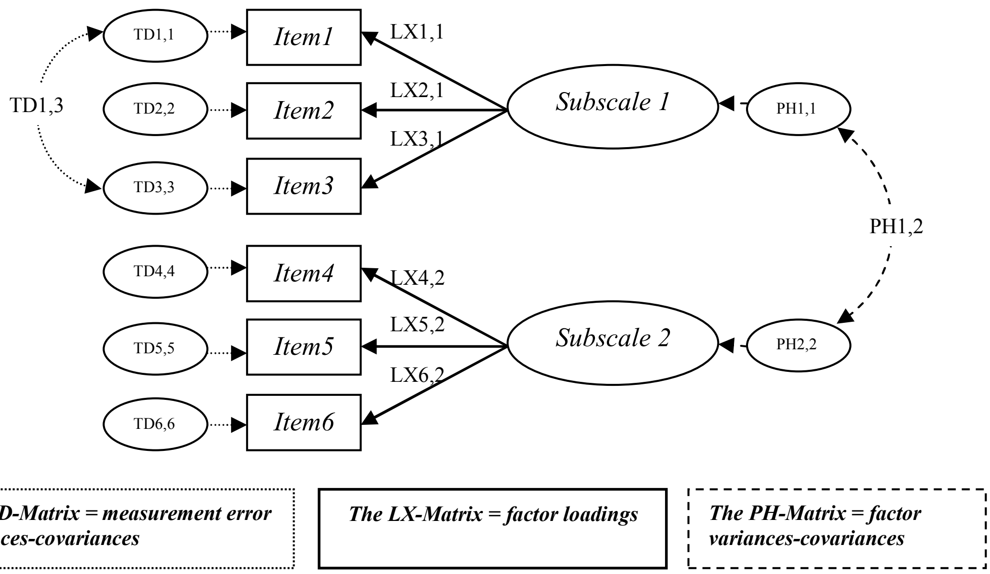


Figure 3.3. The Factor Structure of the First-Order Measurement Models and Its Parameter Estimates for the LX matrix, the PH matrix, and the TD matrix

The cross-cultural measurement invariance of measurement models was examined with MCFA. This is a series of comparisons of measurement models with increasingly restrictive constraints across groups. The χ^2-difference ($\Delta\chi^2$) is normally used to examine a significant increase between a pair of comparisons between two model specifications (e.g. one with less and one with more constraint). Basically, if a set of constraints is applied and model fit (as measured by χ^2) does not show a significant increase (the significant result of $\Delta\chi^2$ is not met) from a less constrained model, then the constraints can be accepted (Bentler, 1980, Griffin et al., 2000, MacCallum et al., 1994, as cited in Hair et al., 2010).

Four levels of invariance testing were performed. First, the invariance of the most unconstrained model of invariance, the factor structure invariance (*configural invariance*), was tested across the two cultural groups. That is, the same pattern of measurement model was constrained to be equal across two cultural groups, whereas parameter estimates (e.g. factor loadings, factor variances-covariances) were allowed to be freely estimated. The aim of this test was to check whether participants from two cultural groups conceptualized the subscale constructs in the same way. Second, a stronger test of invariance was performed by examining the model constrained for equal factor loadings (*metric invariance*) across two cultural groups. The aim of this test was to check whether participants from two cultural groups responded to the items in the same way. Third, the invariance of factor variances-covariances (*factor variance-covariance invariance*) was examined. The aim of this test was to check whether subscale constructs were related to each other in a similar fashion across groups. Last, the invariance of measurement error variances-covariances (*error variance-covariance invariance*) was examined. The aim of this test was to check whether the amount of measurement error present in the items was equivalent across groups (Hair et al., 2010; Milfront & Fischer, 2010; Steenkamp & Baumgartner, 1998).

The present study examined all levels of invariance as mentioned above. However, the scales were not expected to achieve full measurement invariance, because this would be unlikely to hold in practice (Milfont & Fischer, 2010). The main aim of the present study was to examine structural relationships between research variables across German and Thai samples. Thus, the scales were expected to achieve configural invariance and full metric invariance or partial metric invariance[10] as recommended by Hair et al. (2010). However, the present study did not aim to compare means of scale scores across German and Thai samples. Therefore, it did not test the invariance of means of scale scores (*scalar invariance*), which is required particularly for research aiming to compare mean scale scores across groups (Hair et al., 2010; Meredith 1993, as cited in Steenkamp & Baumgartner, 1998).

For the first-order measurement model, there were *four hypothesized models of invariance testing* nested in a hierarchical ordering with an increasing number of parameter estimates. The four hypothesized models are:

[10] Hair et al. (2010) suggested that if full variance is not supported, the test for *partial invariance* may be taken into account. That is to say, the researcher can systematically "free" the constraints on each factor that have the greatest differences in the hope that the $\Delta\chi^2$ will become non-significant with *at least two constraints per construct*.

1) *Model 1*: configural invariance (factor structure [model form] is constrained to be equal across groups).
2) *Model 2*: metric invariance (factor loadings [the LX matrix] are constrained to be equal across groups).
3) *Model 3*: factor variance-covariance invariance (factor variances-covariances [the PH matrix] are constrained to be equal across groups).
4) *Model 4*: error variance-covariance invariance (error variances-covariances [the TD matrix] are constrained to be equal across groups).

Apart from this, only two subscales measuring parental conception of active responsibility (parent-focused and partnership-focused responsibility) were validated in terms of the *second-order measurement model*—a latent construct measured by multiple latent indicators. In the present study, the second-order model validation aims to combine these two subscales into *the composite subscale* of parental conception of active responsibility.

Figure 3.4 depicts *the second order-measurement model*. As can be seen, the composite subscale is a latent construct that can be measured by two latent subscales. Each latent subscale is measured by three items serving as manifest indicators. Overall, the second order-measurement model comprised five matrices of parameter estimates.

From the left to the right, *the PH matrix* represents factor variance invariance of the composite subscale. *The GA matrix* represents the second-order factor loadings of two latent subscales on the composite subscale. *The PS matrix* represents the factor disturbance-covariance of two latent subscales (the relationships between two subscales). *The LY matrix* represents the first-order factor loadings of items measuring two subscales. *The TE matrix* represents the measurement error variances-covariances of items measuring two subscales.

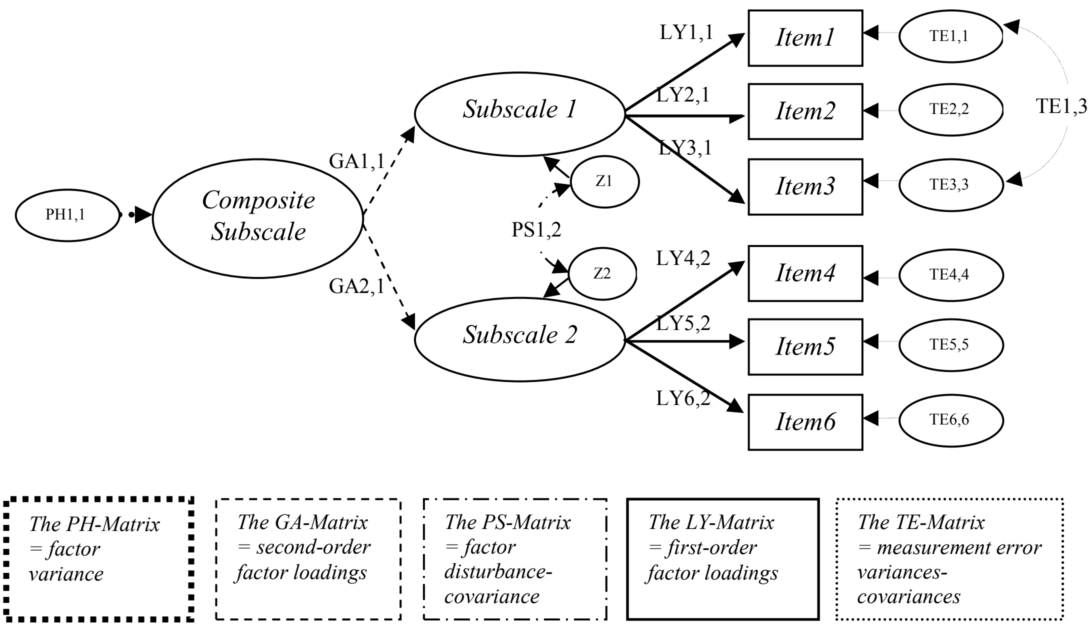


Figure 3.4. The Factor Structure of the Second-Order Measurement Model and its Parameter Estimates for the LY matrix, the GA matrix, the PH matrix, the PS matrix, and the TD matrix

The second-order measurement model had *six hypothesized models of invariance testing* that were nested in a hierarchical ordering with increasing number of parameter estimates. Unlike the first-order measurement model, two more levels of invariance testing were included—invariance of second-order factor loading and invariance of factor disturbance-covariance. The six hypothesized models are:

1) *Model 1*: configural invariance (factor structure [model form] is constrained to be equal across groups).
2) *Model 2*: first-order metric invariance (first–order factor loadings [the LY-matrix] are constrained to be equal across groups).
3) *Model 3*: second-order metric invariance (second–order factor loadings [the GA-matrix] are constrained to be equal across groups).
4) *Model 4*: factor variance invariance (factor variance [the PH matrix] is constrained to be equal across groups).
5) *Model 5*: factor disturbance-covariance invariance (factor disturbance-covariance [the PS matrix] is constrained to be equal across groups).
6) *Model 6*: error variance-covariance invariance (error variances-covariances [the TE matrix] are constrained to be equal across groups).

Step 3

The *best-fit-model* from all hypothesized nested models was selected. Standardized parameter estimates of the best-fit model were described. The model fit was evaluated with the χ^2 test, a ratio of χ^2 to *df*, and four other fit indices—goodness of fit index (GFI), comparative fit index (CFI), the standardized root mean square residual (SRMR), and the root-mean-square-error of approximation (RMSEA). The criteria for acceptable model fit relied considerably on Schreiber et al. (2006)—a non-significant χ^2, a ratio of χ^2 to *df* of 2 or 3 or lower, a value of GFI of .95 or higher, a value of CFI of .95 or higher, a value of SRMR of .08 or lower, and a value of RMSEA of .06 or lower. In addition, the factor score of each subscale was calculated.

To reduce the number of parameter estimates for the complete conceptual model (in the next step of analysis), *the factor scores of all subscales* were calculated (from the best-fit-models) and used as *manifest variables* for validating the complete conceptual model. Details of cross-cultural validity of parent scales are shown in the following.

Parental Conception of Active Responsibility

This scale was a second-order latent construct measured by two first-order latent constructs of parent-focused and partnership-focused responsibility. Parent-focused responsibility was measured by seven items, whereas partnership-focused responsibility was measured by four items. First, correlations were examined between items measuring this scale. In the German sample, significant correlations ranged between .12 ($p < .05$) and .55 ($p < .01$). In the Thai sample, significant correlations ranged between .13 ($p < .01$) and .42 ($p < .01$). In the German sample, Bartlett's test of sphericity yielded a χ^2 of 808.03 with *df* of 55 ($p = .00$). In the Thai sample, Bartlett's test of sphericity yielded a χ^2 of 1,058.82 with *df* of 55 ($p = .00$). This indicated that the correlation matrices for items measuring the two subscales for both samples were not the identity matrix (all off-diagonal elements were zero). The Kaiser-Meyer-Olkin measures (KMO) of sampling of two correlation matrices for both samples were greater than .50 ($KMO_{German\ Sample} = .84$, $KMO_{Thai\ Sample} = .84$). This showed that 11 items measuring two subscales correlated highly with each other. Therefore, our data for both samples were appropriate for MCFA. Details are shown in Table 3.21.

Table 3.21

Means, Standard Deviations, and Correlation Matrices for Items Measuring the Scale of Parental Conception of Active Responsibility for the German and Thai Samples (German Sample = Left-Hand Corner; Thai Sample = Right-Hand Corner)

Thai Sample (N = 494)											
Bartlett's Test of Sphericity [χ^2 (55, N = 494) = 1,058.82, p = .00] KMO = .84											
M	3.34	3.31	3.67	3.63	3.63	3.20	3.07	3.58	3.05	3.26	3.67
SD	.61	.66	.51	.51	.56	.74	.68	.55	.57	.52	.47
Item	PF1	PF2	PF3	PF4	PF5	PF6	PF7	PN1	PN2	PN3	PN4
PF1	—	.27**	.32**	.36**	.32**	.14**	.33**	.42**	.26**	.31**	.31**
PF2	.15*	—	.28**	.37**	.18**	.24**	.14**	.27**	.25**	.20**	.20**
PF3	.10	.36**	—	.36**	.34**	.25**	.18**	.27**	.22**	.17**	.24**
PF4	.32**	.37**	.47**	—	.38**	.20**	.19**	.32**	.22**	.26**	.41**
PF5	.19**	.26**	.41**	.32**	—	.21**	.20**	.22**	.16**	.16**	.31**
PF6	.19**	.40**	.39**	.43**	.35**	—	.32**	.13**	.12**	.17**	.15**
PF7	.36**	.19**	.26**	.38**	.28**	.35**	—	.19**	.21**	.31**	.24**
PN1	.39**	.17**	.07	.25**	.26**	.29**	.29**	—	.27**	.28**	.40**
PN2	.31**	.06	.11	.16**	.12*	.22**	.36**	.32**	—	.40**	.17**
PN3	.40**	.06	.10	.25**	.19**	.28**	.39**	.45**	.38**	—	.34**
PN4	.35**	.09	.01	.16**	.10	.28**	.27**	.55**	.37**	.42**	—
M	3.58	3.26	2.86	3.54	3.34	3.54	3.29	3.61	2.92	3.55	3.72
SD	.59	.82	.79	.60	.70	.57	.71	.56	.79	.57	.51
Bartlett's Test of Sphericity [χ^2 (55, N = 288) = 808.03, p = .00] KMO = .84											
German Sample (N = 288)											

Note. Parent-Focused Responsibility (PF1–PF7). Partnership-Focused Responsibility (PN1 – PN4).
$^*p < .05$. $^{**}p < .01$.

MCFA was then performed on this scale to examine six invariance testing hypotheses. Table 3.22 shows the results of MCFA. First, Model 1 was tested for factor structure invariance. Model 1 fitted the empirical data well [χ^2 (46, N_1 = 288, N_2 = 494) = 54.63, χ^2/df = 1.18, p = .18, GFI = .98, CFI = 1.00, SRMR = .00, RMSEA = .00]. This indicated that the factor structure of this scale was invariant across German and Thai samples. That is, configural invariance was supported. Because configural invariance was supported, first-order factor loadings (subscale items) were constrained to be equal (Model 2). As can be seen from Table 3.22, Model 2 fitted the data well, and the χ^2-difference ($\Delta\chi^2$) between Model 2 versus Model 1 was not significant. This indicated that first-order factor loadings were equivalent across samples. That is, full first-order metric invariance was supported. Afterwards, further models were examined. The second-order metric invariance model (Model 3), the factor variance invariance model (Model 4), and the factor disturbance-covariance invariance model (Model 5) also yielded acceptable fit indices (see Table 3.22). The tests of $\Delta\chi^2$ between adjacent models

(Model 3 vs. Model 2, Model 4 vs. Model 3, and Model 5 vs. Model 4) were not significant. This indicated that factor loadings of latent subscales, factor variance, and factor disturbance-covariance were invariant across samples. That is, full second-order metric invariance, full factor variance invariance, and full factor disturbance-covariance invariance were supported. However, the error variance-covariance invariance model (Model 6) did not provide acceptable fit indices for the data (see Table 3.22). This indicated that measurement error variances-covariances differed across German and Thai samples. That is, error variance-covariance was not supported.

Table 3.22
Test of Cross-Cultural Measurement Invariance for the Scale of Parental Conception of Active Responsibility Across the German and Thai Samples

Nested model	Model fit index							
	χ^2	*df*	χ^2/df	*p*	GFI	CFI	SRMR	RMSEA
Model 1: Configural invariance	.49	4	.12	.97	1.00	1.00	.00	.00
Model 2: Metric invariance (first order)	9.28	13	.71	.75	1.00	1.00	.01	.00
Model 3: Metric invariance (second order)	11.12	14	.79	.68	1.00	1.00	.02	.00
Model 4: Factor variance invariance	11.12	15	.74	.74	1.00	1.00	.02	.00
Model 5: Factor disturbance-covariance invariance	13.93	16	.87	.60	1.00	1.00	.02	.00
Model 6: Error variance-covariance invariance	144.32	68	2.12	.00	.98	.97	.04	.05

Model difference	$\Delta\chi^2$	Δdf	Decision	Critical value of the χ^2-distribution .05	.01
Model 2 vs. Model 1	8.79	9	Accept	16.92	21.67
Model 3 vs. Model 2	1.84	1	Accept	3.84	6.64
Model 4 vs. Model 3	0.00	1	Accept	3.84	6.64
Model 5 vs. Model 4	2.81	1	Accept	3.84	6.64
Model 6 vs. Model 5	–	–	Reject	–	–

Note. The grey shading indicates the best-fit model.

The best-fit model was selected by considering the smallest value of a ratio of χ^2 to *df* found in each tested model. Model 1 (as constrained for equal factor structure) yielded the smallest value of χ^2 to *df* of .12. Standardized parameter estimates for Model 1 for both samples are shown in Table 3.23. Path diagrams of Model 1 for both samples are shown in Figure 3.5 and Figure 3.6. The factor score was calculated to combine two subscales of parent-focused and partnership-focused responsibility into one subscale of parental conception of active responsibility. Factor score equations of parental conception of active responsibility (ACRESP) for German and Thai samples could be expressed as follows:

$ACRESP_{German\ Sample}$ = .00(PF1) + .10(PF2) − .02(PF3) + .09(PF4) + .05(PF5) + .12(PF6) + .12(PF7) + .45(PN1) + .03(PN2) + .23(PN3) + .24(PN4)

$ACRESP_{Thai\ Sample}$ = .18(PF1) + .10(PF2) – .08(PF3) + .29(PF4) + .09(PF5) + .15(PF6) + .15(PF7) + .19(PN1) + .11(PN2) + .09(PN3) + .22(PN4)

Table 3.23

Standardized Parameter Estimates for the Measurement Model of Parental Conception of Active Responsibility for the German and Thai Samples, as Constrained for Equal Factor Structure

Item		German Sample (N = 288)					Thai Sample (N = 494)				
		β	SE	t	R^2	FSR	β	SE	t	R^2	FSR
First order		Parent-focused responsibility (PFRESP)									
	PF1	.55	–	–	.15	.00	.55	–	–	.39	.18
	PF2	.82**	.56	2.69	.33	.10	.44**	.17	4.55	.25	.10
	PF3	.59*	.54	1.99	.17	–.02	.30**	.20	2.73	.11	–.08
	PF4	.92**	.51	3.29	.41	.09	.65**	.18	6.76	.56	.29
	PF5	.71**	.47	2.79	.25	.05	.45**	.18	4.43	.26	.09
	PF6	1.03**	.70	2.67	.52	.12	.43**	.25	3.20	.24	.15
	PF7	.91*	.80	2.06	.40	.12	.47**	.26	3.21	.28	.15
		Partnership-focused responsibility (PNFRESP)									
	PN1	.69	–	–	.67	.45	.69	–	–	.37	.19
	PN2	.33**	.16	3.08	.15	.03	.50**	.15	4.76	.20	.11
	PN3	.53**	.09	8.01	.38	.23	.58**	.12	6.94	.26	.09
	PN4	.57**	.27	3.11	.45	.24	.75**	.24	4.49	.43	.22
Second order	PFRESP	1.00	–	–	1.00	–	1.00	–	–	1.00	–
	PNFRESP	1.07**	.39	3.48	.40	–	.52**	.12	5.61	.46	–

Note. No report on *SE* and *t* value for constrained parameter estimates. FSR = Factor Score Regression. **p* < .05. ***p* < .01.

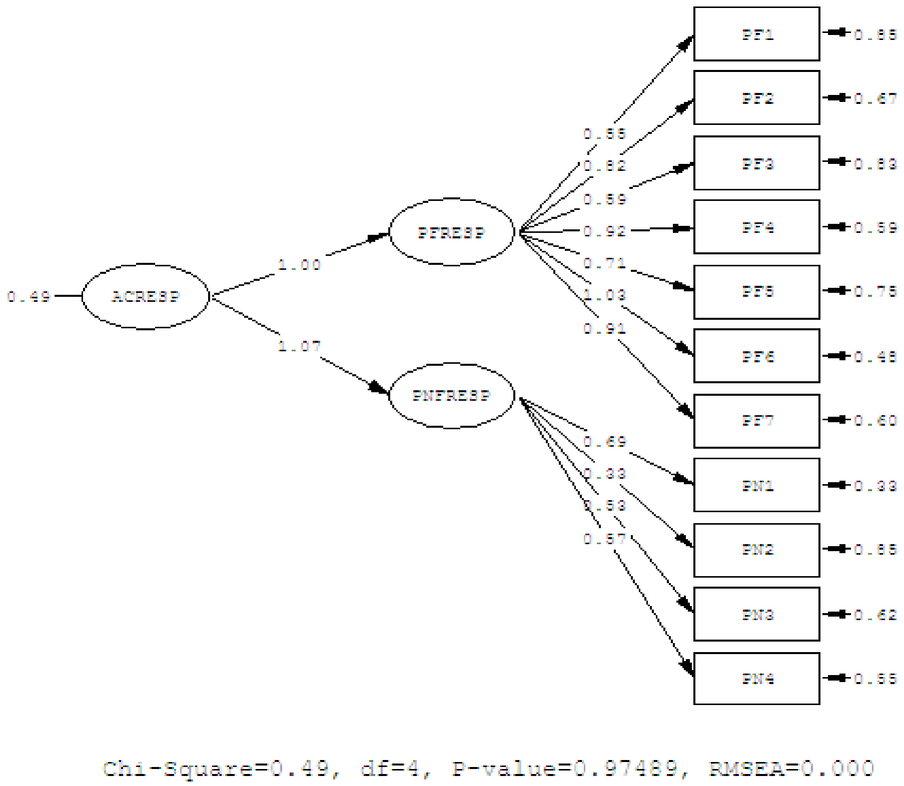


Figure 3.5. Empirically Validated Measurement Model of Parental Conception of Active Responsibility for the German Sample, as Constrained for Equal Factor Structure

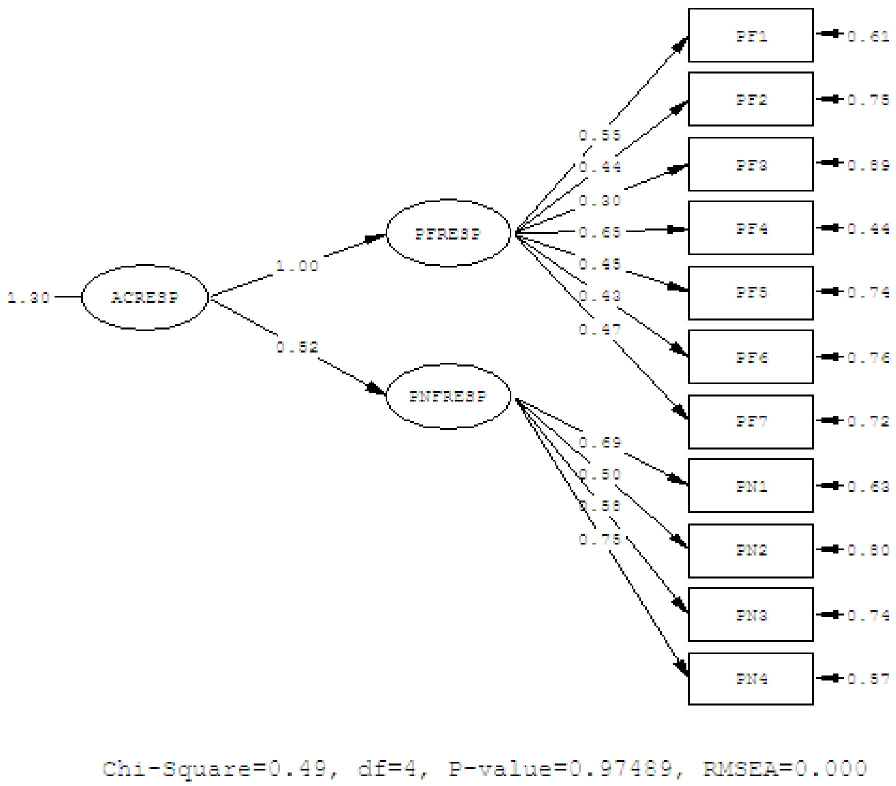


Figure 3.6. Empirically Validated Measurement Model of Parental Conception of Active Responsibility for the Thai Sample, as Constrained for Equal Factor Structure

Parental Conception of Passive Responsibility

Parental conception of passive responsibility, *or school-focused responsibility*, was also a subscale within the scale of parental conception of responsibility. This subscale was a latent construct measured by four items. First, correlations were examined between items measuring this subscale. In the German sample, significant correlations ranged between .20 ($p < .01$) and .48 ($p < .01$). In the Thai sample, significant correlations ranged between .22 ($p < .01$) and .46 ($p < .01$). In the German sample, Bartlett's test of sphericity yielded a χ^2 of 381.27 with *df* of 6 ($p = .00$). In the Thai sample, Bartlett's tests of sphericity yielded a χ^2 of 145.18 with *df* of 6 ($p = .00$). This showed that the two correlation matrices for items measuring this subscale for both samples were not the identity matrices. The KMO measures of sampling adequacy of the two correlation matrices for both samples were greater than .50 ($KMO_{German\ Sample} = .68$, $KMO_{Thai\ Sample} = .73$). This showed that the four items measuring this subscale in both samples correlated highly with each other. Therefore, the data for both samples were appropriate for MCFA. Details are shown in Table 3.24.

Table 3.24
Means, Standard Deviations, and Correlation Matrices for Items Measuring the Subscale of Parental Conception of Passive Responsibility for the German and Thai Samples

Thai Sample ($N = 494$)				
	Bartlett's Test of Sphericity [χ^2 (6, $N = 494$) = 381.27, $p = .00$]			
				KMO = .73
M	3.14	3.66	3.23	3.21
SD	.67	.51	.67	.73
Items	SF1	SF2	SF3	SF4
SF1	—	.28**	.33**	.22**
SF2	.20**	—	.52**	.46**
SF3	.29**	.34**	—	.46**
SF4	.27**	.23**	.48**	—
M	3.03	3.15	3.22	3.24
SD	.84	.73	.69	.70
Bartlett's Test of Sphericity [χ^2 (6, $N = 288$) = 145.18, $p = .00$]				
KMO = .68				
German Sample ($N = 288$)				

* $p < .05$. ** $p < .01$.

MCFA was then performed on this scale to examine four invariance testing hypotheses. Table 3.25 shows the results of MCFA. First, Model 1 was tested for factor structure invariance. Model 1 fitted the empirical data well [χ^2 (4, $N_1 = 288$, $N_2 = 494$) = 4.55, $\chi^2/df = 1.14$, $p = .34$, GFI = 1.00, CFI = 1.00, SRMR = .01, RMSEA = .02). This indicated that the factor structure of this scale was invariant across German and Thai samples. That is, configural invariance was supported. As configural invariance was supported, factor loadings were constrained to be equal (Model 2). As can be seen from Table 3.25, Model 2 fitted the data well but the χ^2 difference ($\Delta\chi^2$) between Model 2 and Model 1 was significant ($p < .05$). This indicated that factor loadings were not equivalent across samples. That is, full metric invariance was not supported. Before continuing further tests, it was necessary to examine whether at least partial metric invariance could be achieved. Then, the factor loading of SF2 was freed, because it revealed the greatest modification indices that could be freed to most reduce $\Delta\chi^2$. As expected, the partial metric invariance model fitted the data better than the full metric invariance model (Model 2) as indicated by better fit indices [χ^2 (7, N_1 = 288, N_2 = 494) = 4.66, χ^2/df = .67, p = .70, GFI = 1.00, CFI = 1.00, SRMR = .02, RMSEA = .00]. As can be seen in Table 3.25, the test of $\Delta\chi^2$ between the partial metric invariance model and Model 1 was not statistically significant. This indicated that partial metric invariance was supported. However, the error variance-covariance invariance model (Model 3) did not provide acceptable fit indices for the data (see Table 3.25). This indicated that measurement error variances-covariances varied across samples. That is, error variance-covariance invariance was not supported.

Table 3.25
Test of Cross-Cultural Measurement Invariance for the Subscale of Parental Conception of Passive Responsibility Across the German and Thai Samples

	Model fit index							
Nested model	χ^2	*df*	χ^2/df	*p*	GFI	CFI	SRMR	RMSEA
Model 1: Configural invariance	4.55	4	1.14	.34	1.00	1.00	.01	.02
Model 2: Metric invariance	16.30	8	2.04	.04	.99	.99	.04	.05
Partial metric invariance	4.66	7	.67	.70	1.00	1.00	.02	.00
Model 3: Error variance-covariance invariance	26.11	12	2.18	.01	.99	.98	.04	.06

				Critical value of the χ^2 distribution	
Model difference	$\Delta\chi^2$	Δdf	Decision	.05	.01
Model 2 vs. Model 1	11.77*	4	Reject	9.49	13.23
Partial metric invariance vs. Model 1	.11	3	Accept	7.82	11.35
Model 3 vs. Model 2	–	–	Reject	–	–

Note. The grey shading indicates the best-fit model.
* $p < .05$.

The best-fit model was selected by considering the smallest value of a ratio of χ^2 to *df* found in each tested model (*with exception for the partial metric invariance model*). Model 1 (as constrained for equal factor structure) yielded the smallest value of a ratio of χ^2 to *df* of 1.14. Standardized parameter estimates for Model 1 for both samples are shown in Table 3.26. Path diagrams of Model 1 for both samples are shown in Figure 3.7 and Figure 3.8. Factor score equations of parental conception of passive responsibility (PSRESP) for German and Thai samples could be expressed as follows:

$PSRESP_{German\ Sample}$ = .14(SF1) + .15(SF2) + .54(SF3) + .29(SF4)

$PSRESP_{Thai\ Sample}$ = .12(SF1) + .36(SF2) + .40(SF3) + .25(SF4)

Table 3.26

Standardized Parameter Estimates for the Measurement Model of Parental Conception of Passive Responsibility for the German and Thai Samples, as Constrained for Equal Factor Structure

Item	German Sample (N = 288)					Thai Sample (N = 494)				
	β	SE	t	R^2	FSR	β	SE	t	R^2	FSR
SF1	.40**	.07	5.87	.16	.14	.41**	.05	8.13	.16	.12
SF2	.43**	.07	6.27	.18	.15	.71**	.05	15.02	.51	.36
SF3	.77**	.08	10.14	.59	.54	.74**	.05	15.47	.54	.40
SF4	.62**	.07	8.71	.38	.29	.63**	.05	13.18	.39	.25

Note. FSR = Factor Score Regression.
* $p < .05$. ** $p < .01$.

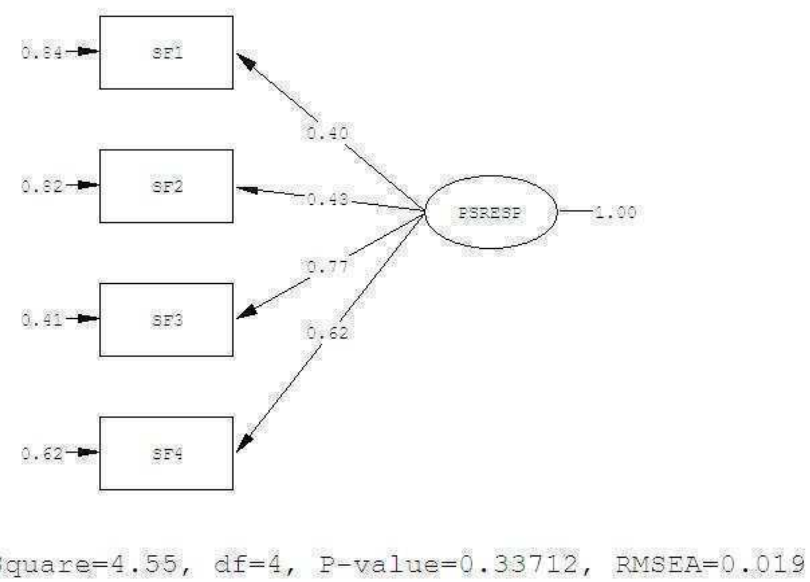


Figure 3.7. Empirically Validated Measurement Model of Parental Conception of Passive Responsibility for the German Sample, as Constrained for Equal Factor Structure

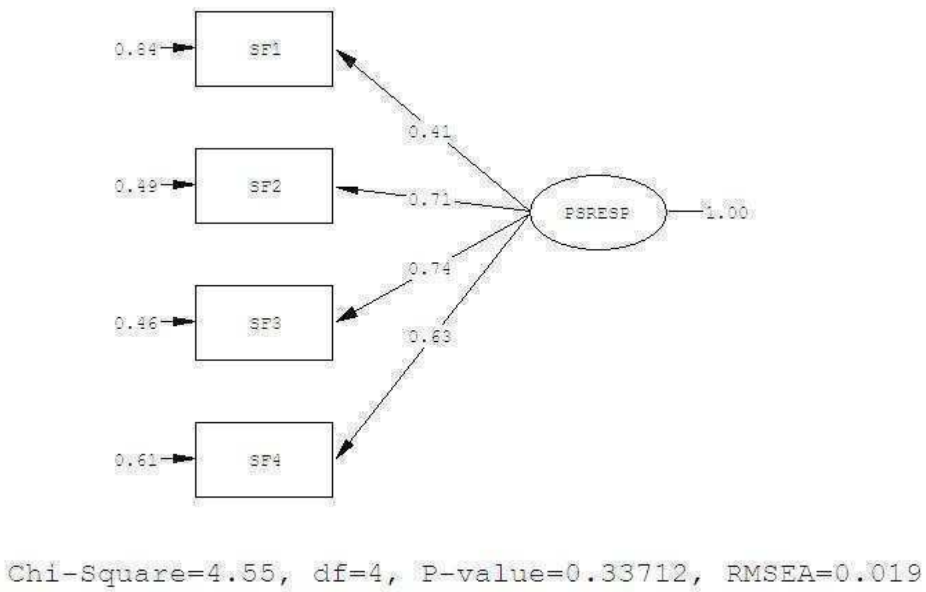


Figure 3.8. Empirically Validated Measurement Model of Parental Conception of Passive Responsibility for the Thai Sample, as Constrained for Equal Factor Structure

Parental Role Conceptions in Learning Situations

The scale of parental role conceptions in learning situations comprised two subscales: (a) goal orientation towards learning and (b) goal orientation towards achievement. A latent construct of goal orientation towards learning was measured by five items, whereas a latent construct of goal orientation towards achievement was measured by 10 items. First, correlations were examined among items measuring two subscales. In the German sample, significant correlations ranged between .12 (p < .05) and .48 (p < .01). In the Thai sample, significant correlations ranged between .09 (p < .05) and .47 (p < .01). In the German sample, Bartlett's test of sphericity yielded a χ^2 of 1,114.73 with *df* of 105 (p = .00). In the Thai sample, Bartlett's tests of sphericity yielded a χ^2 of 1,819.20 with *df* of 105 (p = .00). This showed that the correlation matrices of the items measuring these two subscales for German and Thai samples were not the identity matrices. The KMO measures of sampling adequacy of the two correlation matrices for both samples were greater than .50 ($KMO_{German\ Sample}$ = .83, $KMO_{Thai\ Sample}$ = .83). This showed that the 15 items measuring the two subscales for both samples correlated highly with each other. Therefore, the data in both samples were appropriate for MCFA. Details are shown in Table 3.27.

Table 3.27

Means, Standard Deviations, and Correlation Matrices for Items Measuring the Scale of Parental Role Conceptions in Learning Situations for the German and Thai Samples (German Sample = Left-Hand Corner; Thai Sample = Right-Hand Corner)

Thai Sample (N = 494)															
Bartlett's Test of Sphericity [χ^2 (105, N = 494) = 1,819.20, p = .00] KMO = .83															
M	3.69	3.40	3.65	3.57	3.45	2.54	2.56	2.95	3.02	3.57	2.48	2.05	2.43	2.02	2.49
SD	.53	.59	.53	.53	.65	.78	.79	.75	.75	.54	.79	.75	.78	.80	.88
Item	PC1	PC2	PC3	PC4	PC5	PD1	PD2	PD3	PD4	PD5	PD6	PD7	PD8	PD9	PD10
PC1	—	.32**	.44**	.25**	.38**	.09*	−.12**	−.12**	−.01	.25**	.00	−.21**	.01	−.16**	−.12**
PC2	.30**	—	.33**	.33**	.36**	.14**	.12**	.10*	.07	.27**	.05	−.03	.04	.00	.02
PC3	.32**	.28**	—	.33**	.36**	.09*	.03	.08	.18**	.41**	.09*	−.09*	.06	−.07	.00
PC4	.26**	.26**	.41**	—	.34**	.06	.08	.11*	.21**	.41**	.03	−.02	.07	−.06	.07
PC5	.18**	.28**	.31**	.29**	—	.09*	−.07	.00	.06	.28**	.09*	−.06	.10*	−.05	−.05
PD1	.12*	−.03	.20**	.07	.22**	—	.47**	.28**	.19**	.13**	.35**	.31**	.24**	.20**	.26**
PD2	.09	−.04	.16**	.10	.27**	.44**	—	.40**	.36**	.15**	.45**	.42**	.23**	.26**	.42**
PD3	.09	−.01	.24**	.04	.26**	.36**	.44**	—	.26**	.15**	.35**	.30**	.30**	.22**	.29**
PD4	.25**	.15*	.50**	.38**	.23**	.14*	.16**	.19**	—	.32**	.25**	.22**	.28**	.15**	.32**
PD5	.13*	.11	.33**	.35**	.21**	.11	.16**	.14*	.45**	—	.10*	−.05	.05	.01	.15**
PD6	−.02	−.10	.05	−.05	.12*	.31**	.48**	.44**	.11	.08	—	.47**	.43**	.28**	.41**
PD7	.06	−.06	.06	.04	.11	.38**	.40**	.28**	.02	.02	.59**	—	.39**	.34**	.37**
PD8	.02	−.10	.11	.01	.12*	.26**	.36**	.36**	.10	.01	.52**	.48**	—	.32**	.40**
PD9	.04	.02	.15*	.02	.16**	.08	.17**	.27**	.12*	.17**	.27**	.14*	.32**	—	.38**
PD10	.11	.00	.22**	.14*	.25**	.23**	.41**	.36**	.29**	.20**	.41**	.23**	.42**	.37**	—
M	3.72	3.65	3.76	3.81	3.34	2.42	2.20	3.11	3.80	3.71	1.95	1.61	1.70	1.95	2.51
SD	.53	.50	.44	.45	.69	.87	.76	.80	.43	.46	.83	.69	.81	.85	.84
Bartlett's Test of Sphericity [χ^2 (105, N = 288) = 1,114.73, p = .00) KMO = .83															
German Sample (N = 288)															

Note. Goal Orientation towards Learning (PC1–PC5). Goal Orientation towards Achievement (PD1–PD10).

* $p < .05$. ** $p < .01$.

MCFA was then performed on this scale to examine four invariance testing hypotheses. Table 3.28 shows the results of MCFA. First, Model 1 was tested for factor structure invariance. Model 1 fitted the empirical data well [χ^2 (40, N_1 = 288, N_2 = 494) = 21.95, χ^2/df = .55, p = .99; GFI = 1.00, CFI = 1.00, SRMR = .02, RMSEA = .00]. This indicated that the factor structure of this scale was invariant across German and Thai samples. That is, configural invariance was supported. As the configural invariance was supported, factor loadings were constrained to be equal (Model 2). As Table 3.28 shows, Model 2 fitted the data well and the χ^2 difference ($\Delta\chi^2$) between Model 2 versus Model 1 was not significant. This indicated that factor loadings were equivalent across samples. That is, full metric invariance was supported. Afterwards, the factor variance-covariance invariance model (Model 3) was examined. This model also yielded good fit indices (see Table 3.28). The tests of $\Delta\chi^2$ between Model 3 versus Model 2 were not significant. This indicated that the relationship between two subscales was invariant across samples. That is, full factor variance-covariance invariance was supported. However, the error variance-covariance invariance model (Model 4) did not provide acceptable fit indices for the data (see Table 3.28). This indicated that measurement error variances-covariances varied across samples. That is, error variance-covariance was not supported.

Table 3.28
Test of Cross-Cultural Measurement Invariance for the Scale of Parental Role Conceptions in Learning Situations Across the German and Thai Samples

Nested model	Model fit index							
	χ^2	*df*	χ^2/df	*p*	GFI	CFI	SRMR	RMSEA
Model 1: Configural invariance	21.95	40	.548	.99	1.00	1.00	.02	.00
Model 2: Metric invariance	30.36	55	.552	.99	1.00	1.00	.02	.00
Model 3: Factor variance-covariance invariance	30.90	56	.551	.99	1.00	1.00	.02	.00
Model 4: Error variance-covariance invariance	231.72	140	1.655	.00	.98	.98	.05	.04

Model difference	$\Delta\chi^2$	Δdf	Decision	Critical value of the χ^2 distribution .05	.01
Model 2 vs. Model 1	8.41	15	Accept	25.00	30.58
Model 3 vs. Model 2	.54	1	Accept	3.84	6.64
Model 4 vs. Model 3	–	–	Reject	–	–

Note. The grey shading indicates the best-fit model.

The best-fit model was selected by considering the smallest value of a ratio of χ^2 to *df* found in each tested model. Model 1 (as constrained for equal factor structure) yielded the smallest value of a ratio of χ^2 to *df* of .548. Standardized parameter estimates for Model 1 for both samples are shown in Table 3.29. Path diagrams of Model 1 for both samples are shown in Figure 3.9 and Figure 3.10. Factor score equations of two subscales of goal orientation towards learning (GOALPC) and goal orientation towards achievement (GOALPD) for German and Thai samples could be expressed as follows:

$GOALPC_{German\ Sample}$ = .07(PC1) + .03(PC2) + .83(PC3) + .68(PC4) + .13(PC5)

$GOALPD_{German\ Sample}$ = .14(PD1) + .33(PD2) + .23(PD3) – .02(PD4) + .13(PD5) + .21(PD6) – .14(PD7) + .41(PD8) + .12(PD9) + .13(PD10)

$GOALPC_{Thai\ Sample}$ = .06(PC1) + .19(PC2) + .53(PC3) + .51(PC4) + .29(PC5)

$GOALPD_{Thai\ Sample}$ = .11(PD1) + .37(PD2) + .15(PD3) – .06(PD4) + .11(PD5) + .12(PD6) + .10(PD7) + .38(PD8) + .08(PD9) + .12(PD10)

Table 3.29

Standardized Parameter Estimates for the Measurement Models of Parental Role Conceptions in Learning Situations for the German and Thai Samples, as Constrained for Equal Factor Structure

Item	German Sample (N = 288)					Thai Sample (N = 494)				
	β	SE	t	R^2	FSR	β	SE	t	R^2	FSR
Goal Orientation towards Learning (GOALPC)										
PC1	.33**	.13	2.64	.11	.07	.39**	.11	3.67	.15	.06
PC2	.36**	.13	2.73	.13	.03	.51**	.12	4.27	.26	.19
PC3	.78**	.25	3.08	.62	.83	.64**	.15	4.29	.41	.53
PC4	.75**	.26	2.85	.56	.68	.63**	.15	4.31	.40	.51
PC5	.40**	.14	2.93	.16	.13	.55**	.13	4.24	.31	.29
Goal Orientation towards Achievement (GOALPD)										
PD1	.44**	.08	5.79	.20	.14	.54**	.06	9.13	.30	.11
PD2	.68**	.06	11.24	.47	.33	.70**	.05	14.58	.49	.37
PD3	.62**	.06	10.20	.38	.23	.54**	.05	11.06	.29	.15
PD4	.22**	.07	2.94	.05	–.02	.36**	.06	6.49	.13	–.06
PD5	.25**	.07	3.64	.06	.13	.24**	.05	4.56	.06	.11
PD6	.67**	.06	11.24	.46	.21	.65**	.05	13.72	.43	.12
PD7	.43**	.08	5.16	.18	–.14	.56**	.07	7.78	.32	.10
PD8	.71**	.09	8.39	.51	.41	.69**	.07	10.35	.48	.38
PD9	.42**	.07	6.35	.18	.12	.43**	.05	8.23	.19	.08
PD10	.59**	.06	9.64	.35	.13	.59**	.05	12.32	.35	.12

Note. FSR = Factor Score Regression.
* $p < .05$. ** $p < .01$.

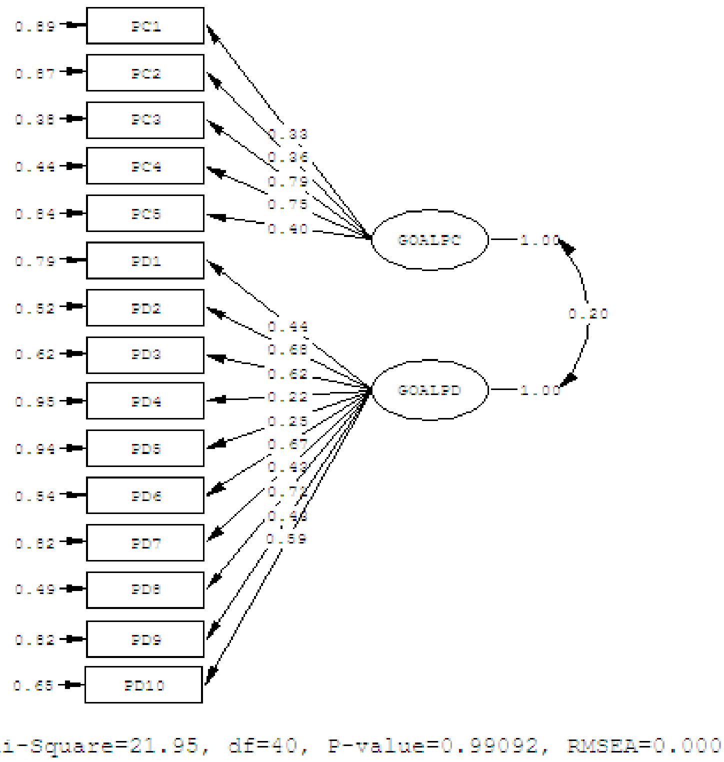


Figure 3.9. Empirically Validated Measurement Models of Parental Role Conceptions in Learning Situations for the German Sample, as Constrained for Equal Factor Structure

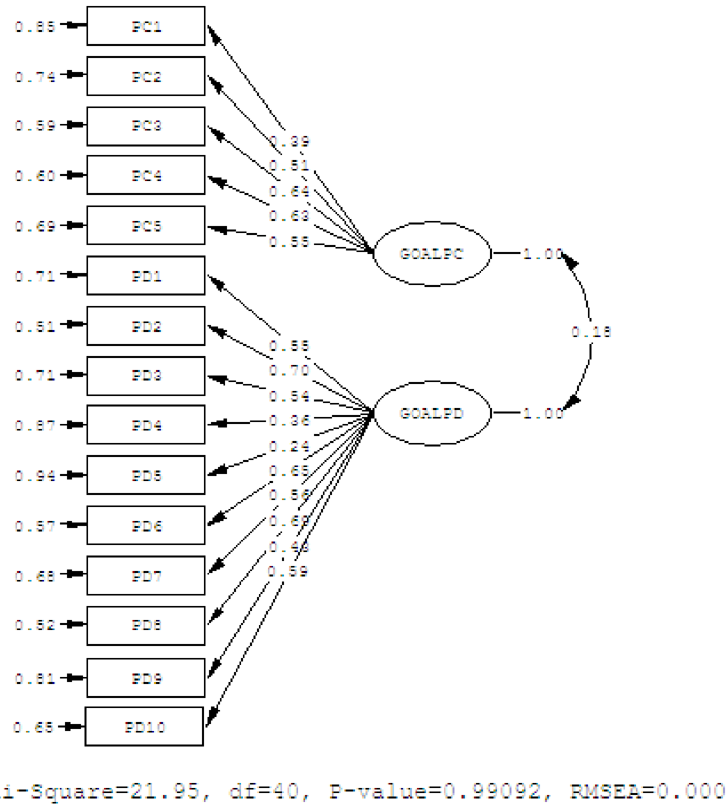


Figure 3.10. Empirically Validated Measurement Models of Parental Role Conceptions in Learning Situations for the Thai Sample, as Constrained for Equal Factor Structure

Parental Teaching Efficacy Beliefs

This scale comprised two subscales: (a) general sense of teaching efficacy belief and (b) domain-specific sense of teaching efficacy belief. A latent construct of general sense of teaching efficacy was measured by five items, whereas a latent construct of domain-specific sense of teaching efficacy was measured by four items. First, correlations were examined between items measuring these two subscales. In the German sample, significant correlations ranged between .13 ($p < .05$) and .77 ($p < .01$). In the Thai sample, significant correlations ranged between .10 ($p < .05$) and .59 ($p < .01$). In the German sample, Bartlett's test of sphericity yielded a χ^2 of 1,232.84 with *df* of 36 ($p = .00$). In the Thai sample, Bartlett's tests of sphericity yielded χ^2 of 1,301.70 with *df* of 36 ($p = .00$). showed that the correlation matrices for items measuring the two subscales for both samples were not the identity matrices. KMO measures of sampling adequacy of the two correlation matrices for both samples were greater than .50 ($KMO_{German\ Sample}$ = .80, $KMO_{Thai\ Sample}$ = .76). This showed that the nine items measuring the two subscales for both samples correlated highly with each other. Therefore, the data for both samples were appropriate for MCFA. Details are shown in Table 3.30.

Table 3.30
Means, Standard Deviations, and Correlation Matrices for Items Measuring the Scale of Parental Teaching Efficacy Beliefs for the German and Thai Samples

Thai Sample (N = 494)									
Bartlett's Test of Sphericity [χ^2 (36, N = 494) = 1,301.70, p = .00] KMO = .76									
M	3.11	3.03	2.85	2.96	2.90	2.76	2.67	2.62	2.81
SD	.57	.58	.69	.67	.66	.81	.80	.82	.73
Item	EF1	EF2	EF3	EF4	EFX5	EFM1	EFM2	EFM3	EFM4
EF1	—	.55**	.42**	.30**	.35**	−.04	.13**	.04	.20**
EF2	.43**	—	.47**	.31**	.42**	−..05	.12**	.07	.10*
EF3	.42**	.61**	—	.41**	.59**	−..02	.25**	.03	.22**
EF4	.31**	.39**	.49**	—	.51**	.00	.36**	.16**	.38**
EF5	.34**	.51**	.69**	.49**	—	.10*	.32**	.15**	.25**
EFM1	.13*	.08	.12*	.27**	.20**	—	.17**	.53**	.28**
EFM2	.13*	.12	.21**	.40**	.31**	.60**	—	.27**	.58**
EFM3	.11	.02	.11	.24**	.19**	.66**	.61**	—	.32**
EFM4	.03	.03	.12	.31**	.22**	.56**	.77**	.73**	—
M	3.01	2.89	3.05	3.01	3.02	3.12	3.00	3.07	3.01
SD	.71	.71	.61	.67	.60	.76	.80	.83	.84
Bartlett's Test of Sphericity [χ^2 (36, N = 288) = 1,232.84, p = .00) KMO = .80									
German Sample (N = 288)									

Note. General Sense of Teaching Efficacy (EF1 − EF5). Domain-Specific Sense of Teaching Efficacy (EFM1 – EFM4).
* p <.05. ** p < .01.

MCFA was then performed on this scale to examine four invariance testing hypotheses. Table 3.31 shows the results of MCFA. First, Model 1 was tested for factor structure invariance. Model 1 fitted the empirical data well [χ^2 (12, N_1 = 288, N_2 = 494) = 7.73, χ^2/df = .64, p = .81, GFI = 1.00, CFI = 1.00, SRMR = .01, RMSEA = .00]. This indicated that the factor structure of this scale was invariant across German and Thai samples. That is, configural invariance was supported. Because the configural invariance was supported, factor loadings were constrained to be equal (Model 2). As Table 3.31 shows, Model 2 fitted the data well and the χ^2 difference ($\Delta\chi^2$) between Model 2 versus Model 1 was not significant. This indicated that factor loadings were equivalent across samples. That is, full metric invariance was supported. Afterwards, the factor variance-covariance invariance model (Model 3) was examined. This model also yielded good fit indices (see Table 3.31). The tests of $\Delta\chi^2$ between Model 3 versus Model 2 were not significant. This indicated that the relationship between the two subscales was invariant across samples. That is, full factor variance-covariance invariance was supported. However, the error variance-covariance invariance model (Model 4) did not provide acceptable fit indices for the data (see Table

3.31). This indicated that measurement error variances-covariances varied across samples. That is, error variance-covariance was not supported.

Table 3.31
Test of Cross-Cultural Measurement Invariance for the Scale of Parental Teaching Efficacy Beliefs Across the German and Thai Samples

Nested model	Model fit index							
	χ^2	*df*	χ^2/df	*p*	GFI	CFI	SRMR	RMSEA
Model 1: Configural invariance	7.73	12	.64	.81	1.00	1.00	.01	.00
Model 2: Metric invariance	15.96	21	.76	.77	1.00	1.00	.02	.00
Model 3: Factor variance-covariance invariance	16.17	22	.74	.81	1.00	1.00	.02	.00
Model 4: Error variance-covariance invariance	180.97	51	3.55	.00	.97	.95	.06	.08

Model difference	$\Delta\chi^2$	Δdf	Decision	Critical value of the χ^2 distribution	
				.05	.01
Model 2 vs. Model 1	8.23	9	Accept	16.92	21.67
Model 3 vs. Model 2	.21	1	Accept	3.84	6.64
Model 4 vs. Model 3	–	–	Reject	–	–

The best-fit model was selected by considering the smallest value of a ratio of χ^2 to *df* found in each tested model. Model 1 (as constrained for equal factor structure) yielded the smallest value of a ratio of χ^2 to *df* of .64. Standardized parameter estimates for Model 1 for both samples are shown in Table 3.32. Path diagrams of Model 1 for both samples are shown in Figure 3.11 and Figure 3.12. Factor score equations of two subscales of general sense of teaching efficacy (GEFFC) and domain-specific sense of teaching efficacy (MEFFC) for German and Thai samples could be expressed as follows:

$GEFFC_{\text{German Sample}} = .01(EF1) + .13(EF2) + .61(EF3) + .18(EF4) + .19(EF5)$

$MEFFC_{\text{German Sample}} = .38(EFM1) + 1.25(EFM2) + .95(EFM3) - 1.25(EFM4)$

$GEFFC_{\text{Thai Sample}} = .10(EF1) + .13(EF2) + .57(EF3) + .23(EF4) + .16(EF5)$

$MEFFC_{\text{Thai Sample}} = .55(EFM1) + .67(EFM2) + .45(EFM3) + .29(EFM4)$

Table 3.32
Standardized Parameter Estimates for the Measurement Models of Parental Teaching Efficacy Beliefs for the German and Thai Samples, as Constrained for Equal Factor Structure

Items	German Sample (N = 288)					Thai Sample (N = 494)				
	β	SE	t	R^2	FSR	β	SE	t	R^2	FSR
General Sense of Teaching Efficacy Belief (GEFFC)										
EF1	.47**	.06	7.79	.22	.01	.50**	.05	10.48	.25	.10
EF2	.67**	.06	12.00	.45	.13	.57**	.05	12.00	.32	.13
EF3	.91**	.05	17.00	.82	.61	.83**	.05	17.16	.69	.57
EF4	.61**	.07	8.42	.37	.18	.57**	.06	8.93	.32	.23
EF5	.76**	.05	14.22	.58	.19	.70**	.05	15.38	.50	.16
Domain-Specific Sense of Teaching Efficacy Belief (MEFFC)										
EFM1	.95**	.04	21.65	.90	.38	.95**	.03	28.31	.90	.55
EFM2	.95**	.04	21.65	.90	1.25	.95**	.03	28.26	.90	.67
EFM3	.94**	.04	21.66	.90	.95	.95**	.03	28.40	.90	.45
EFM4	.50**	.18	2.78	.25	−1.25	.88**	.16	5.38	.77	.29

Note. FSR = Factor Score Regression.
* $p < .05$. ** $p < .01$.

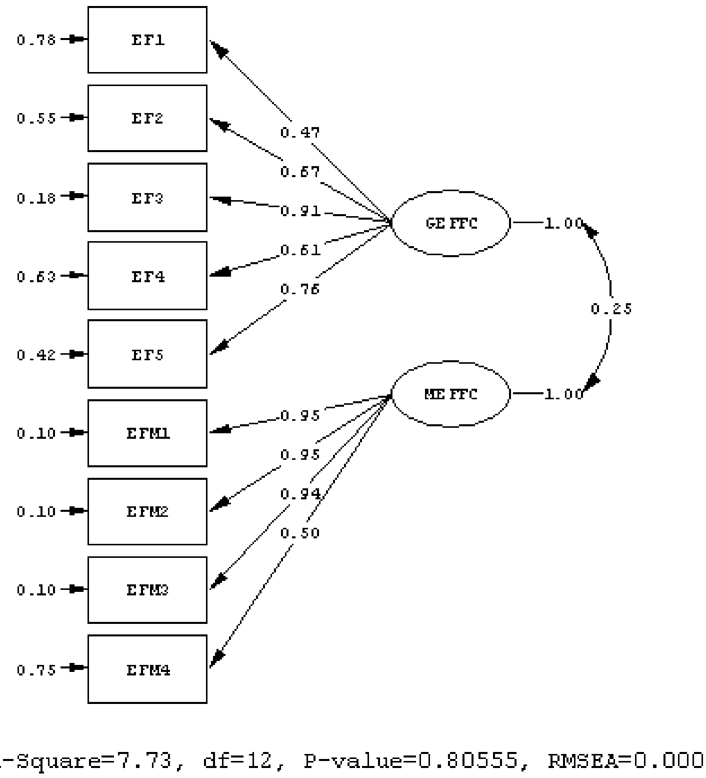


Figure 3.11. Empirically Validated Measurement Models of Parental Teaching Efficacy Beliefs for the German Sample, as Constrained for Equal Factor Structure

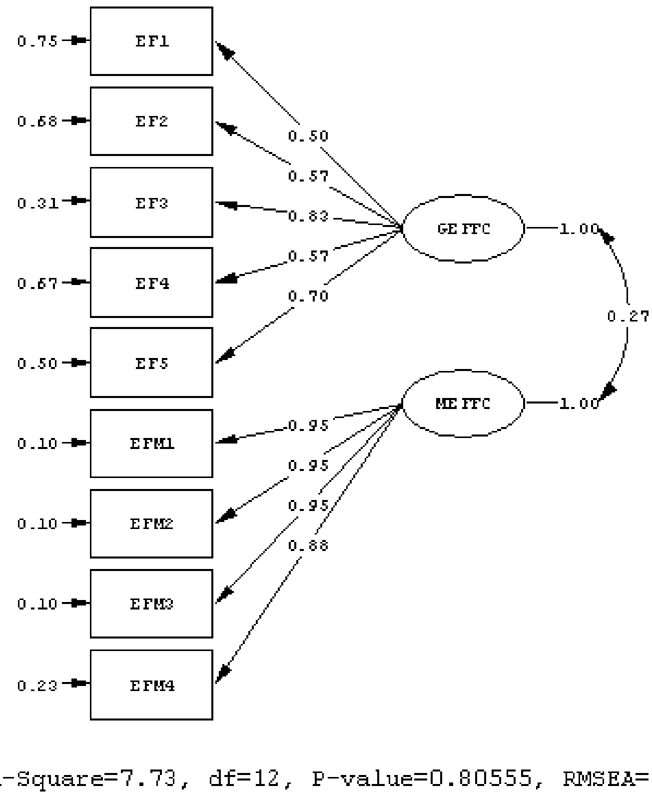


Figure 3.12. Empirically Validated Measurement Models of Parental Teaching Efficacy Beliefs for the Thai Sample, as Constrained for Equal Factor Structure

Perceived Invitations to Involvement

This scale comprised two subscales (a) invitation to involvement from the child and (b) invitation to involvement from the school and teachers. A latent construct of invitation to involvement from the child could be measured by six items, whereas a latent construct of invitation to involvement from the school and teachers could be measured by four items. First, correlations were examined between items measuring these two subscales. In the German sample, significant correlations ranged between .12 (p < .05) and .59 (p < .01). In the Thai sample, significant correlations ranged between .09 (p < .05) and .54 (p < .01). In the German sample, Bartlett's test of sphericity yielded a χ^2 of 611.90 with df of 45 (p = .00). In the Thai sample, Bartlett's tests of sphericity yielded a χ^2 of 965.20 with df of 45 (p = .00). This showed that the correlation matrices for the items measuring the two subscales for both samples were not the identity matrices. KMO measures of sampling adequacy of the two correlation matrices for German and Thai samples were greater than .50 ($KMO_{German\ Sample}$ = .69, $KMO_{Thai\ Sample}$ = .78). This showed that the 10 items measuring the two subscales for both samples correlated highly with each other. Therefore, the data for both samples were appropriate for MCFA. Details are shown in Table 3.33.

Table 3.33

Means, Standard Deviations, and Correlation Matrices for Items Measuring the Scale of Invitations to Involvement for the Child, the School, and Teachers for the German and Thai Samples (German Sample = Left-Hand Corner; Thai Sample = Right-Hand Corner)

Thai Sample (N = 494)										
Bartlett's Test of Sphericity [χ^2 (45, N = 494) = 965.20, p = .00] KMO = .78										
M	2.87	3.17	3.23	3.07	3.32	2.98	2.85	3.15	2.86	2.74
SD	.72	.57	.64	.67	.60	.76	.69	.59	.66	.72
Items	INC1	INC2	INC3	INC4	INC5	INC6	INT1	INT2	INT3	INT4
INC1	—	.49**	.25**	.21**	.13**	.33**	.20**	.14**	.11*	.12**
INC2	.59**	—	.33**	.24**	.29**	.28**	.27**	.23**	.25**	.12**
INC3	.09	.06	—	.54**	.41**	.20**	.31**	.23**	.19**	.07
INC4	.13*	.12*	.34**	—	.37**	.20**	.25**	.17**	.21**	.09*
INC5	.12*	.09	.44**	.28**	—	.17**	.16**	.24**	.19**	.06
INC6	.21**	.18**	.23**	.31**	.35**	—	.16**	.18**	.18**	.14**
INT1	−.11	−.11	.14*	.07	.12*	.09	—	.33**	.34**	.25**
INT2	−.01	−.08	.25**	.02	.20**	.17**	.34**	—	.42**	.27**
INT3	.01	−.12**	.18**	.09	.06	.17**	.44**	.47**	—	.38**
INT4	.00	−.07	.10	.15**	.06	.16**	.36**	.51**	.47**	—
M	2.75	2.57	3.18	3.27	3.47	3.09	3.00	3.42	3.02	3.10
SD	.77	.77	.84	.79	.61	.71	.79	.63	.74	.80
Bartlett's Test of Sphericity [χ^2 (45, N = 288) = 611.90, p = .00] KMO = .69										
German Sample (N = 288)										

Note. Invitation to Involvement from the Child (INC1 – INC6). Invitation to Involvement from the School and Teachers (INT1 – INT4).
* $p < .05$. ** $p < .01$.

MCFA was then performed on this scale to examine four invariance testing hypotheses. Table 3.34 shows the results of MCFA. First, Model 1 was tested for factor structure invariance. Model 1 fitted the empirical data well [χ^2 (20, N_1 = 288, N_2 = 494) = 14.57, χ^2/df = .73, p = .80, GFI = 1.00, CFI = 1.00, SRMR = .02, RMSEA = .00]. This indicated that the factor structure of this scale was invariant across German and Thai samples. That is, configural invariance was supported. Because the configural invariance was supported, factor loadings were constrained to be equal (Model 2). As Table 3.34 shows, Model 2 fitted the data well and the χ^2 difference ($\Delta\chi^2$) between Model 2 versus Model 1 was not significant. This indicated that factor loadings were equivalent across samples. That is, full metric invariance was supported. Afterwards, the factor variance-covariance invariance model (Model 3) was examined. This model also yielded good fit indices (see Table 3.34). However, the tests of $\Delta\chi^2$ between Model 3 versus Model 2 were statistically significant ($p < .01$). This indicated that the imposition of constraint (equal factor variance-covariance across samples) resulted in statistical decreases in the fit of Model 3 compared to Model 2. Thus, the relationship between the two subscales varied across samples. That is, full factor variance-covariance invariance was not supported. In addition, the error variance-covariance invariance model (Model 4) did not provide acceptable fit indices for the data (see Table 3.34). This indicated that measurement error variances-covariances varied across samples. That is, error variance-covariance was not supported.

Table 3.34
Test of Cross-Cultural Measurement Invariance for the Scale of Invitations to Involvement from the Child, the School, and Teachers Across the German and Thai Samples

Nested model	Model fit index							
	χ^2	*df*	χ^2/df	*p*	GFI	CFI	SRMR	RMSEA
Model 1: Configural invariance	14.57	20	.73	.80	1.00	1.00	.02	.00
Model 2: Metric invariance	25.76	30	.86	.69	1.00	1.00	.02	.00
Model 3: Factor variance-covariance invariance	33.68	31	1.08	.34	.99	1.00	.03	.02
Model 4: Error variance-covariance invariance	138.49	62	2.23	.00	.98	.96	.05	.06

Model difference	$\Delta\chi^2$	Δdf	Decision	Critical value of the χ^2 distribution .05	.01
Model 2 vs. Model 1	11.19	10	Accept	18.31	23.21
Model 3 vs. Model 2	7.92**	1	Reject	3.84	6.64
Model 4 vs. Model 3	–	–	Reject	–	–

Note. The grey shading indicates the best-fit model.
** $p < .01$.

The best-fit model was selected by considering the smallest value of a ratio of χ^2 to *df* found in each tested model. Model 1 (as constrained for equal factor structure) yielded the smallest value of a ratio of χ^2 to *df* of .73. Standardized parameter estimates for Model 1 for both samples are shown in Table 3.35. Path diagrams of the *H1*-model for both samples are shown in Figure 3.13 and Figure 3.14. Factor score equations of two subscales of invitation to involvement from the child (INC) and invitation to involvement from the school and teachers (INT) for the German and Thai samples could be expressed as follows:

$INC_{\text{German Sample}} = -.41(INC1) + .68(INC2) + .83(INC3) + .10(INC4) - .18(INC5) + .77(INC6)$

$INT_{\text{German Sample}} = .10(INT1) + .33(INT2) + .31(INT3) + .41(INT4)$

$INC_{\text{Thai Sample}} = -.18(INC1) + .38(INC2) + .51(INC3) + .31(INC4) + .03(INC5) + .25(INC6)$

$INT_{\text{Thai Sample}} = .41(INT1) + .37(INT2) + .28(INT3) + .02(INT4)$

Table 3.35

Standardized Parameter Estimates for the Measurement Models of Invitations to Involvement from the Child, the School, and Teachers for the German and Thai Samples, as Constrained for Equal Factor Structure

Items	German Sample (*N* = 288)					Thai Sample (*N* = 494)				
	β	SE	t	R^2	FSR	β	SE	t	R^2	FSR
Invitation to Involvement from the Child (INC)										
INC1	.22**	.09	2.58	.05	−.41	.30**	.06	5.26	.09	−.18
INC2	.63**	.07	9.55	.40	.68	.63**	.05	12.61	.40	.38
INC3	.94**	.22	4.33	.88	.83	.83**	.08	10.11	.70	.51
INC4	.60**	.14	4.25	.36	.10	.71**	.07	9.71	.50	.31
INC5	.47**	.11	4.19	.22	−.18	.50**	.06	8.67	.25	.03
INC6	.95**	.35	2.72	.91	.77	.48**	.10	4.76	.23	.25
Invitation to Involvement from the School and Teachers (INT)										
INT1	.48**	.11	4.25	.23	.10	.69**	.10	7.24	.48	.41
INT2	.70**	.14	5.18	.49	.33	.67**	.09	7.55	.45	.37
INT3	.67**	.13	5.17	.45	.31	.63**	.08	7.72	.39	.28
INT4	.75**	.16	4.71	.56	.41	.35**	.07	5.21	.12	.02

Note. FSR = Factor Score Regression.
* $p < .05$. ** $p < .01$.

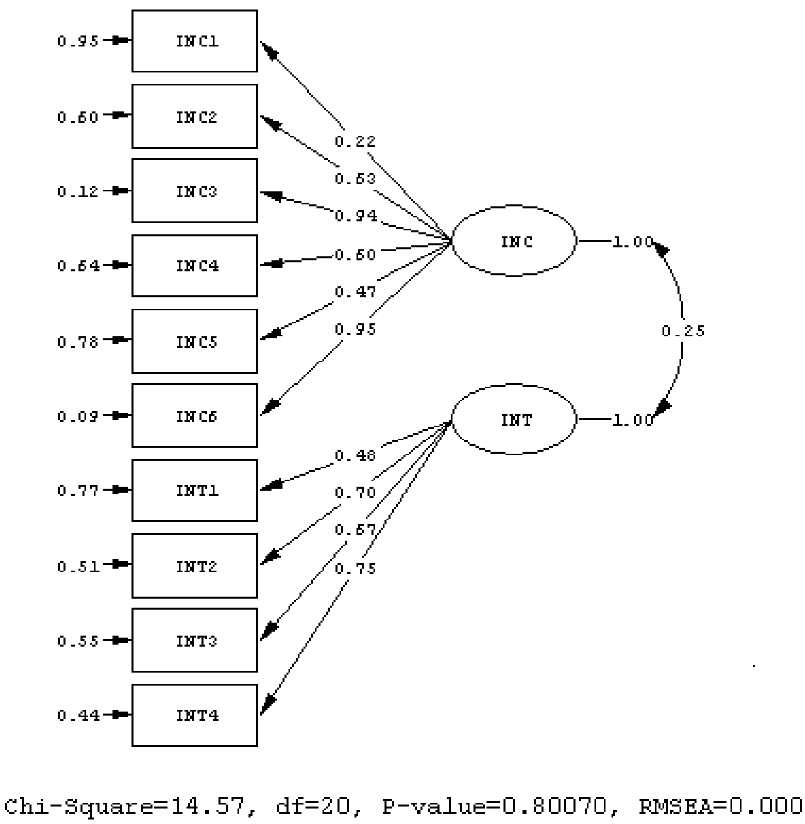


Figure 3.13. Empirically Validated Measurement Models of Invitations to Involvement from the Child, the School, and Teachers for the German Sample, as Constrained for Equal Factor Structure

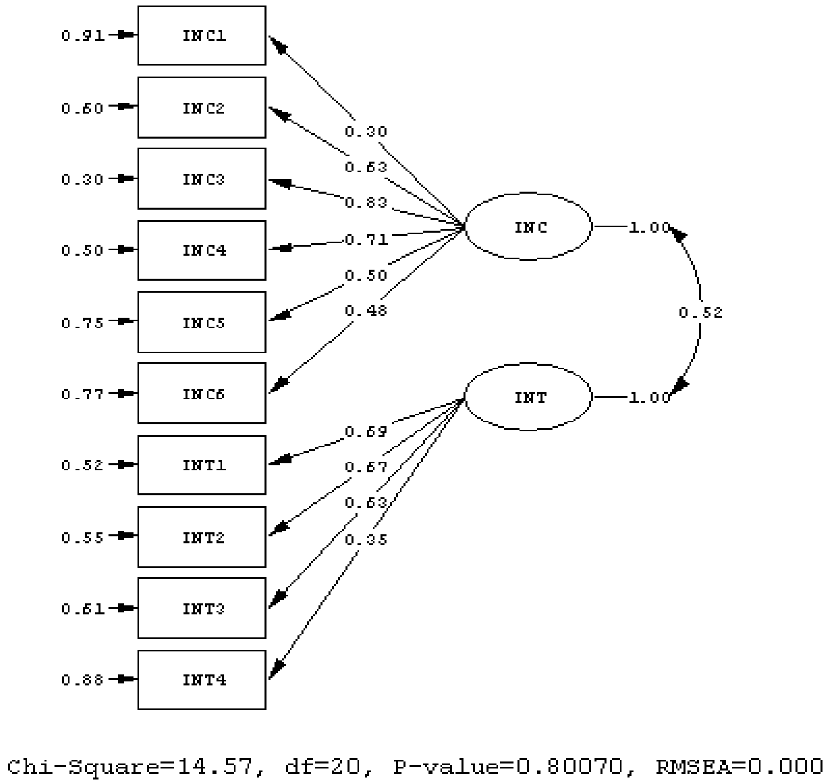


Figure 3.14. Empirically Validated Measurement Models of Invitations to Involvement from the Child, the School, and Teachers for the Thai Sample, as Constrained for Equal Factor Structure

Parental Life Context

This scale comprised two scales: (a) time and energy and (b) valence towards school. A latent construct of time and energy was measured by three items, whereas a latent construct of valence towards school was measured by seven items. First, correlations were examined between items measuring these two subscales. In the German sample, significant correlations ranged between .17 ($p <$ .01) and .68 ($p < .01$). In the Thai sample, significant correlations ranged between .09 ($p < .05$) and .58 ($p < .01$). In the German sample, Bartlett's test of sphericity yielded a χ^2 of 914.22 with *df* of 45 ($p = .00$). In the Thai sample, Bartlett's test of sphericity yielded a χ^2 of 1,270.70 with *df* of 45 ($p = .00$). This showed that the correlation matrices for the items measuring the two subscales for both samples were not the identity matrices. KMO measures of sampling adequacy of the two correlation matrices for German and Thai samples were greater than .50 ($KMO_{German\ Sample} = .83$, $KMO_{Thai\ Sample} = .83$). This showed that the 10 items measuring the two subscales for both samples correlated highly with each other. Therefore, the data for both samples were appropriate for MCFA. Details are shown in Table 3.36.

Table 3.36
Means, Standard Deviations, and Correlation Matrices for Items Measuring the Scale of Parental Life Context for the German and Thai Samples (German Sample = Left-Hand Corner; Thai Sample = Right-Hand Corner)

Thai Sample (N = 494)										
Bartlett's Test of Sphericity [χ^2 (45, N = 494) = 1,270.70, p = .00]										
KMO = .83										
M	3.24	2.95	2.94	3.29	3.36	3.34	3.43	3.33	3.11	3.31
SD	.63	.77	.72	.69	.64	.68	.65	.63	.71	.73
Items	TE1	TE2	TE3	VAL1	VAL2	VAL3	VAL4	VAL5	VAL6	VAL7
TE1	—	.31**	.36**	.09*	.10*	.19**	.16**	.21**	.08	.19**
TE2	.42**	—	.12*	.04	.00	.12**	.07	.08	.05	.12**
TE3	.33**	.35**	—	.07	.04	.08	.11*	.13**	.03	.10*
VAL1	.06	−.03	−.08	—	.51**	.44**	.40**	.41**	.27**	.30**
VAL2	−.03	.04	−.05	.55**	—	.49**	.53**	.48**	.35**	.30**
VAL3	.03	.05	−.06	.67**	.59**	—	.58**	.57**	.32**	.28**
VAL4	.03	.05	−.06	.60**	.57**	.68**	—	.55**	.27**	.35**
VAL5	.00	.05	.01	.54**	.43**	.54**	.46**	—	.39**	.42**
VAL6	.04	.04	−.02	.38**	.20**	.35**	.27**	.51**	—	.40**
VAL7	.06	.06	−.08	.26**	.17**	.30**	.17**	.32**	.37**	—
M	3.28	2.94	2.80	3.03	2.95	3.00	3.13	3.15	2.84	2.82
SD	.71	.81	.82	.72	.68	.76	.78	.70	.79	.80
Bartlett's Test of Sphericity [χ^2 (45, N = 288) = 914.22, p = .00]										
KMO = .83										
German Sample (N = 288)										

Note. Time and Energy (TE1–TE3). Valence Towards School (VAL1–VAL7).
* p < .05. ** p < .01.

MCFA was performed on this scale to examine four invariance testing hypotheses. Table 3.37 shows the results of MCFA. First, Model 1 was tested for factor structure invariance. Model 1 fitted the empirical data well [χ^2 (38, N_1 = 288, N_2 = 494) = 25.58, χ^2/df = .67, p = .94, GFI = .99, CFI = 1.00, SRMR = .02, RMSEA = .00]. This indicated that the factor structure of this scale was invariant across German and Thai samples. That is, configural invariance was supported. Because the configural invariance was supported, factor loadings were constrained to be equal (Model 2). As Table 3.37 shows, Model 2 acceptably fitted the data, but the χ^2 difference ($\Delta\chi^2$) between Model 2 versus Model 1 was statistically significant (p < .01). This indicated that factor loadings were not equivalent across samples. That is, full metric invariance was not supported. Before continuing further tests, it was necessary to examine whether at least partial metric invariance could be achieved. Then, the factor loadings of TE2, VAL1, and VAL7 were freed, because they revealed the greatest modification indices that could be freed to most reduce $\Delta\chi^2$. As expected, the partial metric invariance model fitted the data better than the full metric invariance model

(Model 2) as indicated by better fit indices [χ^2 (45, N_1 = 288, N_2 = 494) = 35.72, χ^2/df = .79, p = .84, GFI = .99, CFI = 1.00, SRMR = .03, RMSEA = .00]. As Table 3.37 shows, the test of $\Delta\chi^2$ between the partial metric invariance model versus Model 1 was not statistically significant. This indicated that partial metric invariance was supported. Afterwards, the factor variance-covariance invariance model (Model 3) was examined. This model did not provide acceptable fit indices (see Table 3.37). This indicated that the relationship between the two subscales varied across samples. That is, full factor variance-covariance invariance was not supported. In addition, the error variance-covariance invariance model (Model 4) did not provide acceptable fit indices for the data (see Table 3.37). This indicated that measurement error variances-covariances varied across samples. That is, error variance-covariance was not supported.

Table 3.37
Test of Cross-Cultural Measurement for the Scale of Parental Life Context Across the German and Thai Samples

	Model fit index							
Nested model	χ^2	df	χ^2/df	p	GFI	CFI	SRMR	RMSEA
Model 1: Configural invariance	25.58	38	.67	.94	.99	1.00	.02	.00
Model 2: Metric invariance	64.92	48	1.35	.05	.99	.99	.04	.03
Partial metric invariance	35.72	45	.79	.84	.99	1.00	.03	.00
Model 3: Factor variance-covariance invariance	75.98	49	1.55	.01	.98	.99	.05	.04
Model 4: Error variance-covariance invariance	137.01	74	1.85	.00	.98	.98	.04	.05

				Critical value of the χ^2 distribution	
Model difference	$\Delta\chi^2$	Δdf	Decision	.05	.01
Model 2 vs. Model 1	39.34**	10	Reject	18.31	23.21
Partial metric invariance vs. Model 1	10.14	7	Accept	14.07	18.48
Model 3 vs. Model 2	–	–	Reject	–	–
Model 4 vs. Model 3	–	–	Reject	–	–

Note. The grey shading indicates the majority. ** p < .01.

The best-fit model was selected by considering the smallest value of a ratio of χ^2 to df found in each tested model. Model 1 (as constrained for equal factor structure) yielded the smallest value of a ratio of χ^2 to df of .67. Standardized parameter estimates for Model 1 for both samples are shown in Table 3.38. Path diagrams of Model 1 for both samples are shown in Figure 3.15 and Figure 3.16. Factor score equations of two subscales of time and energy (TE) and valence towards school (VALENCE) for German and Thai samples could be expressed as follows:

$TE_{German\ Sample}$ = .38(TE1) + .41(TE2) + .26(TE3)

$VALENCE_{German\ Sample}$ = .35(VAL1) + .19(VAL2) + .30(VAL3) + .13(VAL4) + .12(VAL5) + .07(VAL6) − .01(VAL7)

$TE_{Thai\ Sample}$ = .82(TE1) + .08(TE2) + .09(TE3)

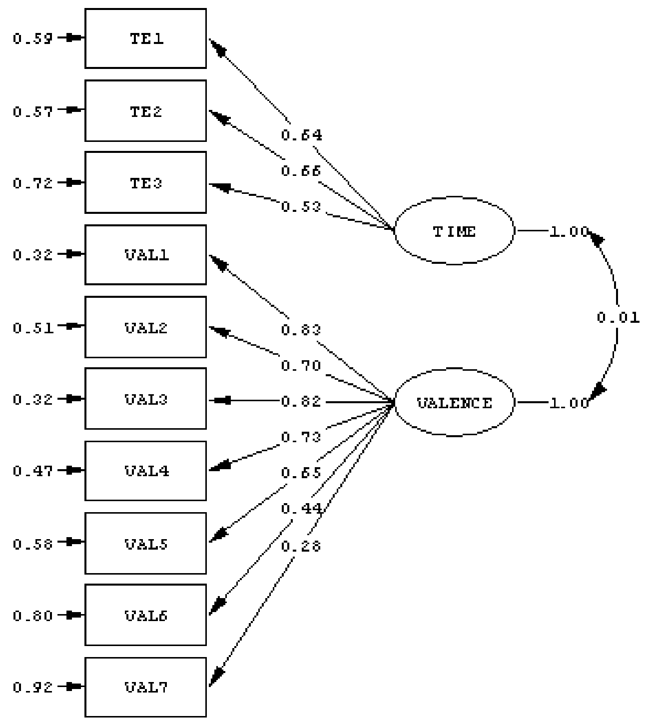
$VALENCE_{Thai\ Sample}$ = .11(VAL1) + .10(VAL2) + .33(VAL3) + .22(VAL4) + .26(VAL5) + .02(VAL6) + .16(VAL7)

Table 3.38

Standardized Parameter Estimates for the Measurement Models of Parental Life Context for the German and Thai Samples, as Constrained for Equal Factor Structure

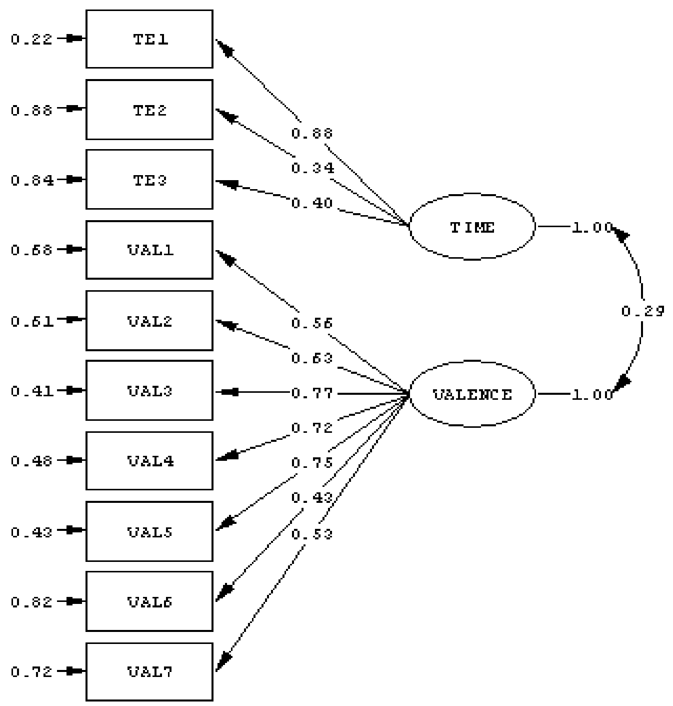
Items	German Sample (N = 288)					Thai Sample (N = 494)				
	β	SE	t	R^2	FSR	β	SE	t	R^2	FSR
Time and Energy (TIME)										
TE1	.64**	.08	8.39	.41	.38	.88**	.10	8.71	.78	.82
TE2	.66**	.08	8.54	.43	.41	.34**	.06	5.91	.12	.08
TE3	.53**	.07	7.42	.28	.26	.40**	.06	6.53	.16	.09
Valence Towards School (VALENCE)										
VAL1	.83**	.05	15.23	.68	.35	.56**	.05	12.29	.32	.11
VAL2	.70**	.06	11.81	.49	.19	.63**	.05	13.75	.39	.10
VAL3	.82**	.05	15.23	.68	.30	.77**	.04	17.15	.59	.33
VAL4	.73**	.06	12.55	.53	.13	.72**	.05	15.24	.52	.22
VAL5	.65**	.06	11.65	.42	.12	.75**	.04	17.07	.56	.26
VAL6	.44**	.06	7.12	.19	.07	.43**	.05	8.16	.18	.02
VAL7	.28**	.07	4.32	.08	−.01	.53**	.06	8.95	.28	.16

Note. FSR = Factor Score Regression.
* $p < .05$. ** $p < .01$



Chi-Square=25.58, df=38, P-value=0.93811, RMSEA=0.000

Figure 3.15. Empirically Validated Measurement Models of Parental Life Context for the German Sample, as Constrained for Equal Factor Structure



Chi-Square=25.58, df=38, P-value=0.93811, RMSEA=0.000

Figure 3.16. Empirically Validated Measurement Models of Parental Life Context for the Thai Sample, as Constrained for Equal Factor Structure

<u>*Short Summary*</u>

According to the MCFA findings in the previous sections, three of the six parent scales (i.e. active responsibility, role conceptions, and the scale of parental efficacy beliefs) achieved the highly restrictive levels of invariance across the German and Thai samples. In other words, not only equal were the factor structures and the item factor loadings of these scales across samples, but also the subscales (in each scale) correlated in a similar fashion in both samples. Unlike the three above-mentioned scales, specific invitations for involvement attained only configural invariance and metric invariance. However, this met the necessary precondition for performing further analyses in line with the research goal. Although the scale of parental conception of passive responsibility and the scale of parental life context did not attain the more restrictive levels of invariance like the other scales, they could still be taken into account because the factor structures and the majority of items in these scales were equal across groups.

3.4.2. Pupil Questionnaire

The pupil questionnaire also consisted of two parts. The first contained two types of questions, namely: (a) demographic characteristics (e.g. pupil gender, pupil age, family status) and (b) questions on homework experiences (e.g. time spent on completing homework, quantity of parental homework assistance). As in the parent questionnaire, some demographic survey questions for pupils were adapted from the *PARS questionnaires* (Research School "Education and Capabilities", 2010). The questions concerning homework experiences were adapted from *the German Parental Help with Learning at Home Questionnaire* (Fragebogen zur elterlichen Hilfe beim häuslichen Lernen) used in the above-mentioned Bielefeld longitudinal study by Wild and colleagues (see Wild, Rammert, & Siegmund, 2003; 2006).

The second part of the pupil questionnaire comprised a wide range of scales. These assessed pupil self-reports on their perceptions of the quality of home-based parental involvement (authoritative vs. authoritarian parental instruction) and their academic functioning outcomes. Academic functioning outcomes include learning motivation (i.e. autonomous learning motivation, controlled learning motivation), academic well-being (i.e. school satisfaction, positive–negative academic emotions), regulation of academic motivation (i.e. interest enhancement, self-consequating), regulation of positive academic emotion (self-reinforcement, self-affirmation, social affirmation), and regulation of negative academic emotion (situation control, positive self-instructions, social support). Details of the scale construction, the internal consistencies of the pupil scales for both samples, and the cross-cultural measurement invariance of the scales are shown in the following.

3.4.2A. Construction of the Pupil Scales

Authoritative Kinds of Parental Instruction

Two subscales were administered: autonomy support (6 items) and responsiveness (7 items). All items were adapted from *the German Parental Help in Home Learning Questionnaire* (Fragebogen zur elterlichen Hilfe beim häuslichen Lernen) by Wild (1999) and the revised version by Lorenz and Wild (2007). The details of the subscales are as follows:

- *The subscale of autonomy-support* assesses pupils' perceptions of their parents' encouragement of the child's self-initiated expression and action, provision of opportunities to make choices, and acknowledgement of the child's feelings and ideas. It begins with the stem, "*When I get a worse math grade than usual, ...*" followed by the list of items. Sample items are "*My parents ask me how they can help me*", and "*My parents try to explain to me without pressure: If I do not study regularly, it will be more and more difficult to keep up*".
- *The subscale of responsiveness* assesses the pupils' perceptions of their parents' readiness to take the child's perspectives, acknowledgement of the child's feelings, dedication of resources and time, interest in the child's behaviours, provision of consolation, and encouragement of continuous self-regulation in failure situations. Sample items are "*My parents ask me how thing were at school*", and "*When I learn with my parents, I feel that they understand and support me*".

Authoritarian Kinds of Parental Instruction

Two subscales were administered, namely: control (6 items) and structure or strictness (4 items). All items were also adapted from *the German Parental Help in Home Learning Questionnaire* (see Wild, 1999; Lorenz & Wild, 2007). The details of the subscales are as follows:

- *The subscale of control* assesses pupils' perceptions of their parents' attempts to change the child by pressuring him/her to do, think, feel, or behave in particular ways. It began with the stem, "*When I get a worse math grade than usual,...*" followed by the list of items. Sample items included: "*My parents scold me and tell me to study more*", and "*My parents make me study at home until I complete all my tasks*".
- *The subscale of structure* assesses pupils' perceptions of their parents' provision of clear and consistent guidelines as well as expectations and rules. Sample items included: "*When I study for a test, I know exactly how much effort my parents expect*", and "*When I take a test result home, I know in advance, whether my parents will be disappointed*".

Autonomous Learning Motivation

Two subscales were administered, namely: intrinsic regulation (6 items) and identified regulation (6 items). These 12 items were adapted from *the German Academic Self-Regulation (ASRQ-G)* by Wild and Krapp (1995). The details of the subscales are as follows:

- *The subscale of intrinsic regulation* assesses the extent to which pupils' learning behaviours are motivated by the persons' interest, enjoyment, and inherent satisfaction. It begins with the stem, "*Why do you make an effort in math class/doing math homework?*" followed by the list of items. Sample items are "*Because I have a strong interest in math*", and "*I like to calculate*".
- *The subscale of identified regulation* assesses the extent to which pupils' learning behaviours are motivated by the self as personally important or valuable. It begins with the same stem as the intrinsic regulation subscale. Sample items are "*Because I want to understand the content*", and "*Because it is important to me to be able to calculate*".

Controlled Learning Motivation

Two subscales were administered, namely: introjected regulation (13 items) and external regulation (6 items). All 12 items were also adapted from the ASRQ-G by Wild and Krapp (1995). The details of the subscales are as follows:

- *The subscale of introjected regulation* assesses the extent to which pupils' learning behaviours are motivated by internal prods and pressures such as threats of guilt or self-esteem-relevant contingencies. It begins with the stem, "*Why do you make an effort in math class/doing math homework?*". Sample items are "*So that I can feel proud*", and "*Because I would be ashamed, if I did not do my best*"
- *The subscale of identified regulation* consisted of six items assessing the extent to which pupils' learning behaviours are motivated by contingencies overtly external to the individual. It begins with the same stem as the introjected regulation subscale. Sample items are "*So that I don't get into trouble with my parents*", and "*Because doing my math tasks is expected of me*".

Academic Well-Being

Two subscales were administered, namely: school satisfaction (5 items) positive academic emotion/absence of negative academic emotion (5 items for positive and 5 items for negative). The details of the subscales are as follows:

- *The subscale of school satisfaction* assesses the extent to which pupils are satisfied with their school generally. Five items were adapted from *the Multidimensional Life Satisfaction Scale for Children (MSLSS)* by Huebner (1994). Sample items are "*Normally, the school makes me happy",* and *"I have fun learning*".
- *The subscale of positive academic emotion-absence of negative academic emotion* assesses the extent to which pupils experience pleasant engagement and the absence of subjective distress and unpleasant engagement with their parents as a result of home-based parental involvement. These 10 items were adapted from *the Positive and Negative Affect Schedule for Children* (PANAS-C) developed by Laurent et al. (1999). Pupils' scores on negative academic emotion were reversed and used as the absence of negative academic emotion. This subscale begins with the question, "*Please think of the last time that you did your homework with your parents. How did you feel?*" followed by the list of items. Sample items for positive academic emotions are "*I felt glad/proud/hopeful/relieved/relaxed*". Sample items for negative academic emotions are "*I felt anxious/angry/ashamed/ bored/discouraged*".

Regulation of Academic Motivation

Two subscales were administered, namely: interest enhancement (4 items) and self-consequating (5 items). Nine items were adapted from the scale by Wolters (1999). The details of the subscales are as follows:

- *The subscale of interest enhancement* assesses the extent to which pupils make a learning task into a game, or make it more enjoyable or fun to get it done. Sample items are "*I try to solve my tasks playfully*" and "*I think about how to finish my tasks and have fun at the same time*".
- *The subscale of self-consequating* assesses the extent to which pupils use self-provided rewards in order to reinforce their desire to complete

a learning task. Sample items are "*I promise to myself that I will do something nice when I am done with my task*" and "*I tell myself that I can do something interesting later, if I do my homework now*".

Regulation of Positive Academic Emotion

Three subscales were administered, namely: self-reinforcement (7 items), self-affirmation (4 items), and seeking social affirmation (7 items). All items were adapted from *The German Regulation of Positive Emotions Questionnaire* (Fragebogen zur aktuellen Regulation positiver Emotionen: RPE 36-ak). This questionnaire was developed by Manfred Holodynski, Eva Regine Bartsch, and Christine Ullmann in 1995 (see Bartsch, 1996; Holodynski, 1995; Ullmann, 1996). The details of the subscales are as follows:

- *The subscale of self-reinforcement* consisted of seven items assessing the extent to which pupils promise to give a reward to themselves in recompense for a pleasant learning situation. It began with the stem, "*If I have solved a difficult math task quite well*" followed by the list of items. This stem was also used for two other subscales. Sample items are "*I like to jump up in the air*" and "*I treat myself to something nice*".
- *The subscale of seeking social affirmation* consisted of four items assessing the extent to which pupils attempt to obtain such confirmation from others that they are experiencing a pleasant learning situation. Sample items are "*I would love to tell others how successful I was*" and "*I keep on thinking back to the moment when I experienced my success*".
- *The subscale of self-affirmation* consisted of seven items assessing the extent to which pupils think of doing certain things to confirm to themselves that they are experiencing a pleasant learning situation. Sample items are "*I will think that I have done well*" and "*I will praise myself*".

Regulation of Negative Academic Emotion

Three subscales were administered— situation control (4 items), positive self-instructions (4 items), and seeking social support (4 items). These 12 items were adapted from *The German Coping Questionnaire for Children and Adolescents*

(Stressverarbeitungsfragebogen für Kinder und Jugendliche: SVF-KJ) by Hampel et al. (2001). The details of the subscales are as follows:

- *The subscale of situation control* assesses the extent to which pupils take control over a difficult learning situation. Sample items are "*I am making a plan to fix the problem!*" and "*I am wondering what to do!*".
- *The subscale of positive self-instructions* assesses the extent to which pupils use vocal statements to encourage themselves to think that a difficult learning situation can be manageable. Sample items are "*I say to myself: I know I can solve the problem!*" and "*I tell myself: I will get that under control!*".
- *The subscale of seeking social support* assesses the extent to which pupils attempt to obtain concrete advice about how to handle a difficult learning situation and make an effort to discuss their feelings about it with others. Sample items are "*I let somebody help me*" and "*I talk to somebody about that*".

3.4.2B Internal Consistencies of the Pupil Scales for the German and Thai Samples

Table 3.39 shows the internal consistencies (alpha) of the pupil subscales for both samples. For the German sample, alphas ranged between .57 and .95; for the Thai sample, between .50 and .89. The internal consistency of the whole pupil questionnaire (108 items) was .95 for the German sample and .94 for the Thai sample. This indicated that the internal consistencies of pupil questionnaires in German and Thai were quite similar.

Table 3.39
Internal Consistencies of Pupil Subscales for the German and Thai Samples

Pupil Scale	Number of items	German Sample (N = 288) alpha	Thai Sample (N = 494) alpha
1. Authoritative kinds of parental instruction			
1.1. Autonomy-support	6	.72	.59
1.2. Responsiveness	7	.82	.71
2. Authoritarian kinds of parental instruction			
2.1. Control	6	.71	.64
2.2. Structure	4	.57	.50
3. Autonomous learning motivation			
3.1. Intrinsic regulation	6	.95	.89
3.2. Identified regulation	6	.87	.78
4. Controlled learning motivation			
4.1. Introjected regulation	13	.87	.82
4.2. External regulation	6	.74	.72
5. Academic well-being			
5.1. School satisfaction	5	.85	.85
5.2. Positive academic emotion	10	.75	.80
6. Regulation of academic motivation			
6. 1. Interest enhancement	4	.79	.77
6. 1. Self-consequating	5	.79	.66
7. Regulation of positive academic emotion			
7. 1. Self-reinforcement	7	.85	.75
7. 2. Seeking social-affirmation	7	.88	.80
7. 3. Self-affirmation	4	.80	.71
8. Regulation of negative academic emotion			
8. 1. Situation control	4	.82	.72
8. 2. Positive self-instructions	4	.83	.72
8. 2. Seeking social support	4	.85	.80
Total	108	.95	.94

3.4.2C. Cross-Cultural Measurement Invariance of the Pupil Scales Across the German and Thai Samples

This phase examined the cross-cultural validity of the pupil scales across the German and Thai samples. In the present study, there were 18 pupil subscales specified under eight pupil scales. Pupil scales consisted of authoritative parental instruction, authoritarian parental instruction, autonomous learning motivation, controlled learning motivation, academic well-being, regulation of academic motivation, regulation of positive academic emotion, and regulation of negative academic emotion. All subscales were specified in terms of first-order measurement models. As with the parent scales, there were three steps of data analyses (see *pp*. 87–92, for greater detail):

1] Exploring correlations between questionnaire items and checking with Bartlett's test of sphericity and the Kaiser-Meyer-Olkin measure of sampling adequacy (KMO).
2] Examining cross-cultural measurement invariance in the pupils' scales with multi-sample confirmatory factor analysis (MCFA).
3] Selecting the best-fit models and calculating factor scores.

Details of cross-cultural validity of pupil scales are as follows.

Authoritative Kinds of Parental Instruction

This scale comprised two subscales: autonomy-support and responsiveness. Autonomy-support was a latent construct measured by six items whereas responsiveness was a latent construct of measured by seven items. First, correlations were examined between items measuring these two subscales. In the German sample, significant correlations ranged between .12 (p < .05) and .53 (p < .01). In the Thai sample, significant correlations ranged between .10 (p < .05) and .39 (p < .01). In the German sample, Bartlett's test of sphericity yielded a χ^2 of 1,091.27 with *df* of 78 (p = .00). In the Thai sample, Bartlett's tests of sphericity yielded a χ^2 of 1,061.00 with *df* of 78 (p = .00). The findings on Bartlett's test showed that the correlation matrices for the items measuring the two subscales for both samples were not the identity matrices (all off-diagonal elements were zero). The Kaiser-Meyer-Olkin measures of sampling adequacy (KMO) of two correlation matrices for German and Thai samples were greater than .50 ($KMO_{German\ Sample}$ = .87, $KMO_{Thai\ Sample}$ = .86). The findings of KMO showed that 13 items measuring two subscales for both samples correlated highly with each other. Therefore, the data for both samples were appropriate for MCFA. Details are shown in Table 3.40.

Table 3.40

Means, Standard Deviations, and Correlation Matrices for Items Measuring the Scale of Authoritative Kinds of Parental Instruction for the German and Thai Samples (German Sample = Left-Hand Corner; Thai Sample = Right-Hand Corner)

Thai Sample (N = 494)													
Bartlett's Test of Sphericity [χ^2 (78, N = 294) = 1,061.00, p = .00]													
KMO = .86													
M	2.61	3.06	3.10	3.34	2.94	3.15	2.51	3.20	3.20	2.99	3.34	2.99	3.31
SD	.87	.87	.92	.75	.87	.90	.96	.80	.79	.79	.78	.85	.73
Item	AUT1	AUT2	AUT3	AUT4	AUT5	AUT6	WAR1	WAR2	WAR3	WAR4	WAR5	WAR6	WAR7
AUT1	–	.24**	.10*	.15**	.20**	.17**	.17**	.09	.16**	.10*	.19**	.12**	.13**
AUT2	.42**	–	.11*	.26**	.15**	.20**	.18**	.34**	.26**	.21**	.22**	.23**	.25**
AUT3	.31**	.36**	–	.23**	.18**	.18**	.15**	.16**	.20**	.16**	.24**	.19**	.19**
AUT4	.30**	.10	.17**	–	.21**	.39**	.22**	.29**	.27**	.20**	.37**	.23**	.30**
AUT5	.34**	.35**	.34**	.13*	–	.24**	.23**	.16**	.23**	.12*	.23**	.18**	.21**
AUT6	.36**	.33**	.32**	.35**	.35**	–	.20**	.16**	.24**	.19**	.31**	.22**	.32**
RES1	.32**	.33**	.23**	.19**	.40**	.40**	–	.16**	.17**	.16**	.16**	.17**	.17**
RES2	.19**	.19**	.12*	.11	.24**	.14*	.35**	–	.34**	.46**	.32**	.28**	.33**
RES3	.36**	.34**	.23**	.24**	.37**	.38**	.53**	.38**	–	.28**	.36**	.28**	.37**
RES4	.16**	.22**	.14*	.20**	.26**	.22**	.29**	.50**	.35**	–	.22**	.35**	.22**
RES5	.37**	.27**	.23**	.18**	.39**	.40**	.53**	.37**	.44**	.30**	–	.22**	.35**
RES6	.17**	.27**	.14*	.22**	.27**	.29**	.35**	.36**	.36**	.45**	.29**	–	.22**
RES7	.31**	.34**	.22**	.30**	.45**	.40**	.45**	.27**	.49**	.25**	.46**	.48**	–
M	2.92	2.95	2.98	3.15	3.40	3.17	3.53	3.73	3.51	3.49	3.33	3.31	3.40
SD	.96	.98	.98	.82	.78	.84	.70	.55	.69	.71	.83	.76	.78
Bartlett's Test of Sphericity [χ^2 (78, N = 288) = 1,091.27, p = .00]													
KMO = .87													
German Sample (N = 288)													

Note. Autonomy-Support (AUT1 – AUT6). Responsiveness (RES1 – RES7).
* $p < .05$. ** $p < .01$.

MCFA was then performed on this scale to examine four invariance testing hypotheses . Table 3.41 shows the results of the MCFA. First, Model 1 was tested for factor structure invariance. Model 1 fitted the empirical data well [χ^2 (82, N_1 = 288, N_2 = 494) = 47.34, χ^2/df = .58, p = .99, GFI = .99, CFI = 1.00, SRMR = .02, RMSEA = .00]. This indicated that the factor structure of this scale was invariant across German and Thai samples. That is, configural invariance was supported. As the configural invariance was supported, factor loadings were constrained to be equal (Model 2). As can be seen from Table 3.41, Model 2 acceptably fitted the data but the χ^2 difference ($\Delta\chi^2$) between Model 2 versus Model 1 was statistically significant ($p < .01$). This indicated that factor loadings were not equivalent across samples. That is, full metric invariance was not supported. Before continuing further tests, it was necessary to examine whether at least partial metric invariance could be achieved. Then, the factor loadings of AUT1, AUT4, and RES1 were freed, because they revealed the greatest modification indices that could be freed to most reduce $\Delta\chi^2$. As expected, the partial metric invariance model fitted the data better than the full metric invariance model (Model 2) as indicated by better fit indices [χ^2 (92, N_1 = 288, N_2 = 494) = 62.73, χ^2/df = .68, p = .99, GFI = .99, CFI = 1.00, SRMR = .04, RMSEA = .00]. As Table 3.41 shows, the test of $\Delta\chi^2$ between the partial metric invariance model versus Model 1 was not statistically significant. This indicated that partial metric invariance was supported. Afterwards, the factor variance-covariance invariance model (Model 3) was examined. This model acceptably fitted the data (see Table 3.41), but the test of $\Delta\chi^2$ between Model 3 versus Model 2 was statistically significant (p < .05). This indicated that the relationship between the two subscales varied across samples. That is, full factor variance-covariance invariance was not supported. In addition, the error variance-covariance invariance model (Model 4) did not provide acceptable fit indices for the data (see Table 3.41). This indicated that measurement error variances-covariances varied across samples. That is, error variance-covariance was not supported.

Table 3.41
Test of Cross-Cultural Measurement Invariance for the Scale of Authoritative Kinds of Parental Instruction Across the German and Thai Samples

	Model fit index							
Nested model	χ^2	df	χ^2/df	p	GFI	CFI	SRMR	RMSEA
Model 1: Configural invariance	47.34	82	.58	.99	.99	1.00	.02	.00
Model 2: Metric invariance	114.20	95	1.20	.09	.98	1.00	.06	.02
Partial metric invariance	62.73	92	.68	.99	.99	1.00	.04	.00
Model 3: Factor variance-covariance invariance	118.62	96	1.23	.06	.98	1.00	.06	.03
Model 4: Error variance-covariance invariance	213.36	132	1.62	.00	.98	.98	.05	.04

				Critical value of the χ^2 distribution	
Model difference	$\Delta\chi^2$	Δdf	Decision	.05	.01
Model 2 vs. Model 1	66.86**	13	Reject	22.36	27.69
Partial metric invariance vs. Model 1	15.39	10	Accept	18.31	23.21
Model 3 vs. Model 2	4.42*	1	Reject	3.84	6.64
Model 4 vs. Model 3	–	–	Reject	–	–

Note. The grey shading indicates the best-fit model.
*p < .05. **p < .01.

The best-fit model was selected by considering the smallest value of a ratio of χ^2 to df found in each tested model. Model 1 (as constrained for equal factor structure) yielded the smallest value of a ratio of χ^2 to df of .58. Standardized parameter estimates for Model 1 for both samples are shown in Table 3.42. Path diagrams of Model 1 for both samples are shown in Figure 3.17 and Figure 3.18. Factor score equations of two subscales of autonomy-support (AUT) and responsiveness (RES) for German and Thai samples could be expressed as follows:

$AUT_{German\ Sample}$ = .15(AUTO1) + .15(AUTO2) + .07(AUTO3) – .01(AUTO4) + .16(AUTO5) + .24(AUTO6)

$RES_{German\ Sample}$ = .18(RES1) + .09(RES2) + .31(RES3) + .04(RES4) + .30(RES5) + .02(RES6) + .14(RES7)

$AUT_{Thai\ Sample}$ = .03(AUTO1) + .08(AUTO2) + .07(AUTO3) + .20(AUTO4) + .06(AUTO5) + .15(AUTO6)

$RES_{Thai\ Sample}$ = .05(RES1) + .12(RES2) + .24(RES3) + .04(RES4) + .17(RES5) + .10(RES6) + .19(RES7)

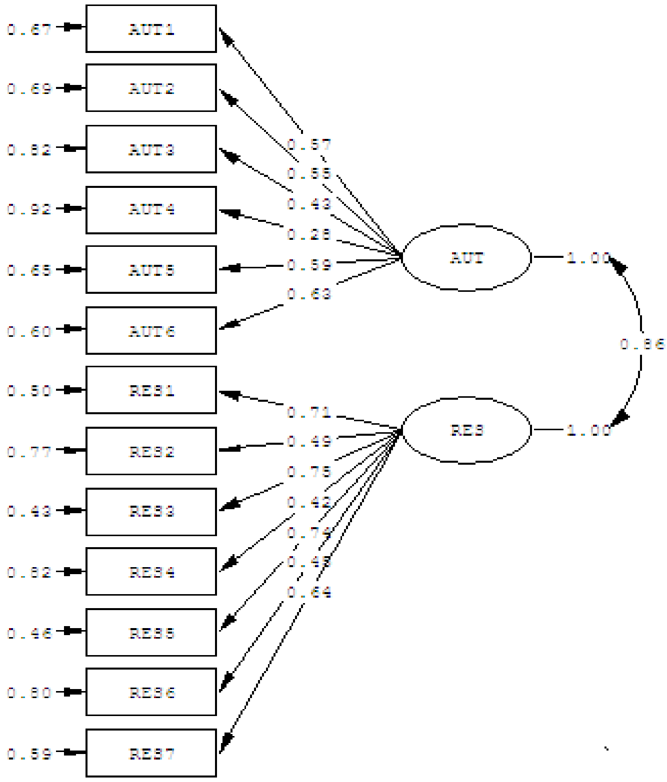
Table 3.42

Standardized Parameter Estimates for the Measurement Models of Authoritative Kinds of Parental Instruction for the German and Thai Samples, as Constrained for Equal Factor Structure

Item	German Sample (*N* = 288)					Thai Sample (*N* = 494)				
	β	SE	t	R^2	FSR	β	SE	t	R^2	FSR
Autonomy-Support (AUT)										
AUT1	.57**	.06	8.99	.33	.15	.26**	.05	5.15	.07	.03
AUT2	.55**	.06	8.64	.31	.15	.43**	.05	8.19	.18	.08
AUT3	.43**	.06	6.60	.18	.07	.35**	.05	7.23	.13	.07
AUT4	.28**	.07	4.00	.08	–.01	.60**	.06	10.55	.35	.20
AUT5	.59**	.06	9.50	.34	.16	.37**	.05	7.46	.14	.06
AUT6	.63**	.06	10.33	.40	.24	.52**	.05	10.06	.27	.15
Responsiveness (RES)										
RES1	.71**	.05	12.91	.50	.18	.33**	.05	6.73	.11	.05
RES2	.49**	.06	8.13	.24	.09	.52**	.05	10.81	.27	.12
RES3	.75**	.06	13.26	.57	.31	.62**	.05	12.27	.38	.24
RES4	.42**	.06	7.00	.18	.04	.40**	.05	8.08	.16	.04
RES5	.74**	.06	12.99	.54	.30	.59**	.05	12.40	.35	.17
RES6	.45**	.06	7.52	.20	.02	.44**	.05	8.70	.19	.10
RES7	.64**	.06	11.41	.41	.14	.59**	.05	12.39	.35	.19

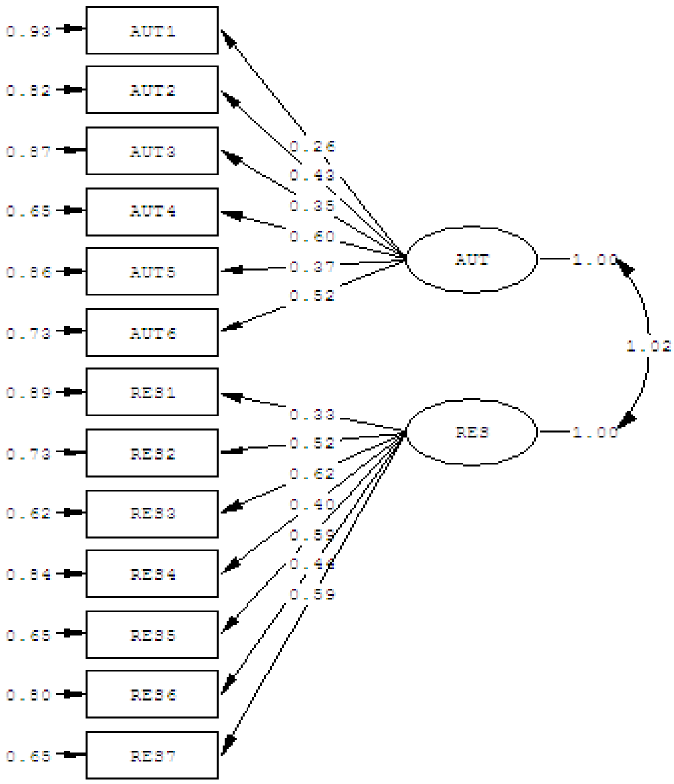
Note. FSR = Factor Score Regression.

* $p < .05$. ** $p < .01$.



Chi-Square=47.34, df=82, P-value=0.99923, RMSEA=0.000

Figure 3.17. Empirically Validated Measurement Models of Authoritative Kinds of Parental Instruction for the German Sample, as Constrained for Equal Factor Structure



Chi-Square=47.34, df=82, P-value=0.99923, RMSEA=0.000

Figure 3.18. Empirically Validated Measurement Models of Authoritative Kinds of Parental Instruction for the Thai Sample, as Constrained for Equal Factor Structure

Authoritarian Kinds of Parental Instruction

This scale comprised two subscales: control and structure. Control was a latent construct measured by six items, whereas structure was a latent construct measured by four items. First, correlations were examined between items measuring these two subscales. In the German sample, significant correlations ranged between .12 (p < .05) and .51 (p < .01). In the Thai sample, significant correlations ranged between .09 (p < .05) and .45 (p < .01). In the German sample, Bartlett's test of sphericity yielded a χ^2 of 502.25 with *df* of 45 (p = .00). In the Thai sample, Bartlett's tests of sphericity yielded a χ^2 of 578.39 with *df* of 45 (p = .00). This showed that the correlation matrices for the items measuring the two subscales for both samples were not the identity matrices. The KMO measures of sampling adequacy of the two correlation matrices for the German and Thai samples were greater than .50 ($KMO_{German\ Sample}$ = .75, $KMO_{Thai\ Sample}$ = .75). This showed that the 10 items measuring the two subscales for both samples correlated highly with each other. Therefore, the data for both samples were appropriate for MCFA. Details are shown in Table 3.43.

Table 3.43
Means, Standard Deviations, and Correlation Matrices for Items Measuring the Scale of Authoritarian Kinds of Parental Instruction for the German and Thai Samples (German Sample = Left-Hand Corner; Thai Sample = Right-Hand Corner)

Thai Sample (N = 494)										
Bartlett's Test of Sphericity [χ^2(45, N = 494) = 578.39, p = .00]										
KMO = .75										
M	2.78	2.48	2.43	2.60	1.85	2.69	3.26	2.63	2.81	3.00
SD	.95	.96	1.07	.98	.89	.86	.74	.97	.90	.85
Item	CON1	CON2	CON3	CON4	CON5	CON6	STR1	STR2	STR3	STR4
CON1	—	.23**	.18**	.09*	.15**	.21**	.24**	.13**	.20**	.14**
CON2	.19**	—	.45**	.18**	.25**	.22**	.13**	.12**	.13**	.07
CON3	.33**	.51**	—	.27**	.32**	.25**	.16**	.13**	.17**	.14**
CON4	.21**	.37**	.26**	—	.20**	.14**	.10*	.12**	.14**	.14**
CON5	.19**	.26**	.21**	.33**	—	.22**	.00	.19**	.14**	.11*
CON6	.18**	.36**	.44**	.20**	.23**	—	.30**	.18**	.20**	.19**
STR1	.23**	.14*	.18**	.02	.22**	.18**	—	.13**	.18**	.28**
STR2	.20**	.22**	.21**	.09	.10	.16**	.18**	—	.35**	.09*
STR3	.23**	.19**	.25**	.19**	.21**	.12*	.07	.41**	—	.20**
STR4	.11	.25**	.21**	.05	.24**	.15*	.40**	.27**	.18**	—
M	2.08	1.90	1.60	1.59	2.40	2.03	2.82	2.88	2.76	3.26
SD	.94	.93	.90	.80	.93	.99	.85	.96	.98	.80
Bartlett's Test of Sphericity [χ^2 (45, N = 288) = 502.25, p = .00]										
KMO = .75										
German Sample (N = 288)										

Note. Control (CON1 – CON6). Structure (STR1 – STR4).
*p < .05. **p < .01.

MCFA was then performed on this scale to examine four invariance testing hypotheses. Table 3.44 shows the results of MCFA. First, Model 1 was tested for factor structure invariance. Model 1 fitted the empirical data well [χ^2 (24, N_1 = 288, N_2 = 494) = 9.23, χ^2/df = .38, p = .99, GFI = 1.00, CFI = 1.00, SRMR = .01, RMSEA = .00]. This indicated that the factor structure of this scale was invariant across German and Thai samples. That is, configural invariance was supported. Because the configural invariance was supported, factor loadings were constrained to be equal (Model 2). As Table 3.44 shows, Model 2 fitted the data well and the χ^2-difference ($\Delta\chi^2$) between Model 2 versus Model 1 was not significant. This indicated that factor loadings were equivalent across samples. That is, full metric invariance was supported. Afterwards, the factor variance-covariance invariance model (Model 3) was examined. This model also yielded good fit indices (see Table 3.44). The tests of $\Delta\chi^2$ between Model 3 versus Model 2 were not significant. This indicated that the relationship between the two subscales was invariant across samples. That is, full factor variance-covariance invariance was supported. However, the error variance-covariance invariance model (Model 4) did not provide acceptable fit indices for the data (see Table 3.44). This indicated that measurement error variances-covariances varied across samples. That is, error variance-covariance was not supported.

Table 3.44

Test of Cross-Cultural Measurement Invariance for the Scale of Authoritarian Kinds of Parental Instruction Across the German and Thai Samples

	Model fit index							
Nested model	χ^2	df	χ^2/df	p	GFI	CFI	SRMR	RMSEA
Model 1: Configural invariance	9.23	24	.38	.99	1.00	1.00	.01	.00
Model 2: Metric invariance	24.65	34	.73	.88	1.00	1.00	.03	.00
Model 3: Factor variance-covariance invariance	26.41	35	.75	.85	1.00	1.00	.03	.00
Model 4: Error variance-covariance invariance	101.27	67	1.51	.00	.99	.97	.03	.04

				Critical value of the χ^2 distribution	
Model difference	$\Delta\chi^2$	Δdf	Decision	.05	.01
Model 2 vs. Model 1	15.42	10	Accept	18.31	23.21
Model 3 vs. Model 2	1.76	1	Accept	3.84	6.64
Model 4 vs. Model 3	–	–	Reject	–	–

Note. The grey shading indicates the best-fit model.
*p < .05. **p < .01.

The best-fit model was selected by considering the smallest value of a ratio of χ^2 to *df* found in each tested model. Model 1 (as constrained for equal factor structure) yielded the smallest value of a ratio of χ^2 to *df* of .38. Standardized parameter estimates for Model 1 for both samples are shown in Table 3.45. Path diagrams of Model 1 for both samples are shown in Figure 3.19 and Figure 3.20. Factor score equations of two subscales of control (CON) and structure (STR) for German and Thai samples could be expressed as follows:

$CON_{German\ Sample}$ = .15(CON1) + .42(CON2) + .45(CON3) + .05(CON4) + .21(CON5) + .05(CON6)

$STR_{German\ Sample}$ = .17(STR1) + .25(STR2) + .19(STR3) + .20(STR4)

$CON_{Thai\ Sample}$ = .15(CON1) + .12(CON2) + .10(CON3) + .08(CON4) + .21(CON5) + .27(CON6)

$STR_{German\ Sample}$ = .14(STR1) + .19(STR2) + .18(STR3) + .24(STR4)

Table 3.45
Standardized Parameter Estimates for the Measurement Models of Authoritarian Kinds of Parental Instruction for the German and Thai Samples, as Constrained for Equal Factor Structure

Item	German Sample (N = 288)					Thai Sample (N = 494)				
	β	SE	t	R^2	FSR	β	SE	t	R^2	FSR
Control (CON)										
CON1	.43**	.08	5.45	.18	.15	.38**	.06	6.04	.14	.15
CON2	.76**	.12	6.52	.57	.42	.39**	.07	5.58	.15	.12
CON3	.78**	.12	6.54	.61	.45	.42**	.07	5.67	.17	.10
CON4	.42**	.10	4.39	.18	.05	.29**	.07	4.53	.09	.08
CON5	.45**	.10	4.66	.20	.21	.44**	.07	6.27	.19	.21
CON6	.48**	.08	5.99	.23	.05	.52**	.06	8.33	.27	.27
Structure (STR)										
STR1	.36**	.09	3.90	.13	.17	.38**	.08	4.70	.14	.14
STR2	.49**	.10	4.65	.24	.25	.40**	.07	5.40	.16	.19
STR3	.42**	.11	4.01	.18	.19	.44**	.07	6.09	.19	.18
STR4	.45**	.11	4.17	.20	.20	.43**	.07	5.88	.18	.24

Note. FSR = Factor Score Regression.
* $p < .05$. ** $p < .01$.

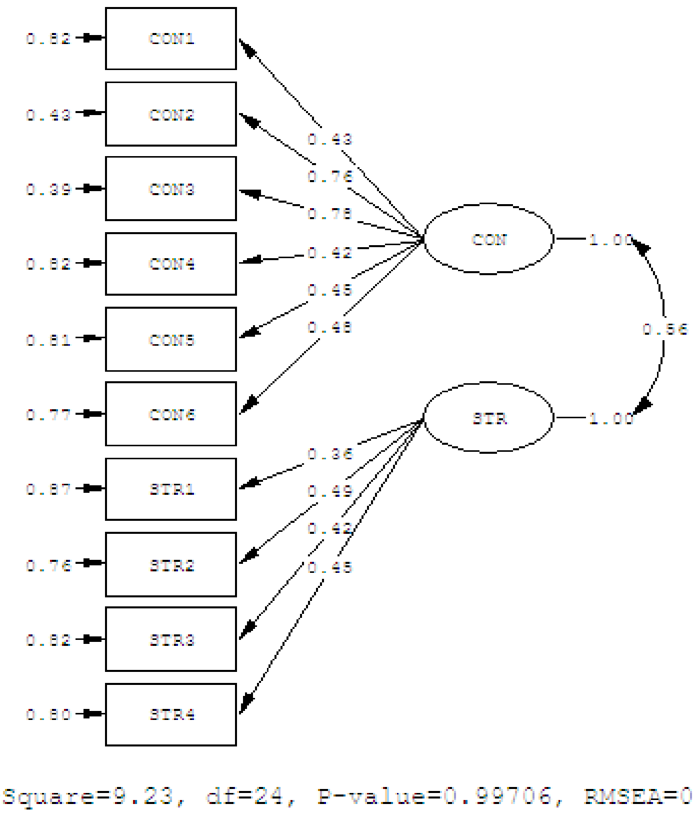


Figure 3.19. Empirically Validated Measurement Models of Authoritarian Kinds of Parental Instruction for the German Sample, as Constrained for Equal Factor Structure

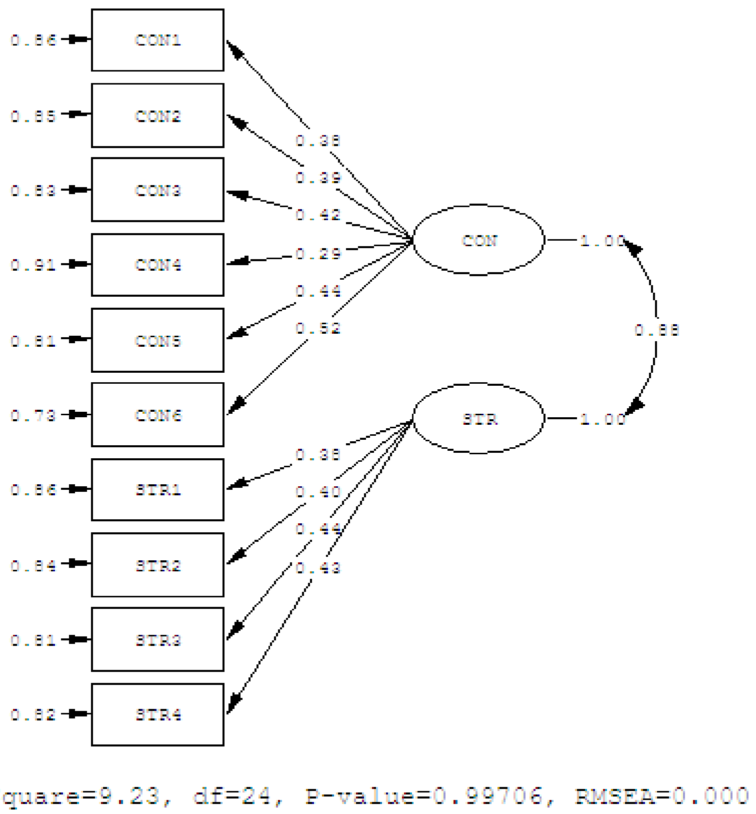


Figure 3.20. Empirically Validated Measurement Models of Authoritarian Kinds of Parental Instruction for the Thai Sample, as Constrained for Equal Factor Structure

Autonomous Learning Motivation

This scale comprised two subscales: intrinsic regulation and identified regulation. Intrinsic regulation was a latent construct measured by six items, whereas identified regulation was a latent construct measured by six items. First, correlations were examined between items measuring these two subscales. In the German sample, significant correlations ranged between .21 ($p < .01$) and .80 ($p < .01$). In the Thai sample, significant correlations ranged between .16 ($p < .01$) and .67 ($p < .01$). In the German sample, Bartlett's test of sphericity yielded a χ^2 of 2,583.34 with *df* of 66 ($p = .00$). In the Thai sample, Bartlett's tests of sphericity yielded a χ^2 of 2,512.10 with *df* of 66 ($p = .00$). This showed that the correlation matrices for the items measuring the two subscales for both samples were not the identity matrices. The KMO measures of sampling adequacy of the two correlation matrices for the German and Thai samples were greater than .50 ($KMO_{German\ Sample} = .92$, $KMO_{Thai\ Sample} = .90$). This showed that the 12 items measuring the two subscales for both samples correlated highly with each other. Therefore, the data for both samples were appropriate for MCFA. Details are shown in Table 3.46.

Table 3.46

Means, Standard Deviations, and Correlation Matrices for Items Measuring the Scale of Autonomous Learning Motivation for the German and Thai Samples (German Sample = Left-Hand Corner; Thai Sample = Right-Hand Corner)

Thai Sample ($N = 494$)												
Bartlett's Test of Sphericity [χ^2 (66, $N = 494$) = 2,512.10, $p = .00$] KMO = .90												
M	3.08	2.96	3.17	2.97	2.92	3.07	3.41	3.47	3.23	3.23	3.35	3.19
SD	.82	.91	.80	.87	.90	.86	.66	.61	.75	.69	.65	.78
Item	IN1	IN2	IN3	IN4	IN5	IN6	ID1	ID2	ID3	ID4	ID5	ID6
IN1	—	.67**	.58**	.51**	.51**	.62**	.34**	.21**	.38**	.29**	.28**	.35**
IN2	.80**	—	.56**	.57**	.57**	.57**	.19**	.16**	.37**	.26**	.26**	.33**
IN3	.77**	.78**	—	.52**	.54**	.57**	.27**	.22**	.39**	.29**	.39**	.39**
IN4	.77**	.76**	.79**	—	.67**	.57**	.20**	.20**	.35**	.34**	.27**	.34**
IN5	.68**	.72**	.70**	.66**	—	.60**	.21**	.20**	.44**	.32**	.31**	.38**
IN6	.82**	.76**	.76**	.77**	.72**	—	.30**	.21**	.39**	.35**	.34**	.42**
ID1	.28**	.23**	.30**	.28**	.26**	.26**	—	.37**	.34**	.30**	.34**	.36**
ID2	.29**	.21**	.31**	.29**	.26**	.29**	.47**	—	.34**	.27**	.46**	.23**
ID3	.47**	.49**	.52**	.51**	.47**	.52**	.40**	.50**	—	.48**	.39**	.59**
ID4	.40**	.34**	.45**	.44**	.38**	.41**	.40**	.47**	.57**	—	.35**	.47**
ID5	.35**	.33**	.40**	.44**	.31**	.33**	.61**	.59**	.54**	.59**	—	.36**
ID6	.52**	.48**	.51**	.52**	.53**	.57**	.38**	.49**	.77**	.60**	.51**	—
M	2.63	2.71	2.80	2.76	2.53	2.71	3.51	3.45	3.30	3.37	3.44	3.29
SD	1.09	1.07	1.06	1.02	1.12	1.04	.62	.67	.80	.75	.70	.81
Bartlett's Test of Sphericity [χ^2 (66, $N = 288$) = 2,583.34, $p = 0$] KMO = .92												
German Sample ($N = 288$)												

Note. Intrinsic Regulation (IT1 – IT6). Identified Regulation (ID1 – ID6).
* $p < .05$. ** $p < .01$.

MCFA was then performed on this scale to examine four invariance testing hypotheses. Table 3.47 shows the results of MCFA. First, Model 1 was tested for factor structure invariance. Model 1 fitted the empirical data well [χ^2 (54, N_1 = 288, N_2 = 494) = 34.25, χ^2/df = .63, p = .98, GFI = .99, CFI = 1.00, SRMR = .02, RMSEA = .00]. This indicated that the factor structure of this scale was invariant across the German and Thai samples. That is, configural invariance was supported. Because the configural invariance was supported, factor loadings were constrained to be equal (Model 2). As Table 3.47 shows, Model 2 fitted the data well and the χ^2 difference ($\Delta\chi^2$) between Model 2 versus Model 1 was not significant. This indicated that factor loadings were equivalent across samples. That is, full metric invariance was supported. Afterwards, the factor variance-covariance invariance model (Model 3) was examined. This model also yielded good fit indices (see Table 3.47). The tests of $\Delta\chi^2$ between Model 3 versus Model 2 were not significant. This indicated that the relationship between the two subscales was invariant across samples. That is, full factor variance-covariance invariance was supported. However, the error variance-covariance invariance model (Model 4) did not provide acceptable fit indices for the data (see Table 3.47). This indicated that measurement error variances-covariances varied across samples. That is, error variance-covariance was not supported.

Table 3.47
Test of Cross-Cultural Measurement Invariance for the Scale of Autonomous Learning Motivation Across the German and Thai Samples

Nested model	Model fit index							
	χ^2	*df*	χ^2/df	*p*	GFI	CFI	SRMR	RMSEA
Model 1: Configural invariance	34.25	54	.63	.98	.99	1.00	.02	.00
Model 2: Metric invariance	53.83	66	1.23	.86	.86	1.00	.04	.00
Model 3: Factor variance-covariance invariance	55.31	67	.82	.85	.99	1.00	.03	.00
Model 4: Error variance-covariance invariance	544.14	105	5.18	.00	.92	.64	.06	.10
				Critical value of the χ^2 distribution				
Model difference	$\Delta\chi^2$	Δdf	Decision	.05	.01			
Model 2 vs. Model 1	19.58	12	Accept	21.03	26.23			
Model 3 vs. Model 2	1.48	1	Accept	3.84	6.64			
Model 4 vs. Model 3	–	–	Reject	–	–			

Note. The grey shading indicates the best-fit model.
* p < .05. ** p < .01.

The best-fit model was selected by considering the smallest value of a ratio of χ^2 to *df* found in each tested model. Model 1 (as constrained for equal factor structure) yielded the smallest value of a ratio of χ^2 to *df* of .63. Standardized parameter estimates for Model 1 for both samples are shown in Table 3.48. Path diagrams of Model 1 for both samples are shown in Figure 3.21 and Figure 3.22. Factor score equations of two subscales of intrinsic regulation (IT) and identified regulation (ID) for German and Thai samples could be expressed as follows:

$IT_{\text{German Sample}}$ = .17(IT1) + .13(IT2) + .22(IT3) + .24(IT4) + .22(IT5) + .11(IT6)

$ID_{\text{German Sample}}$ = .03(ID1) + .06(ID2) + .47(ID3) + .21(ID4) + .01(ID5) + .28(ID6)

$IT_{\text{Thai Sample}}$ = .07(IT1) + .21(IT2) + .23(IT3) + .15(IT4) + .20(IT5) + .24(IT6)

$IT_{\text{German Sample}}$ = .07(ID1) + .10(ID2) + .36(ID3) + .20(ID4) + .05(ID5) + .32(ID6)

Table 3.48

Standardized Parameter Estimates for the Measurement Models of Autonomous Learning Motivation for the German and Thai Samples, as Constrained for Equal Factor Structure

Item	German Sample (*N* = 288)					Thai Sample (*N* = 494)				
	β	SE	t	R^2	FSR	β	SE	t	R^2	FSR
Intrinsic Regulation (IT)										
IT1	.87**	.05	17.75	.76	.17	.70**	.05	15.20	.49	.07
IT2	.87**	.05	18.26	.76	.13	.75**	.04	18.36	.57	.21
IT3	.89**	.05	18.98	.80	.22	.74**	.04	17.76	.55	.23
IT4	.88**	.05	18.57	.78	.24	.73**	.04	17.49	.54	.15
IT5	.82**	.05	16.37	.68	.22	.76**	.04	18.11	.58	.20
IT6	.87**	.05	18.19	.75	.11	.78**	.04	19.17	.60	.24
Identified Regulation (ID)										
ID1	.47**	.06	7.89	.22	.03	.45**	.05	9.53	.21	.07
ID2	.57**	.06	9.85	.33	.06	.43**	.05	8.59	.18	.10
ID3	.89**	.05	17.94	.80	.47	.78**	.04	17.59	.61	.36
ID4	.72**	.06	12.82	.53	.21	.64**	.05	13.03	.40	.20
ID5	.62**	.06	11.06	.39	.01	.50**	.05	10.37	.25	.05
ID6	.86**	.05	17.05	.73	.28	.75**	.04	16.95	.56	.32

Note. FSR = Factor Score Regression.

* $p < .05$. ** $p < .01$.

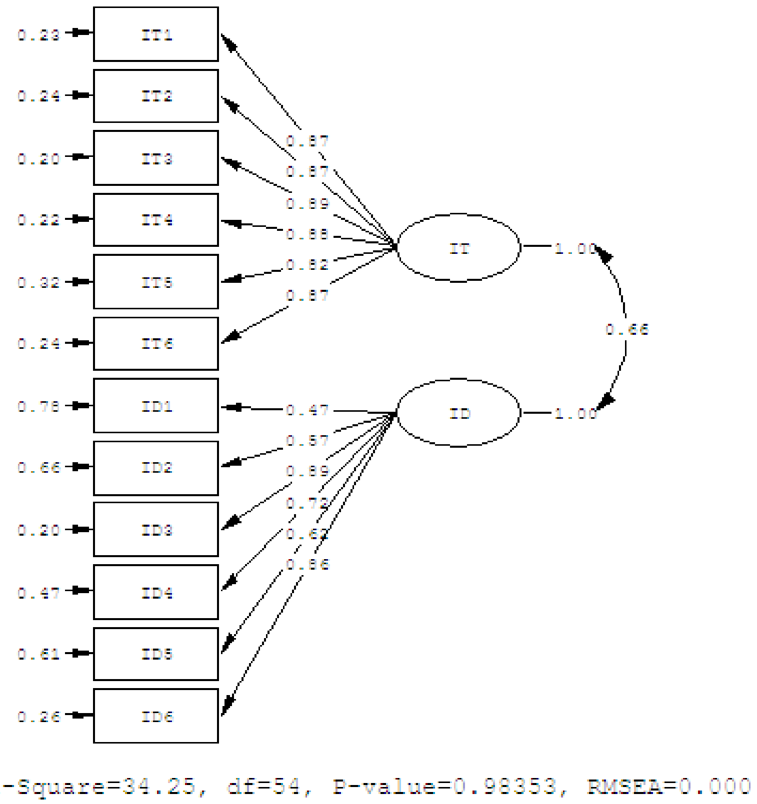


Figure 3.21. Empirically Validated Measurement Models of Autonomous Learning Motivation for the German Sample, as Constrained for Equal Factor Structure

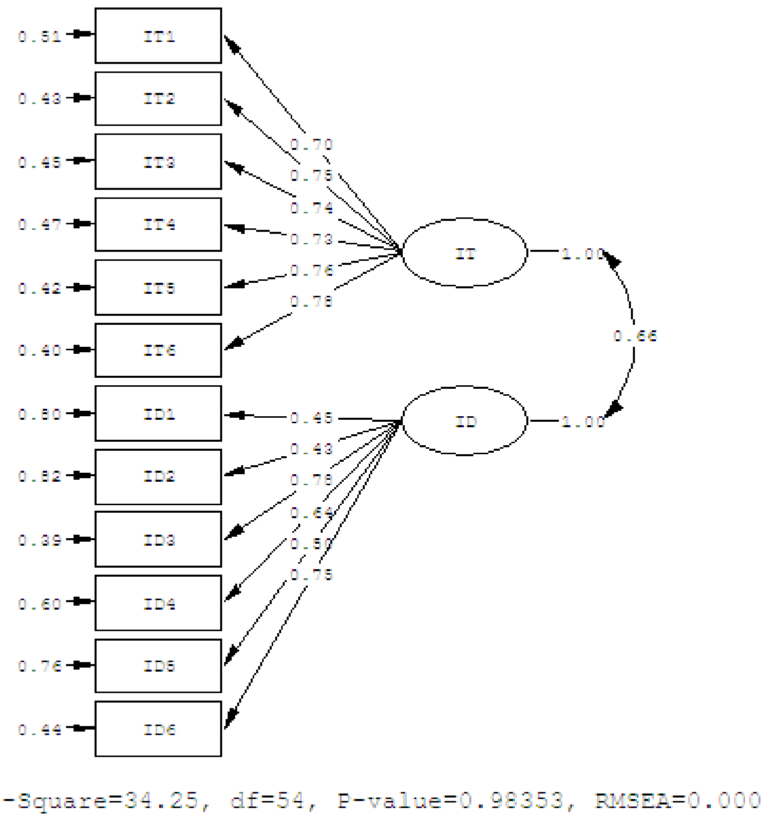


Figure 3.22. Empirically Validated Measurement Models of Autonomous Learning Motivation for the Thai Sample, as Constrained for Equal Factor Structure

Controlled Learning Motivation

This scale comprised two subscales: introjected regulation and extrinsic regulation. Introjected regulation was a latent construct measured by 13 items, whereas extrinsic regulation was a latent construct measured by six items. First, correlations were examined between items measuring these two subscales. In the German sample, significant correlations ranged between .12 ($p < .05$) and .80 ($p < .01$). In the Thai sample, significant correlations ranged between .09 ($p < .05$) and .76 ($p < .01$). In the German sample, Bartlett's test of sphericity yielded a χ^2 of 2,436.02 with *df* of 171 ($p = .00$). In the Thai sample, Bartlett's tests of sphericity yielded a χ^2 of 3,441.56 with *df* of 171 ($p = .00$). This showed that the correlation matrices for the items measuring the two subscales for both samples were not the identity matrices. The KMO measures of sampling adequacy of the two correlation matrices for the German and Thai samples were greater than .50 ($KMO_{German\ Sample} = .89$, $KMO_{Thai\ Sample} = .89$). This showed that the 19 items measuring the two subscales for both samples correlated highly with each other. Therefore, the data for both samples were appropriate for MCFA. Details are shown in Table 3.49 and Table 3.50.

Table 3.49

Means, Standard Deviations, and Correlation Matrices for Items Measuring the Scale of Controlled Learning Motivation for the German Sample

German Sample (N = 288)													
Bartlett's Test of Sphericity [χ^2 (171, N = 288) = 2,436.02, p = 0]													
KMO = .89													
Item	IJ1	IJ2	IJ3	IJ4	IJ5	IJ6	IJ7	IJ8	IJ9	IJ10	IJ11	IJ12	IJ13
IJ1	—												
IJ2	.33**	—											
IJ3	.18**	.19**	—										
IJ4	.29**	.30**	.26**	—									
IJ5	.36**	.80**	.22**	.34**	—								
IJ6	.18**	.16**	.22**	.15*	.23**	—							
IJ7	.48**	.32**	.26**	.37**	.36**	.16**	—						
IJ8	.27**	.21**	.52**	.41**	.29**	.22**	.39**	—					
IJ9	.27**	.32**	.37**	.63**	.35**	.15**	.34**	.42**	—				
IJ10	.28**	.70**	.19**	.27**	.76**	.19**	.37**	.25**	.32**	—			
IJ11	.23**	.26**	.49**	.44**	.33**	.31**	.43**	.66**	.41**	.29**	—		
IJ12	.31**	.61**	.18**	.19**	.66**	.23**	.30**	.14*	.26**	.76**	.23**	—	
IJ13	.22**	.28**	.43**	.30**	.32**	.28**	.27**	.41**	.40**	.28**	.45**	.28**	—
EX1	.37**	.31**	.23**	.20**	.33**	.22**	.43**	.22**	.23**	.32**	.33**	.29**	.27**
EX2	.24**	.38**	.23**	.23**	.39**	.39**	.34**	.28**	.19**	.39**	.33**	.34**	.26**
EX3	.43**	.50**	.22**	.32**	.54**	.25**	.42**	.30**	.42**	.46**	.34**	.50**	.23**
EX4	.28**	.20**	.31**	.24**	.25**	.26**	.41**	.36**	.26**	.22**	.41**	.19**	.27**
EX5	.08	.27**	.01	.13*	.31**	.10	.25**	.16**	.11	.39**	.10	.31**	.09
EX6	.18**	.38**	.17**	.12*	.38**	.31**	.39**	.22**	.10	.42**	.35**	.38**	.28**
M	3.21	2.23	2.76	3.22	2.11	2.62	3.09	2.99	3.11	2.03	2.87	1.97	2.71
SD	.77	.94	.93	.88	.94	1.14	.92	.96	.89	.99	1.03	.94	.98
Items	EX1	EX2	EX3	EX4	EX5	EX6							
EX1	—												
EX2	.37**	—											
EX3	.33**	.40**	—										
EX4	.50**	.34**	.29**	—									
EX5	.22**	.25**	.25**	.06	—								
EX6	.41**	.47**	.33**	.30**	.32**	—							
M	3.09	2.81	2.66	3.34	1.98	2.70							
SD	.85	.99	.97	.79	1.12	1.06							

Note. Introjected Regulation (IJ1 – IT13). External Regulation (EX1 – EX6).
* p < .05. ** p < .01

Table 3.50

Means, Standard Deviations, and Correlation Matrices for Items Measuring the Scale of Controlled Learning Motivation for the Thai Sample

Thai Sample (N = 494)													
Bartlett's Test of Sphericity [χ^2 (171, N = 494) = 3,441.56, p = 0] KMO = .89													
Item	IJ1	IJ2	IJ3	IJ4	IJ5	IJ6	IJ7	IJ8	IJ9	IJ10	IJ11	IJ12	IJ13
IJ1	—												
IJ2	.61**	—											
IJ3	.21**	.19**	—										
IJ4	.09	.13**	.09	—									
IJ5	.51**	.76**	.18**	.12**	—								
IJ6	.29**	.27**	.19**	–.01	.29**	—							
IJ7	.45**	.33**	.20**	.26**	.33**	.29**	—						
IJ8	.15**	.14**	.45**	.12**	.12**	.13**	.22**	—					
IJ9	.12**	.13**	.17**	.43**	.11*	.04	.28**	.25**	—				
IJ10	.51**	.70**	.17**	.09*	.68**	.29**	.35**	.13**	.13**	—			
IJ11	.16**	.18**	.40**	.27*	.12**	.15**	.21**	.49**	.37**	.15**	—		
IJ12	.43**	.54**	.11*	.18**	.52**	.22**	.40**	.08	.24**	.60**	.17**	—	
IJ13	.21**	.13**	.30**	.19**	.11*	.20**	.21**	.35**	.25**	.13**	.42**	.19**	—
EX1	.33**	.36**	.20**	.23**	.24**	.11*	.40**	.16**	.23**	.27**	.15**	.35**	.13**
EX2	.48**	.37**	.11*	.08	.39**	.33**	.36**	.20**	.06	.35**	.17**	.28**	.14**
EX3	.60**	.59**	.11*	.12*	.57**	.25**	.41**	.14**	.16**	.60**	.15**	.55**	.14**
EX4	.38**	.32**	.14**	.17**	.26**	.16**	.40**	.20**	.19**	.28**	.22**	.33**	.23**
EX5	.25**	.34**	.11*	–.03	.39**	.27**	.21**	.07	.02	.46**	.12**	.35**	.15**
EX6	.33**	.28**	.07	.08	.27**	.29**	.36**	.12**	.06	.30**	.12**	.33**	.16**
M	2.66	2.21	2.98	3.40	2.24	2.27	3.05	3.07	3.34	2.14	2.95	2.45	3.05
SD	.90	.93	.85	.67	.98	1.06	.83	.83	.69	.95	.88	.94	.88
Items	EX1	EX2	EX3	EX4	EX5	EX6							
EX1	—												
EX2	.14**	—											
EX3	.32**	.43**	—										
EX4	.41**	.27**	.33**	—									
EX5	.20**	.27**	.32**	.29**	—								
EX6	.27**	.39**	.38**	.32**	.26**	—							
M	2.92	2.64	2.42	2.76	1.88	2.68							
SD	.84	.92	.88	.85	.94	.94							

Note. Introjected Regulation (IJ1 – IT13). External Regulation (EX1 – EX6).
* p < .05. ** p < .01.

MCFA was then performed on this scale to examine four invariance testing hypotheses. Table 3.51 shows the results of MCFA. First, Model 1 was tested for factor structure invariance. Model 1 fitted the empirical data well [χ^2 (102, N_1 = 288, N_2 = 494) = 71.27, χ^2/df = .70, p = .99, GFI = .99, CFI = 1.00, SRMR = .02, RMSEA = .00]. This indicated that the factor structure of this scale was invariant across German and Thai samples. That is, configural invariance was supported. Because the configural invariance was supported, factor loadings were constrained to be equal (Model 2). As Table 3.51 shows, Model 2 acceptably fitted the data but the χ^2 difference ($\Delta\chi^2$) between Model 2 versus Model 1 was statistically significant ($p < .01$). This indicated that factor loadings were not equivalent across samples. That is, full metric invariance was not supported. Before continuing further tests, it was necessary to examine whether at least partial metric invariance could be achieved. Then, the factor loadings of IJ1, IJ4, IJ9, IJ11, and IJ12 were freed, because they revealed the greatest modification indices that could be freed to most reduce $\Delta\chi^2$. As expected, the partial metric invariance model fitted the data better than the full metric invariance model (Model 2) as indicated by better fit indices [χ^2 (116, N_1 = 288, N_2 = 494) = 91.25, χ^2/df = .79, p = .96, GFI = .99, CFI = 1.00, SRMR = .03, RMSEA = .00]. As Table 3.51 shows, the test of $\Delta\chi^2$ between the partial metric invariance model versus Model 1 was not statistically significant. This indicated that partial metric invariance was supported. Afterwards, the factor variance-covariance invariance model (Model 3) was examined. This model acceptably fitted the data (see Table 3.51), and the test of $\Delta\chi^2$ between Model 3 versus Model 2 was not statistically significant. This indicated that the relationship between the two subscales varied across samples. That is, full factor variance-covariance invariance was supported. In addition, the error variance-covariance invariance model (Model 4) did not provide acceptable fit indices for the data (see Table 3.51). This indicated that measurement error variances-covariances varied across samples. That is, error variance-covariance was not supported.

Table 3.51
Test of Cross-Cultural Measurement Invariance for the Scale of Controlled Learning Motivation Across the German and Thai Samples

Nested model	Model fit index							
	χ^2	df	χ^2/df	p	GFI	CFI	SRMR	RMSEA
Model 1: Configural invariance	71.27	102	.70	.99	.99	1.00	.02	.00
Model 2: Metric invariance	137.02	121	1.13	.15	.98	1.00	.05	.02
Partial metric invariance	91.25	116	.79	.96	.99	1.00	.03	.00
Model 3: Factor variance-covariance invariance	139.40	122	1.14	.13	.98	1.00	.05	.02
Model 4: Error variance-covariance invariance	412.60	241	1.71	.00	.96	.98	.05	.04
				Critical value of the χ^2 distribution				
Model difference	$\Delta\chi^2$	Δdf	Decision	.05	.01			
Model 2 vs. Model 1	65.75**	19	Reject	30.14	36.19			
Partial metric invariance vs. Model 1	19.98	14	Accept	23.69	29.14			
Model 3 vs. Model 2	2.38	1	Accept	3.84	6.64			
Model 4 vs. Model 3	–	–	Reject	–	–			

Note. The grey shading indicates the best-fit model.
** $p < .01$.

The best-fit model was selected by considering the smallest value of a ratio of χ^2 to *df* found in each tested model. Model 1 (as constrained for equal factor structure) yielded the smallest value of a ratio of χ^2 to *df* of .70. Standardized parameter estimates for Model 1 for both samples are shown in Table 3.52. Path diagrams of Model 1 for both samples are shown in Figure 3.23 and Figure 3.24. Factor score equations of two subscales of introjected regulation (IJ) and external regulation (EX) for German and Thai samples could be expressed as follows:

$IJ_{German\ Sample}$ = .07(IJ1) – .07(IJ2) + .06(IJ3) + .17(IJ4) + .15(IJ5) – .02(IJ6) + .06(IJ7) + .02(IJ8) + .19(IJ9) + .06(IJ10) + .01(IJ11) + .00(IJ12) + .03(IJ13)

$EX_{German\ Sample}$ = .11(EX1) + .21(EX2) + .15(EX3) + .05(EX4) + .09(EX5) + .41(EX6)

$IJ_{Thai\ Sample}$ = .52(IJ1) – .17(IJ2) + .04(IJ3) + .07(IJ4) + .15(IJ5) + .02(IJ6) + .07(IJ7) + .04(IJ8) – .07(IJ9) + .05(IJ10) + .04(IJ11) + .38(IJ12) – .02(IJ13)

$EX_{German\ Sample}$ = .18(EX1) + .29(EX2) + .09(EX3) + .03(EX4) + .10(EX5) + .16(EX6)

Table 3.52

Standardized Parameter Estimates for the Measurement Models of Controlled Learning Motivation for the German and Thai Samples, as Constrained for Equal Factor Structure

Items	German Sample (*N* = 288)					Thai Sample (*N* = 494)				
	β	SE	t	R^2	FSR	β	SE	t	R^2	FSR
Introjected Regulation (IJ)										
IJ1	.44**	.07	6.55	.19	.07	.80**	.05	16.79	.65	.52
IJ2	.55**	.06	9.05	.31	–.07	.61**	.05	11.56	.37	–.17
IJ3	.39**	.07	5.98	.15	.06	.27**	.05	5.43	.07	.04
IJ4	.54**	.07	7.65	.30	.17	.21**	.06	3.65	.04	.07
IJ5	.63**	.06	10.45	.40	.15	.62**	.05	12.43	.38	.15
IJ6	.35**	.07	5.08	.12	–.02	.37**	.05	7.50	.14	.02
IJ7	.59**	.06	9.22	.35	.06	.57**	.05	11.71	.33	.07
IJ8	.48**	.07	6.80	.23	.02	.23**	.06	4.02	.05	.04
IJ9	.56**	07	7.68	.31	.19	.17**	.05	3.37	.03	–.07
IJ10	.60**	.06	10.11	.37	.06	.62**	.05	13.49	.39	.05
IJ11	.55**	.06	8.78	.30	.01	.26**	.05	5.16	.07	.04
IJ12	.52**	.06	8.13	.27	.00	.71**	.06	12.84	.50	.38
IJ13	.46**	.06	7.14	.21	.03	.26**	.05	5.31	.07	–.02
External Regulation (EX)										
EX1	.57**	.06	9.26	.32	.11	.49**	.05	9.53	.24	.18
EX2	.64**	.06	10.92	.41	.21	.66**	.05	13.58	.43	.29
EX3	.62**	.06	10.06	.38	.15	.66**	.05	13.73	.44	.09
EX4	.48**	.07	7.32	.23	.05	.47**	.05	9.44	.22	.03
EX5	.40**	.07	5.89	.16	.09	.44**	.05	8.65	.19	.10
EX6	.71**	.06	11.70	.51	.41	.56**	.05	11.38	.31	.16

Note. FSR = Factor Score Regression.
* $p < .05$. ** $p < .01$.

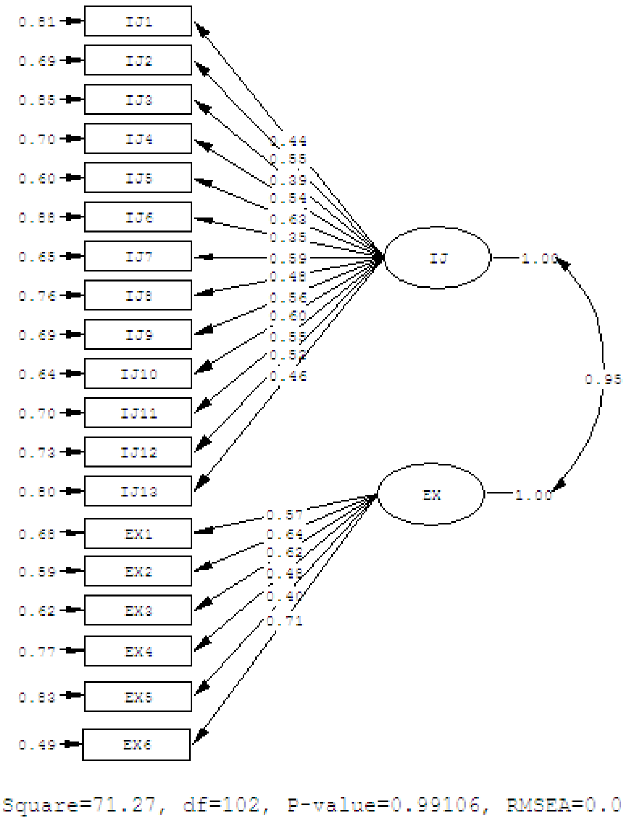


Figure 3.23. Empirically Validated Measurement Models of Controlled Learning Motivation for the German Sample, as Constrained for Equal Factor Structure

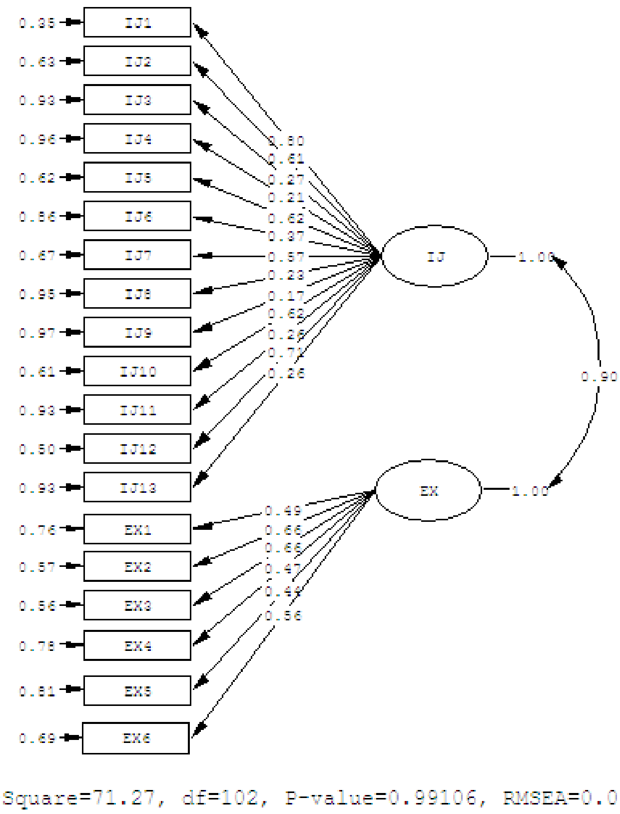


Figure 3.24. Empirically Validated Measurement Models of Controlled Learning Motivation for the Thai Sample, as Constrained for Equal Factor Structure

Academic Well-Being

This scale comprised two subscales: school satisfaction and positive academic emotion-absence of negative academic emotion. School satisfaction was a latent construct measured by five items, whereas positive academic emotion–absence of negative academic emotion was a latent construct measured by 10 items (five items for positive emotion; five items for negative emotion). First, correlations were examined between items measuring these two subscales. In the German sample, significant correlations ranged between .12 ($p < .05$) and .74 ($p < .01$). In the Thai sample, significant correlations ranged between .10 ($p < .05$) and .74 ($p < .01$). In the German sample, Bartlett's test of sphericity yielded a χ^2 of 1,360.09 with *df* of 105 ($p = .00$). In the Thai sample, Bartlett's tests of sphericity yielded χ^2 of 2,441.42 with *df* of 105 ($p = .00$). This showed that the correlation matrices for the items measuring the two subscales for both samples were not the identity matrices. The KMO measures of sampling adequacy of the two correlation matrices for the German and Thai samples were greater than .50 ($KMO_{\text{German Sample}} = .82$, $KMO_{\text{Thai Sample}} = .82$). This showed that the 15 items measuring the two subscales for both samples correlated highly with each other. Therefore, the data for both samples were appropriate for MCFA. Details are shown in Table 3.53.

Table 3.53
Means, Standard Deviations, and Correlation Matrices for Items Measuring the Scale of Academic Well-Being for the German and Thai Samples (German Sample = Left-Hand Corner; Thai Sample = Right-Hand Corner)

Thai Sample (N = 494)															
Bartlett's Test of Sphericity [χ^2 (105, N = 494) = 2,441.42, p = .00]															
KMO = .82															
M	3.06	2.92	3.01	3.04	2.83	3.32	3.20	3.04	2.95	2.77	3.19	3.49	3.19	3.21	3.38
SD	.83	.84	.75	.78	.85	.79	.84	.84	.91	.94	.90	.77	.84	.88	.81
Items	SAT1	SAT2	SAT3	SAT4	SAT5	PA1	PA2	PA3	PA4	PA5	PA6	PA7	PA8	PA9	PA10
SAT1	—	.74**	.56**	.44**	.50**	.10*	.08	.03	.01	.10*	.07	.03	–.02	.09	.11*
SAT2	.74**	—	.62**	.45**	.51**	.07	.08	–.03	.02	.06	.10*	.01	–.05	.10*	.03
SAT3	.67**	.68**	—	.46**	.51**	.13**	.15**	.09	.05	.11*	.07	.05	–.07	.18**	.07
SAT4	.46**	.54**	.41**	—	.51**	.08	.08	.06	.06	.10*	.08	.00	–.02	.07	.09*
SAT5	.45**	.44**	.36*	.43**	—	.11*	.10*	.03	.01	.12**	.05	–.06	–.05	.04	.05
PA1	.20**	.27**	.26**	.12*	.19**	—	.58**	.40**	.34**	.27**	.34**	.26**	.17**	.27**	.21**
PA2	.20**	.22**	.21	.16**	.10	.46**	—	.44**	.38**	.40**	.34**	.25**	.25**	.26**	.19**
PA3	.10	.11	.17	.10	.04	.27**	.26**	—	.41**	.42**	.24**	.23**	.19**	.25**	.16**
PA4	.15*	.14*	.17	.08	.17**	.50**	.37**	.36**	—	.47**	.14**	.18**	.11*	.17*	.07
PA5	.15**	.16**	.15	.04	.06	.32**	.41**	.29**	.31**	—	.13**	.10*	.08	.21	.12*
PA6	.13*	.01	.13	.04	.09	.04	.03	.02	.06	.07	—	.43**	.34**	.38**	.38**
PA7	.16**	.07	.14	–.02	.09	.23**	.25**	.06	.24**	.19**	.32**	—	.45**	.50**	.46**
PA8	.11	.03	.09	–.07	.07	.20**	.13*	–.03	.15*	.19**	.28**	.45**	—	.31**	.34**
PA9	.37**	.31**	.30**	.15*	.29**	.26**	.24**	.12*	.29**	.19**	.26**	.51**	.32**	—	.40**
PA10	.24**	.18**	.24**	.06	.20**	.10	.13*	.10	.09	.14*	.35**	.35**	.30**	.48**	—
M	2.93	2.74	2.63	3.05	3.26	3.16	2.60	2.64	3.20	2.59	3.62	3.50	3.61	3.27	3.58
SD	.87	.97	.93	.81	.85	.84	1.03	1.06	.82	1.04	.70	.79	.66	.87	.75
Bartlett's Test of Sphericity [χ^2 (105, N = 288) = 1,360.09, p = .00)															
KMO = .82															
German Sample (N = 288)															

Note. School Satisfaction (SAT1–SAT5). Positive Academic Emotion (PA1–PA5). Absence of Negative Academic Emotion (PA6–PA10).
* $p < .05$. ** $p < .01$.

MCFA was then performed on this scale to examine four invariance testing hypotheses. Table 3.54 shows the results of MCFA. First, Model 1 was tested for factor structure invariance. Model 1 fitted the empirical data well [χ^2 (84, N_1 = 288, N_2 = 494) = 64.97, χ^2/df = .77, p = .94, GFI = .99, CFI = 1.00, RMR = .03, RMSEA = .00]. This indicated that the factor structure of this scale was invariant across German and Thai samples. That is, configural invariance was supported. Because the configural invariance was supported, factor loadings were constrained to be equal (Model 2). As Table 3.54 shows, Model 2 acceptably fitted the data, but the χ^2 difference ($\Delta\chi^2$) between Model 2 versus Model 1 was statistically significant (p < .01). This indicated that factor loadings were not equivalent across samples. That is, full metric invariance was not supported. Before continuing further tests, it was necessary to examine whether at least partial metric invariance could be achieved. Then, the factor loadings of SA2, SA3, PN2, PN3, PN7, PN8, and PN10 were freed, because they revealed the greatest modification indices that could be freed to most reduce $\Delta\chi^2$. As expected, the partial metric invariance model fitted the data better than the full metric invariance model (Model 2) as indicated by better fit indices [χ^2 (91, N_1 = 288, N_2 = 494) = 73.58, χ^2/df = .81, p = .91, GFI = .99, CFI = 1.00, SRMR = .03, RMSEA = .00]. As Table 3.54 shows, the test of $\Delta\chi^2$ between the partial metric invariance model versus Model 1 was not statistically significant. This indicated that partial metric invariance was supported. Afterwards, the factor variance-covariance invariance model (Model 3) was examined. This model did not provide acceptable fit indices (see Table 3.54), indicating that the relationship between the two subscales varied across samples. That is, full factor variance-covariance invariance was not supported. In addition, the error variance-covariance invariance model (Model 4) did not provide acceptable fit indices for the data (see Table 3.54). This indicated that measurement error variances-covariances varied across samples. That is, error variance-covariance was not supported.

Table 3.54
Test of Cross-Cultural Measurement Invariance for the Scale of Academic Well-Being Across the German and Thai Samples

	Model fit index							
Nested model	χ^2	df	χ^2/df	p	GFI	CFI	SRMR	RMSEA
Model 1: Configural invariance	64.97	84	.77	.94	.99	1.00	.03	.00
Model 2: Metric invariance	116.21	97	1.20	.09	.99	1.00	.04	.02
Partial metric invariance	73.58	91	.81	.91	.99	1.00	.03	.00
Model 3: Factor variance-covariance invariance	130.61	100	1.31	.02	.98	.99	.05	.03
Model 4: Error variance-covariance invariance	270.56	162	1.67	.00	.97	.98	.05	.04

				Critical value of the χ^2 distribution	
Model difference	$\Delta\chi^2$	Δdf	Decision	.05	.01
Model 2 vs. Model 1	51.24**	13	Reject	22.36	27.69
Partial metric invariance vs. Model 1	8.61	7	Accept	14.07	18.48
Model 3 vs. Model 2	–	–	Reject	–	–
Model 4 vs. Model 3	–	–	Reject	–	–

Note. The grey shading indicates the best-fit model.
** p < .01.

The best-fit model was selected by considering the smallest value of a ratio of χ^2 to df found in each tested model. Model 1 (as constrained for equal factor structure) yielded the smallest value of a ratio of χ^2 to df of **.77.** Standardized parameter estimates for Model 1 for both samples are shown in Table 3.55. Path diagrams of Model 1 for both samples are shown in Figure 3.25 and Figure 3.26. Factor score equations of two subscales of school satisfaction (SA) and positive academic emotion-absence of negative academic emotion (PN) for German and Thai samples could be expressed as follows:

$SA_{\text{German Sample}}$ = .36(SAT1) + .41(SAT2) + .14(SAT3) + .00(SAT4) + .05(SAT5)

$PN_{\text{German Sample}}$ = –.01(PA1) + .07(PA2) – .01(PA3) + .00(PA4) + .04(PA5) – .01(PA6) + .04(PA7) + .05(PA8) + .25(PA9) – .04(PA10)

$SA_{\text{Thai Sample}}$ = .12(SAT1) + .23(SAT2) + .25(SAT3) + .10(SAT4) + .13(SAT5)

$PN_{\text{German Sample}}$ = .00(PA1) + .02(PA2) + .01(PA3) + .00(PA4) – .02(PA5) + .22(PA6) + .09(PA7) – .02(PA8) + .16(PA9) + .01(PA10)

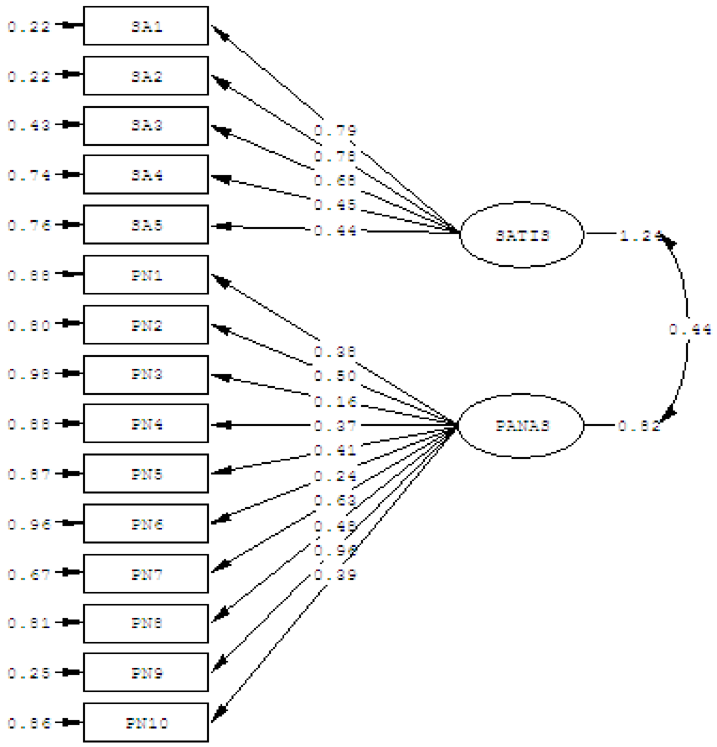
Table 3.55

Standardized Parameter Estimates for the Measurement Models of Academic Well-Being for the German and Thai Samples, as Constrained for Equal Factor Structure

Item	German Sample (N = 288)					Thai Sample (N = 494)				
	β	SE	t	R^2	FSR	β	SE	t	R^2	FSR
School Satisfaction (SA)										
SA1	.79	–	–	.78	.36	.79	–	–	.54	.12
SA2	.78**	.06	16.56	.77	.41	.86**	.06	19.63	.63	.23
SA3	.68**	.08	11.04	.57	.14	.83**	.08	13.45	.59	.25
SA4	.45**	.07	7.97	.26	.00	.64**	.07	10.77	.35	.10
SA5	.44**	.07	7.81	.24	.05	.70**	.07	12.02	.42	.13
Positive Academic Emotion-Absence of Negative Academic Emotion (PN)										
PN1	.38	–	–	.11	–.01	.38	–	–	.16	.00
PN2	.50**	.30	4.48	.20	.07	.38**	.11	8.79	.16	.02
PN3	.16*	.19	2.19	.02	–.01	.30**	.12	6.74	.10	.01
PN4	.37**	.19	5.16	.11	.00	.18**	.11	4.19	.04	.00
PN5	.41**	.29	3.76	.13	.04	.16**	.12	3.51	.03	–.02
PN6	.24*	.30	2.11	.05	–.01	.79**	.42	4.98	.69	.22
PN7	.63**	.34	4.88	.32	.04	.64**	.26	6.67	.46	.09
PN8	.48**	.38	3.34	.19	.05	.39**	.29	3.59	.17	–.02
PN9	.96**	.57	4.49	.75	.25	.70**	.28	6.53	.54	.16
PN10	.39**	.33	3.18	.13	–.04	.47**	.28	4.53	.25	.01

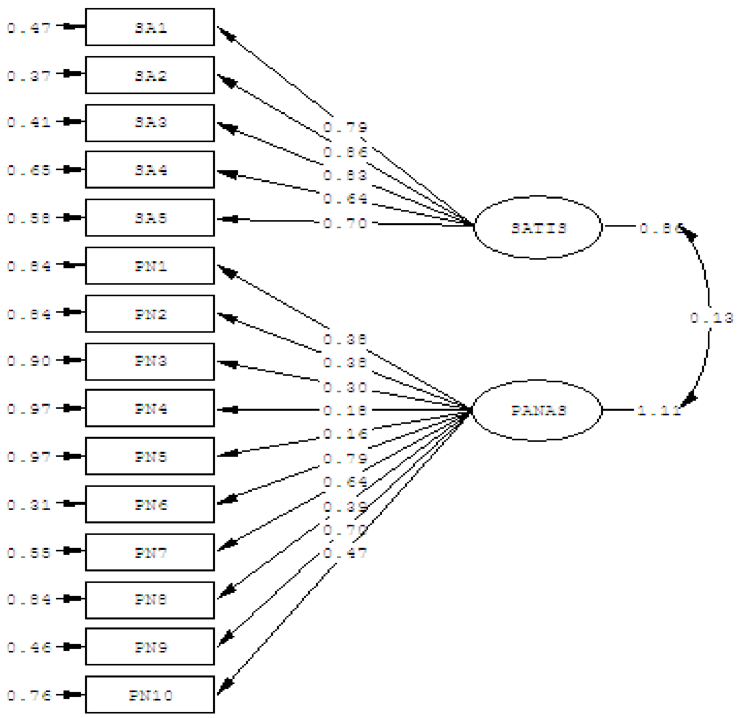
Note. No report on SE and t-value for constrained parameter estimates. FSR = Factor Score Regression.

* $p < .05$. ** $p < .01$.



Chi-Square=64.97, df=84, P-value=0.93876, RMSEA=0.000

Figure 3.25. Empirically Validated Measurement Models of Academic Well-Being for the German Sample, as Constrained for Equal Factor Structure



Chi-Square=64.97, df=84, P-value=0.93876, RMSEA=0.000

Figure 3.26. Empirically Validated Measurement Models of Academic Well-Being for the Thai Sample, as Constrained for Equal Factor Structure

Regulation of Academic Motivation

This scale comprised two subscales: interest enhancement and self-consequating. Interest enhancement was a latent construct measured by four items, whereas self-consequating was a latent construct measured by five items. First, correlations were examined between items measuring these two subscales. In the German sample, significant correlations ranged between .16 ($p < .01$) and .68 ($p < .01$). In the Thai sample, significant correlations ranged between .09 ($p < .05$) and .53 ($p < .01$). In the German sample, Bartlett's test of sphericity yielded a χ^2 of 931.44 with *df* of 36 ($p = .00$). In the Thai sample, Bartlett's tests of sphericity yielded a χ^2 of 969.91 with *df* of 36 ($p = .00$). This showed that the correlation matrices for the items measuring the two subscales for both samples were not the identity matrices. The KMO measures of sampling adequacy of the two correlation matrices for the German and Thai samples were greater than .50 ($KMO_{German\ Sample} = .83$, $KMO_{Thai\ Sample} = .80$). This showed that the nine items measuring the two subscales for both samples correlated highly with each other. Therefore, the data for both samples were appropriate for MCFA. Details are shown in Table 3.56.

Table 3.56

Means, Standard Deviations, and Correlation Matrices for Items Measuring the Scale of Regulation of Academic Motivation for the German and Thai Samples (German Sample = Left-Hand Corner; Thai Sample = Right-Hand Corner)

Thai Sample ($N = 494$)									
Bartlett's Test of Sphericity [χ^2 (36, $N = 494$) = 969.91, $p = .00$] KMO = .80									
M	3.01	3.00	2.96	2.98	3.16	2.46	2.76	3.01	2.92
SD	.86	.81	.84	.88	.75	.91	.93	.87	.89
Item	IEN1	IEN2	IEN3	IEN4	SFC1	SFC2	SFC3	SFC4	SFC5
IEN1	—	.46**	.37**	.53**	.22**	.05	.27**	.20**	.34**
IEN2	.33**	—	.46**	.42**	.18**	.09*	.20**	.20**	.33**
IEN3	.47**	.51**	—	.48**	.16**	.06	.25**	.23**	.36**
IEN4	.68**	.42**	.54**	—	.11*	.00	.16**	.11*	.24**
SFC1	.18**	.45**	.36**	.31**	—	.24**	.36**	.29**	.27**
SFC2	.30**	.27**	.24**	.30**	.41**	—	.20**	.21**	.09*
SFC3	.27**	.22**	.16**	.29**	.39**	.39**	—	.30**	.50**
SFC4	.31**	.42**	.36**	.38**	.61**	.34**	.40**	—	.31**
SFC5	.32**	.24**	.26**	.38**	.38**	.36**	.58**	.44**	—
M	2.33	2.64	2.60	2.35	2.94	2.43	2.33	2.79	2.50
SD	1.07	1.05	1.02	1.06	.89	.96	1.04	1.00	1.05
Bartlett's Test of Sphericity [χ^2 (36, $N = 288$) = 931.44, $p = .00$] KMO = .83									
German Sample ($N = 288$)									

Note. Interest Enhancement (IEN1 – IEN4). Self-Consequating (SFC1 – SFC5).
* $p < .05$. ** $p < .01$.

MCFA was then performed on this scale to examine four invariance testing hypotheses. Table 3.57 shows the results of MCFA. First, Model 1 was tested for factor structure invariance. Model 1 fitted the empirical data well [χ^2 (8, N_1 = 288, N_2 = 494) = 5.12, χ^2/df = .64, p = .74, GFI = 1.00, CFI = 1.00, SRMR = .01, RMSEA = .00]. This indicated that the factor structure of this scale was invariant across the German and Thai samples. That is, configural invariance was supported. Because the configural invariance was supported, factor loadings were constrained to be equal (Model 2). As Table 3.57 shows, Model 2 provided poor fit indices for the data. This indicated that factor loadings were not equivalent across samples. That is, full metric invariance was not supported. Before continuing further tests, it was necessary to examine whether at least partial metric invariance could be achieved. Then, the factor loadings of IEN1, IEN4, SFC1, SFC2, and SFC3 were freed, because they revealed the greatest modification indices that could be freed to most reduce $\Delta\chi^2$. As expected, the partial metric invariance model fitted the data better than the full metric invariance model (Model 2) as indicated by better fit indices [χ^2 (12, N_1 = 288, N_2 = 494) = 8.64, χ^2/df = .72, p = .73, GFI = 1.00, CFI = 1.00, SRMR = .01, RMSEA = .00]. As Table 3.57 shows, the test of $\Delta\chi^2$ between the partial metric invariance model versus Model 1 was not statistically significant. This indicated that partial metric invariance was supported. Afterwards, the factor variance-covariance invariance model (Model 3) was examined. This model did not provide acceptable fit indices (see Table 3.57), indicating that the relationship between the two subscales varied across samples. That is, full factor variance-covariance invariance was not supported. In addition, the error variance-covariance invariance model (Model 4) did not provide acceptable fit indices for the data (see Table 3.57). This indicated that the measurement error variances-covariances varied across samples. That is, error variance-covariance was not supported.

Table 3.57
Test of Cross-Cultural Measurement Invariance for the Scale of Regulation of Academic Motivation Across the German and Thai Samples

Nested model	Model fit index							
	χ^2	*df*	χ^2/df	*p*	GFI	CFI	SRMR	RMSEA
Model 1: Configural invariance	5.12	8	.64	.74	1.00	1.00	.01	.00
Model 2: Metric invariance	46.53	17	2.73	.00	.99	.99	.04	.07
Partial metric invariance	8.64	12	.72	.73	1.00	1.00	.01	.00
Model 3: Factor variance-covariance invariance	52.24	18	2.90	.00	.99	.99	.05	.07
Model 4: Error variance-covariance invariance	140.26	49	2.86	.00	.98	.96	.05	.07

Model difference	$\Delta\chi^2$	Δdf	Decision	Critical value of the χ^2 distribution .05	.01
Model 2 vs. Model 1	41.41**	9	Reject	16.92	21.67
Partial metric invariance vs. Model 1	3.52	4	Accept	9.49	13.28
Model 3 vs. Model 2	–	–	Reject	–	–
Model 4 vs. Model 3	–	–	Reject	–	–

Note. The grey shading indicates the best-fit model.
** $p < .01$.

The best-fit model was selected by considering the smallest value of a ratio of χ^2 to *df* found in each tested model (*with exception for the partial metric invariance model*). Model 1 (as constrained for equal factor structure) yielded the smallest value of a ratio of χ^2 to *df* of .74. Standardized parameter estimates for Model 1 for both samples are shown in Table 3.58. Path diagrams of Model 1 for both samples are shown in Figure 3.27 and Figure 3.28. Factor score equations of two subscales of interest enhancement (IEN) and self-consequating (SFC) for German and Thai samples could be expressed as follows:

$IEN_{German\ Sample}$ = –.27(IEN1) + .32(IEN2) – .04(IEN3) + .77(IEN4)

$SFC_{German\ Sample}$ = .43(SFC1) + .02(SFC2) – .28(SFC3) + .17(SFC4) + .71(SFC5)

$IEN_{Thai\ Sample}$ = .65(IEN1) + .12(IEN2) + .45(IEN3) – .18(IEN4)

$SFC_{German\ Sample}$ = .04(SFC1) + .10(SFC2) + .34(SFC3) + .37(SFC4) + .62(SFC5)

Table 3.58

Standardized Parameter Estimates for the Measurement Models of Regulation of Academic Motivation for the German and Thai Samples, as Constrained for Equal Factor Structure

Items	German Sample (N = 288)					Thai Sample (N = 494)				
	β	SE	t	R^2	FSR	β	SE	t	R^2	FSR
Interest Enhancement (INE)										
INE1	.41**	.07	7.25	.22	–.27	.80**	.10	8.41	.64	.65
INE2	.70**	.09	7.42	.49	.32	.58**	.07	8.02	.33	.12
INE3	.58**	.09	6.14	.34	–.04	.69**	.11	6.53	.47	.45
INE4	.88**	.16	5.40	.78	.77	.44**	.11	4.02	.20	–.18
Self-Consequating (SFC)										
SFC1	.81**	.07	11.91	.66	.43	.45**	.07	6.52	.20	.04
SFC2	.47**	.07	6.78	.22	.02	.30**	.07	4.39	.09	.10
SFC3	.46**	.07	6.66	.21	–.28	.78**	.11	7.16	.61	.34
SFC4	.75**	.07	11.31	.56	.17	.67**	.10	6.82	.45	.37
STR5	.90**	.05	19.20	.80	.71	.89**	.04	25.14	.80	.62

Note. FSR = Factor Score Regression.
* $p < .05$. ** $p < .01$.

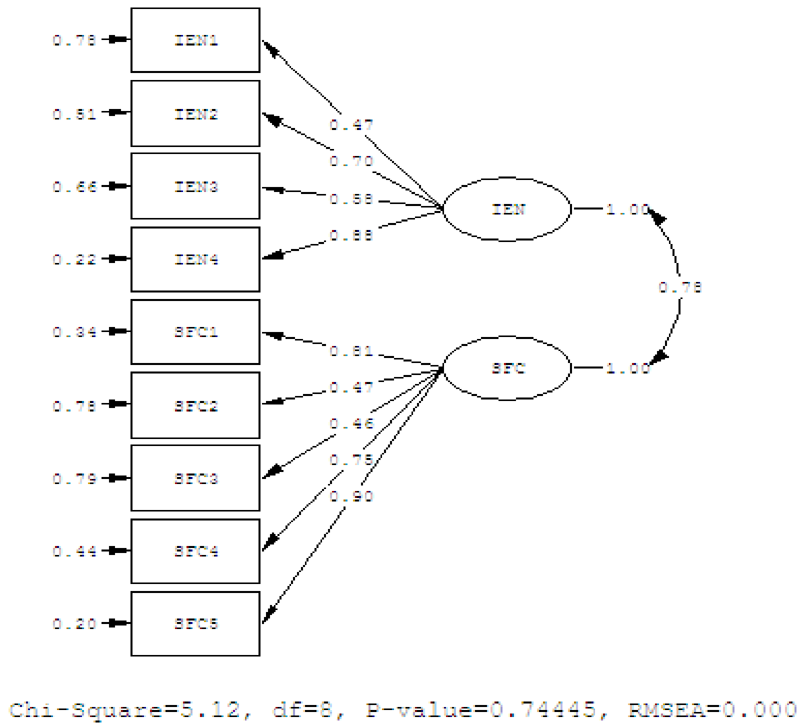


Figure 3.27. Empirically Validated Measurement Models of Regulation of Academic Motivation for the German Sample, as Constrained for Equal Factor Structure

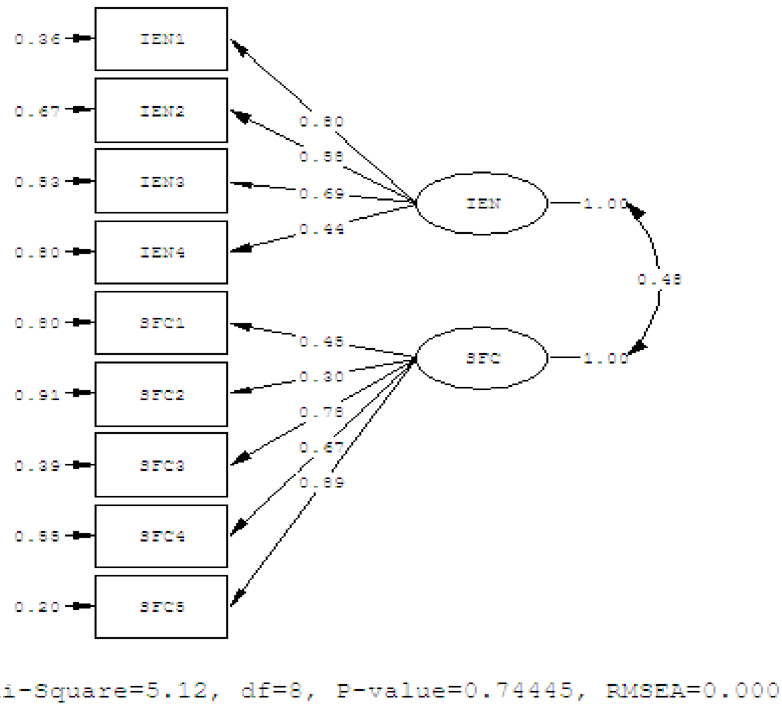


Figure 3.28. Empirically Validated Measurement Models of Regulation of Academic Motivation for the Thai Sample, as Constrained for Equal Factor Structure

Regulation of Positive Academic Emotion

This scale comprised three subscales: self-reinforcement, seeking social affirmation, and self-affirmation. Each subscale was a latent construct measured by seven items. First, correlations were examined between items measuring these three subscales. In the German sample, significant correlations ranged between .16 ($p < .01$) and .67 ($p < .01$). In the Thai sample, significant correlations ranged between .10 ($p < .05$) and .56 ($p < .01$). In the German sample, Bartlett's test of sphericity yielded a χ^2 of 2,410.55 with *df* of 153 ($p = .00$). In the Thai sample, Bartlett's tests of sphericity yielded a χ^2 of 2,636.24 with *df* of 153 ($p = .00$). This showed that the correlation matrices for the items measuring the three subscales for both samples were not the identity matrices. The KMO measures of sampling adequacy of the two correlation matrices for the German and Thai samples were greater than .50 ($KMO_{German\ Sample} = .92$, $KMO_{Thai\ Sample} = .89$). This showed that the 21 items measuring the two subscales for both samples correlated highly with each other. Therefore, the data for both samples were appropriate for MCFA. Details are shown in Table 3.59 and Table 3.60.

Table 3.59

Means, Standard Deviations, and Correlation Matrices for Items Measuring the Scale of Regulation of Positive Academic Emotion for the German Sample

German Sample (N = 288)														
Bartlett's Test of Sphericity [χ^2 (153, N = 288) = 2,410.55, p = .00]														
KMO = .92														
Item	RPE1	RPE2	RPE3	RPE4	RPE5	RPE6	RPE7	RPE8	RPE9	RPE10	RPE11	RPE12	RPE13	RPE14
RPE1	—													
RPE2	.42**	—												
RPE3	.38**	.42**	—											
RPE4	.50**	.38**	.41**	—										
RPE5	.46**	.51**	.51**	.49**	—									
RPE6	.26**	.62**	.38**	.35**	.50**	—								
RPE7	.41**	.32**	.47**	.53**	.52**	.39**	—							
RPE8	.35**	.30**	.40**	.39**	.37**	.31**	.46**	—						
RPE9	.35**	.34**	.41**	.39**	.39**	.30**	.33**	.45**	—					
RPE10	.39**	.31**	.46**	.43**	.51**	.29**	.47**	.42**	.52**	—				
RPE11	.32**	.38**	.36**	.43**	.46**	.40**	.48**	.52**	.53**	.58**	—			
RPE12	.28**	.35**	.43**	.27**	.43**	.33**	.34**	.47**	.37**	.50**	.48**	—		
RPE13	.35**	.25**	.40**	.35**	.40**	.26**	.38**	.37**	.54**	.51**	.52**	.55**	—	
RPE14	.35**	.29**	.35**	.41**	.41**	.38**	.45**	.41**	.47**	.49**	.67**	.51**	.59**	—
RPE15	.25**	.40**	.25**	.26**	.29**	.42**	.28**	.35**	.39**	.33**	.47**	.41**	.36**	.44**
RPE16	.30**	.42**	.27**	.24**	.31**	.36**	.28**	.30**	.35**	.32**	.38**	.45**	.47**	.45**
RPE17	.29**	.37**	.31**	.30**	.36**	.40**	.31**	.30**	.36**	.35**	.42**	.41**	.39**	.47**
RPE18	.27**	.32**	.21**	.16**	.19**	.30**	.19**	.18**	.29**	.24**	.26**	.25**	.27**	.28**
M	2.44	2.81	2.03	2.10	2.28	2.72	2.29	2.41	2.27	2.04	2.34	2.37	2.13	2.28
SD	1.04	1.00	.96	1.06	1.02	1.01	1.07	1.01	1.02	.97	1.05	1.02	.97	1.00
Items	RPE15	RPE16	RPE17	RPE18										
RPE15	—													
RPE16	.54**	—												
RPE17	.59**	.48**	—											
RPE18	.46**	.50**	.50**	—										
M	3.12	2.80	2.73	3.12										
SD	.87	.95	1.05	.91										

Note. Self-Reinforcement (RPE1 – RPE7). Seeking Social Affirmation (RPE8 – RPE14). Self-Affirmation (RPE15 – RPE18).

* p < .05. ** p < .01.

Table 3.60

Means, Standard Deviations, and Correlation Matrices for Items Measuring the Scale of Regulation of Positive Academic Emotion for the Thai Sample

Thai Sample (N = 494)														
Bartlett's Test of Sphericity [χ^2 (153, N = 494) = 2,636.24, p = .00]														
KMO = .89														
Item	RPE1	RPE2	RPE3	RPE4	RPE5	RPE6	RPE7	RPE8	RPE9	RPE10	RPE11	RPE12	RPE13	RPE14
RPE1	—													
RPE2	.43**	—												
RPE3	.15**	.20**	—											
RPE4	.31**	.36**	.36**	—										
RPE5	.32**	.38**	.22**	.35**	—									
RPE6	.20**	.44**	.32**	.28**	.40**	—								
RPE7	.19**	.17**	.56**	.22**	.21**	.40**	—							
RPE8	.22**	.26**	.28**	.32**	.29**	.37**	.34**	—						
RPE9	.21**	.23**	.18**	.24**	.23**	.21**	.14**	.39**	—					
RPE10	.16**	.20**	.36**	.31**	.20**	.37**	.33**	.43**	.30**	—				
RPE11	.31**	.28**	.21**	.33**	.29**	.31**	.18**	.39**	.33**	.37**	—			
RPE12	.25**	.30**	.31**	.33**	.24**	.33**	.31**	.48**	.27**	.48**	.40**	—		
RPE13	.29**	.21**	.31**	.24**	.24**	.29**	.35**	.34**	.29**	.35**	.31**	.46**	—	
RPE14	.32**	.33**	.20**	.35**	.37**	.38**	.22**	.37**	.29**	.32**	.40**	.32**	.31**	—
RPE15	.22**	.26**	.11*	.19**	.26**	.26**	.10*	.24**	.13**	.16**	.31**	.21**	.17**	.30**
RPE16	.30**	.28**	.14**	.18**	.28**	.19**	.06	.26**	.20**	.16**	.39**	.17**	.13**	.35**
RPE17	.25**	.24**	.13**	.21**	.24**	.36**	.19**	.32**	.22**	.31**	.36**	.33**	.25**	.31**
RPE18	.20**	.28**	.05	.25**	.27**	.23**	.01	.22**	.27**	.19**	.30**	.15**	.12**	.34**
M	2.73	3.07	2.25	2.69	2.98	2.76	2.15	2.80	2.92	2.66	2.97	2.59	2.24	3.05
SD	.98	.84	.91	.94	.86	.94	.94	.89	.90	.89	.84	.91	.93	.87
Items	RPE15	RPE16	RPE17	RPE18										
RPE15	—													
RPE16	.53**	—												
RPE17	.36**	.38**	—											
RPE18	.33**	.40**	.32**	—										
M	3.27	3.36	2.94	3.41										
SD	.66	.68	.85	.68										

Note. Self-Reinforcement (RPE1 – RPE7). Social Affirmation (RPE8 – RPE14). Self-Affirmation (RPE15 – RPE18).

* p < .05. ** p < .01.

MCFA was then performed on this scale to examine four invariance testing hypotheses. Table 3.61 shows the results of MCFA. First, Model 1 was tested for factor structure invariance. Model 1 fitted the empirical data well [χ^2 (120, N_1 = 288, N_2 = 494) = 84.48, χ^2/df = .70, p = .99, GFI = .99, CFI = 1.00, SRMR = .02, RMSEA = .00]. This indicated that the factor structure of this scale was invariant across German and Thai samples. That is, configural invariance was supported. Because the configural invariance was supported, factor loadings were constrained to be equal (Model 2). As Table 3.61 shows, Model 2 provided acceptable fit indices for the data, but the χ^2 difference ($\Delta\chi^2$) between Model 2 versus Model 1 was statistically significant (p < .01). This indicated that factor loadings were not equivalent across samples. That is, full metric invariance was not supported. Before continuing further tests, it was necessary to examine whether at least partial metric invariance could be achieved. Then, the factor loadings of RPE3, RPE7, RPE9, RPE11, RPE15, and RPE17 were freed, because they revealed the greatest modification indices that could be freed to most reduce $\Delta\chi^2$. As expected, the partial metric invariance model fitted the data better than the full metric invariance model (Model 2) as indicated by better fit indices [χ^2 (132, N_1 = 288, N_2 = 494) = 103.50, χ^2/df = .78, p = .97, GFI = .99, CFI = 1.00, SRMR = .03, RMSEA = .00]. As Table 3.61 shows, the test of $\Delta\chi^2$ between the partial metric invariance model versus Model 1 was not statistically significant. This indicated that partial metric invariance was supported. Afterwards, the factor variance-covariance invariance model (Model 3) was examined. This model provided acceptable fit indices (see Table 3.61). However, the test of $\Delta\chi^2$ between Model 3 versus Model 2 was statistically significant ($p < .05$). This indicated that relationship between two subscales varied across samples. That is, full factor variance-covariance invariance was not supported. In addition, we found that the error variance-covariance invariance model (Model 4) provided poor fit indices for the data (see Table 3.61). This indicated that measurement error variances-covariances varied across samples. That is, error variance-covariance was not supported.

Table 3.61
Test of Cross-Cultural Measurement Invariance for the Scale of Regulation of Positive Academic Emotion Across the German and Thai Samples

	Model fit index							
Nested model	χ^2	df	χ^2/df	p	GFI	CFI	SRMR	RMSEA
Model 1: Configural invariance	84.48	120	.70	.99	.99	1.00	.02	.00
Model 2: Metric invariance	151.80	138	1.10	.20	.98	1.00	.07	.02
Partial metric invariance	103.50	132	.78	.97	.99	1.00	.03	.00
Model 3: Factor variance-covariance invariance	160.45	141	1.14	.13	.98	1.00	.06	.02
Model 4: Error variance-covariance invariance	401.66	231	1.73	.00	.97	.98	.05	.04

				Critical value of the χ^2 distribution	
Model difference	$\Delta\chi^2$	Δdf	Decision	.05	.01
Model 2 vs. Model 1	67.32**	18	Reject	28.87	34.81
Partial metric invariance vs. Model 1	19.02	12	Accept	21.03	26.22
Model 3 vs. Model 2	8.65*	3	Reject	7.82	11.35
Model 4 vs. Model 3	–	–	Reject	–	–

Note. The grey shading indicates the best-fit model.
* $p < .05$. ** $p < .01$.

The best-fit model was selected by considering the smallest value of a ratio of χ^2 to *df* found in each tested model (*with exception for the partial metric invariance model*). Model 1 (as constrained for equal factor structure) yielded the smallest value of a ratio of χ^2 to *df* of .70. Standardized parameter estimates for Model 1 for both samples are shown in Table 3.62. Path diagrams of Model 1 for both samples are shown in Figure 3.29 and Figure 3.30.

Factor score equations of three subscales of self-reinforcement (SFRE), seeking social affirmation (SOAF), and self-affirmation (SFAF) for German and Thai samples could be expressed as follows:

$SFRE_{\text{German Sample}}$ = .14(RPE1) + .11(RPE2) + .13(RPE3) + .17(RPE4) + .19(RPE5) + .18(RPE6) + .26(RPE7)

$SOAF_{\text{German Sample}}$ = .09(RPE8) + .19(RPE9) + .12(RPE10) + .21(RPE11) + .30(RPE12) + .00(RPE13) + .24(RPE14)

$SFAF_{\text{German Sample}}$ = .44(RPE15) + .70(RPE16) + .61(RPE17) – .14(RPE18)

$SFRE_{\text{Thai Sample}}$ = .16(RPE1) + .09(RPE2) – .05(RPE3) + .21(RPE4) + .18(RPE5) + .30(RPE6) + .04(RPE7)

$SOAF_{\text{Thai Sample}}$ = .14(RPE8) + .07(RPE9) + .21(RPE10) + .07(RPE11) + .33(RPE12) + .08(RPE13) + .36(RPE14)

$SFAF_{\text{Thai Sample}}$ = .05(RPE15) + .28(RPE16) + .16(RPE17) + .31(RPE18)

Table 3.62
Standardized Parameter Estimates for the Measurement Models of Regulation of Positive Academic Emotion for the German and Thai Samples, as Constrained for Equal Factor Structure

Item	German Sample (N = 288)					Thai Sample (N = 494)				
	β	SE	t	R^2	FSR	β	SE	t	R^2	FSR
Self-Reinforcement (SFRE)										
RPE1	.59**	.06	10.09	.35	.14	.52**	.05	9.91	.27	.16
RPE2	.63**	.06	10.96	.40	.11	.59**	.05	11.90	.34	.09
RPE3	.65**	.06	11.13	.42	.13	.36**	.05	6.94	.13	–.05
RPE4	.68**	.06	12.10	.46	.17	.60**	.05	12.57	.36	.21
RPE5	.75**	.05	14.21	.57	.19	.61**	.05	13.37	.37	.18
RPE6	.68**	.06	10.60	.42	.18	.67**	.05	13.56	.45	.30
RPE7	.73**	.06	12.94	.52	.26	.38**	.05	7.45	.14	.04
Seeking Social Affirmation (SOAF)										
RPE8	.64**	.06	11.44	.41	.09	.65**	.04	14.71	.42	.14
RPE9	.69**	.06	12.18	.47	.19	.48**	.05	9.74	.23	.07
RPE10	.71**	.05	13.28	.50	.12	.64**	.04	14.54	.42	.21
RPE11	.80**	.05	15.29	.65	.21	.61**	.05	13.41	.37	.07
RPE12	.76**	.06	13.10	.56	.30	.72**	.05	15.67	.52	.33
RPE13	.67**	.06	11.82	.45	.00	.52**	.05	10.58	.27	.08
RPE14	.79**	.06	13.11	.63	.24	.75**	.06	13.51	.56	.36
Self-Affirmation (SFAF)										

Item	German Sample (*N* = 288)					Thai Sample (*N* = 494)				
	β	SE	t	R^2	FSR	β	SE	t	R^2	FSR
RPE15	.89**	.08	10.61	.78	.44	.49**	.05	9.35	.24	.05
RPE16	.91**	.09	10.60	.82	.70	.60**	.05	11.40	.27	.28
RPE17	.92**	.08	10.81	.85	.61	.57**	.05	11.04	.33	.16
RPE18	.54**	.07	8.31	.30	–.14	.62**	.05	12.09	.38	.31

Note. FSR = Factor Score Regression.
* $p < .05$. ** $p < .01$.

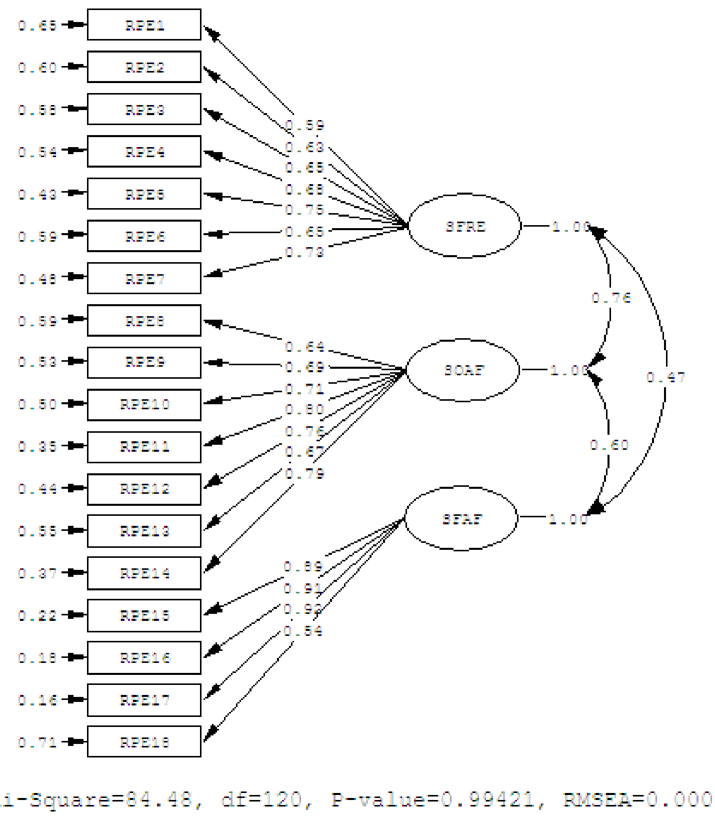


Figure 3.29. Empirically Validated Measurement Models of Regulation of Positive Academic Emotion for the German Sample, as Constrained for Equal Factor Structure

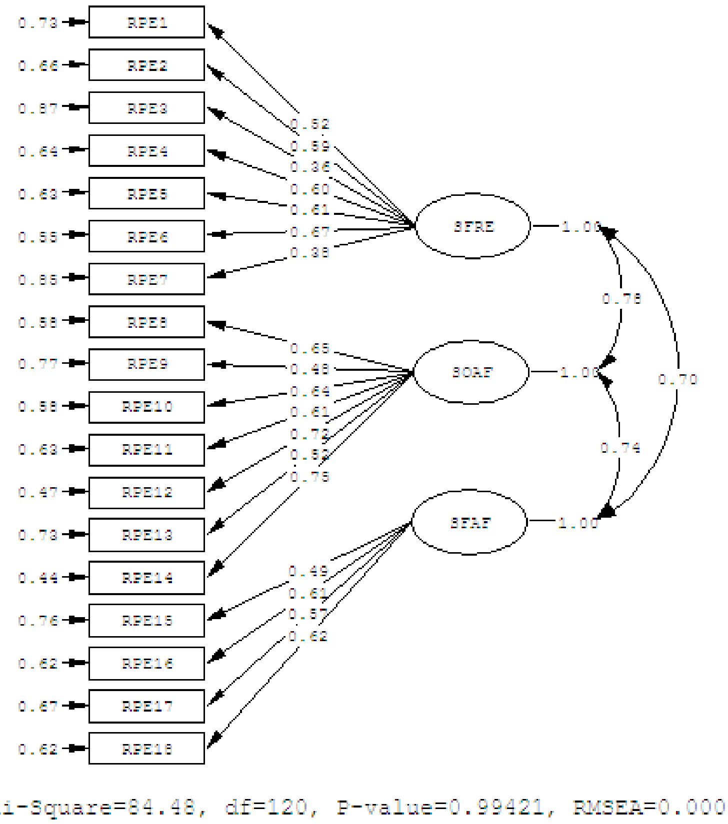


Figure 3.30. Empirically Validated Measurement Models of Regulation of Positive Academic Emotion for the Thai Sample, as Constrained for Equal Factor Structure

Regulation of Negative Academic Emotion

This scale comprised three subscales: situation control, positive self-instructions, and seeking social support. Each subscale was a latent construct measured by four items. First, correlations were examined between items measuring these two subscales. In the German sample, significant correlations ranged between .21 ($p <$ .01) and .80 ($p <$ .01). In the Thai sample, significant correlations ranged between .16 ($p <$ .01) and .67 ($p <$ .01). In the German sample, Bartlett's test of sphericity yielded a χ^2 of 1,530.02 with *df* of 66 (p = .00). In the Thai sample, Bartlett's tests of sphericity yielded a χ^2 of 1,576.31 with *df* of 66 (p = .00). This showed that the correlation matrices for the items measuring the two subscales for both samples were not the identity matrices. The KMO measures of sampling adequacy of the two correlation matrices for the German and Thai samples were greater than .50 ($KMO_{German\ Sample}$ = .89, $KMO_{Thai\ Sample}$ = .85). This showed that the 12 items measuring the two subscales for both samples correlated highly with each other. Therefore, the data for both samples were appropriate for MCFA. Details are shown in Table 3.63.

Table 3.63

Means, Standard Deviations, and Correlation Matrices for Items Measuring the Scale of Regulation of Negative Academic Emotion for the German and Thai Samples (German Sample = Left-Hand Corner; Thai Sample = Right-Hand Corner)

Thai Sample (N = 494)												
Bartlett's Test of Sphericity [χ^2 (66, N = 494) = 1,576.31, p = .00]; KMO = .85												
M	3.12	3.04	3.07	3.13	3.00	2.99	3.06	3.14	2.60	2.85	2.89	2.77
SD	.74	.75	.71	.68	.71	.79	.76	.70	.88	.84	.82	.88
Items	RNE1	RNE2	RNE3	RNE4	RNE5	RNE6	RNE7	RNE8	RNE9	RNE10	RNE11	RNE12
RNE1	—	.45**	.34**	.33**	.31**	.31**	.24**	.29**	.03	.12**	.10*	.10*
RNE2	.52**	—	.50**	.33**	.36**	.36**	.27**	.30**	.11*	.15**	.15**	.18**
RNE3	.46**	.54**	—	.39**	.34**	.33**	.29**	.39**	.15**	.22**	.19**	.17**
RNE4	.52**	.55**	.61**	—	.32**	.34**	.24**	.32**	.10*	.13**	.17**	.13**
RNE5	.46**	.51**	.46**	.54**	—	.44**	.36**	.33**	.08	.11*	.14**	.07
RNE6	.36**	.49**	.39**	.47**	.57**	—	.43**	.36**	.04	.11*	.07	.06
RNE7	.37**	.37**	.37**	.42**	.54**	.53**	—	.42**	.00	.03	.06	.08
RNE8	.30**	.36**	.37**	.40**	.50**	.59**	.53**	—	.03	.05	.08	.10*
RNE9	.21**	.25**	.31**	.22**	.19**	.17**	.17**	.14**	—	.51**	.49**	.41**
RNE10	.25**	.34**	.37**	.33**	.24**	.27**	.23**	.22**	.65**	—	.56**	.50 **
RNE11	.24**	.38**	.41**	.33**	.25**	.32**	.25**	.29**	.56**	.65**	—	.51**
RNE12	.30**	.32**	.36**	.33**	.23**	.30**	.22**	.20**	.50**	.59**	.55**	—
M	2.78	2.95	3.05	2.93	2.98	3.02	2.97	3.05	2.82	2.91	2.80	2.73
SD	1.01	.92	.87	.89	.88	.83	.85	.83	.94	.93	.93	.97
Bartlett's Test of Sphericity [χ^2 (66, N = 288) = 1,530.02, p = .00]; KMO = .89												
German Sample (N = 288)												

Note. Situation Control (RNE1 – RNE4). Positive Self-Instructions (RNE5 – RNE8). Seeking Social Support (RNE9 – RNE12).
* p < .05. ** p < .01.

MCFA was then performed on this scale to examine four invariance testing hypotheses. Table 3.64 shows the results of MCFA. First, Model 1 was tested for factor structure invariance. Model 1 fitted the empirical data well [χ^2 (72, N_1 = 288, N_2 = 494) = 46.93, χ^2/df = .65, p = .99, GFI = .99, CFI = 1.00, SRMR = .02, RMSEA = .00]. This indicated that the factor structure of this scale was invariant across German and Thai samples. That is, configural invariance was supported. Because the configural invariance was supported, factor loadings were constrained to be equal (Model 2). As Table 3.64 shows, Model 2 fitted the data well and the χ^2 difference ($\Delta\chi^2$) between Model 2 versus Model 1 was not significant. This indicated that factor loadings were equivalent across samples. That is, full metric invariance was supported. Afterwards, the factor variance-covariance invariance model (Model 3) was examined. This model also yielded good fit indices (see Table 3.64). The tests of $\Delta\chi^2$ between Model 3 versus Model 2 were not significant. This indicated that the relationship between the two subscales was invariant across samples. That is, full factor variance-covariance invariance was supported. However, the error variance-covariance invariance model (Model 4) did not provide acceptable fit indices for the data (see Table 3.64). This indicated that measurement error variances-covariances varied across samples. That is, error variance-covariance was not supported.

Table 3.64
Test of Cross-Cultural Measurement Invariance for the Scale of Regulation of Negative Academic Emotion Across the German and Thai Samples

Nested model	Model fit index							
	χ^2	*df*	χ^2/df	*p*	GFI	CFI	SRMR	RMSEA
Model 1: Configural invariance	46.93	72	.65	.99	.99	1.00	.02	.00
Model 2: Metric invariance	63.63	84	.75	.95	.99	1.00	.04	.00
Model 3: Factor variance-covariance invariance	70.11	87	.80	.91	.99	1.00	.06	.00
Model 4: Error variance-covariance invariance	151.34	114	1.32	.01	.98	.99	.06	.03
				Critical value of the χ^2 distribution				
Model difference	$\Delta\chi^2$	Δdf	Decision	.05	.01			
Model 2 vs. Model 1	16.70	12	Accept	21.03	26.22			
Model 3 vs. Model 2	6.48	3	Accept	7.82	11.35			
Model 4 vs. Model 3	–	–	Reject	–	–			

Note. The grey shading indicates the best-fit model.

The best-fit model was selected by considering the smallest value of a ratio of χ^2 to *df* found in each tested model. Model 1 (as constrained for equal factor structure) yielded the smallest value of a ratio of χ^2 to *df* of .65. Standardized parameter estimates for Model 1 for both samples are shown in Table 3.65. Path diagrams of Model 1 for both samples are shown in Figure 3.31 and Figure 3.32. Factor score equations of three subscales of situation control (SICON), positive self-instructions (SFINS), seeking social support (SOSUP) for German and Thai samples could be expressed as follows:

$SICON_{\text{German Sample}}$ = .17(RNE1) + .20(RNE2) + .18(RNE3) + .26(RNE4)
$SFINS_{\text{German Sample}}$ = .45(RNE5) + .16(RNE6) + .15(RNE7) + .09(RNE8)
$SOSUP_{\text{German Sample}}$ = .06(RNE9) + .14(RNE10) + .52(RNE11) + .36(RNE12)
$SICON_{\text{German Sample}}$ = .16(RNE1) + .12(RNE2) + .23(RNE3) + .20(RNE4)
$SFINS_{\text{German Sample}}$ = .31(RNE5) + .26(RNE6) + .09(RNE7) + .33(RNE8)
$SOSUP_{\text{German Sample}}$ = .16(RNE9) + .27(RNE10) + .41(RNE11) + .27(RNE12)

Table 3.65

Standardized Parameter Estimates for the Measurement Models of Regulation of Negative Academic Emotion for the German and Thai Samples, as Constrained for Equal Factor Structure

Items	German Sample ($N = 288$)					Thai Sample ($N = 494$)				
	β	SE	t	R^2	FSR	β	SE	t	R^2	FSR
Situation Control (SICON)										
RNE1	.66**	.06	11.32	.43	.17	.53**	.05	10.95	.29	.16
RNE2	.72**	.06	12.68	.52	.20	.58**	.05	11.34	.34	.12
RNE3	.71**	.06	12.14	.51	.18	.64**	.05	12.60	.41	.23
RNE4	.77**	.06	13.87	.59	.26	.58**	.05	11.58	.34	.20
Positive Self-Instructions (SFINS)										
RNE5	.83**	.06	14.94	.69	.45	.67**	.05	13.46	.45	.31
RNE6	.69**	.06	11.87	.48	.16	.66**	.05	12.76	.43	.26
RNE7	.65**	.06	10.96	.42	.17	.53**	.05	9.97	.28	.09
RNE8	.61**	.07	8.88	.37	.09	.67**	.06	10.38	.45	.33
Seeking Social Support (SOSUP)										
RNE9	.65**	.06	10.55	.42	.06	.61**	.07	9.32	.37	.16
RNE10	.75**	.06	12.40	.56	.14	.72**	.07	10.36	.52	.27
RNE11	.86**	.06	13.56	.74	.52	.78**	.07	10.56	.61	.41
RNE12	.78**	.06	12.05	.61	.36	.68**	.07	9.76	.47	.27

Note. FSR = Factor Score Regression.
* $p < .05$. ** $p < .01$.

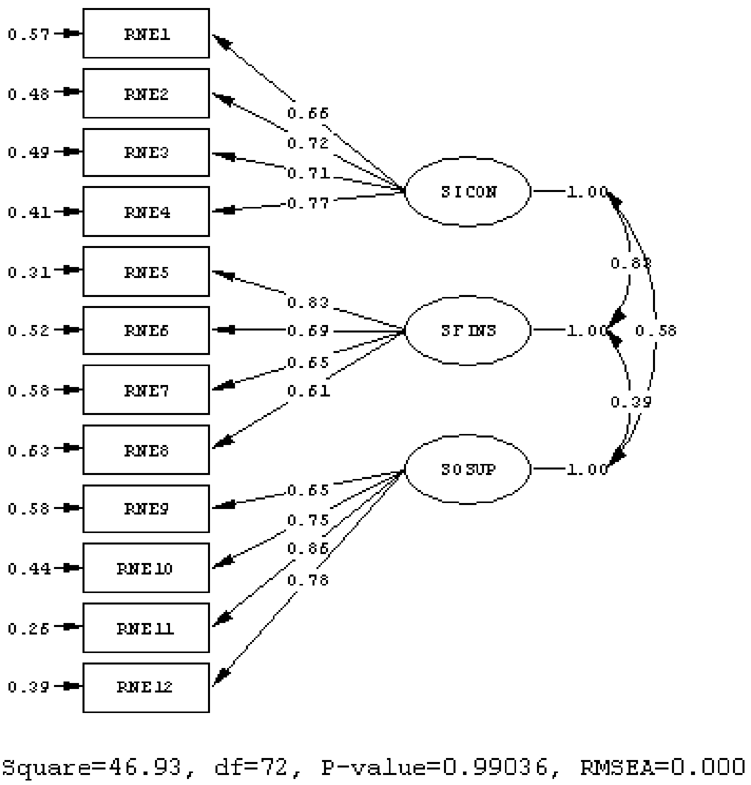


Figure 3.31. Empirically Validated Measurement Models of Regulation of Negative Academic Emotion for the German Sample, as Constrained for Equal Factor Structure

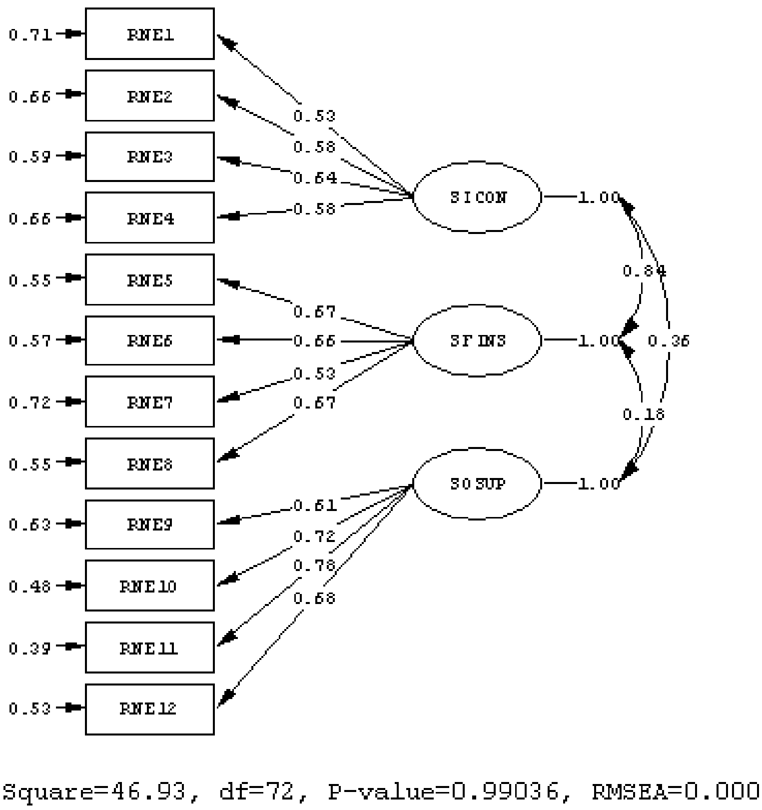


Figure 3.32. Empirically Validated Measurement Models of Regulation of Negative Academic Emotion for the Thai Sample, as Constrained for Equal Factor Structure

<u>*Short Summary*</u>

Up to this point, the findings of MCFA have revealed that only three of the eight pupil scales (perceived authoritative parental instruction, autonomous learning motivation, and regulation of negative emotion) achieved the stronger levels of invariance across two cultural groups. In other words, the factor structures and item factor loadings of these three scales were equal across samples. Moreover, in each scale, the subscales related to each other in the same fashion in both groups. The rest of the parent scales achieved only configural invariance and partial metric invariance. However, this was sufficiently acceptable to meet the preconditions for further analyses.

3.4.3. Summary

The research instruments in the present study were the parent and pupil questionnaires conducted in German and Thai languages. Each questionnaire comprised two parts: (as) a survey of demographic characteristics and (b) scales measuring the research variables. Overall, the parent scales consisted of 59 items and the pupil scales consisted of 108 items. The experts in the related fields from both countries checked the content validity of the German and Thai questionnaires using cross-cultural translation techniques. In both samples, the internal consistency of every subscale was greater than .50. The internal consistencies of the German and Thai parent questionnaires (taking into account all items together) of were quite similar. Moreover, the internal consistencies of the German and Thai pupil questionnaires were also quite similar.

To find out whether the parent and pupil scales used in the current research measured the same psychological constructs in all groups, multi-sample confirmatory factor analysis (MCFA) was performed. That is, a series of comparisons of measurement models with increasingly restrictive levels of invariance was tested across groups.

The main aim of this current research was to examine the empirical model describing the relationships among parents' predictor constructs, pupils' perceived quality of parental instruction, and a set of pupils' academic functioning outcomes across German and Thai samples. To perform this analysis appropriately, the scales used to measure parent and pupil variables in both samples have to achieve configural invariance and metric invariance. The former indicates that participants from both cultural groups conceive the scale construct in the similar way. The latter confirms that participants from both groups respond to the items in the same way. However, partial metric invariance indicating that participants from both groups seem to respond equally to the majority of items in each scale can also be accepted .

With respect to the overall findings of MCFA, the parent and pupil scales of German and Thai achieved configural invariance (equal factor structure) and metric invariance (equal factor loadings) or partial metric invariance (at least two equal factor loadings). Meeting this precondition allowed a German–Thai comparison of the empirical model depicting the relationships among parent and pupil variables.

Chapter IV
Preliminary Findings

The preliminary findings are presented in three parts, namely (4.1) Characteristics of home-based parental involvement for the German and Thai samples, (4.2) Descriptive analysis of the main research variables for the German and Thai samples, (4.3) Tests of the effects of demographic variables on the main research variables for the German and Thai samples.

4.1. Characteristics of Home-Based Parental Involvement

The description of the characteristics of home-based parental involvement for the German and Thai samples focuses on two aspects of analysis. The first aspect will find out who is mostly involved in homework assistance. The second aspect will investigate the amount of time pupils spend on mathematics homework.

4.1.1. Findings from the German Sample

Who Is Mostly Involved in Homework Assistance for German Pupils?

The majority of German pupils (77%) reported that they mostly received homework support from their parents; 12%, from siblings or relatives; and 11%, from institutions (e.g. teacher, private tutor). In addition, the person most responsible for homework assistance varied across school types (Φ_c = .15, p < .05). That is, the majority of pupils from every school type mostly received homework support from their parents (82% of *Hauptschule*, 78% of *Gymnasium*, 75% of *Realschule*, 72% of *Gesamtschule*). Amongst all school types, the *Gymnasium* had the largest proportion (17%) of pupils who mostly received support from institutions. Details are shown in Table 4.1.

Table 4.1
Person Most Responsible for Homework Assistance for the German Pupils by School Type

Person most responsible for homework assistance	School type				
	Hauptschule	*Realschule*	*Gymnasium*	*Gesamtschule*	Overview
Parents (including step-parents)	47	55	64	52	218
	82.40%	*75.30%*	*78.00%*	*72.20%*	*76.80%*
Siblings/relatives	5	12	4	14	35
	8.80%	*16.50%*	*4.90%*	*19.50%*	*12.30%*
Institutions (teacher/private tutor/ homework assistant/classmate	5	6	14	6	31
	8.80%	*8.20%*	*17.10%*	*8.30%*	*10.90%*
Total	57	73	82	72	284
	100.00%	100.00%	100.00%	100.00%	100.00%
Φ_c with school type	.15	*p*	.05		

Note. Φ_c = Cramér's V correlation coefficient. The grey shading indicates the majority.

Amount of Time German Pupils Spend on Mathematics Homework by School Type

The majority of German pupils (56%) spent *more than half an hour* per week on mathematics homework. The amount of time appeared to vary across school types (Φ_c = .28, p < .01). That is, the majority of *Gymnasium* pupils (81%) and the majority of *Gesamtschule* pupils (60%) spent *more than half an hour* per week on mathematics homework. In contrast, the majority of *Hauptschule* pupils (66%) and the majority of *Realschule* pupils (57%) spent *less than half an hour* per week on homework in this subject. Details are shown in Table 4.2.

Table 4.2
Amount of Time German Pupils Spend on Mathematics Homework by School Type

Amount of time	School type				
	Hauptschule	*Realschule*	*Gymnasium*	*Gesamtschule*	Overview
0–30 min	39	41	16	29	125
	66.10%	*56.90%*	*19.50%*	*39.70%*	*43.70%*
31–60 min	15	24	39	35	113
	25.40%	*33.40%*	*47.60%*	*47.90%*	*39.50%*
More than 1 hr	5	7	27	9	48
	8.50%	*9.70%*	*32.90%*	*12.40%*	*16.80%*
Total	59	72	82	73	286
	100.00%	*100.00%*	*100.00%*	*100.00%*	*100.00%*
Φ_c with school type	.28	*p*	.00		

Note. Φ_c = Cramér's V correlation coefficient. The grey shading indicates the majority.

4.1.2. Findings from the Thai Sample

Who Is Mostly Involved in Homework Assistance for Thai Pupils

The majority of Thai pupils (59%) reported that they mostly received homework support from their parents; 28%, from institutions; and 13%, from siblings or relatives. In addition, the person most responsible for homework assistance did not vary across school types. This means that the majority of Thai pupils from every school type mostly received homework support from their parents (71% of OHEC, 66% of OPEC, 54% of OBEC, and 42% of LAO). Details are presented in Table 4.3.

Table 4.3
Persons Most Responsible for Homework Assistance for the Thai Pupils by School Type

	School type				
Person most responsible for homework assistance	*Local Admin* (LAO)	*Basic Education* (OBEC)	*Higher Education* (OHEC)	*Private Education* (OPEC)	Overview
Parents (including step-parents)	42 *41.60%*	72 *53.70%*	63 *70.80%*	112 *65.90%*	289 *58.50%*
Siblings/relatives	18 *17.80%*	27 *20.20%*	5 *5.60%*	16 *9.40%*	66 *13.40%*
Institutions (teacher/private tutor/ homework assistant/classmate)	41 *40.60%*	35 *26.10%*	21 *23.60%*	42 *24.70%*	139 *28.10%*
Total	101 *100.00%*	134 *100.00%*	89 *100.00%*	170 *100.00%*	494 *100.00%*
Φ_c with school type	.17	*p*	.09		

Note. Φ_c = Cramér's V correlation coefficient. The grey shading indicates the majority.

Amount of Time Thai Pupils Spend on Completing Mathematics Homework

Most of the Thai pupils (77%) spent *more than half an hour* per week on mathematics homework. This amount of time varied somewhat across school types (Φ_c = .19, $p < .01$). That is to say, the majority of Thai pupils from every school type spent more than half an hour on their homework in this subject (91% of LAO, 79% of OPEC, 73% of OBEC, and 62% of OHEC). Amongst all school types, the LAO school had the smallest proportion (9%) of pupils who finished their mathematics homework in less than half an hour. The details are shown in Table 4.4.

Table 4.4
Amount of Time Thai Pupils Spend on Mathematics Homework by School Type

	School type				
Amount of time (per week)	*Local Admin* (LAO)	*Basic Education* (OBEC)	*Higher Education* (OHEC)	*Private Education* (OPEC)	Overview
0–30 min	9 *8.90%*	35 *26.70%*	34 *38.20%*	36 *21.20%*	114 *23.20%*
31–60 min	28 *27.70%*	45 *34.40%*	32 *36.00%*	52 *30.60%*	157 *32.00%*
More than 1 hr	64 *63.40%*	51 *38.90%*	23 *25.80%*	82 *48.20%*	220 *44.80%*
Total	101 *100.00%*	131 *100.00%*	89 *100.00%*	170 *100.00%*	491 *100.00%*
Φ_c with school type	.19	*p*	.00		

Note. Φ_c = Cramér’s V correlation coefficient. The grey shading indicates the majority.

4.1.3. Summary

The aim of this part of the analysis was to describe the characteristics of home-based parental involvement for the German and Thai samples. The majority of pupils from both samples mostly received homework support from their parents and spent a lot of time on mathematics homework (more than half an hour per week). As expected, these findings were consistent with the findings of the pilot study in Thailand. Therefore, it could be concluded that in both countries, parents play the most important role in home-based learning and instruction. In addition, home-based learning and instruction in both countries seems to focus on mathematics.

4.2. Descriptive Analysis of the Main Research Variables for the German and Thai Samples

The aim of this part of the analysis was to compute descriptive statistics in order to measure the dispersions and distributions of the main research variables. Measures of data dispersion include minimum (*Min*), maximum (*Max*), mean (*M*), and standardized distribution[1] (*SD*). Measures of data distribution include skewness (*SK*), and kurtosis (*KU*). In the present study, there were 28 main research variables (serving as manifest variables) including 11 predictor constructs of the quality of home-based parental involvement, 4 dimensions of parental instruction, and 14 pupils' academic functioning outcomes. The descriptive analysis used the *factor score* of each research variable (subscale) obtained from the cross-cultural measurement invariance analysis (reported in the methodological chapter).

In this research, each subscale had a different number of items. Consequently, the *maximum* and *minimum* values of the factor score of each subscale were also not similar. Therefore, the baseline data[2] of each factor score was calculated. As a result, factor scores could range between 1 and 100, making them much easier to interpret.

For the interpretation of the baseline data, the factor score of each subscale was divided into four groups using percentile ranking. Cut-off points for four equal groups of each baseline dataset were estimated. Four cut-off points were determined for the four responses ranging from 1 (*strongly disagree*) to 4 (*strongly agree*). The percentile rank of baseline data of less than 25 was classified as *very low* (*strongly disagree*), whereas the percentile rank of baseline data between 25 and 50 was classified as *low* (*disagree*). The percentile rank of baseline data between 51 and 75 was classified as *high* (*agree*), whereas the percentile rank of baseline data greater than 75 was classified as *very high* (*strongly agree*).

To make the tables easier to read, the following abbreviations were used for the main research variables.

---

[1] A large standard deviation indicates that the data points are far from the mean, whereas a small standard deviation indicates that they are clustered closely around that mean.

[2] Baseline data can be expressed by the equation: [(Value – Min)/(Max – Min)] x 100

Predictor Constructs

Parental Conception of Responsibility for Involvement in their Child's Education

ACRESP	Conception of active responsibility
PSRESP	Conception of passive responsibility

Parental Role Conceptions in Learning Situations

GOALPC	Goal orientation towards learning
GOALPD	Goal orientation towards achievement

Parental Teaching Efficacy Beliefs

GEFFC	General teaching efficacy beliefs
MEFFC	Domain-specific teaching efficacy beliefs

Specific Invitations for Involvement

INC	Invitation to involvement from child
INT	Invitation to involvement from school and teachers

Life Context

TE	Time and energy
VALENCE	Valence towards school

Quality of Parental Instruction

Authoritative Kinds of Parental Instruction

AUTO	Autonomy-support
RESS	Responsiveness

Authoritarian Kinds of Parental Instruction

CONTR	Control
STRUC	Structure

Pupils' Academic Functioning Outcomes

Autonomous Learning Motivation

ITMOTIV	Intrinsic regulation
IDMOTIV	Identified regulation

Controlled Learning Motivation

IJMOTIV	Introjected regulation
EXMOTIV	External regulation

Academic Well-Being

SATIS	School satisfaction
PANAS	Positive academic emotion

Academic Self-Regulation Competencies

INENH	Interest enhancement
SCON	Self-consequating
SFRE	Self-reinforcement
SOAF	Seeking social affirmation
SFAF	Self-affirmation

SICON	Situation control
SFINS	Positive self-instructions
SOSUP	Seeking social support

4.2.1. Findings from the German Sample

Table 4.5 presents the findings from the descriptive analysis of the main research variables for the German sample. The analysis was based on the data from a total of 288 parent–child dyads.

Looking at the predictor construct variables, parents had low scores on parental conception of active responsibility, goal orientation towards achievement, and invitation to involvement from the child. In contrast, they had high scores on the rest of the antecedent variables (baseline data ranged between 40.90 and 86.18; standardized deviations ranged between .55 and 1.13). Overall, the distributions of parental conception of passive responsibility, invitation to involvement from the child, and time and energy were left-skewed[3] and platykurtic,[4] whereas the distribution of goal orientation towards achievement was right-skewed[5] and platykurtic. The distributions of the rest of predictor construct variables were left-skewed and leptokurtic.[6]

According to the normality test,[7] general teaching efficacy beliefs, invitation to involvement from children, and time and energy were normally distributed as indicated by non-significant skewness and kurtosis. Goal orientation towards learning was not normally distributed as indicated by significant skewness and kurtosis. The rest of the predictor construct variables were almost normally distributed as indicated by significant skewness and non-significant kurtosis.

Looking at the four dimensions of parental instruction, pupils had low scores on parents' provision of autonomy-support, responsiveness, and structure. In

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[3] A left-skewed distribution means that most values are concentrated on the right of the mean, with extreme values to the left. Left-skewed distribution is met when skewness is negative.

[4] A platykurtic distribution refers to a distribution that is flatter than a normal distribution with a wider peak. Platykurtic is met when kurtosis is negative.

[5] A right-skewed distribution means that most values are concentrated on the left of the mean, with extreme values to the right. Right-skewed distribution is met when skewness is positive.

[6] A leptokurtic distribution refers to a distribution that is sharper than a normal distribution. Leptokurtic distribution is met when kurtosis is positive.

[7] Normality was tested by evaluating the significant values of skewness and kurtosis with respect to the Z score of skewness (Z_{sk}) as well as the Z score of kurtosis (Z_{ku}). Z_{sk} is calculated by skewness divided by its standard error (SE_{sk}), whereas Z_{ku} is calculated by kurtosis divided by its standard error (SE_{sk}). When non-significant skewness and kurtosis were found, data were normally distributed. When at least one skewness or kurtosis was statistically significant, the data were assumed to be almost normally distributed.

contrast, pupils had high scores on parents' provision of control (baseline data ranged between 29.66 and 80.22; standardized deviations ranged between .48 and .86). Overall, the distributions of autonomy-support and responsiveness were left-skewed and leptokurtic. The distribution of control was right-skewed and leptokurtic, whereas the distribution of structure was left-skewed and platykurtic. The normality test revealed that responsiveness and control were not normally distributed, whereas autonomy-support and structure were almost normally distributed.

Looking at the pupil's academic functioning variables, pupils had high scores on intrinsic motivation, extrinsic motivation, and interest enhancement. They had low scores on the rest of the pupil outcome variables (baseline data ranged between 43.25 and 76.47; standardized deviations ranged between 0.27 and 1.33). Overall, the distributions of interest enhancement, self-reinforcement, and seeking social affirmation were right-skewed and platykurtic. The distributions of identified regulation and positive academic emotion–absence of negative academic emotion were left-skewed and leptokurtic. The distributions of the rest of the pupil outcome variables were left skewed and platykurtic. The normality test revealed that self-reinforcement, seeking social affirmation, and seeking social support were normally distributed, whereas the rest of pupils' outcomes were almost normally distributed.

Table 4.5

Descriptive Analysis of the Main Research Variables for the German Sample (N = 288)

Research variable	*Min*	*Max*	*M of factor score*	*SD*	*SK*	*KU*	Z_{sk}	Z_{ku}	*M of* baseline data	Score inter-pretation
Predictor constructs										
ACRESP	2.99	5.68	4.99	.55	–.88	.18	–6.13**	.64	74.46	low
PSRESP	1.71	4.48	3.66	.57	–.33	–.36	–2.30*	–1.24	70.48	high
GOALPC	3.73	6.96	6.51	.62	–1.55	1.73	–10.74**	6.06**	86.18	low
GOALPD	1.87	6.16	3.63	.84	.38	–.09	2.60**	–.30	40.99	high
GEFFC	1.32	4.48	3.38	.60	–.16	.42	–1.13	1.47	65.16	high
MEFFC	.16	7.82	4.09	1.13	–.42	.02	–2.90**	.08	51.24	high
INC	2.68	7.98	5.34	1.07	–.21	–.42	–1.44	–1.47	50.20	low
INT	1.15	4.60	3.64	.66	–.47	.15	–3.25**	.51	72.14	high
TE	1.31	4.20	3.18	.63	–.27	–.33	–1.85	–1.17	64.67	high
VALENCE	1.51	4.63	3.48	.68	–.55	.19	–3.83**	.65	63.04	high
Quality of parental instruction										
AUTO	.73	3.07	2.36	.48	–.66	.21	–4.56**	.73	69.74	low
RESS	1.38	4.32	3.74	.60	–1.14	1.04	–7.91**	3.62**	80.22	low
CONTR	1.33	5.32	2.51	.86	1.01	.77	7.03**	2.69**	29.66	high
STRUC	1.06	3.24	2.37	.49	–.10	–.62	–.71	–2.15*	60.30	low
Pupils' academic functioning outcomes										
ITMOTIV	1.09	4.36	2.93	1.03	–.06	–1.12	–.42	–3.92**	56.35	high
IDMOTIV	1.21	4.24	3.53	.71	–.89	.26	–6.16**	.90	76.47	low
IJMOTIV	.89	2.98	2.11	.47	–.27	–.58	–1.90	–2.04*	58.54	low
EXMOTIV	1.02	4.08	2.78	.75	–.12	–.78	–.81	–2.74**	57.54	high
SATIS	.96	3.84	2.71	.78	–.37	–.41	–2.58**	–1.44	60.70	low
PANAS	.29	1.56	1.19	.27	–.83	.33	–5.73**	1.16	70.49	low
INENH	–.15	3.93	1.92	.82	.07	–.65	.47	–2.28*	50.82	high
SCON	1.05	5.02	2.91	.93	–.09	–.70	–.60	–2.44*	46.79	low
SFRE	1.18	4.72	2.79	.89	.15	–.37	1.03	–1.31	45.47	low
SOAF	1.15	4.60	2.64	.90	.12	–.49	.82	–1.71	43.25	low
SFAF	1.19	6.86	4.56	1.33	–.49	–.28	–3.37**	–.98	59.49	low
SICON	.81	3.24	2.37	.60	–.42	–.34	–2.94**	–1.20	64.39	low
SFINS	.85	3.40	2.54	.62	–.45	–.11	–3.13**	–.38	66.37	low
SOSUP	1.08	4.32	3.01	.87	–.27	–.45	–1.90	–1.59	59.68	low
Z score of skewness *(Z_{sk})*			$Z_{sk} = SK/ SE_{sk}$; SE_{sk} = .14							
Z score of kurtosis *(Z_{ku})*			$Z_{ku} = SK/ SE_{ku}$; SE_{sk} = .29							
Interpretation of baseline data for all variables										
The ranges of interpretation divided by percentile rank (PR)			< PR 25				= very low (*strongly disagree*)			
			PR25–PR50				= low (*disagree*)			
			PR51–PR75				= high (*agree*)			
			> PR75				= very high (*strongly agree*)			

**p* < .05. ***p* > .01.

4.2.2. Findings from the Thai Sample

Table 4.6 presents the findings from the descriptive analysis of the main research variables for the Thai sample. The analysis was based on the data from a total of 499 parent–child dyads.

Looking at the predictor construct variables, parents had high scores on goal orientation towards achievement, invitation to involvement from the child, and personal time and energy. In contrast, they had low scores on the rest of the predictor construct variables (baseline data ranged between 50.97 and 77.85; standardized deviations ranged between .51 and 1.12). Overall, the distributions of goal orientation towards achievement and domain-specific teaching efficacy beliefs were *right-skewed and leptokurtic* (as indicated by positive skewness and positive kurtosis), whereas the distributions of the rest of predictor construct variables were *left-skewed and leptokurtic* (as indicated by negative skewness and positive kurtosis). The normality test revealed that goal orientation towards achievement, general teaching efficacy beliefs, and domain-specific teaching efficacy beliefs were normally distributed. In contrast, parental conception of active responsibility, invitation to involvement for the child, invitation to involvement from the school and teachers, and valence towards school were not normally distributed. The rest of the predictor construct variables were almost normally distributed.

Looking at the four dimensions of parental instruction, pupils had high scores on parents' provision of control but low scores on the other three dimensions (baseline data ranged between 58.40 and 71.58; standardized deviations ranged between .32 and .52). Overall, the distributions of autonomy-support and responsiveness were *left-skewed and leptokurtic*, whereas the distributions of control and structure were *left-skewed and platykurtic* (as indicated by negative skewness and negative kurtosis). The normality test showed that control and structure were normally distributed whereas responsiveness was almost normally distributed. However, autonomy-support was not normally distributed.

Looking at the pupils' academic functioning variables, pupils had high scores on intrinsic regulation, identified regulation, self-affirmation, situation control, and positive self-instructions. In contrast, they had low scores on the rest of the academic functioning variables (baseline data ranged between 53.22 and 76.36; standardized deviations ranged between .33 and .96). Overall, the distributions of intrinsic regulation, introjected regulation, extrinsic regulation, and self-consequating were left-skewed and platykurtic. The distributions of the rest of the pupil outcomes variables were *left-skewed and leptokurtic*. The normality test showed that introjected regulation and extrinsic regulation were normally distributed, whereas school satisfaction, interest enhancement, situation control, and positive self-instructions were not normally distributed. The rest of the pupils' academic functioning variables were almost normally distributed.

Table 4.6

Descriptive Analysis of the Main Research Variables for the Thai Sample (N = 494)

Research variable	*Min*	*Max*	*M of factor score*	*SD*	*SK*	*KU*	Z_{sk}	Z_{ku}	*M* of Baseline data	Score inter-pretation
Predictor constructs										
ACRESP	2.75	5.96	5.07	.51	–.42	.24	–3.77**	1.11	72.39	low
PSRESP	1.25	4.52	3.60	.63	–.60	.44	–5.44**	2.01*	71.78	low
GOALPC	3.16	6.32	5.62	.64	–.75	.14	–6.85**	.65	77.85	low
GOALPD	1.53	5.92	3.77	.75	.21	.30	1.88	1.36	50.97	high
GEFFC	1.19	4.76	3.47	.63	–.08	.24	–.76	1.11	63.96	low
MEFFC	1.96	7.84	5.30	1.12	.06	.29	.51	1.31	56.77	low
INC	1.30	5.56	4.13	.62	–.27	.92	–2.45*	4.21**	66.43	high
INT	1.08	4.32	3.19	.53	–.41	.99	–3.76**	4.53**	65.11	low
TE	1.26	3.96	3.16	.56	–.36	.11	–3.24**	.52	70.21	high
VALENCE	1.48	4.80	4.01	.60	–.94	1.62	–8.55**	7.39**	76.17	low
Quality of parental instruction										
AUTO	.59	2.36	1.86	.32	–.76	.61	–6.95**	2.78**	71.58	low
RESS	1.20	3.64	2.89	.47	–.68	.30	–6.19**	1.37	69.34	low
CONTR	.93	3.72	2.28	.52	–.01	–.08	–.13	–.35	48.41	high
STRUC	1.03	3.00	2.18	.42	–.08	–.35	–.76	–1.61	58.40	low
Pupils' academic functioning outcomes										
ITMOTIV	1.10	4.40	3.33	.77	–.49	–.21	–4.41**	–.97	67.71	high
IDMOTIV	1.27	4.40	3.58	.61	–.56	.08	–5.07**	.37	73.94	high
IJMOTIV	1.01	4.64	2.95	.78	–.09	–.40	–.85	–1.84	53.33	low
EXMOTIV	.85	3.40	2.21	.52	–.11	–.16	–1.02	–.74	53.22	low
SATIS	.83	3.32	2.47	.54	–.58	.55	–5.25**	2.50*	65.66	low
PANAS	.45	1.97	1.54	.33	–.86	.36	–7.83**	1.65	71.72	low
INENH	.50	4.52	3.11	.75	–.63	.44	–5.75**	2.02*	64.85	low
SCON	1.51	5.88	4.23	.96	–.39	–.12	–3.52**	–.56	62.33	low
SFRE	.78	3.81	2.61	.60	–.38	.40	–3.47**	1.84	60.55	low
SOAF	1.26	5.04	3.50	.79	–.38	.29	–3.47**	1.31	59.17	low
SFAF	.80	3.20	2.63	.43	–.60	.49	–5.46**	2.21*	76.36	high
SICON	.71	2.84	2.20	.38	–.55	1.40	–5.02**	6.40**	69.83	high
SFINS	.99	3.96	3.02	.54	–.34	.50	–3.09**	2.29*	68.27	high
SOSUP	1.11	4.44	3.12	.75	–.52	.41	–4.74**	1.89	60.35	low

Z score of skewness (Z_{sk})	$Z_{sk} = SK/ SE_{sk}$; SE_{sk} = .11	
Z score of kurtosis (Z_{ku})	$Z_{ku} = SK/ SE_{ku}$; SE_{sk} = .22	
Interpretation of baseline data for all variables		
The ranges of interpretation divided by percentile rank (PR)	< PR 25	= very low (*strongly disagree*)
	PR25–PR50	= low (*disagree*)
	PR51–PR75	= high (*agree*)
	> PR75	= very high (*strongly agree*)

**p* < .05. ***p* < .01.

4.2.3. Summary

The aim of this part of the analysis was to check the dispersions and distributions of the main research variables. The results of the descriptive analysis showed that German parents had high scores on most of the predictor constructs (7 out of 10 variables), whereas German pupils had low scores on most of the pupil variables (14 out of 18 variables). In addition, most of the main research variables for the German sample (except goal orientation towards achievement, responsiveness, and control) were more or less normally distributed. In the Thai sample, parents had low scores on most of the predictor constructs (7 out of 10 variables). Thai pupils had low scores on most of the pupil variables (12 out of 18 variables). More than one-half of the main research variables for the Thai sample (18 out of 28 variables) were more or less normally distributed.

4.3. Effects of Demographic Variables on the Main Research Variables

This part of the analysis used one-way MANOVAs to test whether demographic variables influenced the main research variables. The demographic variables (serving as categorical variables) were grade level, school type, and pupil's gender. The findings will indicate whether some variables need to be controlled for. Findings on the German sample will be presented first followed by the Thai sample.

4.3.1. Findings from the German Sample

Grade Level

A one-way MANOVA was performed to examine the effects of grade level on the main research variables (see Table 4.7). Using Wilks's lambda, there was no significant main effect of grade level on a set of the main research variables, Λ = .87, $F(28, 259) = 1.37$, $p = .11$. Therefore, univariate tests comparing the effect of grade level on each main research variable were not performed.

Table 4.7

Effects of Grade Level on the Main Research Variables for the German Sample (N = 288)

	(1) 5th grade *n* = 149		(2) 6th grade *n* = 139		Levene's test of equality of error variances *df1* = 1 *df2* = 286		Tests of between-subjects effects *df* = 1	
Research variable	*M**	*SD*	*M**	*SD*	*F*	*p*	*F*	*p*
Predictor constructs								
ACRESP	5.01	.55	4.97	.55	.01	.92	.39	.53
PSRESP	3.68	.61	3.65	.53	1.78	.18	.20	.66
GOALPC	6.55	.60	6.48	.64	1.25	.26	.95	.33
GOALPD	3.61	.81	3.64	.87	1.66	.20	.08	.77
GEFFC	3.36	.61	3.40	.58	.00	.99	.36	.55
MEFFC	4.11	1.16	4.06	1.10	.49	.48	.15	.70
INC	5.29	1.10	5.39	1.04	.63	.43	.62	.43
INT	3.64	.69	3.64	.64	.43	.52	.01	.93
TE	3.15	.62	3.21	.63	.50	.48	.54	.46
VALENCE	3.51	.67	3.44	.69	.04	.85	.80	.37
Quality of parental instruction								
AUTO	2.34	.49	2.39	.47	.32	.57	.93	.34
RESS	3.75	.63	3.73	.56	2.36	.13	.05	.82
CONTR	2.50	.89	2.53	.84	.17	.68	.14	.71
STRUC	2.32	.51	2.43	.47	1.17	.28	3.33	.07
Pupils' academic functioning outcomes								
ITMOTIV	3.02	1.03	2.83	1.03	.13	.72	2.47	.12
IDMOTIV	3.57	.71	3.48	.71	.37	.54	1.12	.29
IJMOTIV	**2.18**	**.48**	**2.04**	**.44**	**1.93**	**.17**	**6.44**	**.01**
EXMOTIV	2.84	.76	2.71	.73	1.22	.27	2.17	.14
SATIS	2.78	.86	2.64	.69	7.48	.01	2.34	.13
PANAS	**1.22**	**.27**	**1.14**	**.27**	**.00**	**1.00**	**6.19**	**.01**
INENH	**2.02**	**.80**	**1.82**	**.83**	**.05**	**.82**	**4.24**	**.04**
SCON	2.97	.95	2.85	.90	.90	.35	1.21	.27
SFRE	2.88	.92	2.69	.84	1.15	.29	3.21	.07
SOAF	**2.76**	**.91**	**2.52**	**.87**	**.12**	**.73**	**5.19**	**.02**
SFAF	**4.72**	**1.32**	**4.39**	**1.32**	**.01**	**.93**	**4.52**	**.03**
SICON	2.34	.65	2.41	.55	2.35	.13	.93	.34
SFINS	2.55	.65	2.53	.58	1.42	.24	.07	.79
SOSUP	2.94	.95	3.09	.77	6.72	.01	2.24	.14
Box's test of equality of covariance matrices	Box's M = 466.75, *F* (406, 245,322.25) = 1.03, *p* = .31							
Bartlett's test of sphericity	χ^2 (405, *N* = 288) = 4,020.48, *p* = .00							
Test of main effect of grade level using Wilks's lambda	Λ = .87, *F*(28, 259) = 1.37, *p* = .11							

Note. *mean of factor score. Significant *F* tests of between-subjects effects are shown in bold.

School Type

A one-way MANOVA was performed in order to examine the effects of school type on the main research variables (see Table 4.8). Using Wilks's lambda, the results showed that school type had a significant main effect on a set of the main research variables, $\Lambda = .62$, $F(84, 769.70) = 1.57$, $p = .00$. To clarify the significant multivariate findings, separate univariate tests were performed to compare the effect of school type on each main research variable. Univariate tests showed statistically significant effects of school type on five research variables, namely, domain-specific teaching efficacy, invitation from the school and teachers, identified regulation, extrinsic regulation, and seeking social affirmation. The findings of post hoc tests using Fisher's least significant difference (LSD) revealed that *Gymnasium* parents reported significantly higher levels of domain-specific teaching efficacy compared to *Realschule* and *Gesamtschule* parents. *Gesamtschule* parents reported significantly higher levels of invitation to involvement from the school and teachers compared to their peers from other school types. *Hauptschule* pupils reported significantly higher levels of identified regulation compared to *Gymnasium* pupils. *Gesamtschule* and *Realschule* pupils reported significantly higher levels of extrinsic regulation compared to *Gymnasium* pupils. Furthermore, *Gymnasium* pupils reported significantly lower levels of seeking social affirmation compared to their peers attending other school types.

Table 4.8

Effects of School Type on the Main Research Variables for the German Sample (N = 288)

Research variable	(1) *Hauptschule* $n = 59$		(2) *Realschule* $n = 73$		(3) *Gymnasium* $n = 82$		(4) *Gesamtschule* $n = 74$		Levene's test of equality of error variances $df1 = 3$ $df2 = 284$		Tests of between-subjects effects $df = 3$		Mean Comparison +++
	*M**	*SD*	*M**	*SD*	*M**	*SD*	*M**	*SD*	*F*	*p*	*F*	*p*	
Predictor constructs													
ACRESP	4.92	.63	5.09	.56	4.92	.51	5.03	.52	1.31	.27	1.71	.16	
PSRESP	3.71	.66	3.72	.52	3.63	.57	3.61	.54	1.39	.25	.71	.55	
GOALPC	6.51	.66	6.42	.69	6.56	.53	6.55	.61	2.50	.06	.82	.49	
GOALPD	3.87	.85	3.58	.78	3.50	.73	3.64	.97	3.75	.01	2.39	.07	
GEFFC	3.35	.55	3.39	.60	3.31	.65	3.46	.56	.39	.76	.85	.47	
MEFFC	**4.01**	**1.06**	**3.97**	**1.08**	**4.39**	**1.13**	**3.92**	**1.18**	**1.46**	**.23**	**2.87**	**.04**	**3 > 2, 3 > 4**
INC	5.42	1.11	5.44	.98	5.29	1.11	5.24	1.09	.54	.66	.62	.60	
INT	**3.40**	**.70**	**3.54**	**.68**	**3.71**	**.61**	**3.85**	**.62**	**.35**	**.79**	**6.24**	**.00**	**3 > 1, 4 > 1, 4 > 2**
TE	3.14	.52	3.20	.68	3.15	.64	3.23	.64	2.41	.07	.33	.80	
VALENCE	3.56	.70	3.41	.55	3.54	.66	3.40	.79	2.87	.04	1.13	.34	
Quality of parental instruction													
AUTO	2.31	.53	2.36	.50	2.41	.46	2.35	.43	2.15	.09	.59	.63	
RESS	3.73	.59	3.76	.59	3.75	.64	3.70	.56	.09	.97	.16	.92	
CONTR	2.51	.81	2.44	.85	2.49	.94	2.61	.84	.87	.46	.50	.69	
STRUC	2.28	.46	2.38	.49	2.37	.46	2.44	.54	.76	.52	1.18	.32	
Pupils' academic functioning outcomes													
ITMOTIV	3.21	1.01	2.84	1.01	2.83	1.05	2.92	1.04	.28	.84	1.91	.13	
IDMOTIV	**3.70**	**.59**	**3.48**	**.76**	**3.38**	**.74**	**3.60**	**.69**	**1.52**	**.21**	**2.77**	**.04**	**1 > 3**
IJMOTIV	2.13	.45	2.13	.46	2.03	.44	2.18	.50	1.02	.39	1.57	.20	
EXMOTIV	**2.77**	**.72**	**2.81**	**.69**	**2.56**	**.78**	**3.00**	**.72**	**.69**	**.56**	**4.78**	**.00**	**2 > 3, 4 > 3**
SATIS	2.73	.89	2.56	.78	2.74	.75	2.81	.73	1.39	.25	1.40	.24	
PANAS	1.20	.24	1.20	.26	1.17	.30	1.18	.28	2.02	.11	.28	.84	
INENH	1.90	.85	1.88	.83	1.99	.80	1.91	.83	.07	.98	.29	.84	
SCON	2.82	.86	2.76	1.03	3.01	.91	3.01	.88	1.95	.12	1.47	.22	
SFRE	2.80	.99	2.80	.77	2.73	.83	2.84	.98	2.67	.05	.23	.88	
SOAF	**2.75**	**.86**	**2.73**	**.85**	**2.40**	**.85**	**2.74**	**.99**	**1.13**	**.34**	**2.91**	**.04**	**1 > 3, 2 > 3, 4 > 3**
SFAF	4.40	1.36	4.76	1.31	4.55	1.27	4.52	1.40	.39	.76	.88	.45	
SICON	2.27	.66	2.36	.56	2.49	.59	2.34	.60	.78	.51	1.70	.17	
SFINS	2.51	.69	2.47	.58	2.57	.62	2.62	.58	.71	.55	.85	.47	
SOSUP	2.86	.95	2.98	.83	3.08	.85	3.10	.87	.84	.47	1.05	.37	

Box's test of equality of covariance matrices	Box's M = 1,654.41, F (1,218, 152,394.20) = 1.12, p = .00
Bartlett's test of sphericity	χ^2 (405, N = 288) = 4,008.98, p = .00
Test of main effect of school type using Wilks's lambda	Λ = .62, F(84, 769.70) = 1.57, p = .00

Note. *mean of factor score. Significant *F* tests of between-subjects effects are shown in bold. +++Post hoc tests using Fisher's least significant difference (LSD) were employed when equal variances were assumed.

Pupils' Gender

A one-way MANOVA was performed to examine the effects of pupils' gender on pupils' research variables (see Table 4.9). Overall, the finding of Wilks's lambda revealed that pupils' gender had a significant main effect on a set of pupils' research variables, Λ = .81, $F(18, 269) = 3.58$, p = .00. To clarify the significant multivariate findings, separate univariate tests were performed to compare the effect of pupils' gender on each pupil variable. Univariate tests showed statistically significant effects of pupils' gender on four research variables, namely, control, intrinsic regulation, introjected regulation, and self-consequating. The results of mean comparisons revealed that boys reported significantly higher levels of these four research variables than girls.

Table 4.9

Effects of Pupils' Gender on Pupils' Research Variables for the German Sample (N = 288)

Research variable	(1) Girl n = 131		(2) Boy n = 157		Levene's test of equality of error variances $df1$ = 1 $df2$ = 286		Tests of between-subjects effects df = 1		Mean comparison
	*M**	*SD*	*M**	*SD*	*F*	*p*	*F*	*p*	
Quality of parental instruction									
AUTO	2.36	.40	2.37	.53	15.29	.00	.02	.90	
RESS	3.73	.58	3.75	.61	1.38	.24	.09	.77	
CONTR	**2.36**	**.67**	**2.64**	**.98**	**12.63**	**.00**	**7.41**	**.01**	**2 > 1**
STRUC	2.32	.47	2.42	.51	1.48	.22	3.00	.08	
Pupils' academic functioning outcomes									
ITMOTIV	**2.58**	**.98**	**3.23**	**.98**	**.99**	**.32**	**31.69**	**.00**	**2 > 1**
IDMOTIV	3.40	.74	3.63	.67	.24	.63	7.80	.01	
IJMOTIV	**2.05**	**.45**	**2.16**	**.47**	**.00**	**.98**	**4.03**	**.05**	**2 > 1**
EXMOTIV	2.69	.70	2.85	.77	1.73	.19	3.26	.07	
SATIS	2.76	.75	2.67	.81	3.70	.06	.99	.32	
PANAS	1.17	.28	1.20	.27	.08	.77	.74	.39	
INENH	1.83	.80	2.00	.83	.23	.63	3.26	.07	
SCON	**2.79**	**.94**	**3.01**	**.91**	**.06**	**.81**	**4.11**	**.04**	**2 > 1**
SFRE	2.84	.86	2.75	.91	1.40	.24	.67	.41	
SOAF	2.59	.91	2.68	.89	.08	.78	.72	.40	
SFAF	4.51	1.28	4.61	1.38	.52	.47	.40	.53	
SICON	2.35	.55	2.40	.64	4.17	.04	.50	.48	
SFINS	2.49	.58	2.59	.64	1.82	.18	1.80	.18	
SOSUP	3.08	.82	2.96	.91	3.33	.07	1.35	.25	
Box's test of equality of covariance matrices				Box's M = 245.53, F (171, 235,244.45) = 1.34, p = .00					
Bartlett's test of sphericity				χ^2 (170, N = 288) = 3,089.62, p = .00					
Test of multivariate main effect of pupils' gender using Wilks's lambda				Λ = .81, $F(18, 269) = 3.58$, p = .00					

Note. *mean of factor score. Significant *F* tests of between-subjects effects are shown in bold.

4.3.2. Findings from the Thai Sample

Grade Level

A one-way MANOVA examined the effects of grade level on the main research variables (see Table 4.10). Using Wilks's lambda, there was a significant main effect on a set of the main research variables, Λ = .90, F(28, 465) = 1.87, p = .01. To clarify the significant multivariate findings, separate univariate tests were performed to compare the effect of grade level on each research variable. Univariate tests showed statistically significant effects of grade level on six research variables, namely, autonomy-support, positive academic emotion, interest enhancement, self-consequating, self-reinforcement, and seeking social affirmation. The results of mean comparisons revealed that the 5th graders reported significantly higher levels of these six variables compared to the 6th graders.

Table 4.10
Effects of Grade Level on the Main Research Variables for the Thai Sample (N = 494)

	(1) 5th grade n = 253		(2) 6th grade n = 241		Levene's test of equality of error variances $df1$ = 1 $df2$ = 492		Tests of between-subjects effects df = 1		
Research variable	M*	SD	M*	SD	F	p	F	p	Mean comparison
Predictor constructs									
ACRESP	5.07	.50	5.07	.52	.19	.67	.00	.96	
PSRESP	3.58	.63	3.62	.62	.07	.79	.47	.49	
GOALPC	5.58	.66	5.66	.61	3.83	.05	1.85	.18	
GOALPD	3.76	.73	3.77	.78	.82	.37	.01	.93	
GEFFC	3.45	.65	3.49	.60	1.65	.20	.45	.50	
MEFFC	5.39	1.17	5.20	1.06	.79	.37	3.28	.07	
INC	4.10	.58	4.17	.66	3.77	.05	1.53	.22	
INT	3.15	.54	3.23	.51	.34	.56	2.41	.12	
TE	3.13	.55	3.18	.58	2.70	.10	.75	.39	
VALENCE	4.01	.56	4.01	.64	1.12	.29	.00	.98	
Quality of parental instruction									
AUTO	**1.89**	**.32**	**1.83**	**.31**	**.02**	**.89**	**4.50**	**.03**	**1 > 2**
RESS	2.90	.48	2.88	.46	.57	.45	.22	.64	
CONTR	2.28	.49	2.28	.56	4.72	.03	.01	.91	
STRUC	2.17	.43	2.19	.41	3.09	.08	.39	.53	
Pupils' academic functioning outcomes									
ITMOTIV	3.39	.75	3.27	.79	1.11	.29	3.20	.07	
IDMOTIV	3.59	.62	3.58	.60	1.30	.25	.04	.85	
IJMOTIV	3.01	.78	2.88	.77	.01	.94	3.70	.06	
EXMOTIV	2.24	.53	2.17	.50	.62	.43	1.90	.17	
SATIS	2.48	.54	2.45	.54	.23	.63	.26	.61	
PANAS	**1.57**	**.33**	**1.50**	**.33**	**.20**	**.65**	**5.70**	**.02**	**1 > 2**
INENH	**3.19**	**.72**	**3.02**	**.78**	**2.34**	**.13**	**6.09**	**.01**	**1 > 2**
SCON	**4.3**	**.91**	**4.07**	**.98**	**3.14**	**.08**	**14.25**	**.00**	**1 > 2**

Research variable	(1) 5th grade n = 253 M*	SD	(2) 6th grade n = 241 M*	SD	Levene's test of equality of error variances $df1$ = 1 $df2$ = 492 F	p	Tests of between-subjects effects df = 1 F	p	Mean comparison
SFRE	**2.68**	**.57**	**2.54**	**.62**	**2.08**	**.15**	**6.91**	**.01**	**1 > 2**
SOAF	**3.57**	**.73**	**3.42**	**.84**	**1.92**	**.17**	**4.48**	**.04**	**1 > 2**
SFAF	2.64	.40	2.63	.46	5.20	.02	.02	.88	
SICON	2.20	.37	2.19	.38	.01	.91	.04	.83	
SFINS	3.05	.54	2.98	.55	.11	.74	2.29	.13	
SOSUP	3.14	.72	3.10	.79	1.02	.31	.29	.59	
Box's test of equality of covariance matrices	Box's M = 506.87, F (406, 729,641.77) = 1.18, p = .01								
Bartlett's test of sphericity	χ^2 (405, N = 494) = 6,148.88, p = .00								
Test of main effect of grade level using Wilks's lambda	Λ = .90, F(28, 465) = 1.87, p = .01								

Note. *mean of factor score. Significant F tests of between-subjects effects are shown in bold.

School Type

A one-way MANOVA was performed to examine the effects of school type on the main research variables (see Table 4.11). Using Wilks's lambda, results revealed that school type had a significant main effect on a set of the main research variables, Λ = .57, F(84, 1,385.96) = 3.47, p = .00. To clarify the significant multivariate findings, separate univariate tests were performed to compare the effect of school type on each main research variable. Multivariate tests showed statistically significant effects of school type on 19 research variables (see Table 4.11). The results of post hoc tests using Fisher's least significant difference (LSD) and Dunnett's T3 revealed that:

1) OPEC parents reported significantly higher levels of goal orientation towards achievement and general teaching efficacy beliefs compared to OHEC parents. OPEC pupils reported significantly higher levels of parental control, intrinsic regulation, interest enhancement, self-reinforcement, and seeking social affirmation compared to OHEC pupils. In addition, OPEC parents reported significantly higher levels of parental conception of active responsibility and goal orientation towards learning compared to LAO parents. OPEC pupils reported significantly higher levels of structure, two competencies for motivational regulation, and four competencies for emotional regulation compared to LAO pupils. Moreover, OPEC parents reported significantly higher levels of goal orientation towards achievement compared to OBEC parents. OPEC pupils reported

significantly higher levels of autonomy-support, structure, and two competencies for motivational regulation compared to OBEC pupils.

2) OHEC parents reported significantly higher levels of parental conception of active responsibility and goal orientation towards learning compared to LAO parents. OHEC pupils reported significantly higher levels of autonomy-support and structure compared to LAO pupils. In addition, OHEC parents reported significantly higher levels of time and energy compared to LAO and OBEC parents.
3) OBEC parents reported significantly higher levels of parental conception of passive responsibility compared to OHEC parents. OBEC pupils reported significantly higher levels of parental control and seeking out of social affirmation compared to OHEC pupils. In addition, OBEC pupils reported significantly higher levels of self-reinforcement compared to LAO pupils.
4) LAO pupils reported significantly higher levels of school satisfaction compared to both OBEC and OPEC pupils. In addition, it was found that the LAO pupils reported significantly higher levels of positive academic emotion compared to OBEC pupils.

Table 4.11
Effects of School Type on the Main Research Variables for the Thai Sample (N = 494)

Research variable	(1) *Local Admin* (LAO) *n* = 101		(2) *Basic Education* (OBEC) *n* = 134		(3) *Higher Education* (OHEC) *n* = 89		(4) *Private Education* (OPEC) *n* = 170		Levene's test of equality of error variances *df1* = 3 *df2* = 490		Tests of between-subjects effects *df* = 3		Mean comparison +++
	*M**	*SD*	*M**	*SD*	*M**	*SD*	*M**	*SD*	*F*	*p*	*F*	*p*	
Predictor constructs													
ACRESP	**4.89**	**.50**	**5.07**	**.57**	**5.19**	**.50**	**5.12**	**.45**	**2.50**	**.06**	**6.43**	**.00**	**3 > 1, 4 > 1**
PSRESP	**3.71**	**.53**	**3.64**	**.56**	**3.38**	**.74**	**3.62**	**.64**	**3.30**	**.02**	**5.15**	**.00**	**1 > 3, 2 > 3**
GOALPC	**5.44**	**.60**	**5.54**	**.74**	**5.85**	**.50**	**5.66**	**.60**	**5.72**	**.00**	**7.67**	**.00**	**3 > 1, 4 > 1, 3 > 2**
GOALPD	**4.01**	**.74**	**3.84**	**.84**	**3.52**	**.72**	**3.70**	**.65**	**2.74**	**.04**	**8.22**	**.00**	**1 > 3, 1 > 4, 2 >3, 4 > 3**
GEFFC	**3.50**	**.56**	**3.43**	**.63**	**3.27**	**.68**	**3.59**	**.61**	**2.96**	**.03**	**5.52**	**.00**	**4 > 3**
MEFFC	5.24	.95	5.20	.96	5.40	1.23	5.35	1.27	4.65	.00	0.79	.50	
INC	4.04	.51	4.17	.66	4.19	.72	4.12	.59	3.53	.02	1.07	.36	
INT	3.27	.52	3.19	.50	3.10	.65	3.19	.47	3.66	.01	1.72	.16	
TE	**2.99**	**.50**	**3.13**	**.55**	**3.34**	**.55**	**3.18**	**.58**	**6.61**	**.00**	**6.71**	**.00**	**3 > 1, 4 >1, 3 > 2**
VALENCE	**3.99**	**.53**	**3.95**	**.62**	**4.09**	**.60**	**4.02**	**.62**	**0.83**	**.48**	**1.08**	**.36**	
Quality of parental instruction													
AUTO	**1.79**	**.25**	**1.81**	**.35**	**1.88**	**.32**	**1.93**	**.31**	**2.60**	**.05**	**5.66**	**.00**	**4 > 1, 4 > 2**
RESS	**2.81**	**.46**	**2.91**	**.44**	**2.86**	**.54**	**2.94**	**.44**	**1.46**	**.23**	**2.05**	**.11**	
CONTR	**2.25**	**.47**	**2.35**	**.52**	**2.16**	**.51**	**2.31**	**.55**	**0.48**	**.70**	**2.87**	**.04**	**2 > 3, 4 > 3**
STRUC	**2.02**	**.36**	**2.15**	**.44**	**2.21**	**.37**	**2.29**	**.42**	**1.97**	**.12**	**9.37**	**.00**	**4 > 1, 3 > 1, 4 > 2**
Pupils' academic functioning outcomes													
ITMOTIV	**3.44**	**.57**	**3.27**	**.75**	**3.17**	**.88**	**3.41**	**.81**	**6.67**	**.00**	**2.86**	**.04**	**1 > 3, 4 > 3**
IDMOTIV	3.53	.48	3.51	.63	3.61	.68	3.66	.62	3.85	.01	1.97	.12	
IJMOTIV	3.01	.61	2.90	.82	2.79	.90	3.02	.76	6.25	.00	2.21	.09	
EXMOTIV	2.14	.41	2.24	.53	2.12	.52	2.26	.55	2.79	.04	2.19	.09	
SATIS	**2.65**	**.39**	**2.41**	**.56**	**2.49**	**.51**	**2.39**	**.59**	**3.94**	**.01**	**6.07**	**.00**	**1 > 2, 1 > 4**
PANAS	**1.58**	**.27**	**1.47**	**.37**	**1.49**	**.36**	**1.60**	**.29**	**3.96**	**.01**	**5.84**	**.00**	**1 > 2, 4 > 2**
INENH	**2.96**	**.64**	**3.11**	**.76**	**3.00**	**.84**	**3.25**	**.73**	**1.76**	**.15**	**3.83**	**.01**	**4 > 1, 4 > 3**
SCON	**4.11**	**.82**	**4.12**	**1.03**	**4.22**	**.98**	**4.40**	**.94**	**1.66**	**.17**	**2.88**	**.04**	**4 > 1, 4 > 2**
SFRE	**2.46**	**.47**	**2.64**	**.59**	**2.50**	**.69**	**2.75**	**.60**	**3.48**	**.02**	**6.38**	**.00**	**2 > 1, 4 > 1, 4 > 3**
SOAF	**3.49**	**.62**	**3.63**	**.73**	**3.19**	**.87**	**3.55**	**.85**	**3.93**	**.01**	**6.35**	**.00**	**1 > 3, 2 > 3, 4 > 3**
SFAF	**2.52**	**.37**	**2.64**	**.39**	**2.61**	**.53**	**2.71**	**.41**	**4.86**	**.00**	**4.40**	**.01**	**4 > 1**
SICON	**2.13**	**.26**	**2.19**	**.39**	**2.14**	**.44**	**2.27**	**.38**	**5.71**	**.00**	**4.28**	**.01**	**4 > 1**
SFINS	**2.93**	**.40**	**3.02**	**.52**	**2.96**	**.61**	**3.10**	**.58**	**5.15**	**.00**	**2.57**	**.05**	**4 > 1**
SOSUP	3.04	.62	3.21	.76	3.03	.79	3.15	.80	1.47	.22	1.50	.21	
Box's test of equality of covariance matrices							Box's M = 1908.40, *F* (1,218, 347,786.61) = 1.40, *p* = .00						
Bartlett's test of sphericity							χ^2 (405, *N* = 494) = 6,128.25, *p* = .00						
Test of main effect of school type using Wilks's lambda							Λ = .57, *F*(84, 1,385.96) = 3.47, *p* = .00						

Note. *mean of factor score. Significant *F* tests of between-subjects effects are shown in bold.
+++Post hoc test using Fisher's least significant difference (LSD) was employed when equal variances were assumed. Post hoc test using Dunnett's T3 was employed when equal variances were not assumed.

Pupils' Gender

Table 4.12 presents the findings of the one-way MANOVA for testing the effects of pupils' gender on pupils' research variables. Using Wilks's lambda, there was a significant main effect of pupils' gender on a set of pupils' research variables, Λ = .90, $F(18, 475) = 3.03$, p = .00. To clarify the significant multivariate findings, separate univariate tests were performed to compare the effect of pupils' gender on each pupils' research variable. Univariate tests showed statistically significant effects of pupils' gender on four research variables, namely, control, introjected regulation, extrinsic regulation, and school satisfaction. The results of mean comparisons indicated that boys reported significantly higher levels of control, introjected regulation, and extrinsic motivation compared to girls. In contrast, girls reported significantly higher levels of school satisfaction compared to boys.

Table 4.12

Effects of Pupils' Gender on Pupils' Research Variables for the Thai Sample (N = 494)

Research variable	(1) Girl $N = 237$		(2) Boy $N = 257$		Levene's test of equality of error variances $df1 = 1$ $df2 = 492$		Tests of between-subjects effects $df = 1$		Mean comparison
	*M**	*SD*	*M**	*SD*	*F*	*p*	*F*	*p*	
Quality of parental instruction									
AUTO	1.88	.30	1.84	.33	.76	.38	1.59	.21	
RESS	2.91	.49	2.87	.45	.54	.46	.87	.35	
CONTR	**2.23**	**.49**	**2.33**	**.55**	**1.88**	**.17**	**4.11**	**.04**	**2 > 1**
STRUC	2.16	.42	2.20	.42	.05	.83	1.54	.22	
Pupils' academic functioning outcomes									
ITMOTIV	3.30	.73	3.37	.80	.97	.32	.86	.35	
IDMOTIV	3.57	.60	3.60	.62	.08	.79	.24	.63	
IJMOTIV	**2.78**	**.78**	**3.10**	**.75**	**.49**	**.49**	**21.72**	**.00**	**2 > 1**
EXMOTIV	**2.10**	**.51**	**2.31**	**.50**	**.39**	**.54**	**22.38**	**.00**	**2 > 1**
SATIS	**2.52**	**.51**	**2.41**	**.56**	**.75**	**.39**	**4.81**	**.03**	**1 > 2**
PANAS	1.53	.33	1.55	.33	.15	.70	.19	.66	
INENH	3.04	.73	3.17	.77	.55	.46	3.53	.06	
SCON	4.15	.91	4.31	.99	.75	.39	3.21	.07	
SFREW	2.58	.56	2.64	.64	3.85	.05	1.22	.27	
SOCON	3.49	.75	3.51	.83	1.64	.20	.08	.78	
SFCON	2.63	.41	2.64	.45	1.46	.23	.07	.79	
SICON	2.19	.34	2.20	.41	2.43	.12	.09	.77	
SFINS	2.98	.51	3.05	.57	2.88	.09	1.83	.18	
SOSUP	3.08	.69	3.16	.80	3.89	.05	1.52	.22	
Box's test of equality of covariance matrices					Box's M = 256.87, F (171, 733,256.31) = 1.45, p = .00				
Bartlett's test of sphericity					χ^2 (170, N = 494) = 4,506.77, p = .00				
Test of main effect of pupils' gender using Wilks's lambda					Λ = .90, F (18, 475) = 3.03, p = .00				

Note. *mean of factor score. Significant *F* tests of between-subjects effects are shown in bold.

4.3.3. Summary

The aim of this part of the analysis was to examine the effects of demographic variables on the main research variables using one-way MANOVAs. Overall, the findings revealed that there was no significant main effect of grade level on the research variables for the German sample, but a significant main effect of grade level in the Thai sample. However, the results of the univariate tests for the Thai sample showed that grade level had significant effects only on some research variables (6 out of 28). This indicated that grade level did not have a strong effect on the main research variables. Moreover, the proportions of pupils by grade level were quite similar in both samples. That is, more than one-half of the pupils from both samples were in 5th grade (52% of the German sample; 51% of the Thai sample). Therefore, it was assumed that there was no need to control for grade level. In addition, school type yielded a significant main effect on the main research variables in both samples. Results of univariate tests on the German sample revealed that school type had significant effects on only some research variables (5 out of 28). Yet, in the Thai sample, there were significant effects of school type on more than one-half of the research variables (19 out of 28). This indicated that school type had a strong effect on the main research variables. Hence, the current research should also control for school type. However, in the present study, family SES was a crucial variable and also controlled. As shown in the methodological chapter, school types in both samples represented participants from various SES backgrounds. Therefore, it may be reasonable to assume that school type had already been controlled through family SES. Finally, pupil's gender had a significant main effect on the main research variables in both samples. However, the results of univariate tests for both samples showed that these effects were significant only on some variables (4 out of 18 for the German sample; 4 out of 18 for the Thai sample). This indicated that pupils' gender did not have a strong effect on pupils' variables. Moreover, in both samples, pupils' gender was found to have significant effects on two similar pupils' variables (control and introjected regulation). Furthermore, the proportions of pupils by gender were quite similar in both samples. That is, more than one-half of the pupils from both samples were boys (55% of the German sample; 52% of the Thai sample). Therefore, it was assumed that it was not necessary to control for pupils' gender.

Chapter V
Main Findings

This chapter presents the main findings of the current research divided into four parts, namely: (5.1.) intercorrelations among the main research variables, (5.2) The structural models of antecedents of the quality of home-based parental involvement, (5.3) The structural models of antecedents and consequences of the quality of home-based parental involvement, and (5.4) The test of the invariance in the complete structural model across the German and Thai samples.

5.1. Intercorrelations Among the Main Research Variables

This part of analysis used Pearson's correlation coefficients to gain first insights into the relationships among the main research variables for the German and Thai samples. The correlational analysis emphasized three aspects: (a) correlations among research variables that belonged to the same latent constructs (e.g. two dimensions of authoritative kinds of parental instruction, two forms of autonomous learning motivation); (b) correlations among predictor constructs and dimensions of parental instruction; and (c) correlations among dimensions of parental instruction and pupils' academic functioning outcomes. For ease of presentation in the tables, abbreviations are used for the main research variables (see the list of abbreviations in *pp.* 170–171).

5.1.1. Findings from the German Sample

Table 5.1 shows the intercorrelation matrix for the main research variables for the German sample. The significant correlations among the four dimensions of parental instruction ranged from $r = .16$ ($p < .01$) to $r = .63$ ($p < .01$). As expected, two dimensions of authoritative parental instruction (i.e. autonomy-support and responsiveness) had strong positive intercorrelations. On the other hand, two dimensions of authoritarian parental instruction (i.e. control and structure) also had strong positive intercorrelations.

The significant correlations among the 14 pupils' academic functioning outcomes ranged from $r = .12$ ($p < .05$) to $r = .68$ ($p < .01$). As mentioned in previous chapters, these 14 academic functioning outcomes were grouped conceptually under five latent constructs, namely, autonomous learning motivation, controlled learning motivation, academic well-being, regulation of academic motivation, and regulation of academic emotion. As expected, pupils' academic functioning outcomes that belonged to the same latent constructs had strong positive intercorrelations.

The significant correlations between the four dimensions of parental instruction and the 14 pupils' academic functioning outcomes ranged from $r = .12$ ($p < .05$) to $r = .41$ ($p < .05$). As expected, the two dimensions of authoritative parental instruction correlated positively with all pupils' academic functioning outcomes, *except external regulation*. Parental control had a strong positive correlation with external regulation. Yet, it correlated negatively with two indicators of academic well-being (i.e. school satisfaction, positive academic emotion). Surprisingly, the two strategies of regulation of positive academic emotion (i.e. self-reinforcement, social affirmation) correlated positively with parental control. Structure had a strong positive correlation with introjected regulation and external regulation. Moreover, structure correlated positively with self-consequating and all emotion regulation strategies.

The significant correlations between 11 predictor constructs and four dimensions of parental instruction ranged from $r = -.12$ ($p < .05$) to $r = .29$ ($p < .01$). Overall, 7 of the 11 predictor constructs had significant intercorrelations with the four dimensions of parental instruction. As expected, the two dimensions of authoritative parental instruction correlated positively with general teaching efficacy, domain-specific teaching efficacy, and time and energy for involvement. Yet, the two dimensions of authoritative parental instruction correlated negatively with goal orientation towards achievement. In contrast, the two dimensions of authoritarian parental instruction yielded positive correlations with goal orientation towards achievement. General teaching efficacy and time and energy correlated negatively with parental control. Family SES correlated positively with autonomy-support but negatively with parental control.

Table 5.1
Intercorrelation Matrix for the Main Research Variables for the German Sample (N = 288)

Research variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. AUTO	—														
2. RESS	.63**	—													
3. CONTR	–.22**	–.29**	—												
4. STRUC	.16**	.01	.41**	—											
5. ITMOTIV	.17**	.25**	–.04	–.05	—										
6. IDMOTIV	.24**	.36**	–.01	.10	.61**	—									
7. IJMOTIV	.28**	.36**	.08	.22**	.42**	.52**	—								
8. EXMOTIV	.05	.05	.40**	.39**	.15**	.31**	.49**	—							
9. SATIS	.26**	.35**	–.14*	–.10	.44**	.37**	.28**	–.03	—						
10. PANAS	.32**	.41**	–.22**	–.08	.27**	.33**	.27**	.03	.37**	—					
11. INENH	.29**	.26**	.02	.06	.43**	.33**	.40**	.16**	.36**	.33**	—				
12. SCON	.29**	.35**	.07	.14*	.29**	.26**	.46**	.30**	.26**	.26**	.45**	—			
13. SFRE	.20**	.16**	.12*	.23**	.07	.09	.36**	.31**	.15*	.16**	.26**	.40**	—		
14. SOAF	.21**	.18**	.14*	.15*	.21**	.18**	.45**	.32**	.16**	.12*	.29**	.38**	.68**	—	
15. SFAF	.23**	.25**	.04	.19**	.14*	.26**	.48**	.30**	.20**	.16**	.33**	.43**	.52**	.63**	—
16. SICON	.39**	.39**	–.03	.22**	.26**	.34**	.36**	.19**	.33**	.22**	.39**	.38**	.32**	.24**	.36**
17. SFINS	.32**	.36**	.02	.18**	.31**	.39**	.32**	.18**	.38**	.22**	.36**	.41**	.35**	.30**	.41**
18. SOSUP	.35**	.33**	–.05	.17**	.06	.18**	.28**	.13*	.19**	.16**	.22**	.20**	.26**	.26**	.29**
19. ACRESP	.10	.16**	–.09	–.05	.12*	.11	.06	–.02	.13*	.08	.11	.02	–.01	.05	.09
20. PSRESP	–.06	.00	–.04	.04	.01	.04	–.03	.05	–.06	.07	–.00	–.01	.06	.08	.07
21. GOALPC	.01	.05	.04	.07	.10	.07	.06	.02	.14*	.04	.11	.07	.01	.07	.09
22. GOALPD	–.16**	–.16**	.29**	.19**	.05	.10	.11	.21**	–.06	–.05	–.02	–.03	.07	.08	.01
23. GEFFC	.13*	.15*	–.12*	–.01	.20**	.12*	.15**	.00	.10	.16**	.08	.03	–.00	.02	.03
24. MEFFC	.15*	.19**	–.06	.06	.25**	.13*	.16**	–.00	.13*	.08	.11	.15*	.07	–.02	.10
25. INC	.09	.18**	–.10	–.04	.07	.02	.13*	–.06	.13*	.11	.14*	.05	.03	.08	.13*
26. INT	.07	.03	–.10	–.09	.04	.00	–.01	–.12*	.09	.02	.04	.02	–.05	–.08	–.01
27. TE	.25**	.25**	–.12*	.01	.21**	.14*	.15**	.07	.20**	.14*	.14*	.10	.01	.03	.07
28. VAL	–.05	–.07	.05	–.04	.04	–.02	–.05	–.08	–.05	–.03	–.10	–.16**	–.08	–.05	–.11
29. FSES	.19**	.05	–.14*	.01	-.04	–.04	–.09	–.18**	.06	.01	.09	.01	–.06	–.16**	–.03

	16	17	18	19	20	21	22	23	24	25	26	27	28	29
16. SICON	—													
17. SFINS	.66**	—												
18. SOSUP	.47**	.35**	—											
19. ACRESP	.05	.04	.13*	—										
20. PSRESP	–.02	–.05	–.02	.18**	—									
21. GOALPC	.06	.07	.05	.35**	.22**	—								
22. GOALPD	–.01	–.01	–.01	–.05	.18**	.23**	—							
23. GEFFC	.14*	.16**	.10	.24**	.04	.23**	.04	—						
24. MEFFC	.25**	.23**	.17**	.17**	–.02	.05	–.05	.25**	—					
25. INC	.09	.07	.14*	.32**	.11	.29**	.02	.35**	.10	—				
26. INT	.02	.11	.08	.28**	–.08	.16**	–.10	.29**	.14*	.18**	—			
27. TE	.16**	.17**	.12*	.29**	–.01	.12*	–.10	.43**	.21**	.35**	.30**	—		
28. VAL	–.04	.01	–.03	–.06	.02	.06	.16**	.02	.18**	–.06	–.00	.01	—	
29. FSES	.14*	.04	.09	.14*	–.11	.07	–.27**	.05	.18**	.08	.05	.10	.03	—

Note. Four dimensions of parental instruction (1–4). Fourteen pupils' academic functioning outcomes (5–18). Eleven predictor constructs (19–29).
**p* < .05. ***p* < .01.

5.1.2. Findings from the Thai Sample

Table 5.2 shows that the significant correlations among the four dimensions of parental instruction ranged from $r = .11$ ($p < .05$) to $r = .59$ ($p < .01$). As assumed, on the one hand, the two dimensions of authoritative parental instruction had strong positive intercorrelations with each other, and, on the other hand, the two dimensions of authoritarian parental instruction also had strong positive intercorrelations.

The significant correlations among the 14 pupils' academic functioning outcomes ranged from $r = .10$ ($p < .05$) to $r = .69$ ($p < .01$). Overall, pupils' academic functioning outcomes that belonged to the same latent constructs had strong positive intercorrelations.

The significant correlations between the four dimensions of parental instruction and the 14 pupils' academic functioning outcomes ranged from $r = .10$ ($p < .05$) to $r = .37$ ($p < .05$). As expected, the two dimensions of authoritative parental instruction correlated positively with all the pupils' academic functioning outcomes. In addition, the two dimensions of authoritarian parental instruction correlated positively with the two forms of controlled learning motivation. Unexpectedly, the two dimensions of authoritarian parental instruction correlated positively with the two strategies for motivation regulation and the six strategies for emotion regulation.

The significant correlations between the 11 predictor constructs and the 4 dimensions of parental instruction ranged from $r = –.09$ ($p < .05$) to $r = .18$ ($p < .01$). Overall, 6 of the 11 predictor constructs intercorrelated significantly with the four dimensions of parental instruction. As hypothesized, parental conception of active responsibility and goal orientation towards learning correlated positively with the two dimensions of authoritative parental instruction and structure. Time and energy for involvement correlated negatively with parental control. Family SES correlated positively with autonomy-support and structure.

Table 5.2

Intercorrelation Matrix for the Main Research Variables for the Thai Sample (N = 494)

Research variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. AUTO	—														
2. RESS	.59**	—													
3. CONTR	.11*	–.03	—												
4. STRUC	.22**	.16**	.40**	—											
5. ITMOTIV	.25**	.27**	.05	.07	—										
6. IDMOTIV	.35**	.37**	.07	.26**	.56**	—									
7. IJMOTIV	.15**	.17**	.22**	.23**	.20**	.23**	—								
8. EXMOTIV	.11*	.11*	.30**	.30**	.12**	.21**	.69**	—							
9. SATIS	.16**	.14**	.07	.07	.34**	.25**	.19**	.08	—						
10. PANAS	.11*	.16**	–.24**	–.08	.18**	.16**	–.11*	–.17**	.12**	—					
11. INENH	.27**	.21**	.15**	.15**	.43**	.38**	.23**	.15**	.26**	.10*	—				
12. SCON	.32**	.26**	.18**	.18**	.25**	.31**	.32**	.24**	.23**	–.03	.45**	—			
13. SFRE	.23**	.24**	.16**	.20**	.23**	.29**	.29**	.22**	.16**	.04	.36**	.54**	—		
14. SOAF	.23**	.23**	.18**	.16**	.30**	.21**	.37**	.28**	.24**	.01	.34**	.44**	.62**	—	
15. SFAF	.29**	.32**	.10*	.19**	.28**	.37**	.18**	.15**	.20**	.12**	.34**	.42**	.47**	.48**	—
16. SICON	.34**	.30**	.11*	.18**	.39**	.41**	.21**	.16**	.36**	.07	.47**	.43**	.37**	.37**	.43**
17. SFINS	.33**	.30**	.14**	.19**	.42**	.43**	.29**	.24**	.34**	.07	.46**	.42**	.40**	.38**	.42**
18. SOSUP	.23**	.20**	.09	.07	.08	.17**	.22**	.18**	.11*	.01	.18**	.30**	.33**	.36**	.31**
19. ACRESP	.19**	.12**	.00	.08	.03	.07	–.01	.02	.02	–.01	.04	.10*	.05	–.00	.07
20. PSRESP	.03	.08	.03	–.01	.00	–.02	.03	.04	.02	.02	.01	.04	.07	.08	–.01
21. GOALPC	.11*	.15**	–.08	.11*	–.01	.08	–.05	–.01	.04	–.08	.04	.05	–.02	–.10*	.08
22. GOALPD	–.01	–.01	.08	–.06	.10*	.00	.10*	.04	.11*	.00	.06	.02	.08	.10*	.02
23. GEFFC	.08	.08	–.05	–.04	.08	–.01	–.02	–.04	.01	.12**	.11*	.02	.03	.00	.06
24. MEFFC	.09	.02	–.03	.08	.07	.05	–.04	–.03	–.05	–.00	.02	–.01	–.07	–.06	.04
25. INC	.08	.17**	–.06	.01	.05	.11*	–.02	.03	.11*	.06	.05	.07	.05	–.02	.16**
26. INT	.07	.04	–.06	–.06	.03	.01	.04	.11*	.06	.07	.02	.07	.04	.05	.08
27. TE	.09	.16**	–.09*	.01	.04	.04	–.08	–.06	.06	.04	.00	.03	.01	–.06	.05
28. VAL	.12**	.05	–.08	–.01	.13**	.11*	–.01	–.01	.08	.02	.12**	.11*	.04	.03	.10*
29. FSES	.18**	.09	–.02	.15**	–.10*	.05	–.04	.00	.01	–.04	.10*	.08	.03	–.09	.06

	16	17	18	19	20	21	22	23	24	25	26	27	28	29
16. SICON	—													
17. SFINS	.59**	—												
18. SOSUP	.25**	.13**	—											
19. ACRESP	.05	.11*	.02	—										
20. PSRESP	.03	.06	.01	.27**	—									
21. GOALPC	.09*	.07	–.00	.49**	.21**	—								
22. GOALPD	.04	.06	.04	.08	.26**	.11*	—							
23. GEFFC	.03	.02	–.01	.28**	.17**	.16**	.21**	—						
24. MEFFC	–.03	–.02	–.04	.05	–.17**	.02	–.04	.24**	—					
25. INC	.08	.09*	–.03	.39**	.15**	.30**	.11*	.40**	.10*	—				
26. INT	.02	–.00	.06	.23**	.13**	.12**	.15**	.36**	.06	.41**	—			
27. TE	–.00	.00	–.02	.40**	.07	.33**	–.03	.25**	.08	.41**	.14**	—		
28. VAL	.06	.07	.07	.25**	.02	.18**	–.06	.20**	.10*	.13**	.14**	.23**	—	
29. FSES	.10*	.08	.03	.20**	–.21**	.26**	–.18**	.05	.06	.14**	–.06	.26**	.16**	—

Note. Four dimensions of parental instruction (1–4). Fourteen pupils' academic functioning outcomes (5–18). Eleven predictor constructs (19–29).

**p* < .05. ***p* < .01.

5.1.3 Summary

As shown in previous sections, findings revealed that the research variables belonging to the same latent constructs had strong positive intercorrelations in both samples. Hence, these variables may be assumed to be significant indicators of the constructs they belonged to. However, some different results were found across German and Thai samples. The predictor constructs correlated with the four dimensions of parental instruction in different ways, and the four parents' instructional dimensions also correlated with a set of pupils' academic functioning outcomes in different ways. To conclude, the findings from this correlational analysis create an initial impression that the main research variables are more or less closely related to each other and that these relations take the expected directions. Yet, it is too early to draw any conclusion on the causal paths between antecedents and consequences of the quality of parental instruction. The next step will perform structural equation modelling analysis in order to test these causal paths empirically.

5.2. Examining the Conceptual Model

This part of the analysis aimed to empirically validate the conceptual model of the current study (as explained earlier in the literature review chapter, see *pp.* 49–53). To gain a deeper insight into the *consistency of each causal path*, the main complex model was broken down into five smaller structural models and one complete structural model. A series of model validations were performed in a hierarchical order based on an increasing number of causal paths.

The first model and *the second* model examined what impact predictor constructs had on authoritative and authoritarian kinds of parental instruction. *The third model* investigated what predictor constructs contribute when both kinds of parental instruction were included. *The fourth model* and *the fifth model* examined how far the two distinct kinds of instruction mediated relations among the predictor constructs and a set of pupils' academic functioning outcomes. Finally, the sixth model (the complete model or the full hypothetical model) examined an overview of all linkages. In the final phase of analysis, the invariance in the complete model was tested across German and Thai samples.

Model fit was evaluated by considering the χ^2 test, a ratio of χ^2 to *df*, and four other fit indices—the goodness of fit index (GFI), the comparative fit index (CFI), the standardized root mean square residual (SRMR), and the root-mean-square-error of approximation (RMSEA). The criteria for acceptable model fit relied considerably on Schreiber et al. (2006)—a non-significant χ^2, a ratio of χ^2 to *df* of 2 or 3 or lower, a value of GFI of .95 or higher, a value of CFI of .95 or higher, a value of SRMR of .08 or lower, and a value of RMSEA of .06 or lower.

5.2.1. Structural Models of the Antecedents of the Quality of Home-Based Parental Involvement

This section presents the findings from the validation of the first, the second, and the third models with the data drawn from each sample. In total, there are six sub-sections: (5.2.1A) the structural model of the antecedents of authoritative parental instruction for the German sample, (5.2.1B) the structural model of the antecedents of authoritative parental instruction for the Thai sample, (5.2.1C) the structural model of the antecedents of authoritarian parental instruction for the German sample, (5.2.1D) the structural model of the antecedents of authoritarian parental instruction for the Thai sample, (5.2.1E) the structural model of the antecedents of authoritative versus authoritarian parental instruction for the German sample, and (5.2.1F) the structural model of the antecedents of authoritative versus authoritarian parental instruction for the Thai sample.

5.2.1A. Structural Model of the Antecedents of Authoritative Parental Instruction for the German Sample

The first test examined the structural model of antecedents of authoritative parental instruction for the German sample. As Figure 5.1 shows, the structural model was specified by 11 manifest parent variables influencing the latent construct of authoritative parental instruction as measured by two manifest indicators—autonomy-support and responsiveness. The model structure as well as the standardized parameter estimates and model fit indices are presented in Figure 5.1. Findings revealed that the structural model fitted the empirical data well, as indicated by excellent fit indices, χ^2 (4, N = 288) = 1.01, χ^2/df = .25, p = .91, GFI = .99, CFI = 1.00, SRMR = .01, RMSEA = .00. Responsiveness yielded a higher factor loading (β = .99, p < .01) on the latent construct of authoritative parental instruction compared to autonomy-support (β = .63). The latent construct of authoritative parental instruction was predicted significantly by seven predictor constructs. The R^2 for authoritative parental instruction was .29. This means that the predictor constructs explained 29% of the variance in authoritative parental instruction.

As expected, a higher level of authoritative parental instruction was predicted significantly by higher levels of domain-specific teaching efficacy beliefs (β = .25, p < .05), invitation to involvement from the child (β = .16, p < .05), and personal time and energy (β = .22, p < .01). In contrast, a lower level of authoritative parental instruction was predicted significantly by higher levels of parental conception of passive responsibility (β = –.23, p < .05) and goal orientation towards achievement (β = –.21, p < .01).

Contrary to theoretical expectations, a lower level of authoritative parental instruction was predicted significantly by higher levels of invitation to involvement from the school staff (β = –.22, p < .01) and valence towards school (β = –.17, p < .01).

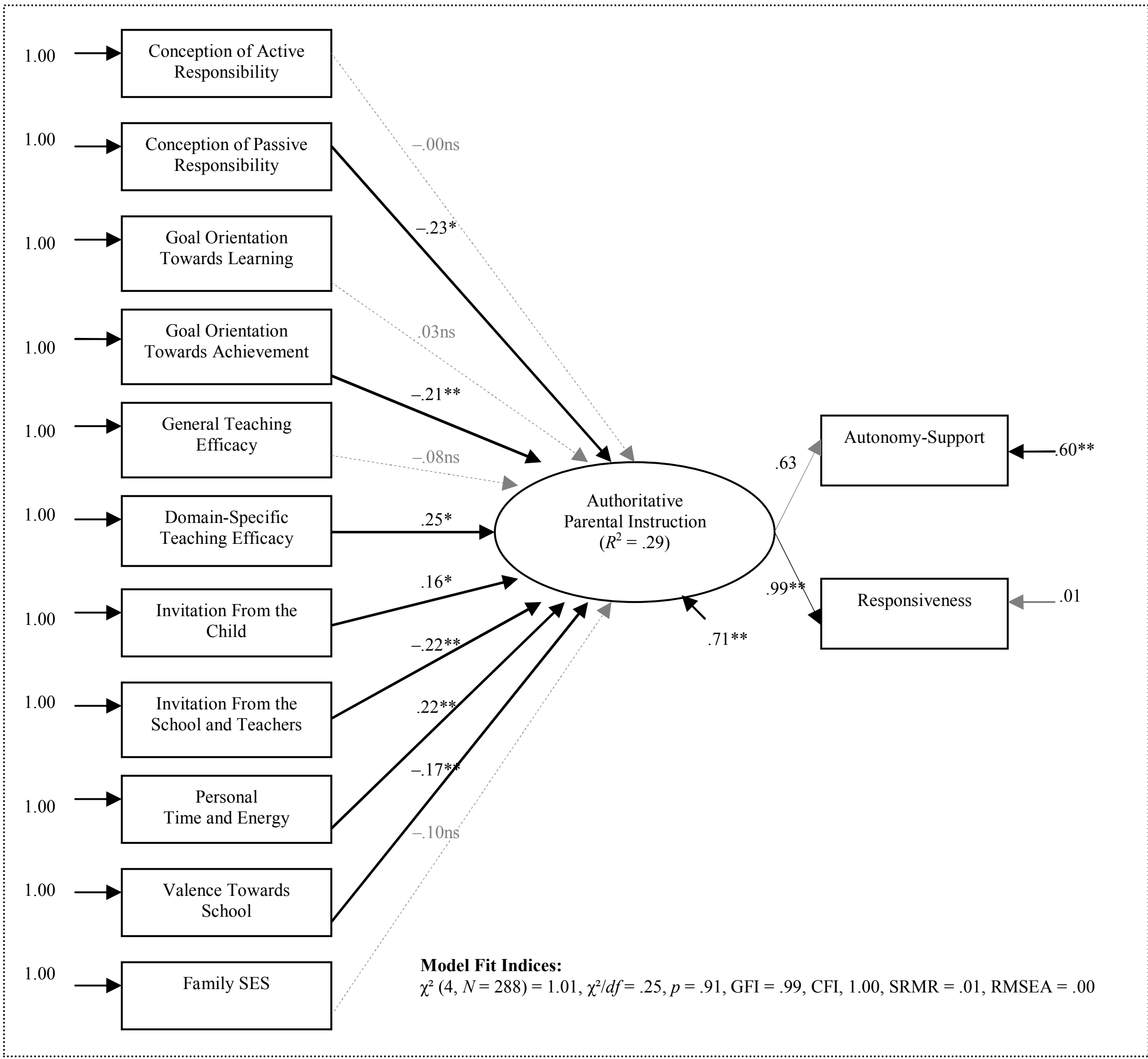


Figure 5.1.
Empirically Validated Structural Model of the Antecedents of Authoritative Parental Instruction for the German Sample (*$p < .05$. **$p < .01$.).

5.2.1B. Structural Model of the Antecedents of Authoritative Parental Instruction for the Thai Sample

As in the previous sub-section of the analysis (5.2.1A), the same structure of structural model of antecedents of authoritative parental instruction was tested, but, this time, the model was validated with data from the Thai sample. As can be seen in Figure 5.2, results showed that the structural model fitted the empirical data nicely, as indicated by reasonable good fit indices, χ^2 (2, N = 494) = 2.83, χ^2/df = 1.42, p = .24, GFI = .99, CFI = .99, SRMR = .01, RMSEA = .03. The factor loadings of both autonomy-support (β = .77) and responsiveness (β = .77, p < .01) on the latent construct of authoritative parental instruction were equal. The latent construct of authoritative parental instruction was predicted significantly by seven predictor constructs. The R^2 for authoritarian parental instruction was .20.

Thus, the predictor constructs explained 20.00% of the variance in authoritative parental instruction.

In line with theoretical expectations, a higher level of authoritative parental instruction was predicted significantly by higher levels of parental conception of active responsibility ($\beta = .28$, $p < .01$), invitation to involvement from the child ($\beta = .26$, $p < .01$), and personal time and energy ($\beta = .15$, $p < .05$). In contrast, a lower level of authoritative parental instruction was predicted significantly by a higher level of goal orientation towards achievement ($\beta = -.14$, $p < .05$).

Surprisingly, a lower level of authoritative parental instruction was predicted significantly by higher levels of domain-specific teaching efficacy beliefs ($\beta = -.14$, $p < .05$), invitation from the school and teachers to involvement ($\beta = -.15$, $p < .05$), and family SES ($\beta = -.14$, $p < .01$).

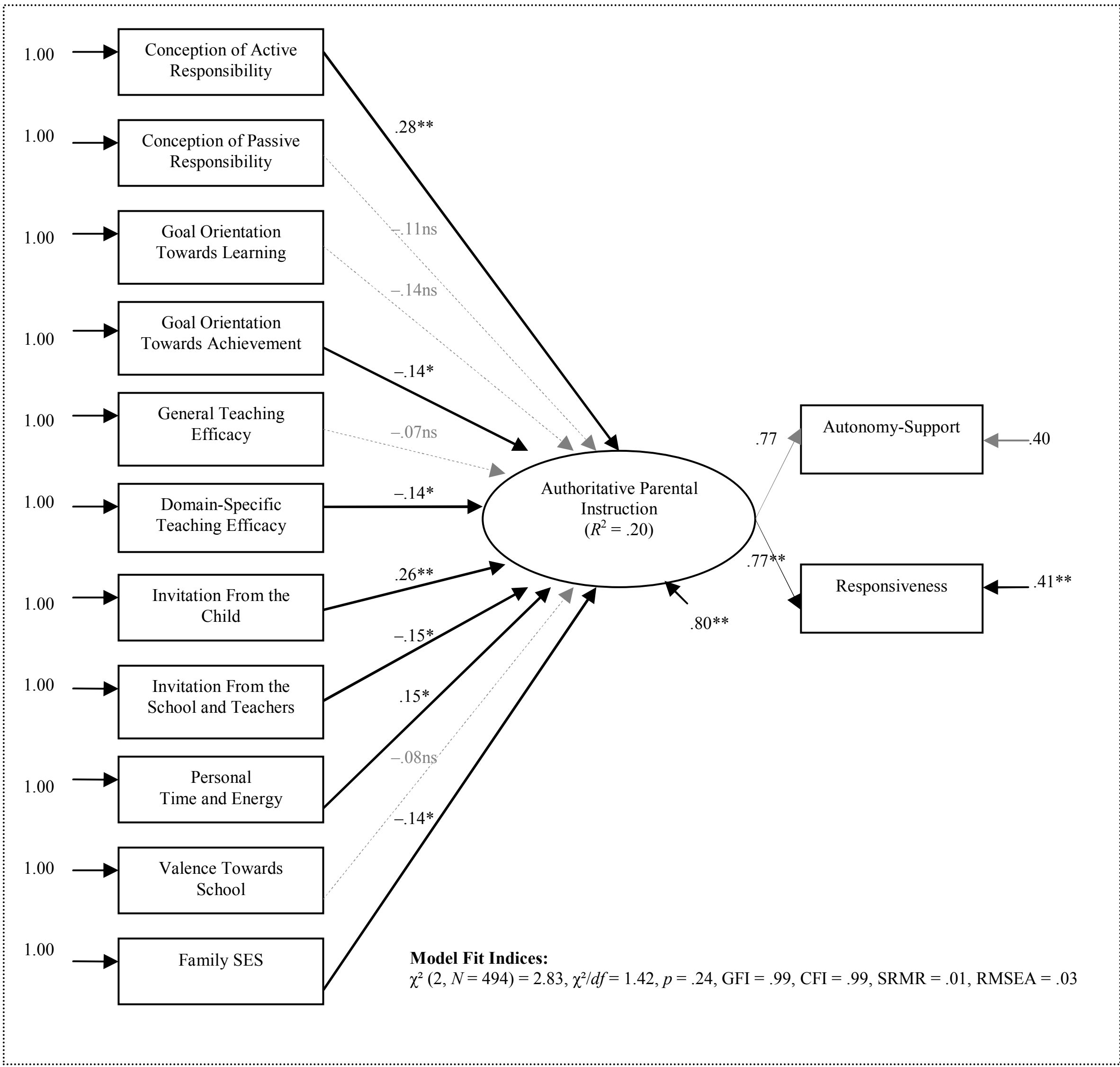


Figure 5.2.
Empirically Validated Structural Model of the Antecedents of Authoritative Parental Instruction for the Thai Sample (*$p < .05$. **$p < .01$.).

5.2.1C. Structural Model of the Antecedents of Authoritarian Parental Instruction for the German Sample

This sub-section of the analysis tested the structural model of antecedents of authoritarian parental instruction for the German sample. The structural model was specified by 11 manifest factors predicting the latent construct of authoritarian parental instruction as measured by two manifest indicators—control and structure. As Figure 5.3 shows, findings revealed that the empirical data supported the structural model well, as indicated by excellent fit indices, χ^2 (8, N = 288) = 4.57, χ^2/df = .57, p = .80, GFI = .99, CFI = 1.00, SRMR = .01, RMSEA= .00. Parental control yielded a higher factor loading (β = .89) on the latent construct of authoritarian parental instruction compared to structure (β = .46, p <

.01). The latent construct of authoritarian parental instruction was predicted significantly by six predictor constructs. The R^2 for authoritarian parental instruction was .35, suggesting that the predictor constructs explained 35% of the variance in authoritarian parental instruction.

In line with assumptions, a higher level of goal orientation towards achievement (β = .22, p < .01) significantly predicted a higher level of authoritarian parental instruction. In contrast, a lower level of authoritarian parental instruction was predicted significantly by higher levels of parental conception of passive responsibility (β = –.22, p = .01), general teaching efficacy (β = –.17, p < .05), invitation from the school and teachers (β = –.15, p < .05), valence towards school (β = –.37, p < .01), and family SES (β = –.21, p < .01).

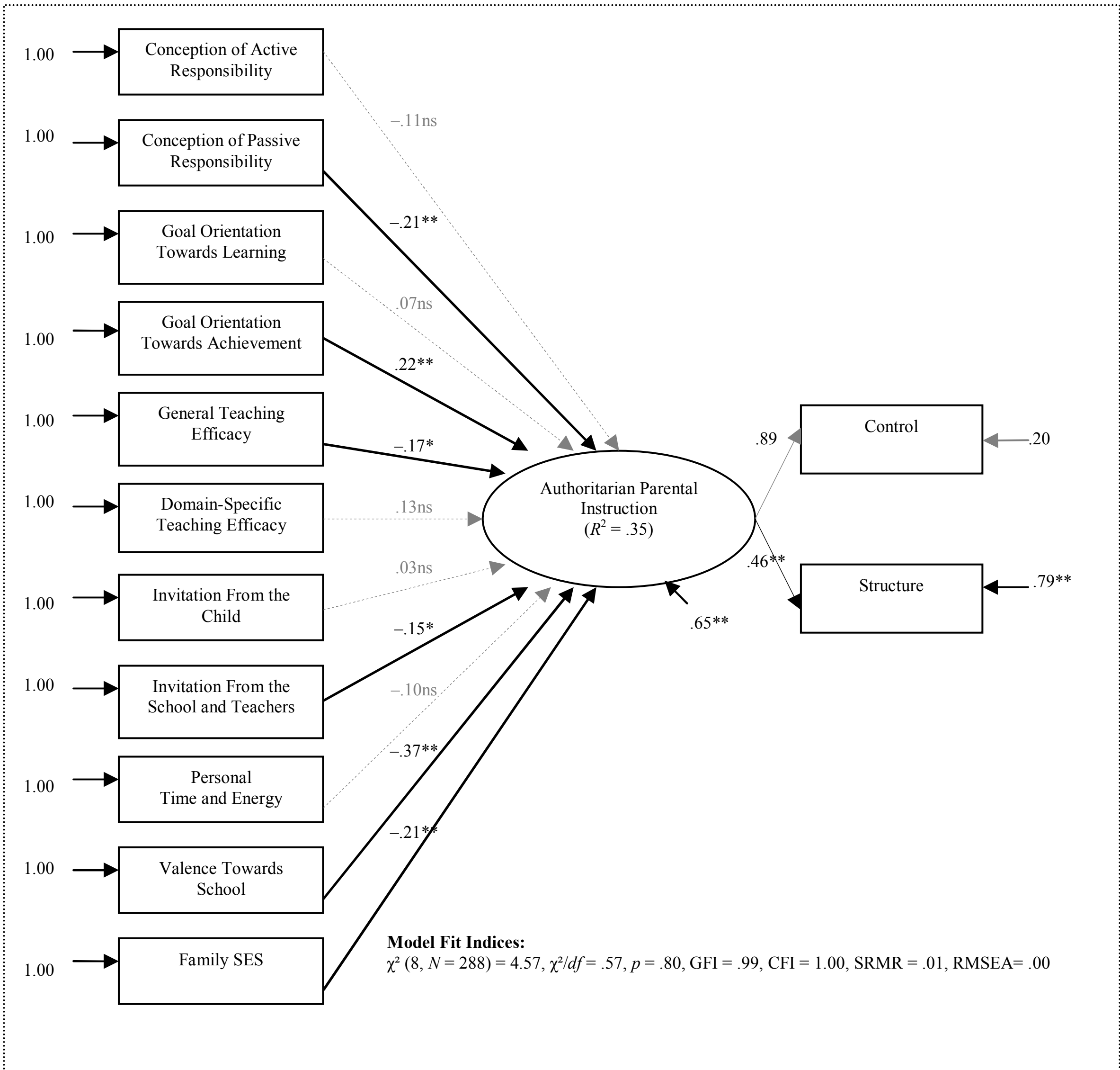


Figure 5.3.
Empirically Validated Structural Model of the Antecedents of Authoritarian Parental Instruction for the German Sample (*p < .05. **p < .01.).

5.2.1D. Structural Model of the Antecedents of Authoritarian Parental Instruction for the Thai Sample

As in the previous sub-section of the analysis (5.2.1C), the same structural model of antecedents of authoritarian parental instruction was tested by validating the model with data obtained from the Thai sample. As Figure 5.4 shows, findings revealed that the structural model fitted the data well, as indicated by excellent fit indices, χ^2 (1, N = 494) = .02, χ^2/df = .02, p = .88, GFI = 1.00, CFI = 1.00, SRMR = .00, RMSEA= .00. Parental control yielded a higher factor loading (β = .84) on the latent construct of authoritarian parental instruction compared to structure (β = .47, p < .01). The latent construct of authoritarian parental instruction was predicted significantly by six predictor constructs. The R^2 for authoritarian parental instruction was .22, revealing that the predictor constructs explained 22% of the variance in authoritarian parental instruction.

As expected, a higher level of authoritarian parental instruction was predicted significantly by goal orientation towards achievement (β = .16, p < .01). In contrast, a lower level of authoritarian parental instruction was predicted significantly by higher levels of goal orientation towards learning (β = –.24, p < .01), general teaching efficacy (β = –.17, p < .01), invitation to involvement from the child (β = –.21, p < .01), and invitation to involvement from the school and teachers (β = –.13, p < .05).

Contrary to the hypotheses, a higher level of authoritarian parental instruction was predicted significantly by a higher level of parental conception of active responsibility (β = .42, p < .01).

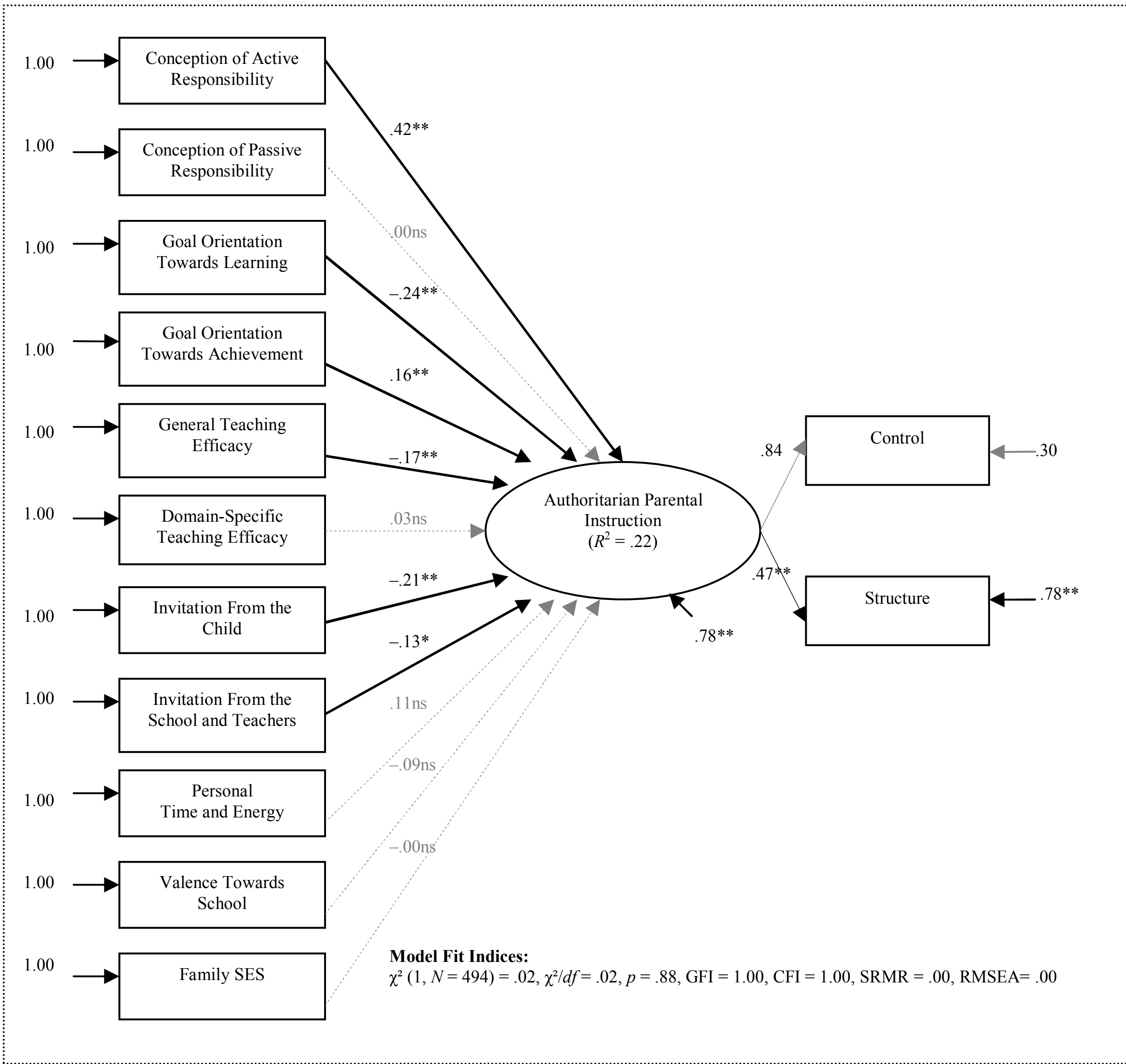


Figure 5.4.
Empirically Validated Structural Model of the Antecedents of Authoritarian Parental Instruction for the Thai Sample (*$p < .05$. **$p < .01$.).

5.2.1E. Structural Model of the Antecedents of Authoritative Versus Authoritarian Parental Instruction for the German Sample

This sub-section of the analysis examined how predictor constructs contributed when both distinct kinds of parental instruction were *included together* in the structural model. As Figure 5.5 shows, findings revealed that the data supported the structural model well, as indicated by excellent fit indices, χ^2 (9, N = 288) = .48, χ^2/df = .05, p = .99, GFI = 1.00, CFI = 1.00, SRMR = .00, RMSEA= .00. Responsiveness yielded a higher factor loading (β = .95, $p < .01$) on the latent construct of authoritative parental instruction compared to autonomy-support (β = .65). Parental control yielded a higher factor loading (β = .84) on the latent construct of authoritarian parental instruction compared to structure (β = .49, $p < .01$).

Antecedents of Authoritative Parental Instruction

The latent construct of authoritative parental instruction was predicted significantly by four predictor constructs. The R^2 for authoritative parental instruction was .20, indicating that the predictor constructs explained 20% of the variance in authoritative parental instruction.

As expected, results showed that domain-specific parental teaching efficacy (β = .16, $p < .05$) and time and energy (β = .25, $p < .01$) were significant positive predictors of authoritative parental instruction. In contrast, goal orientation towards achievement (β = –.16, $p < .05$) was a significant negative predictor of authoritative parental instruction. Contrary to expectations, invitation from the school staff (β = –.24, $p < .01$) was a significant negative predictor of authoritative parental instruction. The results from this model were consistent with those from the previous model in Sub-section 5.2.1A, in which *authoritative parental instruction was a single outcome* (see Figure 5.1).

In addition, the previous model in Sub-section 5.2.1A showed that parental conception of passive responsibility, invitation from the child, and valence towards school yielded significant direct effects on authoritative parental instruction. Surprisingly, these predictor constructs were no longer significant predictors of authoritative parental instruction in the current model.

Antecedents of Authoritarian Parental Instruction

The latent construct of authoritarian parental instruction was predicted significantly by five predictor constructs. The R^2 for authoritarian parental instruction was .31. Thus, the predictor constructs explained 31% of the variance in authoritarian parental instruction.

In line with assumptions, the results revealed that goal orientation towards achievement (β = .28, p < .01) was a significant positive predictor of authoritarian parental instruction. In contrast, parental conception of passive responsibility (β = –.15, p < .01), invitation from the school staff (β = –.21, p < .01), and valence towards school (β = –.16, p < .05) were significant negative predictors of authoritarian parental instruction. The results from this model were yet again in line with those from the previous model in Sub-section 5.2.1C in which *authoritarian parental instruction was a single outcome* (see Figure 5.3).

Furthermore, in the previous model in Sub-section 5.2.1C, time and energy was not found to be a significant predictor of authoritarian parental instruction at all. Yet, in the current model, this predictor construct was a significant negative predictor of authoritarian parental instruction (β = –.22, p < .05)—in line with theoretical expectations.

Apart from this, in the previous model in Sub-section 5.2.1C, general teaching efficacy and family SES were significant predictors of authoritative parental instruction. Surprisingly, these two predictor constructs were no longer significant predictors of authoritative parental instruction in the current model.

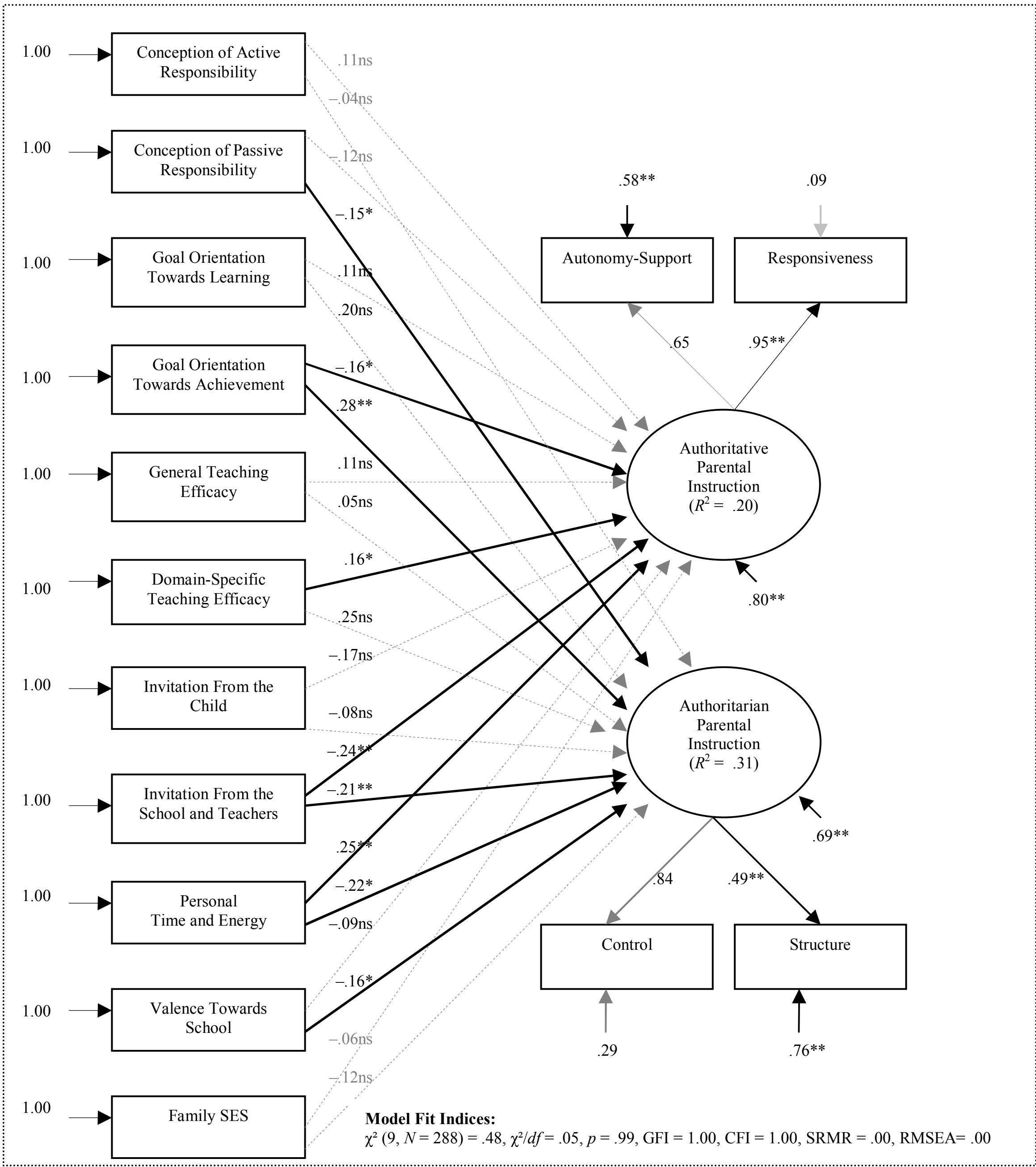


Figure 5.5.
Empirically Validated Structural Model of the Antecedents of Authoritative Versus Authoritarian Parental Instruction for the German Sample (**p* < .05. ***p* < .01.).

5.2.1F. Structural Model of the Antecedents of Authoritative Versus Authoritarian Parental Instruction for the Thai Sample

The same structural model of antecedents of authoritative versus authoritarian parental instruction was tested as in the previous sub-section of the analysis (5.2.1D), but, this time, the current model was validated with the data from the Thai sample. As Figure 5.6 shows, findings revealed that the structural model fitted the data well, as indicated by excellent fit indices, χ^2 (11, N = 494) = 1.14, χ^2/df = .10, p = .99, GFI = 1.00, CFI = 1.00, SRMR = .00, RMSEA = .00).

Responsiveness yielded a higher factor loading (β = .95, p < .01) on the latent construct of authoritative parental instruction compared to autonomy-support (β = .78). Parental control yielded a higher factor loading (β = .84) on the latent construct of authoritarian parental instruction compared to structure (β = .47, p < .01).

Antecedents of Authoritative Parental Instruction

The latent construct of authoritative parental instruction was predicted significantly by five predictor constructs. The R^2 for authoritative parental instruction was .11, suggesting that the predictor constructs explained 11% of the variance in authoritative parental instruction.

In line with assumptions, findings showed that invitation to involvement from the child (β = .18, p < .01) was a significant positive predictor of authoritative parental instruction. This finding in the current model was consistent with the finding in the previous model in Sub-section 5.2.1B in which *authoritative parental instruction was a single outcome* (see Figure 5.2).

Furthermore, in the previous model in Sub-section 5.2.1B, domain-specific teaching efficacy and personal time and energy were significant positive direct effects of authoritative parental instruction. However, in the current model, the direct effects of these two predictor constructs on authoritative parental instruction were still significant, but revealed negative path coefficients ($\beta_{\text{domain-specific teaching efficacy}}$ = –.15, p < .01; $\beta_{\text{time and energy for involvement}}$ = –.17, p < .05). These findings in the current model were contrary to theoretical expectations.

Moreover, in the previous model in Sub-section 5.2.1B, parental conception of passive responsibility and goal orientation towards learning were not significant predictors of authoritative parental instruction at all. Yet, in the current model, these two predictor constructs yielded significant direct effects on authoritative parental instruction and revealed path coefficients in the expected directions. That is, a higher level of authoritative parental instruction was predicted significantly by a higher level of goal orientation towards learning (β = .14, p < .05). Vice versa, a lower level of authoritative parental instruction was predicted significantly by a higher level of parental conception of passive responsibility (β = –.19, p < .01).

Apart from this, in the previous model in Sub-section 5.2.1B, parental conception of active responsibility, goal orientation towards achievement, and family SES were significant predictors of authoritative parental instruction. Surprisingly, the findings in the current model showed that these three predictor constructs were no longer significant predictors of authoritative parental instruction.

Antecedents of Authoritarian Parental Instruction

The latent construct of authoritarian parental instruction was predicted significantly by six predictor constructs. The R^2 for authoritarian parental instruction was .43, which means that the predictor constructs explained 43% of the variance in authoritarian parental instruction.

As expected, goal orientation towards learning was a significant negative predictor of authoritarian parental instruction ($\beta = -.24$, $p < .01$). This result in the current model was consistent with the result in the previous model in Sub-section 5.2.1D in which *authoritarian parental instruction was a single outcome* (see Figure 5.4).

In addition, in the previous model in Sub-section 5.2.1D, goal orientation towards achievement yielded a significant positive direct effect on authoritarian parental instruction. Surprisingly, in the current model, the direct effect of this predictor construct on authoritarian parental instruction was still significant, but revealed a negative path coefficient ($\beta = -.33$, $p < .01$). This result in the current model was not in line with theoretical expectations.

Apart from this, in the previous model in Sub-section 5.2.1D, parental conception of passive responsibility, time and energy for involvement, valence towards school, and family SES to authoritarian parental instruction were not significant predictors of authoritarian parental instruction at all. Yet, in the current model, there were significant direct effects of these four predictor constructs on authoritarian parental instruction that revealed path coefficients in the expected directions. That is to say, a higher level of authoritarian parental instruction was predicted significantly by higher levels of parental conception of passive responsibility ($\beta = .28$, $p < .01$) and family SES ($\beta = .46$, $p < .01$). In contrast, a lower level of authoritarian parental instruction was predicted significantly by higher levels of personal time and energy ($\beta = -.23$, $p < .01$) and valence towards school ($\beta = -.22$, $p < .01$).

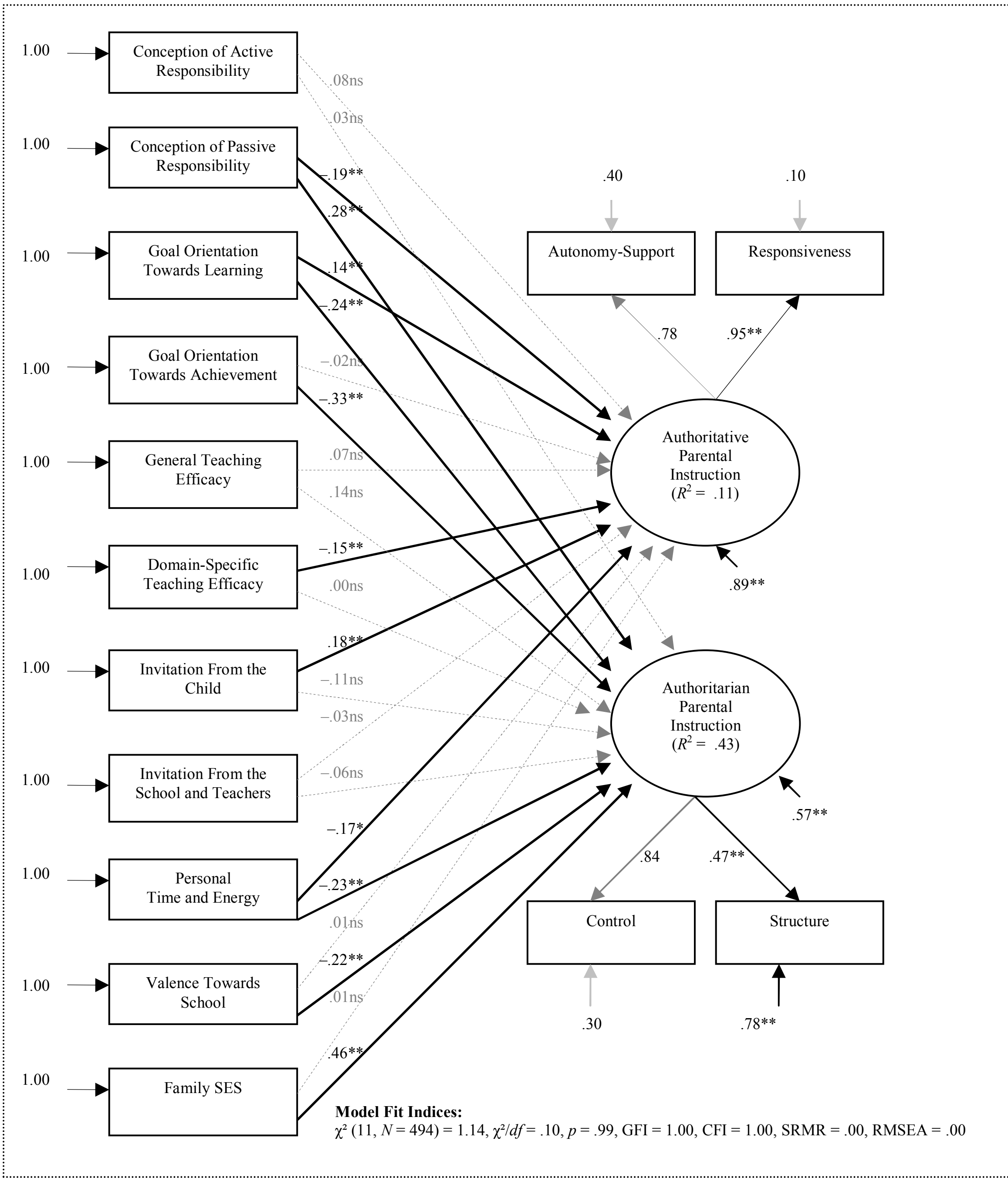


Figure 5.6.
Empirically Validated Structural Model of the Antecedents of Authoritative Versus Authoritarian Parental Instruction for the Thai Sample (*$p < .05$. **$p < .01$.).

5.2.1G. Short Summary

The aim of this analysis of this section was to empirically examine the linkages between 11 predictor constructs and two distinct kinds of parental instruction. To gain a deeper insight into the consistency of each causal path, a series of model validations were tested empirically in a hierarchical order based on an increasing number of causal paths. As shown in six sub-sections (5.2.1A−5.2.1F), the first model (authoritative parental instruction as a single outcome), the second model (authoritarian parental instruction as a single outcome), and the third model (two distinct kinds of parental instruction as double outcomes) were empirically validated with the data from the German and Thai samples—12 models in total. Overall, the models fitted the empirical data well. Yet, it was found that some linkages were not consistently significant when more or less variables were included in the models.

Looking at the consistent linkages in particular:

In the German sample, in the first and the third models, authoritative parental instruction were consistently significantly predicted by goal orientation towards achievement, domain-specific teaching efficacy, invitation from the school staff to involvement, and time and energy. In the second and the third models, authoritarian parental instruction was significantly consistently predicted by parental conception of passive responsibility, goal orientation towards achievement, invitation from the school staff to involvement, and valence towards school.

In the Thai sample, in the first and the third models, there were three consistently significant predictors of authoritative parental instruction. That is, domain-specific teaching efficacy, invitation from the child to involvement, and time and energy. In the second and the third models, authoritarian parental instruction was consistently significantly predicted by goal orientation towards learning and goal orientation towards achievement.

5.2.2. Structural Models of the Antecedents and Consequences of the Quality of Home-Based Parental involvement

Continuing from the previous sub-section (5.2.1), this section of the analysis presents the findings from the validation of *the fourth*, *fifth*, and *sixth models* (as mentioned earlier in *p*. 193) with the data from each sample. In total, the findings are divided into six sub-sections: (5.2.2A) the structural model of antecedents and consequences of authoritative parental instruction for the German sample, (5.2.2B) the structural model of antecedents and consequences of authoritative parental instruction for the Thai sample, (5.2.2C) the structural model of antecedents and consequences of authoritarian parental instruction for the German sample, (5.2.2D) the structural model of antecedents and consequences of authoritarian parental instruction for the Thai sample, (5.2.2E) the *complete* structural model of antecedents and consequences of authoritative versus authoritarian kinds of parental instruction for the German sample, and (5.2.2F) the complete structural model of antecedents and consequences of authoritative versus authoritarian kinds of parental instruction for the Thai sample.

5.2.2A. Structural Model of the Antecedents and Consequences of Authoritative Parental Instruction for the German Sample

This sub-section of the analysis tested the structural model of antecedents and consequences of authoritative parental instruction for the German sample. As Figure 5.7 shows, the structural model was specified by 11 manifest parent variables (predictor constructs) influencing the latent construct of authoritative parental instruction (as measured by autonomy-support and responsiveness). As a mediator, the latent construct of authoritative parental instruction, in turn, predicted five latent constructs of pupils' academic functioning outcomes (i.e. autonomous learning motivation, control learning motivation, academic well-being, regulation of academic motivation, and regulation of academic emotion). The model structure as well as standardized parameter estimates and model fit indices are presented in Figure 5.7. and Table 5.3. Overall, the findings revealed that the empirical data supported the structural model well, as indicated by excellent good fit indices, χ^2 (223, N = 288) = 185.05, χ^2/df = .83, p = .97, GFI = .95, CFI = 1.00, SRMR = .04, RMSEA = .00.

The Measurement Models

The validation of the measurement model of authoritative parental instruction revealed that responsiveness yielded a higher factor loading (β = .56, p < .01) on the latent construct of authoritative parental instruction compared to autonomy-support (β = .44).

In addition, findings on the validation of the measurement models of the five pupils' academic outcomes revealed that:

1) Identified regulation yielded a higher factor loading (β = .90, p < .01) on the latent construct of autonomous learning motivation compared to intrinsic regulation (β = .69).
2) Introjected regulation yielded a higher factor loading (β = 1.00) on the latent construct of controlled learning motivation compared to external regulation (β = .47, p < .01).
3) The factor loadings of both school satisfaction (β = .61) and positive academic emotion (β = .60, p < .01) on the latent construct of academic well-being were more or less equal.
4) Self-consequating yielded a higher factor loading (β = .72, p < .01) on the latent construct of regulation of academic motivation compared to interest enhancement (β = .61).
5) The factor loadings of the latent construct of regulation of academic emotion ranged between .48 (p < .01) and .70 (p < .01). Positive self-instructions yielded the highest factor loading. Self-reinforcement, seeking social affirmation, and seeking social yielded the smallest factor loadings.

Antecedents of Authoritative Parental Instruction

The latent construct of authoritative parental instruction was predicted significantly by four predictor constructs. The R^2 for authoritative parental instruction was .16, indicating that the predictor constructs explained 16% of the variance in authoritative parental instruction.

In line with theoretical assumptions, a higher level of authoritative parental instruction was predicted significantly by higher levels of domain-specific teaching efficacy beliefs (β = .27, p < .01), invitation to involvement from the child (β = .15, p < .05), and personal time and energy (β = .16, p < .05). In contrast, a lower level of authoritative parental instruction was predicted significantly by a higher level of valence towards school ($\beta = -.17$, $p < .05$).

Consequences of Authoritative Parental Instruction

The latent construct of authoritative parental instruction significantly predicted five latent constructs of pupils' academic outcomes. Overall, predictor constructs and authoritative parental instruction explained 36% of the variance in autonomous learning motivation ($R^2 = .36$), 45% of the variance in controlled learning motivation ($R^2 = .45$), 97% of the variance in academic well-being ($R^2 = .97$), 80% of the variance in regulation of academic motivation ($R^2 = .80$), and 96% of the variance in regulation of academic emotion ($R^2 = .96$).

As expected, a higher level of authoritative parental instruction significantly predicted higher levels of autonomous learning motivation ($\beta = .37$, $p < .01$), academic well-being ($\beta = .68$, $p < .01$), regulation of academic motivation ($\beta = .90$, $p < .01$), and regulation of academic emotion ($\beta = .98$, $p < .01$). Surprisingly, a higher level of authoritative parental instruction significantly predicted a higher level of controlled learning motivation ($\beta = .67$, $p < .01$).

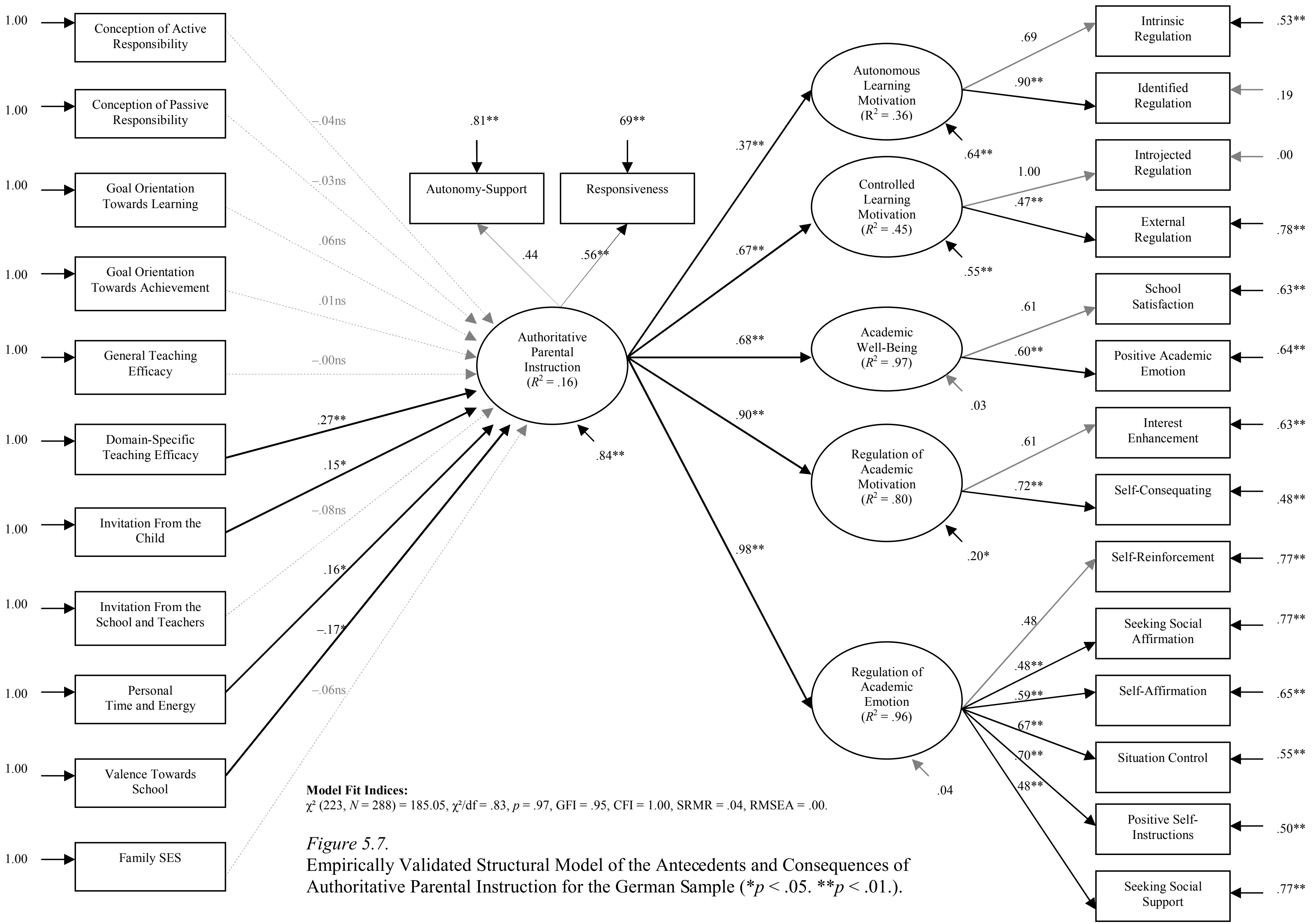
Mediation by Authoritative Parental Instruction

In addition, indirect effects of predictor constructs on pupils' academic functioning outcomes *as mediated* by authoritative parental instruction were examined (see Table 5.3). Overall, it was found that:

- Domain-specific teaching efficacy had significant positive indirect effects on all pupils' academic functioning outcomes, that is, autonomous learning motivation ($\beta = .10$, $p < .05$), controlled learning motivation ($\beta = .18$, $p < .01$), academic well-being ($\beta = .18$, $p < .01$), regulation of academic motivation ($\beta = .24$, $p < .01$), and regulation of academic emotion ($\beta = .26$, $p < .01$). These findings indicated that authoritative parental instruction mediated the relationships between domain-specific teaching efficacy and all pupils' outcomes.
- Invitation to involvement from the child had significant positive indirect effects on controlled learning motivation ($\beta = .10$, $p < .05$), academic well-being ($\beta = .10$, $p < .05$), regulation of academic motivation ($\beta = .14$, $p < .05$), and regulation of academic emotion ($\beta =$

.15, $p < .05$). These findings suggested that authoritative parental instruction mediated the relationships between invitation from the child to involvement and these four pupils' outcomes.

- Personal time and energy had significant positive indirect effects on controlled learning motivation ($\beta = .10$, $p = .05$), academic well-being ($\beta = .11$, $p < .05$), regulation of academic motivation ($\beta = .14$, $p < .05$), and regulation of academic emotion ($\beta = .15$, $p < .05$). These findings revealed that authoritative parental instruction mediated the relationships between parental time and energy for involvement and these three pupils' outcomes.
- Valence towards school had significant negative indirect effects on controlled learning motivation ($\beta = -.11$, $p < .05$), academic well-being ($\beta = -.11$, $p < .05$), regulation of academic motivation ($\beta = -.15$, $p < .05$), and regulation of academic emotion ($\beta = -.16$, $p < .05$). These findings indicated that authoritative parental instruction mediated the relationships between valence towards school and these four pupils' outcomes.



Model Fit Indices:
χ^2 (223, N = 288) = 185.05, χ^2/df = .83, p = .97, GFI = .95, CFI = 1.00, SRMR = .04, RMSEA = .00.

Figure 5.7.
Empirically Validated Structural Model of the Antecedents and Consequences of Authoritative Parental Instruction for the German Sample (*p < .05. **p < .01.).

Table 5.3
Standardized Parameter Estimates (Direct, Indirect, and Total Effects) for the Structural Model of the Antecedents and Consequences of Authoritative Parental Instruction for the German Sample

	Dependent variable								
	Authoritative parental instruction			Autonomous learning motivation			Controlled learning motivation		
Independent variable	DE	IE	TE	DE	IE	TE	DE	IE	TE
Authoritative parental instruction	—	—	—	.37**	—	.37**	.67**	—	.37**
Conception of active responsibility	–.04	—	–.04	—	–.02	–.02	—	–.03	–.03
Conception of passive responsibility	–.03	—	–.03	—	–.01	–.01	—	–.02	–.02
Goal orientation towards learning	.06	—	.06	—	.02	.02	—	–.04	–.04
Goal orientation towards achievement	.01	—	.01	—	.00	.00	—	.01	.01
General teaching efficacy	–.00	—	–.00	—	–.00	–.00	—	–.00	–.00
Domain-specific teaching efficacy	.27**	—	.27**	—	.10*	.10*	—	.18**	.18**
Invitation from the child	.15*	—	.15*	—	.06	.06	—	.10*	.10*
Invitation from the school and teachers	–.08	—	–.08	—	–.03	–.03	—	–.05	–.05
Personal time and energy	.16*	—	.16*	—	.06	.06	—	.10*	.10*
Valence towards school	–.17*	—	–.17*	—	–.06	–.06	—	–.11**	–.11**
Family SES	–.06	—	–.06	—	–.02	–.02	—	–.04	–.04
	Dependent variable								
	Academic well-being			Regulation of academic motivation			Regulation of academic emotion		
Independent variable	DE	IE	TE	DE	IE	TE	DE	IE	TE
Authoritative parental instruction	.68**	—	.68**	.90**	—	.90**	.98**	—	.98**
Conception of active responsibility	—	–.03	–.03	—	–.04	–.04	—	–.04	–.04
Conception of passive responsibility	—	–.02	–.02	—	–.02	–.02	—	–.03	–.03
Goal orientation towards learning	—	.04	.04	—	.05	.05	—	.06	.06
Goal orientation towards achievement	—	.01	.01	—	.01	.01	—	.01	.01
General teaching efficacy	—	–.00	–.00	—	–.00	–.00	—	–.01	–.01
Domain-specific teaching efficacy	—	.18**	.18**	—	.24**	.24**	—	.26**	.26**
Invitation from the child	—	.10*	.10*	—	.14*	.14*	—	.15*	.15*
Invitation from the school and teachers	—	–.05	–.05	—	–.07	–.07	—	–.08	–.08
Personal time and energy	—	.11*	.11*	—	.14*	.14*	—	.15*	.15*
Valence towards school	—	–.11*	–.11*	—	–.15*	–.15*	—	–.16*	–.16*
Family SES	—	–.04	–.04	—	.05	.05	—	–.06	–.06

Note. DE = Direct Effect. IE = Indirect Effect. TE = Total Effect.
*$p < .05$. **$p < .01$.

5.2.2B. Structural Model of the Antecedents and Consequences of Authoritative Parental Instruction for the Thai Sample

The same structural model of antecedents and impacts of authoritative parental instruction as in the previous Sub-section of analysis (5.2.2A) was tested, but, this time, the model was validated with the data from the Thai sample. The model structure as well as the standardized parameter estimates and model fit indices are presented in Figure 5.8 and Table 5.4. Overall, the findings revealed that the data supported the structural model well, as indicated by excellent fit indices, χ^2 (222, N = 494) = 195.31, χ^2/df = .88; p = .90, GFI = .97, CFI = 1.00, SRMR = .03, RMSEA = .00.

The Measurement Models

When validating the measurement model of authoritative parental instruction, the findings showed that autonomy-support yielded a higher factor loading (β = .59) on the latent construct of authoritative parental instruction compared to responsiveness (β = .50, $p < .01$).

In addition, the findings on the validation of the measurement models of the five pupils' learning outcomes revealed that:

- Identified regulation yielded a higher factor loading (β = .84, $p < .01$) on the latent construct of autonomous learning motivation compared to intrinsic regulation (β = .65).
- Introjected regulation yielded a higher factor loading (β = .96) on the latent construct of controlled learning motivation compared to external regulation (β = .72, $p < .01$).
- School satisfaction yielded a higher factor loading (β = .49) on the latent construct of academic well-being compared to positive academic emotion (β = .26, $p < .01$).
- Self-consequating yielded a higher factor loading (β = .75, $p < .01$) on the latent construct of regulation of academic motivation compared to interest enhancement (β = .60).
- The factor loadings of the latent construct of regulation of academic emotion ranged between .46 ($p < .01$) and .70 ($p < .01$). Self-affirmation yielded the greatest factor loading, whereas seeking social support yielded the smallest factor loading.

Antecedents of Authoritative Parental Instruction

The latent construct of authoritative parental instruction was predicted significantly by three predictor constructs. The R^2 for authoritative parental instruction was .05, suggesting that the predictor constructs explained 5% of the variance in authoritative parental instruction.

In line with the theoretical considerations, a higher level of authoritative parental instruction was predicted significantly by higher levels of invitation from the child to involvement (β = .13, $p < .05$), valence towards school (β = .12, $p < .05$), and family SES (β = .12, $p < .05$).

Consequences of Authoritative Parental Instruction

The latent construct of authoritative parental instruction significantly predicted the five latent constructs of pupils' academic functioning outcomes. Overall, predictor constructs and authoritative parental instruction explained 45% of the variance in autonomous learning motivation (R^2 = .45), 11% of variance in controlled learning motivation (R^2 = .11), 36% of the variance in academic well-being (R^2 = .36), 45% of the variance in regulation of academic motivation (R^2 = .45), and 73% of the variance in regulation of academic emotion (R^2 = .73).

In line with the theoretical assumptions, a higher level of authoritative parental instruction significantly predicted higher levels of autonomous learning motivation (β = .67, $p < .01$), academic well-being (β = .60, $p < .01$), regulation of academic motivation (β = .45, $p < .01$), and regulation of academic emotion (β = .85, $p < .01$). Contrary to expectations, a higher level of authoritative parental instruction significantly predicted a higher level of controlled learning motivation (β = .13, $p < .01$).

Mediation by Authoritative Parental Instruction

Apart from this, the study examined whether authoritative parental instruction mediated the relationships between predictor constructs and pupils' academic functioning outcomes (see Table 4.22). Results showed that autonomous learning motivation mediated by authoritative parental instruction received significant positive indirect effects from invitation from the child to involvement (β = .09, $p < .05$), valence towards school (β = .08, $p < .05$), and family SES (β = .08, $p < .05$). These results suggested that authoritative parental instruction mediated the relationships between these three predictor constructs and autonomous learning motivation.

Furthermore, there were significant positive indirect effects on regulation of academic emotion from invitation from the child to involvement ($\beta = .11$, $p < .05$), valence towards school ($\beta = .09$, $p < .05$), and family SES ($\beta = .10$, $p < .05$). These findings indicated a mediating effect of authoritative parental instruction on the relationships between these three predictor constructs and autonomous learning motivation.

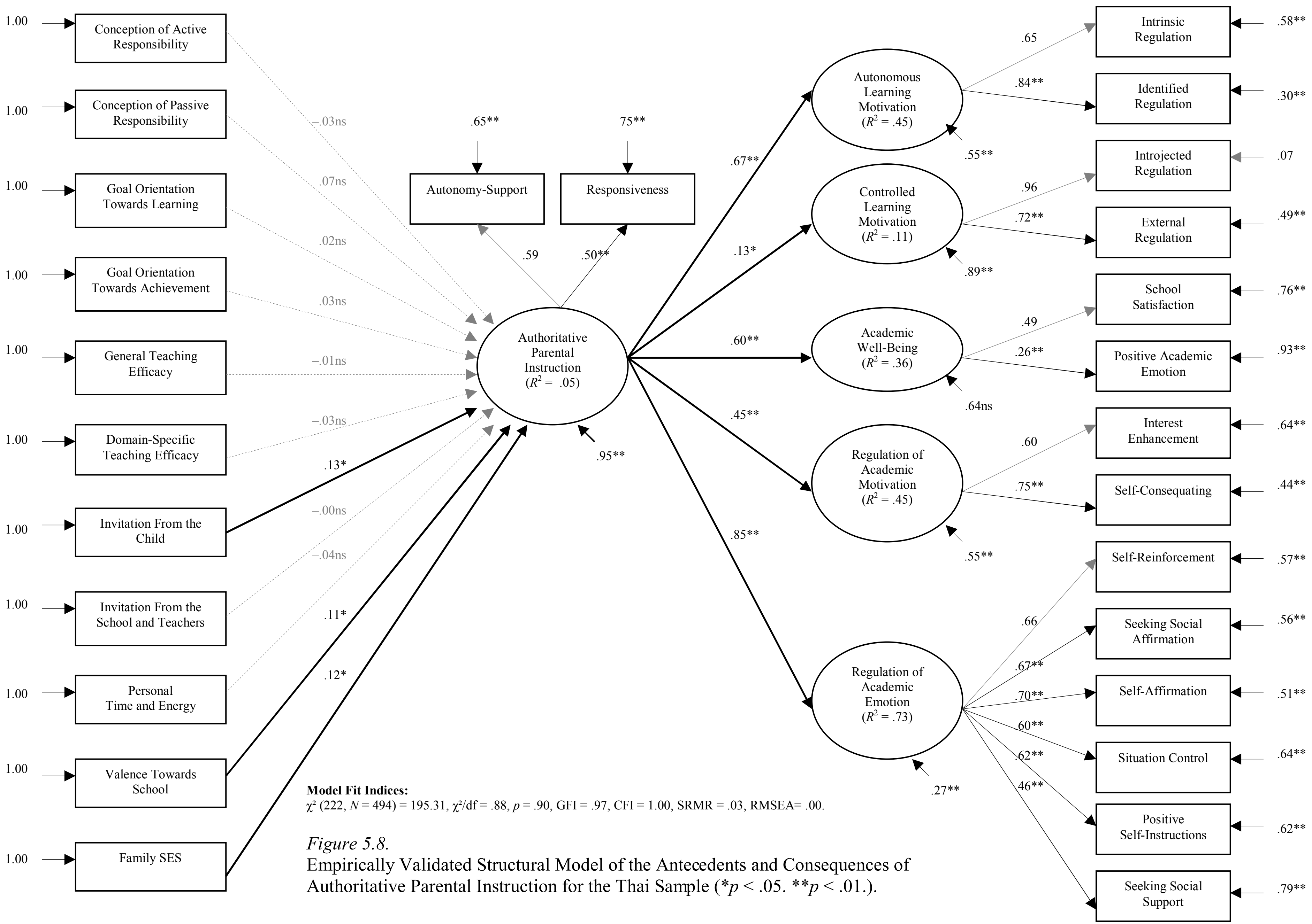


Figure 5.8.
Empirically Validated Structural Model of the Antecedents and Consequences of Authoritative Parental Instruction for the Thai Sample (*p < .05. **p < .01.).

Table 5.4

Standardized Parameter Estimates (Direct, Indirect, and Total Effects) for the Structural Model of Antecedents and Consequences of Authoritative Parental Instruction for the Thai Sample

	Dependent variable								
	Authoritative parental instruction			Autonomous learning motivation			Controlled learning motivation		
Independent variable	DE	IE	TE	DE	IE	TE	DE	IE	TE
Authoritative parental instruction	—	—	—	.67**	—	.67**	.13*	—	.13*
Conception of active responsibility	–.03	—	–.03	—	–.02	–.02	—	.00	.00
Conception of passive responsibility	.07	—	.07	—	.04	.04	—	.01	.01
Goal orientation towards learning	.02	—	.02	—	.01	.01	—	.00	.00
Goal orientation towards achievement	.03	—	.03	—	.02	.02	—	.00	.00
General teaching efficacy	–.01	—	–.01	—	–.01	–.01	—	.00	.00
Domain-specific teaching efficacy	–.03	—	-.03	—	–.02	–.02	—	.00	.00
Invitation from child	.13*	—	.13*	—	.09*	.09*	—	.02	.02
Invitation from school and teachers	–.00	—	–.00	—	.00	.00	—	.00	.00
Personal time and energy	–.04	—	–.04	—	–.02	–.02	—	.00	.00
Valence towards school	.11*	—	.11*	—	.07*	.07*	—	.01	.01
Family SES	.12*	—	.12*	—	.08*	.08*	—	.02	.02

	Dependent variable								
	Academic well-being			Regulation of academic motivation			Regulation of academic emotion		
Independent variable	DE	IE	TE	DE	IE	TE	DE	IE	TE
Authoritative parental instruction	.60**	—	.60**	.45**	—	.45**	.85**	—	.85**
Conception of active responsibility	—	–.02	–.02	—	–.01	–.01	—	–.03	–.03
Conception of passive responsibility	—	.04	.04	—	.03	.03	—	.06	.06
Goal orientation towards learning	—	.01	.01	—	.01	.01	—	.02	.02
Goal orientation towards achievement	—	.02	.02	—	.01	.01	—	.03	.03
General teaching efficacy	—	–.01	–.01	—	–.01	–.01	—	–.01	–.01
Domain-specific teaching efficacy	—	–.02	–.02	—	–.01	–.01	—	–.03	–.03
Invitation from child	—	.08	.08	—	.06	.06	—	.11*	.11*
Invitation from school and teachers	—	.00	.00	—	.00	.00	—	.00	.00
Personal time and energy	—	–.02	–.02	—	–.02	–.02	—	–.03	–.03
Valence towards school	—	.06	.06	—	.05	.05	—	.09*	.09*
Family SES	—	.07	.07	—	.05	.05	—	.10*	.10*

Note. DE = Direct Effect. IE = Indirect Effect. TE = Total Effect.
*$p < .05$. **$p < .01$.

5.2.2C. Structural Model of the Antecedents and Consequences of Authoritarian Parental Instruction for the German Sample

This sub-section of the analysis tested the structural model of antecedents and consequences of authoritarian parental instruction for the German sample. As Figure 5.9 shows, the structural model was specified by 11 manifest parent variables influencing the latent construct of authoritarian parental instruction (as measured by control and structure). In turn, the latent construct of authoritarian parental instruction predicted five latent constructs of pupils' academic functioning outcomes. Model structure as well as standardized parameter estimates and model fit indices are presented in Figure 5.9. and Table 5.5. Overall, the findings revealed that the structural model fitted the data well, as indicated by excellent fit indices, χ^2 (215, N = 288) = 187.49, χ^2/df = .87, p = .91, GFI = .95, CFI = 1.00, SRMR = .06, RMSEA= .00.

The Measurement Models

The measurement model of authoritarian parental instruction was validated. This showed that parental provision of structure yielded a higher factor loading (β = .89, $p < .01$) on the latent construct of authoritarian parental instruction compared to parental control (β = .71).

In addition to this, the findings on the validation of measurement models of five pupils' academic outcomes revealed that:

- Identified regulation yielded a higher factor loading (β = .92, $p < .01$) on a latent construct of autonomous learning motivation compared to intrinsic regulation (β = .66).
- Introjected regulation yielded a higher factor loading (β = .93) on the latent construct of controlled learning motivation compared to external regulation (β = .51, $p < .01$).
- School satisfaction yielded a higher factor loading (β = .68) on the latent construct of academic well-being compared to positive academic emotion (β = .52, $p < .01$).
- Self-consequating yielded a higher factor (β = .70, $p < .01$) on the latent construct of regulation of academic motivation compared to interest enhancement (β = .63).
- The factor loadings of the latent construct of regulation of academic emotion ranged between .41 ($p < .01$) and .69 ($p < .01$). Positive self-

instructions yielded the highest factor loading whereas seeking social support yielded the smallest factor loading.

Antecedents of Authoritarian Parental Instruction

The latent construct of authoritarian parental instruction was predicted significantly by five predictor constructs. The R^2 for authoritarian parental instruction was .11. Thus, the predictor constructs explained 11% of the variance in authoritarian parental instruction.

As expected, a higher level of authoritarian parental instruction was predicted significantly by a higher level of goal orientation towards achievement ($\beta = .20$, $p < .01$). In contrast, a lower level of authoritarian parental instruction was predicted significantly by a lower level of family SES ($\beta = -.12$, $p < .05$).

Contrary to assumptions, a higher level of authoritarian parental instruction was predicted significantly by higher levels of goal orientation towards learning ($\beta = .12$, $p < .05$) and domain-specific teaching efficacy beliefs ($\beta = .12$, $p < .05$). In contrast, a lower level of authoritarian parental instruction was predicted significantly by a higher level of parental conception of passive responsibility ($\beta = -.14$, $p < .05$).

Consequences of Authoritarian Parental Instruction

The latent construct of authoritarian parental instruction significantly predicted three pupils' academic outcomes. Overall, predictor constructs and authoritarian parental instruction explained 1% of the variance in autonomous learning motivation ($R^2 = .01$), 22% of the variance in controlled learning motivation ($R^2 = .22$), 5% of the variance in academic well-being ($R^2 = .05$), 2% of the variance in regulation of academic motivation ($R^2 = .02$), and 6% of the variance in regulation of academic emotion ($R^2 = .06$).

In line with the theoretical considerations, a higher level of authoritarian parental instruction significantly predicted a higher level of controlled learning motivation ($\beta = .47$, $p < .01$). In contrast, a lower level of authoritarian parental instruction significantly predicted a higher level of academic well-being ($\beta = -.21$, $p < .05$). Moreover, as anticipated, no significant direct effect of authoritarian parental instruction on autonomous learning motivation and regulation of academic emotion were found.

Surprisingly, results showed that a higher level of authoritarian parental instruction significantly predicted a higher level of regulation of academic emotion ($\beta = .25$, $p < .01$).

Mediation by Authoritarian Parental Instruction

Apart from this, indirect effects of predictor constructs on pupils' academic outcomes were examined as mediated by authoritarian parental instruction (see Table 5.5). Overall, goal orientation towards achievement yielded significant positive indirect effects on controlled learning motivation ($\beta = .10$, $p < .05$) and regulation of academic emotion ($\beta = .05$, $p < .05$). In contrast, goal orientation towards achievement yielded a significant negative indirect effect on academic well-being ($\beta = -.04$, $p < .05$). These results suggested that authoritarian parental instruction mediated the relationships between goal orientation towards achievement and these three pupils' academic outcomes.

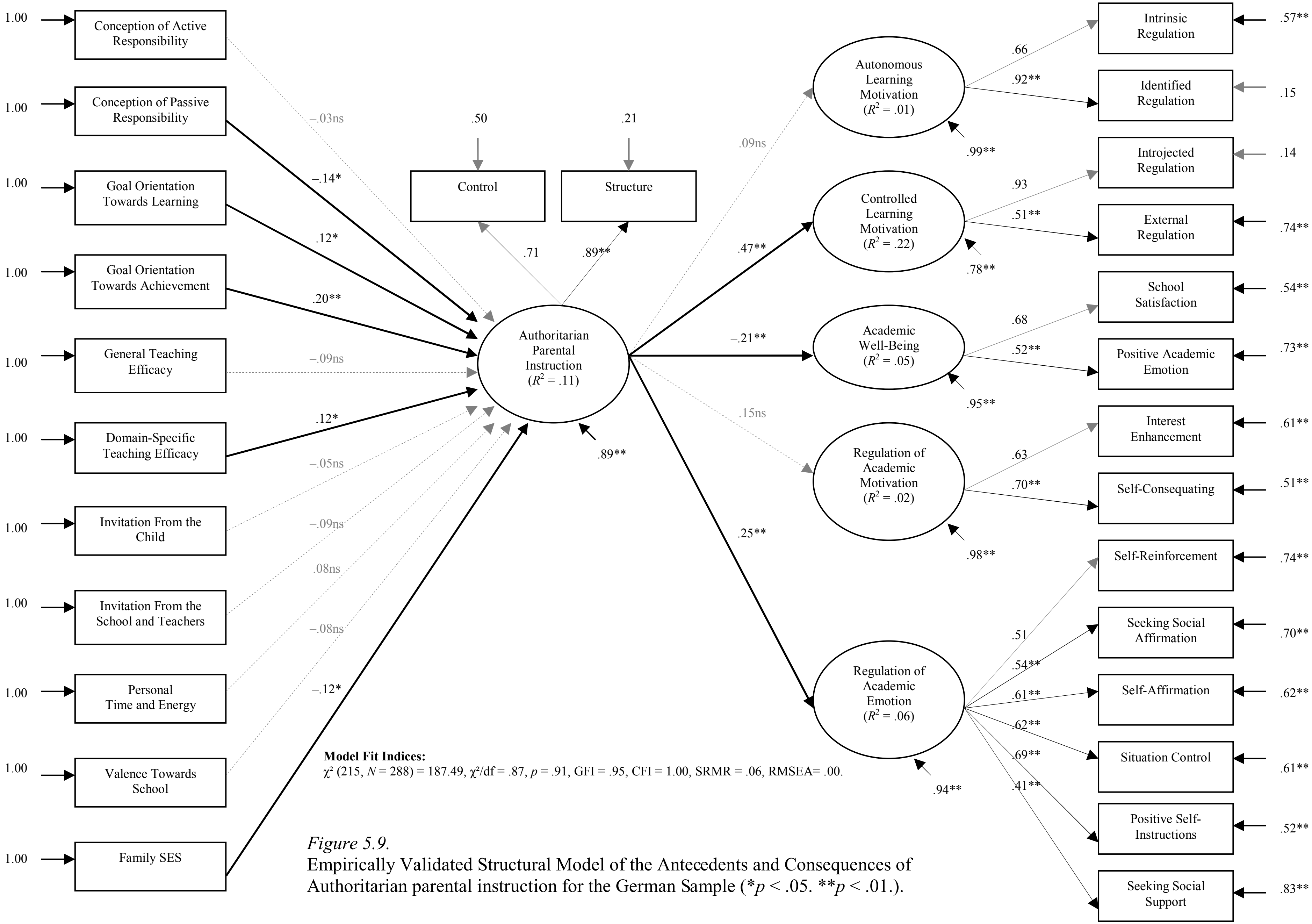


Figure 5.9.
Empirically Validated Structural Model of the Antecedents and Consequences of Authoritarian parental instruction for the German Sample (*p < .05. **p < .01.).

Table 5.5.
Standardized Parameter Estimates (Direct, Indirect, and Total Effects) for the Structural Model of the Antecedents and Consequences of Authoritarian Parental Instruction for the German Sample

	Dependent variable								
	Authoritarian parental instruction			Autonomous learning motivation			Controlled learning motivation		
Independent variable	DE	IE	TE	DE	IE	TE	DE	IE	TE
Authoritarian parental instruction	—	—	—	.09	—	.09	.47**	—	.47**
Conception of active responsibility	–.03	—	–.03	—	.00	.00	—	–.02	–.02
Conception of passive responsibility	–.14*	—	–.14*	—	–.01	–.01	—	–.07	–.07
Goal orientation towards learning	.12*	—	.12*	—	.01	.01	—	.06	.06
Goal orientation towards achievement	.20**	—	.20**	—	.02	.02	—	.10*	.10*
General teaching efficacy	–.09	—	–.09	—	–.01	–.01	—	–.04	–.04
Domain-specific teaching efficacy	.12*	—	.12*	—	.01	.01	—	.06	.06
Invitation from child	–.05	—	–.05	—	.00	.00	—	–.03	–.03
Invitation from school and teachers	–.09	—	–.09	—	–.01	–.01	—	–.04	–.04
Personal time and energy	.08	—	.08	—	.01	.01	—	.04	.04
Valence towards school	–.08	—	–.08	—	–.01	–.01	—	–.04	–.04
Family SES	–.12*	—	–.12*	—	–.01	–.01	—	–.06	–.06
	Dependent variable								
	Academic well-being			Regulation of academic motivation			Regulation of academic emotion		
Independent variable	DE	IE	TE	DE	IE	TE	DE	IE	TE
Authoritarian parental instruction	–.21**	—	–.21**	.15	—	.15	.25**	—	.25**
Conception of active responsibility	—	.01	.01	—	–.01	–.01	—	–.01	–.01
Conception of passive responsibility	—	.03	.03	—	–.02	–.02	—	–.03	–.03
Goal orientation towards learning	—	–.03	–.03	—	.02	.02	—	.03	.03
Goal orientation towards achievement	—	–.04*	–.04*	—	.03	.03	—	.05*	.05*
General teaching efficacy	—	.02	.02	—	–.01	–.01	—	–.02	–.02
Domain-specific teaching efficacy	—	–.03	–.03	—	.02	.02	—	.03	.03
Invitation from child	—	.01	.01	—	–.01	–.01	—	–.01	–.01
Invitation from school and teachers	—	.02	.02	—	–.01	–.01	—	–.02	–.02
Personal time and energy	—	–.02	–.02	—	.01	.01	—	.02	.02
Valence towards school	—	.02	.02	—	–.01	–.01	—	–.02	–.02
Family SES	—	.03	.03	—	–.02	–.02	—	–.03	–.03

Note. DE = Direct Effect. IE = Indirect Effect. TE = Total Effect.
**p* < .05. ***p* < .01.

5.2.2D. Structural Model of the Antecedents and Consequences of Authoritarian Parental Instruction for the Thai Sample

The same structural model of antecedents and effects of authoritarian parental instruction was tested as in the previous sub-section of the analysis (5.2.2C), but, this time, the model was validated with the data from the Thai sample. The model structure as well as the standardized parameter estimates and model fit indices are presented in Figure 5.10. and Table 5.6. Overall, the findings revealed that the data supported the structural model well, as indicated by excellent fit indices, χ^2 (207, N = 494) = 181.5, χ^2/df = .88, p = .90, GFI = .97, CFI = 1.00, SRMR = .03, RMSEA = .00.

The Measurement Models

The measurement model of authoritarian parental instruction was validated. Findings showed that parental control yielded a higher factor loading (β = .32) on the latent construct of authoritarian parental instruction compared to parents' provision of structure (β = .30, p < .01).

In addition, the findings on the validation of the measurement models of the five pupils' academic outcomes revealed that:

- Identified regulation yielded a higher factor loading (β = .47, p < .01) on the latent construct of autonomous learning motivation compared to intrinsic regulation (β = .37).
- Introjected regulation yielded a higher factor loading (β = .94) on the latent construct of controlled learning motivation compared to external regulation (β = .73, p < .01).
- School satisfaction yielded a higher factor loading (β = .71) on the latent construct of academic well-being compared to positive academic emotion (β = .16, p < .01).
- Self-consequating yielded a higher factor (β = .75, p < .01) on the latent construct of regulation of academic motivation compared to interest enhancement (β = .61).
- The factor loadings of the latent construct of regulation of academic emotion ranged between .44 (p < .01) and .74 (p < .01). Seeking social affirmation yielded the highest factor loading whereas seeking social support yielded the smallest factor loading.

Antecedents of Authoritarian Parental Instruction

The latent construct of authoritarian parental instruction was predicted significantly by three predictor constructs. The R^2 for authoritarian parental instruction was .04, suggesting that the predictor constructs explained 4% of the variance in authoritarian parental instruction.

In line with the theoretical expectations, a higher level of authoritarian parental instruction was predicted significantly by goal orientation towards achievement (β = .11, p < .05). In contrast, the lower level of authoritarian parental instruction was predicted significantly by a higher level of personal time and energy (β = –.11, p < .05). Contrary to expectations, a higher level of authoritarian parental instruction was predicted significantly by a higher level of family SES (β = .13, p < .05).

Consequences of Authoritarian Parental Instruction

In turn, the latent construct of authoritarian parental instruction significantly predicted all pupils' academic outcomes. Overall, predictor constructs and authoritarian parental instruction explained 28% of the variance in autonomous learning motivation (R^2 = .28), 55% of the variance in controlled learning motivation (R^2 = .55), 32% of the variance in regulation of academic well-being (R^2 = .32), 74% of the variance in regulation of academic motivation (R^2 = .74), and 72% of the variance in regulation of academic emotion (R^2 = .72).

As expected, a higher level of authoritarian parental instruction significantly predicted a higher level of controlled learning motivation (β = .74, p < .01). Surprisingly, a higher level of authoritarian parental instruction predicted significantly higher levels of autonomous learning motivation (β = .53, p < .01), academic well-being (β = .57, p < .01), regulation of academic motivation (β = .86, p < .01), and regulation of academic emotion (β = .85, p < .01).

Mediation by Authoritarian Parental Instruction

Furthermore, the indirect effects of predictor constructs on pupils' academic outcomes were examined as mediated by authoritarian parental instruction (see Table 5.6). Overall, it was found that:

- Goal orientation towards achievement yielded significant positive indirect effects on controlled learning motivation (β = .08, p < .05), academic well-being (β = .06, p < .05), regulation of academic motivation (β = .10, p < .05), and regulation of academic emotion (β = .09, p < .05). These results indicated that authoritarian parental involvement mediated the relationships between goal orientation towards achievement and the four above-mentioned pupils' outcomes.

- Time and energy for involvement yielded significant negative indirect effects on controlled learning motivation (β = –.08, p < .05), academic well-being (β = –.60, p < .05), regulation of academic motivation (β = –.09, p < .05), and regulation of academic emotion (β = –.09, p < .05). These results suggested that authoritarian parental involvement mediated the relationships between time and energy for involvement and the four above-mentioned pupils' outcomes.
- Family SES yielded significant positive indirect effects on autonomous learning motivation (β = .07, p < .05), controlled learning motivation (β = .09, p < .05), academic well-being (β = .07, p < .05), regulation of academic motivation (β = .11, p < .05), and regulation of academic emotion (β = .11, p < .05). These results indicated that authoritarian parental instruction mediated the relationships between family SES and all of the pupils' academic outcomes.

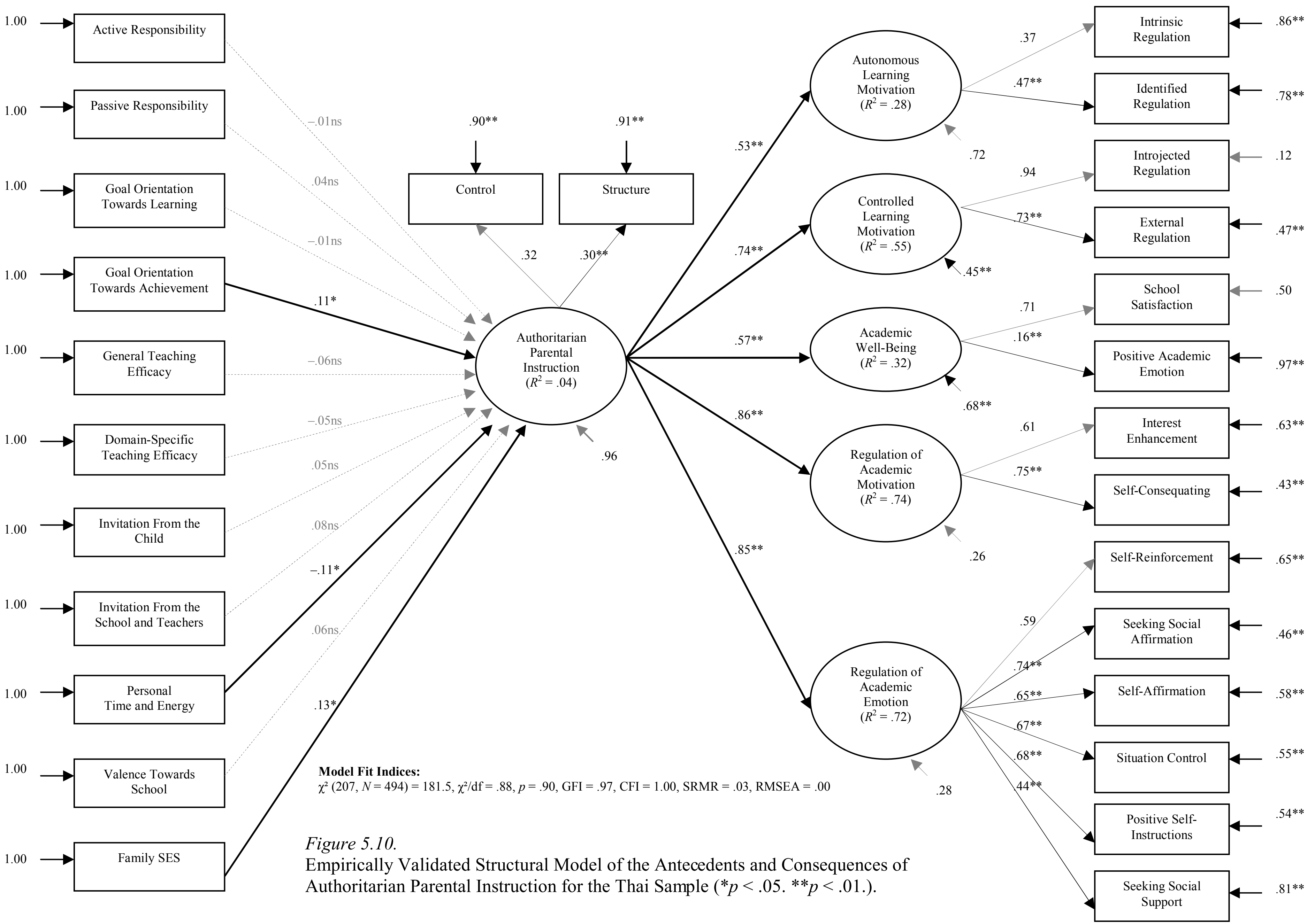


Figure 5.10.
Empirically Validated Structural Model of the Antecedents and Consequences of Authoritarian Parental Instruction for the Thai Sample (*$p < .05$. **$p < .01$.).

Table 5.6
Standardized Parameter Estimates (Direct, Indirect, and Total Effects) for the Structural Model of the Antecedents and Consequences of Authoritarian Parental Instruction for the Thai Sample

	Dependent variable								
	Authoritarian parental instruction			Autonomous learning motivation			Controlled learning motivation		
Independent variable	DE	IE	TE	DE	IE	TE	DE	IE	TE
Authoritarian parental instruction	—	—	—	.53**	—	.53**	.74**	—	.74**
Conception of active responsibility	–.01	—	–.01	—	.01	.01	—	.01	.01
Conception of passive responsibility	.04	—	.04	—	.02	.02	—	.03	.03
Goal orientation towards learning	–.01	—	–.01	—	–.01	–.01	—	–.01	–.01
Goal orientation towards achievement	.11*	—	.11*	—	.06	.06	—	.08*	.08*
General teaching efficacy	–.06	—	–.06	—	–.03	–.03	—	–.04	–.04
Domain-specific teaching efficacy	–.05	—	–.05	—	–.03	–.03	—	–.04	–.04
Invitation from child	.05	—	.05	—	.03	.03	—	.04	.04
Invitation from school and teachers	.08	—	.08	—	.04	.04	—	.06	.06
Personal time and energy	–.11*	—	–.11*	—	–.06	–.06	—	–.08*	–.08*
Valence towards school	.06	—	.06	—	.03	.03	—	.04	.04
Family SES	.13*	—	.13*	—	.07*	.07*	—	.09*	.09*

	Dependent variable								
	Academic well-being			Regulation of academic motivation			Regulation of academic emotion		
Independent variable	DE	IE	TE	DE	IE	TE	DE	IE	TE
Authoritarian parental instruction	.57**	—	.57**	.86**	—	.86**	.85**	—	.85**
Conception of active responsibility	—	.01	.01	—	.01	.01	—	.01	.01
Conception of passive responsibility	—	.02	.02	—	.04	.04	—	.04	.04
Goal orientation towards learning	—	–.01	–.01	—	–.01	–.01	—	–.01	–.01
Goal orientation towards achievement	—	.06*	.06*	—	.10*	.10*	—	.09*	.09*
General teaching efficacy	—	–.03	–.03	—	–.05	–.05	—	–.05	–.05
Domain-specific teaching efficacy	—	–.03	–.03	—	–.04	–.04	—	–.04	–.04
Invitation from child	—	.03	.03	—	.04	.04	—	.04	.04
Invitation from school and teachers	—	.04	.04	—	.06	.06	—	.06	.06
Personal time and energy	—	–.06*	–.06*	—	–.09*	–.09*	—	–.09*	–.09*
Valence towards school	—	.03	.03	—	.05	.05	—	.05	.05
Family SES	—	.07*	.07*	—	.11*	.11*	—	.11*	.11*

Note. DE = Direct Effect. IE = Indirect Effect. TE = Total Effect.
*$p < .05$. **$p < .01$.

5.2.2E. Complete Structural Model of the Antecedents and Consequences of Authoritative Versus Authoritarian Parental Instruction for the German Sample

This sub-section of analysis validated the complete structural model of antecedents and consequences of authoritative versus authoritarian parental instruction with the data drawn from the German sample. As Figure 5.11 shows, the structural model was specified by 11 parents' manifest variables (predictor constructs) influencing two latent constructs—authoritative parental instruction (as measured by autonomy-support and responsiveness) and authoritarian parental instruction (as measured by control and structure). As mediators, two latent constructs of authoritative and authoritarian parental instruction jointly predicted five latent constructs of pupils' academic outcomes—autonomous learning motivation, control learning motivation, academic well-being, regulation of academic motivation, and regulation of academic emotion. The model structure as well as the standardized parameter estimates and model fit indices are presented in Figure 5.11. and Table 5.7. Overall, the findings revealed that the complete structural model nicely fitted the empirical data, as indicated by good fit indices, χ^2 (259, N = 288) = 250.60, χ^2/df = .97, p = .63, GFI = .94, CFI = 1.00, SRMR = .06, RMSEA = .00.

The Measurement Models

The findings on the validation of the measurement models for the two distinct kinds of parental instruction showed, on one hand, that responsiveness yielded a higher factor loading (β = .69, p < .01) on the latent construct of authoritarian parental instruction compared to autonomy-support (β = .61). On the other hand, parental control yielded a higher factor loading (β = .71) on the latent construct of authoritarian parental instruction compared to parents' provision of structure (β = .60, p < .01).

Furthermore, the findings on the validation of the measurement models of the five pupils' academic outcomes revealed that:

- Identified regulation yielded a higher factor loading (β = .83, p < .01) on the latent construct of autonomous learning motivation compared to intrinsic regulation (β = .70).
- Introjected regulation yielded a higher factor loading (β = .93) on the latent construct of controlled learning motivation compared to external regulation (β = .71, p < .01).

- School satisfaction yielded a higher factor loading (β = .59) on the latent construct of academic well-being compared to positive academic emotion (β = .58, $p < .01$).
- Self-consequating yielded a higher factor (β = .77, $p < .01$) on the latent construct of regulation of academic motivation compared to interest enhancement (β = .63).
- The factor loadings of the latent construct of regulation of academic emotion ranged between .46 ($p < .01$) and .69 ($p < .01$). Positive self-instructions yielded the highest factor loading whereas seeking social support yielded the smallest factor loading.

Antecedents of Authoritative Parental Instruction

The latent construct of authoritative parental instruction was predicted significantly by six predictor constructs. The R^2 for authoritative parental instruction was .22, suggesting that authoritative parental instruction explained 22% of the variance in authoritative parental instruction.

In contrast to the theoretical expectations, findings showed that valence towards school (β = –.18, $p < .01$) had a significant negative direct effect on authoritative parental instruction. Yet, this unexpected finding in the complete model was consistent with the finding in the previous model in Sub-section 5.2.2A in which *authoritative parental instruction was a single mediator* (see Figure 5.7).

Additionally, in the previous model in Sub-section 5.2.2A, domain-specific teaching efficacy and time and energy for involvement yielded significant positive direct effects on authoritative parental instruction. However, in the complete model, these two predictor constructs were still found to be significant but revealed negative path coefficients ($\beta_{\text{domain-specific teaching efficacy}} = –.15$, $p < .05$; $\beta_{\text{time and energy}} = –.27$, $p < .01$). Nevertheless, these findings in the complete model were not in line with the theoretical expectations.

Moreover, in the previous model in Sub-section 5.2.2A, goal orientation towards achievement, invitation from school staff to involvement, and family SES were not significant predictors of authoritative parental instruction at all. Yet, in the complete model, these three predictor constructs had negative direct effects on authoritative parental instruction. That is to say, a lower level of authoritative parental instruction was predicted significantly by higher levels of goal orientation towards achievement (β = –.22, p < .01), invitation from school staff to involvement (β = –.15, p < .05), and family SES (β = –.14, p < .05). However, only a significant negative linkage between goal orientation towards achievement and authoritarian parental instruction was in line with the theoretical expectations.

Apart from this, in the previous model in Sub-section 5.2.2A, invitation from the child to involvement was a significant positive predictor of authoritative parental instruction. Surprisingly, this predictor construct was no longer a significant predictor of authoritative parental instruction in the complete model.

Antecedents of Authoritarian Parental Instruction

The latent construct of authoritarian parental instruction was predicted significantly by three predictor constructs. The R^2 of authoritarian parental instruction was .10, indicating that the predictor constructs explained 10% of the variance in authoritarian parental instruction.

As expected, the findings revealed that authoritarian parental instruction received a significant positive direct effect of goal orientation towards achievement (β = .16, p < .01) but a significant negative direct effect of family SES (β = –.14, p < .01). These findings on the complete model were consistent with the findings on the previous model in Sub-section 5.2.2.C in which *authoritarian parental instruction was a single mediator* (see Figure 5.9).

In addition, in the previous model in Sub-section 5.2.2C, invitation from the school staff to involvement was not a significant predictor of authoritarian parental instruction at all. Yet, in the complete model, this predictor had a significant negative direct effect on authoritarian parental instruction (β = –.14, p < .01), which was in line with theoretical assumptions.

Apart from this, in the previous model in Sub-section 5.2.2C, parental conception of passive responsibility, goal orientation towards learning, goal orientation towards achievement, and domain-specific teaching efficacy were significant predictors of authoritarian parental instruction. Surprisingly, these predictor constructs were no longer significant predictors of authoritarian parental instruction in the complete model.

Consequences of Authoritative Parental Instruction

The latent construct of authoritative parental instruction significantly predicted all of pupils' academic outcomes. In line with the theoretical expectations, the results revealed that a higher level of authoritative parental instruction significantly predicted higher levels of autonomous learning motivation (β = .48, p < .01), academic well-being (β = .52, p < .01), regulation of academic motivation (β = .73, p < .01), and regulation of academic emotion (β = .43, p < .01). Surprisingly, a higher level of authoritative parental instruction significantly predicted controlled learning motivation (β = .68, p < .01). These results in the complete model were consistent with the findings from the previous model in Sub-section 5.2.2A (*authoritative parental instruction as a single mediator*).

Consequences of Authoritarian Parental Instruction

The latent construct of authoritarian parental instruction significantly predicted four pupils' academic outcomes. As expected, the results showed that a higher level of authoritarian parental instruction significantly predicted a higher level of controlled learning motivation (β = .86, p < .01). In contrast, a lower level of authoritarian parental instruction significantly predicted a higher level of academic well-being (β = –.43, p < .01). Contrary to expectations, a higher level of authoritarian parental instruction significantly predicted a higher level of regulation of academic emotion (β = .30, p < .01). These results in the complete model were consistent with the results in the previous model in Sub-section 5.2.2C (*authoritarian parental instruction as a single mediator*).

In addition, in the previous model in Sub-section 5.2.2C, authoritarian parental instruction was not a significant predictor of autonomous learning motivation at all. Surprisingly, in the complete model, authoritarian parental instruction yielded a significant positive direct effect (β = .40, p < .01) on autonomous learning motivation. This result in the complete model ran counter to theoretical assumptions.

Beside this, the complete model revealed no significant linkage between authoritarian parental instruction and the regulation of academic motivation. This result was in line with the theoretical assumptions.

Mediation by Authoritative Parental Instruction

The study examined whether authoritative parental instruction mediated the linkages between predictor constructs and pupils' academic outcomes (see Table 5.7). Overall, it was found that:

- Domain-specific teaching efficacy yielded significant positive indirect effects on autonomous learning motivation (β = .09, p < .05), controlled learning motivation (β = .15, p < .01), regulation of academic motivation (β = .11, p < .05), and regulation of academic emotion (β = .08, p < .05). These results suggested that authoritative parental instruction mediated the linkages between domain-specific teaching efficacy and the four above-mentioned pupils' academic outcomes.
- Time and energy for involvement yielded significant positive indirect effects on autonomous learning motivation (β = .13, p < .01), controlled learning motivation (β = .18, p < .01), academic well-being (β = .14, p < .05), regulation of academic motivation (β = .20, p < .01), and regulation of academic emotion (β = .11, p < .01). These results indicated that authoritative parental instruction mediated the linkages between time and energy for involvement and all of the pupils' academic outcomes.
- Valence towards school yielded significant negative indirect effects on academic well-being (β = –.13, p < .01) and regulation of academic motivation (β = –.13, p < .01). These results pointed out that the linkages between valence towards school and two mentioned pupils' academic outcomes were mediated by authoritative parental instruction.

Mediation by Authoritarian Parental Instruction

The mediating effects of authoritarian parental instruction on the linkages between predictor constructs and pupils' academic outcomes were also examined (see Table 5.7). Overall, it was found that:

- Goal orientation towards achievement yielded significant negative indirect effects on academic well-being (β = –.19, p < .01) and regulation of academic motivation (β = –.15, p < .01). These findings indicated that authoritarian parental instruction had mediating effects on the linkages between goal orientation towards achievement and the two above-mentioned pupils' outcomes.
- Invitation from the school staff yielded significant negative indirect effects on autonomous learning motivation (β = –.12, p < .01),

controlled learning motivation (β = –.21, $p < .01$), regulation of academic motivation (β = –.12, $p < .05$), and regulation of academic emotion (β = –.11, $p < .05$). These findings suggested that authoritarian parental instruction had mediating effects on the linkages between invitation from the school staff and the four above-mentioned pupils' outcomes;

- Family SES yielded significant negative indirect effects on autonomous learning motivation (β = –.13, $p < .01$), controlled learning motivation (β = –.22, $p < .01$), regulation of academic motivation (β = –.11, $p < .05$), and regulation of academic emotion (β = –.10, $p < .05$). These findings pointed out that authoritarian parental instruction had mediating effects on the linkages between family SES and the four above-mentioned pupils' outcomes.

Overall, independent variables in the complete model explained 22% of the variance in autonomous learning motivation (R^2 = .22), 88% of the variance in controlled learning motivation (R^2 = .88), 56% of the variance in academic well-being (R^2 = .56), 58% of the variance in regulation of academic motivation (R^2 = .58), and 51% of the substantial variance in regulation of academic emotion (R^2 = .51).

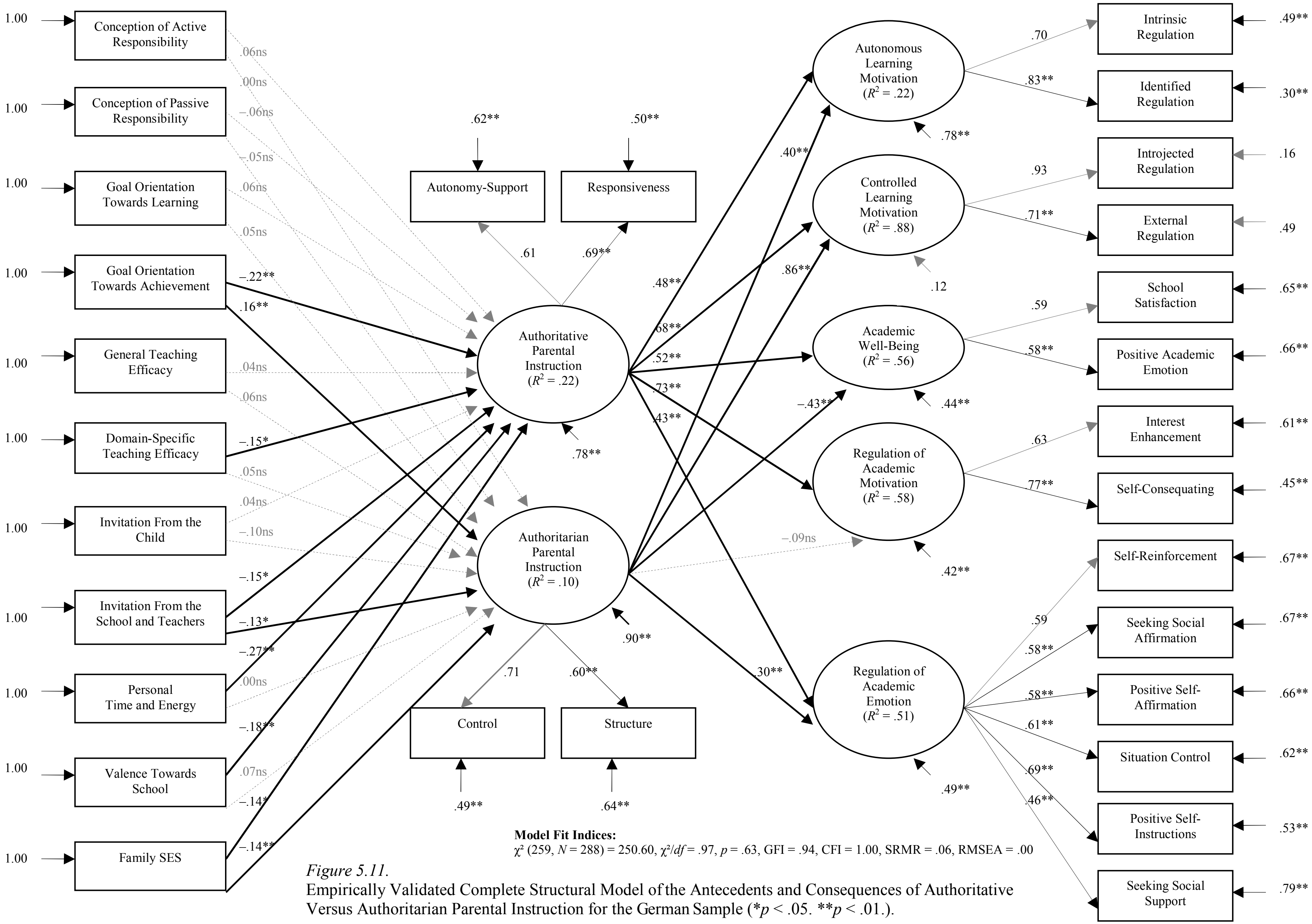


Figure 5.11.
Empirically Validated Complete Structural Model of the Antecedents and Consequences of Authoritative Versus Authoritarian Parental Instruction for the German Sample (*p < .05. **p < .01.).

Table 5.7

Standardized Parameter Estimates (Direct, Indirect, and Total Effects) for the Complete Structural Model of the Antecedents and Consequences of Authoritative Versus Authoritarian Parental Instruction for the German Sample

	Dependent variable								
	Authoritative parental instruction			Authoritarian parental instruction			Autonomous learning motivation		
Independent variable	DE	IE	TE	DE	IE	TE	DE	IE	TE
Authoritative parental instruction	—	—	—	—	—	—	.48**	—	.48**
Authoritarian parental instruction	—	—	—	—	—	—	.40*	—	.40*
Conception of active responsibility	.06	—	.06	.00	—	.00	—	.03	.03
Conception of passive responsibility	–.06	—	–.06	–.05	—	–.05	—	–.05	–.05
Goal orientation towards learning	.06	—	.06	.05	—	.05	—	.05	.05
Goal orientation towards achievement	–.22**	—	–.22**	.16**	—	.16**	—	–.04	–.04
General teaching efficacy	.04	—	.04	.06	—	.06	—	.04	.04
Domain-specific teaching efficacy	.15*	—	.15*	.05	—	.05	—	.09*	.09*
Invitation from child	.04	—	.04	–.10	—	–.10	—	–.02	–.02
Invitation from school and teachers	–.15*	—	–.15*	–.13*	—	–.13*	—	–.12**	–.12**
Personal time and energy	.27**	—	.27**	.00	—	.00	—	.13**	.13**
Valence towards school	–.18**	—	–.18**	.07	—	.07	—	–.06	–.06
Family SES	–.14*	—	–.14*	–.14**	—	–.14**	—	–.13**	–.13**
	Dependent variable								
	Controlled learning motivation			Academic well-being			Regulation of academic motivation		
Independent variable	DE	IE	TE	DE	IE	TE	DE	IE	TE
Authoritative parental instruction	.68**	—	.68**	.52**	—	.52**	.73**	—	.73**
Authoritarian parental instruction	.86**	—	.86**	–.43**	—	–.43**	.09	—	.09
Conception of active responsibility	—	.04	.04	—	.03	.03	—	.04	.04
Conception of passive responsibility	—	–.08	–.08	—	–.01	–.01	—	–.05	–.05
Goal orientation towards learning	—	.08	.08	—	.01	.01	—	.05	.05
Goal orientation towards achievement	—	–.01	–.01	—	–.19**	–.19**	—	–.15**	–.15**
General teaching efficacy	—	.07	.07	—	.00	.00	—	.03	.03
Domain-specific teaching efficacy	—	.15**	.15**	—	.05	.05	—	.11*	.11*
Invitation from child	—	–.06	–.06	—	.07	.07	—	.02	.02
Invitation from school and teachers	—	–.21**	–.21**	—	–.02	–.02	—	–.12*	–.12*
Personal time and energy	—	.18*	.18*	—	.14*	.14*	—	.20**	.20**
Valence towards school	—	–.06	–.06	—	–.13**	–.13**	—	–.13**	–.13**
Family SES	—	–.22**	–.22**	—	–.01	–.01	—	–.11*	–.11*
	Dependent variable								
	Regulation of academic emotion								
Independent variable	DE	IE	TE						
Authoritative parental instruction	.43**	—	.43**						
Authoritarian parental instruction	.30*	—	.30*						
Conception of active responsibility	—	.02	.02						
	Dependent variable								
	Regulation of academic emotion								
Independent variable	DE	IE	TE						
Conception of passive responsibility	—	–.04	–.04						
Goal orientation towards learning	—	.04	.04						
Goal orientation towards achievement	—	–.05	–.05						
General teaching efficacy	—	.03	.03						
Domain-specific teaching efficacy	—	.08*	.08*						
Invitation from child	—	–.01	–.01						
Invitation from school and teachers	—	–.10*	–.10*						
Personal time and energy	—	.11**	.11**						
Valence towards school	—	–.06	–.06						
Family SES	—	–.10**	–.10**						

Note. DE = Direct Effect. IE = Indirect Effect. TE = Total Effect.
*$p < .05$. **$p < .01$.

5.2.2F. Complete Structural Model of the Antecedents and Consequences of Authoritative Versus Authoritarian Parental Instruction for the Thai Sample

The same complete structural model of antecedents and impacts of the quality of home-based parental involvement was tested as in the previous sub-section of analysis, but, this time, the model was validated with the data from the Thai sample. The model structure as well as the standardized parameter estimates and model fit indices are presented in Figure 5.12. and Table 5.8. Overall, the findings revealed that the structural model nicely fitted the data, as indicated by good fit indices, χ^2 (249, N = 494) = 251.67, χ^2/df = 1.01, p = .44, GFI = .97, CFI = 1.00, SRMR = .03, RMSEA= .00.

The Measurement Models

The findings on the validation of the measurement model of authoritative parental instruction revealed that the factor loadings of both autonomy-support (β = .54) and responsiveness (β = .54, p < .01) on the latent construct of authoritative parental instruction were equal. Regarding the measurement model of authoritarian parental instruction, parents' provision of structure yielded a higher factor loading (β = .58, p < .01) on the latent construct of authoritarian parental instruction compared to parental control (β = .48).

In addition, the findings of validation of measurement models of five pupils' academic outcomes revealed that:

- Identified regulation yielded a higher factor loading (β = .84, p < .01) on the latent construct of autonomous learning motivation compared to intrinsic regulation (β = .68).
- Introjected regulation yielded a greater important factor loading (β = .95) on the latent construct of controlled learning motivation compared to external regulation (β = .73, p < .01);
- School satisfaction yielded a higher factor loading (β = .51) on the latent construct of academic well-being compared to positive academic emotion (β = .29, p < .01).
- Self-consequating yielded a higher factor (β = .72, p < .01) on the latent construct of regulation of academic motivation compared to interest enhancement (β = .62).
- The factor loadings of regulation of academic emotion ranged between .46 (p < .01) and .71 (p < .01). Seeking social affirmation

yielded the highest factor loading, whereas seeking social support yielded the smallest factor loading.

Antecedents of Authoritative Parental Instruction

The latent construct of authoritative parental instruction was predicted significantly by three predictor constructs. The R^2 for authoritative parental instruction was .12, suggesting that the predictor constructs explained 12% of the variance in authoritative parental instruction.

As expected, the results revealed that a higher level of authoritative parental instruction was predicted significantly by higher levels of invitation from the child to involvement ($\beta = .20$, $p < .01$) and valence towards school ($\beta = .16$, $p < .05$). These results in the complete model were consistent with the results in the previous model in Sub-section 5.2.2B in which *authoritative parental instruction was a single mediator* (see Figure 5.8).

Furthermore, in the previous model in Sub-section 5.2.2B, goal orientation towards learning was not a significant predictor of authoritative parental instruction at all. Yet, in the complete model, this predictor construct was a significant positive predictor of authoritative parental instruction ($\beta = .19$, $p < .01$). This result of the complete model was in line with theoretical expectations.

Apart from this, in the previous model in Sub-section 5.2.2B, family SES was a significant positive predictor of authoritative parental instruction. Surprisingly, this predictor construct was no longer a significant predictor of authoritative parental instruction in the complete model.

Antecedents of Authoritarian Parental Instruction

The latent construct of authoritarian parental instruction was predicted significantly by five predictor constructs. The R^2 for authoritarian parental instruction was .22, indicating that the predictor constructs explained 22% of the variance in authoritarian parental instruction.

In line with the theoretical assumptions, a higher level of authoritarian parental instruction was predicted significantly by a higher level of goal orientation towards achievement ($\beta = .21$, $p < .01$). Contrary to expectations, a higher level of authoritarian parental instruction was predicted significantly by a higher level of family SES ($\beta = .15$, $p < .05$). These results in the complete model were consistent with the results in the previous model in Sub-section 5.2.2D in which *authoritarian parental instruction was a single mediator* (see Figure 5.10).

Additionally, in the previous model in Sub-section 5.2.2D, parental conception of active responsibility, goal orientation towards learning, and general teaching efficacy beliefs were not significant predictors of authoritarian parental instruction at all. Yet, in the complete model, these three predictor constructs significantly predicted authoritarian parental instruction. As expected, a lower level of authoritarian parental instruction was predicted significantly by higher levels of goal orientation towards learning ($\beta = -.43$, $p < .01$) and general teaching efficacy beliefs ($\beta = -.18$, $p < .01$). Contrary to expectations, a higher level of authoritarian parental instruction was predicted significantly by a higher level parental conception of active responsibility ($\beta = .21$, $p < .05$).

Consequences of Authoritative Parental Instruction

The latent construct of authoritative parental instruction significantly predicted four pupils' academic outcomes. In line with theoretical expectations, a higher level of authoritative parental instruction significantly predicted higher levels of academic well-being ($\beta = .27$, $p < .01$), regulation of academic motivation ($\beta = .76$, $p < .01$), and regulation of academic emotion ($\beta = .52$, $p < .01$). Surprisingly, a higher level of authoritative parental instruction significantly predicted a higher level of controlled learning motivation ($\beta = .23$, $p < .01$). These findings in the complete model were consistent with the findings in the previous model in Sub-section 5.2.2B (*authoritative parental instruction as a single mediator*).

Alongside this, in the previous model in Sub-section 5.2.2B, authoritative parental instruction was a significant positive predictor of autonomous learning motivation. However, in the complete model, authoritative parental instruction was no longer a significant predictor of autonomous learning motivation. This finding in the complete model ran counter to theoretical expectations.

Consequences of Authoritarian Parental Instruction

The latent construct of authoritarian parental instruction significantly predicted four pupils' academic outcomes. As expected, a higher level of authoritarian parental instruction significantly predicted a higher level of controlled learning motivation ($\beta = .35$, $p < .01$). Contrary to expectations, a higher level of authoritarian parental instruction significantly predicted higher levels of academic well-being (β = .21, p < .01), regulation of academic motivation (β = .45, p < .01), and regulation of academic emotion (β = .47, p < .01). These findings in the complete model were consistent with the findings in the previous model in Sub-section 5.2.2D (*authoritarian parental instruction as a single mediator*).

Mediation by Authoritative Parental Instruction

The indirect effects of predictor constructs on pupils' academic outcomes were examined as mediated by *authoritative parental instruction* (see Table 5.8). Findings revealed that invitation from the child to involvement yielded a significant positive indirect effect on regulation of academic motivation (β = .13, p < .05). This finding indicated that authoritative parental instruction mediated the linkage between invitation from the child to involvement and regulation of academic motivation.

Mediation by Authoritarian Parental Instruction

The mediating effects of authoritarian parental instruction on the linkages between predictor constructs and pupils' academic outcomes were also examined (see Table 5.8). Overall, it was found that:

- Goal orientation towards learning yielded significant negative indirect effects on controlled learning motivation (β = –.11, p < .01) and regulation of academic emotion (β = –.10, p < .05). These findings indicated that authoritarian parental instruction mediated the linkages between goal orientation towards learning and the two above-mentioned pupils' outcomes.
- Goal orientation towards achievement yielded significant positive indirect effects on controlled learning motivation (β = .07, p < .05) and regulation of academic emotion (β = .08, p < .05). These findings suggested that authoritarian parental instruction mediated the linkages between goal orientation towards achievement and the two above-mentioned pupils' outcomes.
- General teaching efficacy beliefs yielded significant negative indirect effects on controlled learning motivation (β = –.06, p < .05) and regulation of academic emotion (β = –.09, p < .05). These findings indicated that authoritarian parental instruction mediated the linkages

between general teaching efficacy beliefs and the two above-mentioned pupils' outcomes.

- Family SES yielded significant positive indirect effects on controlled learning motivation (β = .07, p < .01), regulation of academic motivation (β = .12, p < .05), and regulation of academic emotion (β = .10, p < .05). These findings suggested that authoritarian parental instruction mediated the linkages between family SES and the three above-mentioned pupils' outcomes.

Overall, independent variables in the complete model explained 11% of the variance in autonomous learning motivation (R^2 = .11), 16% of the variance in controlled learning motivation (R^2 = .16), 29% of the variance in academic well-being (R^2 = .29), 70% of the variance in regulation of academic motivation (R^2 = .70), and 78% of the variance in regulation of academic emotion (R^2 = .78).

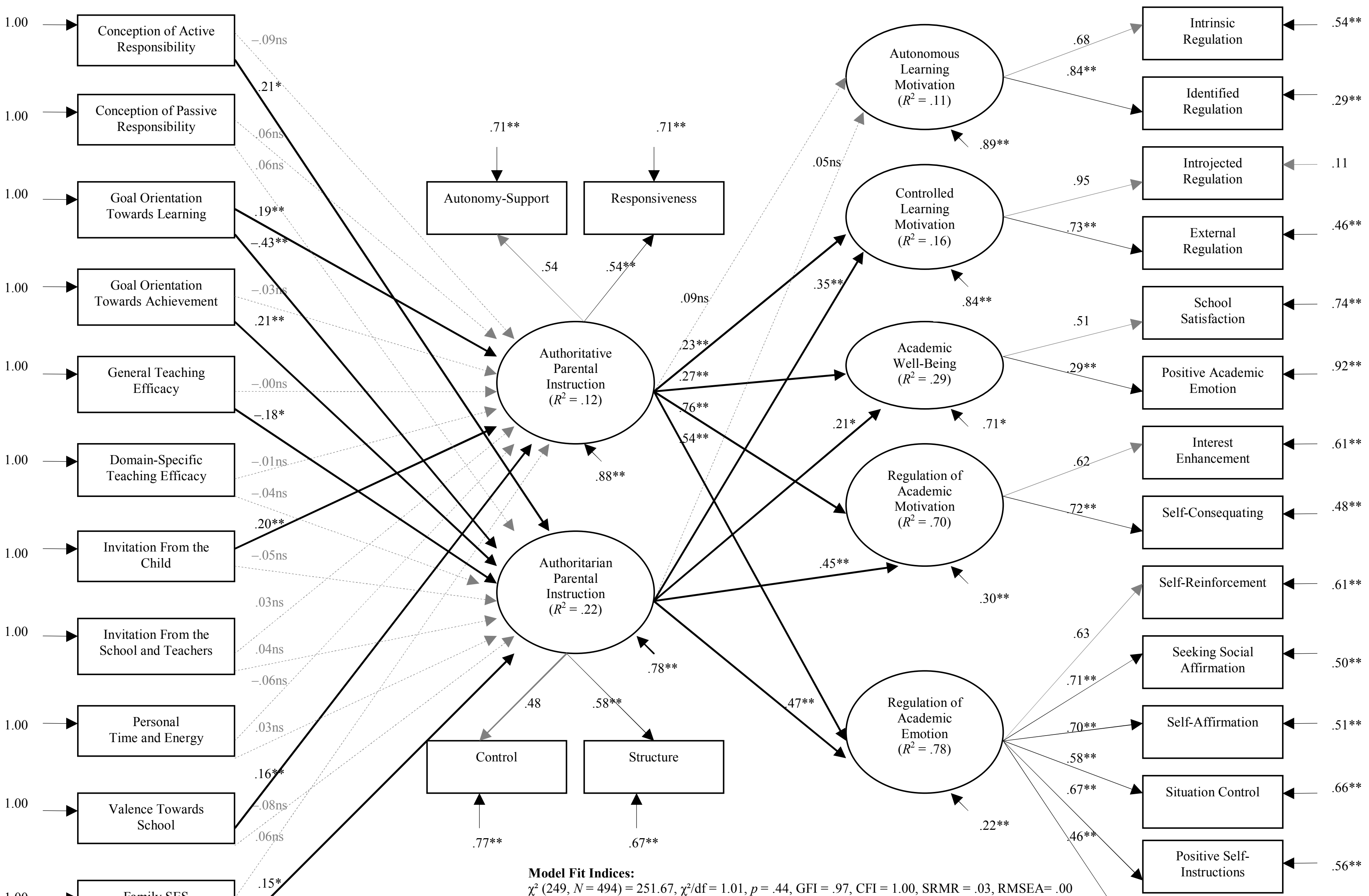


Figure 5.12.
Empirically Validated Complete Structural Model of the Antecedents and Consequences of the Quality of Home-Based Parental Involvement for the Thai Sample (*$p < .05$. **$p < .01$.).

Table 5.8

Standardized Parameter Estimates (Direct, Indirect, and Total Effects) for the Complete Structural Model of the Antecedents and Consequences of Authoritative Versus Authoritarian Parental Instruction for the Thai Sample

	Dependent variable								
	Authoritative parental instruction			Authoritarian parental instruction			Autonomous learning motivation		
Independent variable	DE	IE	TE	DE	IE	TE	DE	IE	TE
Authoritative parental instruction	—	—	—	—	—	—	.09	—	.09
Authoritarian parental instruction	—	—	—	—	—	—	.05	—	.05
Conception of active responsibility	–.09	—	–.09	.21*	—	.21*	—	.00	.00
Conception of passive responsibility	.06	—	.06	.06	—	.06	—	.01	.01
Goal orientation towards learning	.19**	—	.19**	–.43**	—	–.43**	—	–.01	–.01
Goal orientation towards achievement	–.03	—	–.03	.21**	—	.21**	—	.01	.01
General teaching efficacy	–.00	—	–.00	–.18*	—	–.18*	—	–.01	–.01
Domain-specific teaching efficacy	.01	—	.01	–.04	—	–.04	—	.00	.00
Invitation from child	.20**	—	.20**	–.05	—	–.05	—	.01	.01
Invitation from school and teachers	.03	—	.03	.04	—	.04	—	.00	.00
Personal time and energy	–.06	—	–.06	.03	—	.03	—	–.01	–.01
Valence towards school	.16*	—	.16*	–.08	—	–.08	—	.01	.01
Family SES	.06	—	.06	.15*	—	.15*	—	.01	.01

	Dependent variable								
	Controlled learning motivation			Academic well-being			Regulation of academic motivation		
Independent variable	DE	IE	TE	DE	IE	TE	DE	IE	TE
Authoritative parental instruction	.23**	—	.23**	.26**	—	.26**	.76**	—	.76**
Authoritarian parental instruction	.35**	—	.35**	.21*	—	.21*	.45**	—	.45**
Conception of active responsibility	—	.05	.05	—	.02	.02	—	.03	.03
Conception of passive responsibility	—	.03	.03	—	.03	.03	—	.07	.07
Goal orientation towards learning	—	–.11**	–.11**	—	–.04	–.04	—	–.05	–.05
Goal orientation towards achievement	—	.07*	.07*	—	.04	.04	—	.07	.07
General teaching efficacy	—	–.06*	–.06*	—	–.04	–.04	—	–.09	–.09
Domain-specific teaching efficacy	—	–.01	–.01	—	.00	.00	—	–.01	–.01
Invitation from child	—	.03	.03	—	.04	.04	—	.13*	.13*
Invitation from school and teachers	—	.02	.02	—	.02	.02	—	.04	.04
Personal time and energy	—	–.02	–.02	—	–.02	–.02	—	–.05	–.05
Valence towards school	—	.01	.01	—	.02	.02	—	.08	.08
Family SES	—	.07**	.07**	—	.05	.05	—	.12*	.12*

	Dependent variable		
	Regulation of academic emotion		
Independent variable	DE	IE	TE
Authoritative parental instruction	.54**	—	.54**
Authoritarian parental instruction	.47**	—	.47**
Conception of active responsibility	—	.05	.05
Conception of passive responsibility	—	.06	.06
Goal orientation towards learning	—	–.10*	–.10*
Goal orientation towards achievement	—	.08*	.08*
General teaching efficacy	—	–.09*	–.09*
Domain-specific teaching efficacy	—	–.01	–.01
Invitation from child	—	.09	.09
Invitation from school and teachers	—	.03	.03
Personal time and energy	—	–.04	–.04
Valence towards school	—	.05	.05
Family SES	—	.10*	.10*

Note. DE = Direct Effect. IE = Indirect Effect. TE = Total Effect.
*$p < .05$. **$p < .01$.

5.2.2G. Short Summary

The aim of this analysis of this section was to empirically examine the linkages between 11 predictor constructs, two distinct kinds of parental instruction (as mediators), and 5 pupils' academic functioning outcomes. To gain a deeper insight into the consistency of each causal path, a series of model validations were tested empirically in a hierarchical order based on an increasing number of causal paths. As shown in six sub-sections (5.2.2A−5.2.2F), the fourth model (authoritative parental instruction as a single mediator), the fifth model (authoritarian parental instruction as a single mediator), and the sixth model (the complete model; two distinct kinds of parental instruction as double mediators) were empirically validated with the data from the German and Thai samples—6 models in total. Overall, the models fitted the empirical data well. Yet, it was found that some linkages were not consistently significant when more or less variables were included in the models.

Looking at the consistent linkages in particular:

In the German sample, in the fourth and the sixth models, authoritative parental instructions were consistently significantly predicted by domain-specific teaching efficacy, time and energy, and valence towards school. All pupils' academic functioning outcomes were consistently significantly predicted by authoritative parental instruction in both models. In the fifth and the sixth models, authoritarian parental instruction was consistently significantly predicted by goal orientation towards achievement and family SES. Yet, only three outcomes—controlled learning motivation, academic well-being, and regulation of emotion regulation were consistently significantly predicted by authoritarian parental instruction in both models.

In the Thai sample, in the fourth and the sixth models, invitation from the child and valence towards school consistently significantly contributed to authoritative parental instruction. In the fifth and the sixth models, authoritarian parental instruction were consistently significantly predicted by goal orientation towards achievement and family SES. All pupils' academic functioning outcomes were consistently significantly predicted by both distinct kinds of parental instruction.

5.4. Test of Invariance for the Complete Structural Model of The Antecedents and Consequences of the Quality of Home-Based Parental Involvement Across the German and Thai Samples

The aim of this part of the analysis was to test the invariance in the complete structural model of antecedents and consequences of the quality of home-based parental involvement across German and Thai samples. In other words, to test whether culture had a moderating effect on the complete structural model. The present study hypothesized that culture would be a moderating variable that intervenes in the relationship among research variables estimated in the complete structural model. Culture was a nonmetric moderating variable characterized by a categorical variable of country-of-origin—two sample groups of Germans and Thais. To test the invariance in the complete structural model across German and Thai samples, a multiple group analysis (MGA) was performed with *LISREL* program version 8.53 (Jöreskog & Sörbom, 2002). The procedures in multiple group analysis are quite similar to the procedures in multi-sample confirmatory analysis (MCFA) as reported in the methodological chapter (see *pp*. 86−92).

Multiple group analysis (MGA) is an analysis within the framework of structural equation modelling (SEM) designed to examine differences between similar models estimated for different groups of respondents (as characterized by a moderating variable). MGA is a series of comparisons of structural models with increasingly restrictive constraints of parameter estimates across groups. The χ^2 difference ($\Delta\chi^2$) is used to test for a significant increase between a pair of comparisons between two model specifications (e.g. one with less and one with more constraint). Basically, if a set of constraints is applied and model fit (as measured by χ^2) does not show a significant increase (the significant result of $\Delta\chi^2$ is not met) from a less constrained model, then there is no support for moderation because parameter estimates do not differ between groups (Hair et al., 2010). That is, the moderating variable yields no impact on the working model.

This part of analysis tested *six hypothesized models of invariance testing* nested in a hierarchical ordering with increasing number of parameter estimates. The six hypothesized models were:

- *Model 1*: model structure invariance (model structure [model form] is constrained to be equal across groups).

- *Model 2*: metric invariance (factor loadings of latent constructs [the LY matrix] are constrained to be equal across groups).
- *Model 3*: invariance in path coefficients from exogenous variables to endogenous variables (path coefficients from antecedent factors to authoritative and authoritarian parental instruction [the GA matrix] are constrained to be equal across groups).
- *Model 4*: invariance in path coefficients among endogenous variables (path coefficients from authoritative and authoritarian parental instruction to pupils' academic functioning outcomes [the BE matrix] are constrained to be equal across groups).
- *Model 5*: factor disturbance-covariance invariance (factor disturbances-covariances [the PS matrix] are constrained to be equal across groups).
- *Model 6*: error variance-covariance invariance (measurement error variances-covariances of endogenous variables [the TE matrix] are constrained to be equal across groups).

The first test was of *Model 1*, model structure invariance. As Table 5.9 shows, the empirical data supported *Model 1* well, revealing excellent fit indices, χ^2 (430, $N_1 = 288$; $N_2 = 494$) = 401.60, $\chi^2/df = .93$, $p = .83$, GFI = .97, CFI = 1.00, SRMR = .03, RMSEA = .00. This indicated that the model structure of the complete structural model was not invariant across German and Thai samples. Because model structure invariance was supported, factor loadings of latent constructs (i.e. two distinct types of parental instruction, five pupils' academic outcomes) were constrained to be equal (*Model 2*). *Model 2* fitted the data well, but the χ^2 difference ($\Delta\chi^2$) between *Model 2* versus *Model 1* was statistically significant ($p < .05$). This indicated that factor loadings of latent constructs were not equivalent across samples. That is, metric invariance was not supported. Afterwards, further nested models were examined. It was found that the invariance model of path coefficients from exogenous variables to endogenous variables (*Model 3*) and the invariance model of path coefficients among endogenous variables (*Model 4*) yielded acceptable fit indices (see Table 5.9). However, the tests of $\Delta\chi^2$ between adjacent models (*Model 3* vs. *Model 2*; *Model 4* vs. *Model 3*) were statistically significant ($p < .01$). This indicated that path coefficients from antecedent factors to two distinct types of parental instruction as well as path coefficients from two distinct types of parental instruction to pupils' learning outcomes varied across samples. That is, invariance in path coefficients was not supported.

Apart from this, the factor disturbance-covariance invariance model (*Model 5*) and the error variance-covariance invariance model (*Model 6*) did not provide acceptable fit indices for the data (see Table 5.9). This indicated that factor disturbance-covariance invariance and error variance-covariance invariance were not supported. Among all six nested models, *Model 1* (configural invariance) was considered as the best-fit model, indicating by the smallest value of the ratio of χ^2 to *df* of .93.

Table 5.9
Test of Invariance for the Complete Structural Model of the Antecedents and Consequences of Authoritative Versus Authoritarian Parental Instruction Across the German and Thai Samples

	Model fit index							
Nested model	χ^2	*df*	χ^2/df	*p*	GFI	CFI	SRMR	RMSEA
Model 1: model structure invariance	401.60	430	.93	.83	.97	1.00	.03	.00
Model 2: metric invariance	425.77	441	.97	.69	.97	1.00	.03	.00
Model 3: invariance in path coefficients from exogenous variables to endogenous variables	479.92	463	1.04	.28	.97	1.00	.04	.01
Model 4: invariance in path coefficients among endogenous variables	516.77	473	1.09	.08	.97	1.00	.04	.02
Model 5: factor disturbance-covariance invariance	568.24	486	1.17	.01	.96	.99	.04	.02
Model 6: error variance-covariance invariance	767.46	567	1.35	.00	.96	.98	.04	.03
				Critical value of χ^2 distribution				
Model difference	$\Delta\chi^2$	Δdf	Decision		.05	.01		
Model 2 vs. Model 1	24.17*	11	Reject		19.68	24.73		
Model 3 vs. Model 2	54.15**	22	Reject		33.92	40.29		
Model 4 vs. Model 3	36.85**	10	Reject		18.31	23.21		
Model 5 vs. Model 4	–	–	Reject		–	–		
Model 6 vs. Model 5	–	–	Reject		–	–		

* $p < .05$. ** $p < .01$. The grey shading indicates the best-fit model.

In short, the findings shown above reveal that the complete structural model of antecedents and consequences of the quality of home-based parental involvement was invariant in terms of model structure, whereas all parameter estimates for the model (e.g. factor loadings, causal paths) varied across German and Thai samples. Therefore, it could be concluded that culture (country of origin) had a moderating effect on the complete structural model, and the relationships between the research variables were moderated by cultural background.

Chapter VI

Discussion

This chapter summarizes and discusses the main research findings, clarifies some limitations of the research study, and gives recommendations for further studies.

6.1. Summary

Research Aims

The aims of the present cross-cultural study were (a) to develop and empirically validate the conceptual model describing the linkages between antecedents of the quality of home-based parental involvement and its impact on pupils' learning motivation, academic well-being, and academic self-regulation competencies; and (b) to test the invariance of the conceptual model across two distinct cultural settings—Germany and Thailand—representing *individualistic* versus *collectivistic* cultures.

Research Questions

Three research questions were addressed in this study:

1] What are the significant predictors of the quality of home-based parental involvement in German and Thai family contexts?

2] How does the quality of home-based parental involvement influence pupils' academic functioning outcomes, as measured in terms of learning motivation, academic well-being, and self-regulated learning competencies in German and Thai family contexts?

3] Does culture moderate *at least* some linkages between antecedents and effects of the quality of home-based parental involvement?

Participants

The participants in this study were parents and their children (5th- and 6th graders) from both countries. Most parents (above 80%) in both samples were mothers. To recruit a variety of participants from different social backgrounds, *school type* was used as a sampling unit. The total sample consisted of 1,564 parent–child dyads—288 from Germany and 494 from Thailand.

Data Collection

The data collection was carried out in eight schools in *North Rhine-Westphalia* (Germany) and eight schools in *Bangkok Metropolitan Area* and *Chonburi Province* (Thailand). The pupil questionnaire survey was administered in regular classrooms. After school, pupils took the parent questionnaires home to their parents. Parent questionnaires were returned afterwards.

Research Instruments

In the current work, parent and pupil questionnaires (comprising a wide range of *subscales*) were constructed in German and Thai. Items were rated on a 4-point Likert scale ranging from 1 (*strongly disagree*) to 4 (*strongly agree*). Scholars applied cross-cultural translation techniques to check the content validity and the content equivalence of the German and Thai questionnaires. In both languages, the internal consistency of each scale was greater than .50. Findings in the measurement invariance analysis indicated that all scales achieved configural invariance (equal factor structure) and metric invariance (most of factor loadings are equal) across German and Thai samples. This indicated that all constructs were interpreted similarly by both German and Thai participants. Therefore, the present data could be used for a further comparison of the relations among research variables between Germany and Thailand.

The Conceptual Model

On the basis of a literature review, a *conceptual model* was developed to describe the linkages between predictor constructs, the quality of home-based parental involvement, and students' academic functioning outcomes. The conceptual model was depicted in terms of *structural equation modelling* (SEM).

In the conceptual model, the quality of home-based parental involvement was characterized operationally by two distinct kinds of parental instruction—

authoritative versus authoritarian. The *former* was defined by parental autonomy-support and responsiveness; the *latter*, by parental control and structure. The conceptual model contained five predictor dimensions as antecedents of the quality of home-based parental involvement. These five predictor dimensions were parental role conception of responsibility, parental role conception in learning situations, parental teaching efficacy, specific invitations for home-based involvement, and life context. These predictor dimensions were assessed by 10 predictor constructs serving as manifest variables (2 predictor constructs per dimension). As a *control variable*, family SES was included in the conceptual model as one of predictor constructs. This resulted in a total of 11 predictor constructs (serving as manifest variables).

On the basis of the literature review, it was hypothesized that *variations* in predictor constructs might contribute to either authoritative or authoritarian kinds of parental instruction. As *mediators*, the two distinct kinds of instructional strategies, in turn, were assumed to lead to different results in terms of pupils' academic functioning outcomes, namely, in their learning motivation, academic well-being, and academic self-regulation competencies.

Data Analysis

The conceptual model was empirically tested *step by step* by using structural equation modelling (SEM) analysis to gain a deeper insight into the *consistency* of each causal path. That is, the conceptual model was broken down into five smaller models (hierarchically ordered with an increasing number of causal paths) and *one complete model*. *The first* and *the second* model described the impact of predictor constructs on authoritative and authoritarian kinds of parental instruction, respectively. *The third model* investigated the contribution of predictor constructs when interrelations between both kinds of instruction were taken into account. *The fourth* and *the fifth model* examined how far the two distinct kinds of instruction mediate the relations among predictor constructs and a set of pupils' academic functioning outcomes. Finally, *the sixth model* examined an overview of all linkages. In the final phase of analysis, multiple group analysis (MGA) was used to test the *invariance* of the complete model across the German and Thai samples.

Review of the Main Findings

Overall, the results of the SEM analysis showed that a series of hierarchically ordered models (five smaller models and one complete model) fitted the data from both samples well. This provided empirical support for the conceptual model of the study (developed on the basis of literature review).

However, the main findings were derived from the *validated complete conceptual model*, because this model empirically tested the linkages between *all research variables*. The next section reviews the main findings and how they answer the three research questions in the present study.

<u>Research Question 1</u>:

What are the significant predictors of the quality of home-based parental involvement in German and Thai family contexts?

Germany

In the German sample, findings suggested that *German parents* are more likely to adopt *authoritative* kinds of instruction the *less* they frame their children's learning situations as *a chance* to improve their children's performance (product-oriented), feel efficacious in their own teaching skills in the specific domain, have the time and energy to address their children's school-related issues, and report on their own school-related experiences in a positive way. In contrast, German parents are more likely to adopt *authoritarian* kinds of instruction in home-based learning situations the *more* they are product-oriented.

Apart from this, findings revealed that parents' perceived invitation from school staff to involvement and family SES have significant *negative direct effects* on both distinct kinds of parental instruction. Hence, these two predictor constructs do not distinguish the quality of parental instruction at all. This may indicate that both kinds of German parents—those who feel *less* invited from the school staff to become engaged in home-based involvement and those who report *low* SES—have a tendency to *neglect* home-based involvement.

Overall, it can be concluded that the validated conceptual model for the German sample seems to place a greater emphasis on the predictors of authoritarian kinds of instruction in Germany—something that is more likely to be found in an *individualistic culture*. However, the results supported the conceptual model with only *few exceptions*. That is, parental conceptions of responsibility, general teaching efficacy, and invitation from the child to involvement are not found to be significant predictors of the quality of parental instruction.

Thailand

In the Thai sample, the findings suggested that *Thai parents* are *more* likely to adopt *authoritarian* kinds of instruction, the more they believe that parents should take active responsibility for their child's education, view their children's learning situations as an opportunity to strive for their children's performance, and report high SES. In contrast, parents are *less* likely to perform in an *authoritarian* way, the more they frame the child's learning situations as a chance to develop the child's self-regulation in learning (process-oriented) and feel confident in their own teaching skills in general. Parents are more likely to adopt authoritative kinds of parental instruction the more they are process-oriented, feel invited by the child to become involved, and hold more positive images of their own schooling.

Overall, it can be concluded that the validated model for the Thai sample appears to offer more of an explanation of *risk factors* that lead Thai parents to adopt authoritarian kinds of instruction—something that is more likely to be normative in *collectivistic* cultural settings. However, only a few exceptions were found to the extent that parental conception of passive responsibility, domain-specific teaching efficacy, invitation from the school staff, and time and energy are not significant predictors of the quality of parental instruction.

<u>*Research Question 2*</u>:

How does the quality of home-based parental involvement influence pupils' academic functioning outcomes (i.e. learning motivation, academic well-being, and academic self-regulation competencies) in German and Thai family contexts?

Germany

In the German sample, results suggested that *German parents* are more likely to create learning situations in an authoritative way the more their children are self-determined (autonomous) in their learning, achieve positive academic well-being, and utilize motivational and emotional regulation strategies to ensure that they make an effort and complete their learning assignments.

When taking the mediating effect of the quality of parental instruction into account, the results underline that parental teaching efficacy in the specific domain along with time and energy for involvement appear to be the *key protective factors* that prompt German parents to adopt authoritative kinds of instruction, and these, in turn, help their children to achieve high levels in all kinds of academic functioning outcomes. In addition, parents' negative experiences with their own past school seem to undermine parents' readiness to be authoritative in their instruction, and this, in turn, impairs the child's ability to use motivational regulation strategies. Vice versa, a parental performance goal appears to be the *key risk factor* that prompts German parents to perform in an authoritarian way, and this, in turn, discourages their children's academic well-being as well as their children's abilities to develop their motivational regulation competency.

Thailand

In the Thai sample, results suggested that Thai parents are more likely to adopt authoritative kinds of instruction the more their children report a higher level of academic well-being and that they are competent in their motivational and emotional regulation skills, compared to their peers whose parents perform home-based instruction in a more authoritarian manner. However, the quality of parental instruction (either in authoritative or in authoritarian manner) in Thailand does not foster the child's self-determination in learning at all. Although Thai children perceive their parents as being authoritarian in performing home-based instruction, they report positive academic well-being. In addition, it is more the case that parents' provision of controlling and structuring instructional strategies encourages their children to be non-self-determined (controlled) in their learning.

Taking the mediating effect of the quality of parental instruction into account, the results suggested that invitation from their children appears to be the *key protective factor* promoting parents' authoritative instruction. In other words, Thai parents are prompted to create learning situations in a more authoritative way, the more their children show the need for and request their help and support through home-based involvement. This, in turn, encourages Thai children to be more competent in their motivational regulation skills. In contrast, parents' achievement orientation, general teaching efficacy, and family SES seem to be the *key risk factors* that prompt Thai parents to adopt authoritarian kinds of instruction, which, in turn, enhance their children's controlled learning motivation. Surprisingly, Thai students also benefit from authoritarian kinds of parental instruction to the extent that this instruction style promotes their emotional regulation competencies. Apart from this, Thai children of authoritarian parents may experience the use of motivation regulation strategies when their parents tend to report low family SES.

Research Question 3:

Does culture moderate at least some linkages between antecedents and effects of the quality of home-based parental involvement?

The review of the main findings in the earlier chapter indicated that the relationships between a set of predictor constructs, two distinct kinds of parental instruction, and a set of pupils' academic functioning outcomes *varied* across the two distinct cultural settings. At that stage in the research, it was too early to infer that culture plays a role as a *moderator* of these relationships. It was first necessary to perform multiple group analysis (MGA) in order to compare the empirical model with increasingly restrictive constraints of parameter estimates across the two groups.

The results of MGA revealed that the pattern of the model is invariant across German and Thai samples, but that the mechanisms within the model differ across the two samples. Ultimately, the findings confirmed that culture moderates linkages among antecedents of the quality of parental instruction and its consequences.

In sum, it can be concluded that parents from different cultures adopt different types of parental instruction due to variations in their attitudes, interpersonal conditions, and family contexts. Yet, in both cultures, achievement-oriented parents are more likely to become controlling and structuring when it comes to home-based instruction. In contrast, authoritative parents from both cultures are more likely to help their children to successfully achieve desired academic functioning outcomes than authoritarian parents.

6.2. Discussion

6.2.1. Antecedents of the Quality of Home-Based Parental Involvement in German and Thai Cultural Settings

Predictor Constructs Derived from Hoover-Dempsey and Sandler's Model and Their Contribution to the Quality of Parental Instruction

(a) <u>*Parental Conceptions of (Active vs. Passive) Responsibility*</u>

In the Thai sample, the parental conception of *active responsibility* has a significant *positive direct effect* on *authoritarian* kinds of parental instruction. This indicates that parents who hold a more active view of their responsibility for their child's education tend to be in control of their child's school-related issues.

According to previous studies (e.g. Green et al., 2007; Hoover-Dempsey & Sandler, 2005), the parental conception of active responsibility (active role beliefs) is a *significant predictor* of *the amount* of home-based parental involvement (the more parents are active, the more they become involved). The results from the Thai sample extend the previous findings by showing that the parental conception of active responsibility also contributes to *the quality* of home-based instruction.

However, the results from the German sample revealed that the two distinct conceptions of responsibility (active vs. passive) are in *no way significant predictors* of the two distinct kinds of parental instruction. To discuss these non-significant results, it is necessary to take a closer look at *the smaller models* (see Figure 5.3, Figure 5.5, and Figure 5.9) examining the linkages between parental conceptions of responsibility and the quality of parental instruction. In every smaller model, parental conception of passive responsibility had a significant *negative direct effect* on *authoritarian* kinds of parental instruction—indicating that the *less* parents hold a *passive* view of their responsibility, the *more* they adopt *authoritarian* kinds of instruction. From a methodological point of view, these unexpected results in the German sample may well be due to increasing parameter estimates and error terms in *the complete* validated SEM model.

(b) General Teaching Efficacy

In the Thai sample, results revealed that general teaching efficacy has a significant *negative direct effect* on authoritarian kinds of parental instruction. According to Green et al. (2007), parents' general efficacy beliefs significantly predict *the amount* of home-based and school-based involvement. The present finding in the Thai sample extends the work of Green et al. (2007) by showing that parents' general efficacy beliefs and time and energy also contribute to the quality of parental instruction.

(c) Domain-Specific Teaching Efficacy

In the German sample, parents' domain-specific teaching efficacy yielded a significant *negative direct effect* on *authoritative* kinds of parental instruction. This was contrary to theoretical expectations (a positive direct effect should be found instead). When discussing this unexpected result, it is necessary to reconsider *the smaller SEM models* (see Figure 5.1, Figure 5.5, and Figure 5.7) examining the linkage between domain-specific teaching efficacy and authoritative kinds of parental instruction. In every smaller model, domain-specific teaching efficacy has a significant *positive direct effect* on authoritative kinds of parental instruction. Hence, it may be reasonable to assume that this unexpected result in the German sample is probably also due to increasing parameter estimates and error terms in *the complete* validated SEM model.

(d) Invitation from the Child to Involvement

In the Thai sample, invitation from the child to involvement has a significant *positive direct effect* on authoritative kinds of parental instruction. Green et al. (2007) found that invitation from the child to involvement was a significant predictor of the amount of home-based parental involvement. Hence, the present result from the Thai sample extends Green et al. (2007)'s research by confirming that child invitation is also a significant predictor of the quality of home-based instruction.

(e) Invitation from the School and Teachers to Involvement

In the German sample, findings revealed that *invitation from the school and teachers* has significant *negative direct effects* on the two distinct kinds of parental instruction. These findings indicated that *invitation from the school and teachers* contributed more to *the amount* of home-based parental involvement, but not to *differences in the quality* of home-based involvement. One possible explanation for this unexpected finding is that the school and teachers may basically increase the parents' awareness of the importance of being involved in general issues of their child's education. For instance, it may make parents aware of the need to participate actively in school events and to keep an eye on their child's homework. However, the school and teachers may not provide parents with enough guidelines or advice on how they should help their children with school-related issues at home.

(f) Time and Energy for Involvement

In the German sample, results revealed that *time and energy for involvement* has a significant *negative direct effect* on authoritative kinds of parental instruction. This ran counter to the theoretical expectations. When discussing this unexpected result, it is necessary to reconsider the smaller SEM models (see Figure 5.1, Figure 5.5., and Figure 5.7) that examined the relations between time and energy and authoritative kinds of parental instruction. In every smaller model, time and energy had a significant *positive direct effect* on authoritative kinds of parental instruction. Therefore, it may be reasonable to assume that this unexpected result might also be due to increasing parameter estimates and error terms in the complete validated SEM model. When considering the results of all SEM models together, however, time and energy appears to be a significant predictor of authoritative kinds of parental instruction. The finding from the German sample is in line with Grolnick (2009), who pointed out that, in order to provide autonomy-support, responsiveness, or involvement, parents may need to have the time, the resources, as well as the psychological ability to take their child's perspective and let him/her solve a problem alone.

(g) Valence Towards School

In the German sample, results revealed that *valence towards school* has a significant *negative direct effect* on *authoritative* kinds of parental instruction. Moreover, *no significant linkage* is found between valence towards school and *authoritaria*n kinds of parental instruction. When discussing these unexpected results, it is necessary to reconsider the results of the *five smaller SEM* models (see Figure 5.1, Figure 5.3, Figure 5.5, Figure 5.7, and Figure 5.9) that examined the linkages between valence towards school and the two distinct kinds of parental instruction. In the smaller models, valence towards school has significant *negative direct effects* on *both distinct kinds* of parental instruction. From a methodological perspective, these unexpected results may well be due to increasing parameter estimates and error terms in the complete validated SEM model. However, these findings in the smaller models may also indicate that parents who did not like school (when they were pupils) tend to neglect home-based involvement. Nevertheless, another possible explanation to these unexpected results might be that German parents who had negative experiences during their own schooling (i.e. felt rejected by teachers, had learning difficulties) may be interested in providing the best possible support to their children so that they do not have to suffer the way they did. Accordingly, they tend to be highly responsive and autonomy-supportive when dealing with their child's school-related issues.

In the Thai sample, results suggested that valence towards school has a significant *positive direct effect* on authoritative kinds of instruction. According to Tayler et al. (2004), parents' own school experiences may shape their behaviours in relation to their children's school. For instance, parents whose school experiences were warm and supportive may view the child's school as a positive place. Results on the Thai sample extend the work of Tayler et al. (2004) by showing that parents' positive experience with their own school *in the past* determines the parents' tendency to perform home-based instruction in a more authoritative manner.

Parental Role Conceptions in Learning Situations

In the German sample, results suggested that parents are *more* likely to adopt *authoritarian* kinds of instruction the *more* they are *product-oriented*. In contrast, parents are *less* likely to adopt *authoritative* kinds of instruction the *more* they are *product-oriented*. In the Thai sample, results suggested that highly *process-oriented* parents are *more* likely to create learning situations in an *authoritative* manner, whereas parents who are *less process-oriented* but *more product-oriented* tend to act in an *authoritarian* way when it comes to home-based involvement.

As expected, the results from both samples are consistent with Renshaw and Gardner (1990) who found that process-oriented parents who interpreted their children's learning tasks as having a learning goal were *less directive*. In contrast, those product-oriented parents who interpreted their children's learning tasks as having an achievement goal were *more directive and controlling.*

Family SES

In the German sample, findings revealed that family SES (as measured by *parental education* and *home literacy resources*) has significant *negative direct effects* on both distinct kinds of instruction. These findings indicate that family SES is not at all likely to predict the quality of parental instruction. However, these findings tend to indicate that some German parents with low SES neglect home-based involvement. Nevertheless, these findings in the German sample are in line with previous studies suggesting that family SES leads to variations in the *amount* of parental involvement. For instance, compared with high-SES parents, low-SES parents may not have equal opportunities to take part in such school events due to inflexible work schedules (Heymann & Earle, 2000). In addition, low-SES parents with little education may not feel competent enough to help their children with homework or know how to search for the educational resources available in their communities (Lee & Bowen, 2006).

In the Thai sample, it was surprisingly found that *high SES* parents are more likely to adopt authoritarian kinds of instruction. These finding *contradict* prior research (e.g. Chen & Berdan, 2006; Hoff-Ginsberg & Tardif, 1995) indicating the opposite, namely, that *low-SES* parents tend to act in an authoritarian way. However, these finding from the Thai sample are in line with Rudy and Grusec (2006), who have argued that parents in a *collectivistic culture* (such as Thailand) are more likely to endorse authoritarian kinds of instruction because they see these as *normative* and necessary to promote the optimal development of their child. Consequently, even high-SES Thai parents (who are highly educated and can afford greater amount of home literacy resources for their child) are more likely to act in a more authoritarian way because they see this way of instruction as being normative and good for their child's educational success.

6.2.2. Consequences of the Quality of Home-Based Parental Involvement in German and Thai Cultural Settings

Learning Motivation

In the German sample, results suggested that authoritative kinds of parental instruction are more likely to foster pupils' autonomous learning motivation compared to authoritarian kinds of parental instruction. In contrast, authoritarian kinds of parental instruction are more likely to enhance pupils' controlled learning motivation compared to authoritative kinds of parental instruction. These results in the German sample are in line with *the central hypothesis of SDT* proposing that when parental support is more likely to satisfy the child's basic needs, the child's learning is more likely to be autonomous rather than controlled (e.g. Grolnick, 2009). Moreover, these results in the German sample are consistent with previous SDT research (e.g. Exeler &Wild, 2003; Grolnick & Ryan, 1989; Grolnick, Ryan, & Deci, 1991; Lorenz & Wild, 2007; Soenens & Vansteenskiste, 2005) reporting significant positive linkages between parents' autonomy-support, responsiveness, and pupils' autonomous motivation across different cultural groups.

In the Thai sample, the results suggested that authoritarian kinds of parental instruction are more likely to enhance pupils' controlled learning motivation compared to authoritative kinds of parental instruction. These results are also in line with previous studies.

However, the results in the Thai sample contradict the theoretical assumptions because *no significant correlation* is found between authoritative kinds of parental instruction and pupils' autonomous learning motivation. To dig deeper, it is necessary to look at the results of the smaller validated models for the Thai sample. Interestingly, authoritative parental instruction is associated significantly with pupils' autonomous learning motivation *when authoritarian parental instruction is excluded from the model* (see Figure 5.8). From a methodological point of view, it may be assumed that the impact of authoritative parental instruction on pupils' autonomous learning motivation becomes insignificant due to the increasing number of estimated parameters as well as measurement errors.

A further possible explanation for these unexpected results might be that the Thai data were collected in 5th- and 6th-grade pupils who (*at that time*) were facing the transition to lower secondary school in Thailand. At the end of 6th grade, most Thai pupils leave their primary schools for new schools. New schools require specific scholastic tests as well as school performance history as selection criteria. This particular situation may make parents become highly controlling and make them set high expectations regarding school success due to their *worries* and *concerns* about their child's future.

The above explanation has been supported convincingly by previous studies inspired by SDT that have underlined how parents' stress and perceptions of threat to their child's lives correlates with their controlling behaviour (e.g. Grolnick et al., 1997; Gurland & Grolnick, 2005). When being controlled, their children appear to report a higher level of controlled learning motivation. Accordingly, parental stress or perceived threat to their children's environment might have been *extraneous variables* in the present study that caused this unexpected finding. At this stage, findings are not clear enough to conclude that parents' support for basic needs is not critical to the child's academic self-determination in the Thai family context. It would be worth gaining a deeper insight into these linkages by controlling for parents' stress or perceived threats to their child's environment.

Another possible explanation might be that the present study highlighted only the linkage between the quality of parental instruction and autonomous versus controlled learning motivation. Other kinds of inner motivational resources were not investigated. Grolnick, Ryan, and Deci (1991) have proposed that three inner resources, namely, control understanding, perceived competence, and relative autonomy (autonomous motivation) may be critical motivational resources for promoting pupils' school success. These three inner resources are systematically intercorrelated, and can be promoted when parents provide autonomy-support and involvement (responsiveness). According to Grolnick, Ryan, and Deci (1991), empirical findings reveal that pupils' relative autonomy (autonomous motivation) is significantly positively associated with their perceived scholastic competence. With respect to the concept of inner resources, it may be assumed that, in the Thai context, parents' adoption of authoritative kinds of parental instruction *alone* may not allow Thai children to feel competent in their learning. Consequently, this does not foster their autonomous learning motivation. Hence, Thai parents may need to show other kinds of instruction that allow their children to feel highly competent in their learning. Further research should take the concept of inner resources into account.

Academic Well-Being

Previous studies guided by SDT (e.g. Chirkov & Ryan, 2001; Niemiec et al., 2006) have found significant linkages between parents' provision of autonomy-support and responsiveness in the *general life domain* and in *subjective well-being indicators* (e.g. life satisfaction, positive affect).

The results of the present study extend these previous studies by showing how parents' autonomy-support and responsiveness relate significantly to the child's well-being in the *academic domain*.

In the German sample, results suggested that German parents are *more* likely to create home-based learning situations in an *authoritative* way (providing high autonomy-support and responsiveness) the *more* their children report *positive* academic well-being (*high* school satisfaction, positive academic emotions). Vice versa, German parents are *more* likely to adopt *authoritarian* kinds of instruction (providing high control and structure) the *more* their children report *negative* academic well-being (*low* school satisfaction, positive academic emotions).

In the Thai sample, results also revealed that authoritative kinds of parental instruction contribute to the child's positive academic well-being. This also extends the results of previous studies. However, the result in the Thai sample ran somewhat counter to theoretical assumptions, because *authoritarian* parental instruction has a significant *positive direct effect* on the child's *academic well-being*. The possible explanation for this unexpected result may be that in *collectivistic cultures* (that also include Thailand), children are normally more obedient to their parents' commands and respect their authority than children from *individualistic cultures* (e.g. Zhang, 1996, as cited in Laupa & Tse, 2005). Therefore, in Thai culture, when Thai parents perform home-based instruction in a more authoritarian way (high control and structure), Thai children may comply with their parents' controlling teaching behaviours, expectations, and rules because they see this way of parental instruction as an expression of parental care and concern for their educational success. Consequently, Thai children may report high school satisfaction and positive emotion in learning situations even though their parents create home-based instruction in a more authoritarian manner.

Regulation of Academic Motivation

Wolters (1999, 2003) has proposed that students' use of motivational regulation strategies is crucial for their learning and achievement. However, much less research has investigated motivational regulation as an aspect of self-regulated learning. Furthermore, his empirical findings have revealed that motivational regulation strategies are *intercorrelated* with metacognition and cognition regulation strategies.

Vansteenskiste, Zhou, Lens, and Soenens (2005) have found that self-determined academic motivation mediates the linkages between *parental autonomy-support* and metacognition and cognition regulation strategies.

Taking the results from these two previous studies together, the present study assumed that parents' provision of high autonomy-support (and low control) in the context of home-based learning and instruction should also contribute directly to pupils' use of motivational regulation strategies.

In the German sample, results revealed that authoritative kinds of parental instruction have a significant *positive direct effect* on motivational regulation strategies. Yet, *no significant linkage* at all is found between authoritarian parental instruction and motivational regulation strategies.

In the Thai sample, results revealed that the two distinct kinds of parental instruction have significant *positive direct effects* on motivational regulation strategies. Nevertheless, the positive direct effect of authoritative kinds of parental instruction on motivational regulation strategies is *much stronger* than the positive direct effect of authoritarian kinds of parental instruction.

As expected, the findings of the current study extend previous findings by showing that pupils are more likely to develop their motivational regulation competencies when their parents are more likely to adopt authoritative, and not authoritarian, kinds of parental instruction.

Regulation of Academic Emotion

Knollmann and Wild (2007b) have found that pupils' motivational orientation is *a key mediator* of the relationship between the quality of parental instruction and pupils' emotion regulation. The findings in the present study *extend* Knollmann and Wild (2007b)'s research by showing that there is a direct effect of the quality of parental instruction on pupils' utilization of emotional regulation strategies.

In the present study, the results from both samples revealed that two distinct kinds of parental instruction have significant *positive direct effects* on pupils' use of emotional regulation strategies. In line with expectations, *in both samples*, the significant *direct effect* of *authoritative* parental instruction on emotional regulation strategies is *stronger* than the *direct effect* of *authoritarian* parental instruction on emotional regulation strategies. That is, parents from both samples tend to foster their children's emotional regulation competencies when home-based instruction is performed in a more authoritative way.

However, the results from both samples suggested that children may also use emotional regulation strategies when their parents create home-based learning situations in a more authoritarian way. One possible explanation for these results might be that, in the present study, adaptive styles of regulation of negative emotions (e.g. situation control, positive self-instructions) were indicators of the measurement model of emotional regulation strategies. When home-based instruction is performed by parents in a more authoritarian way, children may tend to experience negative academic emotions (e.g. anxiety, anger). Consequently, children may use some emotional regulation strategies to help them to *cope* with stressful learning situations.

6.2.3. Applications of the Study

The results of the present study should be beneficial to school administrators, teachers, and parents. They may be used to improve the efficiency of *parent training programmes* designed to promote parents' awareness of the need to become involved in their child's schooling. The present results could be used to recommend that parent training programmes should *place more emphasis* on *home-based parental involvement* rather than school-based involvement. The present study and previous studies have confirmed empirically that home-based parental involvement is critical for the *academic functioning outcomes* desired in the child. Moreover, parent training programmes should not only aim to *increase the amount* of home-based involvement (e.g. encourage parents to spend more time with their children in learning situations at home) but also *improve* its quality. This means that parents should receive important guidelines for appropriate instructional strategies in relation to home-based learning situations. In addition, they should be trained and informed about *how and in which way* they should help their children with learning at home, and particularly how to do this in a more *authoritative* manner. For instance, while helping with homework, parents should give the child an opportunity to solve a task problem on his/her own and not just give the child the right answer. In addition, parents should dedicate time to their children and adopt their children's perspective. Last but not least, parent training programmes should particularly aim to foster appropriate attitudes and beliefs relevant to the child's education in parents—beliefs that may prompt them to adopt more authoritative kinds of parental instruction.

6.3. Research Limitations

1] This research took many variables into account (i.e. 11 parent variables; 18 pupil variables). Hence, measurement error may have increased due to the number of unobserved variables. When carrying out the data collection, each school allowed the questionnaire to be conducted in a regular classroom lesson (lasting approximately 40 min). Experience showed that some pupils needed more time, while others were unable to fill out the questionnaire on time (especially 5th-graders). Tired pupils could also be observed answering the questionnaire rather absent-mindedly. This may also have increased measurement error and lowered the credibility of the results.

2] The German sample (N = 288) was smaller than the Thai sample (N = 494) because the *classroom* was used as one of the sampling units. The classroom size of schools participating in Thailand was quite large (30–45 pupils per classroom) compared to that in German schools (25–35 pupils per classroom). Moreover, the return rate of the parent questionnaire was lower in the German sample (75%) than the Thai sample (92%). In addition, it was observed that participating schools differed in how far they communicated with parents about the participation in the research project. Active collaboration between school and parents may well be needed to increase the return rate of the parent questionnaire.

3] The data collection in Thailand was carried out between July and August 2010. At this point in time, Thai pupils were preparing for their midterm examinations. Therefore, *exam stress* or *anxiety* of pupils needs to be taken into consideration as an extraneous variable.

4] This research included family SES as a control variable. In order to recruit a variety of participants from different social backgrounds, *school type* was used as one of sampling units. However, different school types, in either Germany or Thailand, may differ in what they teach and its level of difficulty. As a result, teachers in different types of school may assign homework with different levels of difficulty to their pupils. The present study controlled only for the amount of homework. In other words, it emphasized home-based parental involvement in mathematics, because it was assumed that pupils spent most of their time on this subject. However, the *difficulty of homework* needs to be controlled as well.

6.4. Recommendations for Further Studies

Apart from the research limitations mentioned in the previous section, the following recommendations can be made for further studies:

1] In the current research, parents reported the information on all predictor constructs, whereas the quality of parental instruction was assessed by the perceptions of the child, and not by parents' self-report. This may be the reason why some of the predictor constructs derived from Hoover-Dempsey and Sandler's model did not contribute fully to the quality of parental instruction. It could well be that the parents who completed the parent questionnaire were not the same persons as those whom the pupils were thinking about while answering questions. For instance, the person most responsible for the child's homework may not have been available to answer the parent questionnaire at that time. Therefore, further studies should pay more attention to how they assess the quality of parental instruction. One alternative would be to assess both the parents' self-report and the child's perception of the quality of parental instruction and then compare the two.

2] Because the present study was designed as a cross-sectional study, it does not permit causal conclusions. This would require a longitudinal study. For instance *latent growth curve modelling* could be used to measure the development of parents' attitudes, their involvement practices, and the child's academic functioning outcomes *over time*.

3] This research focused only on the child's subjective well-being. It would be interesting to examine the impact of the quality of parental instruction on multidimensional aspects of well-being (subjective and psychological).

4] Further studies should also focus on investigating the direct impact of the quality of parental instruction on all aspects of self-regulated learning strategies. This could deepen the understanding of how the quality of parental support influences the multidimensional conceptions of self-regulated learning;

5] Previous SDT research has found that parents' provision of *autonomy-support to control* in the context of familial socialization were significantly predicted by some interesting parents' psychological constructs, for instance, parents' trust in the organismic development of the child (e.g. Landry et al., 2008) and parents' own autonomous motivation (e.g. Katz, Kaplan, & Buzukashvily, 2011). Therefore, it would be interesting to know whether these above-mentioned predictor constructs also influence pupils' academic functioning outcomes indirectly—particularly the outcomes in terms of academic well-being and all aspects of self-regulated learning strategies. Therefore, future research could take these mentioned predictor constructs into account.

6] Finally, past research has suggested that parents of young children *may* expect *boys* to do better i*n mat*h but *girls* to do better in more verbal assignments (e.g. Lummis & Stevenson, 1990). In order to test whether parental attitudes and their practices depend on subjects, home-based parental invo*lvement in other main subjects*, such as science or foreign languages, should also be taken into account.

References

Armsden, G. C., & Greenberg, M. T. (1987). The inventory of parent and peer attachment: Relationships to well-being in adolescence. *Journal of Youth and Adolescence, 16*, 427–454.

Asiedu-Addo, S. K., & Yidana, I. (2004). Mathematics teachers' knowledge of the subject content and methodology. *Mathematics Connection, 4*, 45–51.

Baker, J. A., Dilly, L. J., Aupperlee, J. L., & Patil, S. A. (2003). The developmental context of school satisfaction: Schools as psychologically healthy environments. *School Psychology Quarterly, 18*(2), 206–221.

Barnard, W. M. (2004). Parent involvement in elementary school and educational attainment. *Children and Youth Services Review, 26*, 39–62.

Bartsch, R. E. (1996). Ausdrucksminiaturisierung und Emotionsregulation bei positiven und negativen Gefühlen [Miniaturization of expression and emotion regulation of positive and negative feelings], Unveröffentlichte Diplomarbeit, Universität Bielefeld, Bielefeld, Germany.

Baumert, J., & Schümer, G. (2001). Schulformen als selektionsbedingte Lernmilieus [School types as selected conditions of learning milieus]. In Deutsches PISA-Konsortium (Ed.), *PISA 2000: Basiskompetenzen von Schülerinnen und Schülern im internationalen Vergleich* (pp. 454–467). Opladen, Germany: Leske + Budrich.

Bellin, N., Dunge, O., & Gunzenhauser, C. (2010). The importance of class composition for reading achievement: Migration background, social composition and instructional practices. An analysis of the German PIRLS data. *IERI Monograph Series: Issues and Methodologies in Large-Scale Assessments, 9−34.*

Bronstein, P., Ginsburg, G. S., & Herrera, I. S. (2005). Parental predictors of motivational orientation in early adolescence: A longitudinal study. *Journal of Youth and Adolescence, 34*, 559–575.

Burn, J., & Thongpasert, N. (2005). A culture-based model for strategic implementation of virtual education delivery. *International Journal of Education and Development using Information and Communication Technology, 1*(1), 32–52.

Chen, E. & Berdan, L.E. (2006). Socioeconomic status and patterns of parental adolescent interactions. *Journal of Research on Adolescence, 16*(1), 19–27.

Chirkov, V. I. (2009). A cross-cultural analysis of autonomy in education: A self-determination theory perspective. *Theory and Research in Education, 7*(2), 253–262.

Chirkov, V. I., & Ryan, R. M. (2001). Parent-and teacher autonomy-support in Russian and U.S. adolescents: Common effects on well-being and academic motivation. *Journal of Cross-Cultural Psychology, 32*(5), 618–635.

Chirkov, V. I., Ryan, R. M., Kim, Y., & Kaplan, U. (2003). Differentiating autonomy from individualism and independence: A self-determination theory perspective on internalization of cultural orientation, gender and well-being. *Journal of Personality and Social Psychology, 84*, 97–110.

Cotton, K., & Wikelund, K, R. (1989). *Parent involvement in education. (School Improvement Research Series SIRS Close-up No. 6).* Portland, OR: Northwest Regional Educational Laboratory.

Darling, N., & Steinberg, L. (1993). Parenting style as context: An integrative model. *Psychological Bulletin*, *113*, 487–496.

Deci, E. L., & Ryan, R. M. (2000). The "what" and "why" of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry, 11*, 227–268.

Deci, E. L., Ryan, R. M., & Williams, G. C. (1996). Need satisfaction and the self-regulation of learning. *Learning and Individual Differences, 8*(3), 165–183.

Deci, E. L., Vallerland, R. J., Pelletier, L. G., & Ryan, R. M. (1991). Motivation and education: The self-determination perspective. *Educational Psychologist, 26*(3&4), 325–346.

DeSantis King, A. L., Huebner, S., Suldo, S. M., & Volois, R. F. (2006). An ecological view of school satisfaction in adolescence: Linkages between social support and behavior problems. *Applied Research in Quality of Life, 1*, 279–295.

Desforges, C. & Abouchaar, A. (2003). *The impact of parental involvement, parental support and family education on pupil achievement and adjustment: A literature review.* London: Department for Education and Skills.

Diener, E. (1984). Subjective well-being. *Psychological Bulletin, 95*, 542–575.

Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The Satisfaction With Life Scale. *Journal of Personality Assessment, 49*, 71–75.

Division of Statistics and Scientific Computation, College of Natural Sciences, the University of Texas at Austin. (2011). Multiple group analysis. Retrieved from http://ssc.utexas.edu/software/faqs/amos

Eamon, M. K. (2005). Social-demographic, school, neighborhood, and parenting influences on the academic achievement of Latino young adolescents. *Journal of Youth and Adolescence, 34*, 163–174.

Eccles, J. S., & Harold, R. D. (1996). Family involvement in children's and adolescents' schooling. In A. Booth, & J. F. Dunn (Eds.), *Family-school links: How do they affect educational outcomes?* (pp. 3–34). Mahwah, NJ: Lawrence Erlbaum Associates.

Elmore, G. M., & Huebner, E. S. (2010). Adolescent's satisfaction with school experiences: Relationships with demographics, attachment relationships, and school engagement behavior. *Psychology in the Schools, 47*(6), 525–537.

Epstein, J. L. (2005). School-initiated family and community partnerships. In T. Erb (Ed.), *This we believe in action: Implementing successful middle level schools* (pp. 77–96). Westerville, OH: National Middle School Association.

Epstein, J. L., Sanders, M. G., Simon, B. S., Salinas, K. C., Jansorn, N. R., & Van Voorhis, F. L. (2002). *School, family, and community partnerships: Your handbook for action* (2nd ed.). Thousand Oaks, CA: Corwin Press.

Exeler, J., & Wild, E. (2003). *Die Rolle des Elternhauses für die Förderung selbstbestimmten Lernens.* [The role of parental involvement in supporting self-determinated learning]. *Unterrichtswissenschaft, 1*, 6–22.

Fan, X. & Chen, M. (2001). Parental Involvement and students' academic achievement: A meta-analysis. *Educational Psychology Review, 13*, 1–22.

Fan, W., & Williams, C. M. (2010). The effects of parental involvement on students' academic self-efficacy, engagement and intrinsic motivation, *Educational Psychology, 30*(1), 53–74.

Flett, G. L, Hewitt, P. L, & Martin, T. R. (1995). *Dimensions of Perfectionism and Procrastination*. In JR Ferrari, JL Johnson, WG McCown (Eds.), *Procrastination and task avoidance: Theory, research, and treatment* (pp. 113–136). New York: Plenum Press.

Gerber, J., & Wild, E. (2009). Mit wem wird wie zuhause gelernt? Die Hausaufgabenpraxis im Fach Deutsch. *Unterrichtswissenschaft*, *37*(3), 216–233.

Gläser-Zikuda, M., & Fuß, S. (2004). Wohlbefinden von Schülerinnen und Schülern im Unterricht [Well-being of students in classroom]. In T. Hascher (Hrsg.), *Schule positiv erleben. Ergebnisse und Erkenntnisse zum Wohlbefinden von Schülerinnen und Schülern* (S. 27–48). Bern, Stuttgart, Wien: Haupt.

Gonzalez, S., Dowson, M., Brickman, S., & McInerney, D. (2005). *Self-regulation of academic motivation: Advances in structure and measurement.* Retrieved from http://www.aare.edu.au/05pap/gon05371.pdf

Gouveia, V. V., & Ros, M. (2000). The Hofstede and Schwartz models for classifying individualism at the cultural level: Their relation to macro-social and macro-economic variables. *Psicothema, 12*, 25–33.

Green, C. L., Walker, J. M. T., Hoover-Dempsey, K. V., & Sandler, H. (2007). Parents' motivations for involvement in children's education: An empirical test of a theoretical model of parental involvement. *Journal of Educational Psychology, 99*, 532–544.

Grolnick, W. S. (2009). The role of parents in facilitating autonomous self-regulation for education. *Theory and Research in Education, 7,* 164–173.

Grolnick, W. S., Benjet, C., Kurowski, C. O., & Apostoleris, N. H. (1997). Predictors of parent involvement in children's schooling. *Journal of Educational Psychology, 89*(3), 538–548.

Grolnick, W. S., & Ryan, R. M. (1989). Parent styles associated with children's self-regulation and competence in school. Journal of Educational Psychology, 81 (2), 143–154.

Grolnick, W. S, Ryan, R. M., & Deci, E. L. (1991). The inner resources for school achievement: Motivational mediators of children's perceptions of their parents. *Journal of Educational Psychology, 83*, 508–517.

Grolnick, W. S., & Slowiaczek, M. L. (1994). Parents' involvement in children's schooling: A multidimensional conceptualization and motivational model. *Child Development, 65*, 237–252.

Guess, C. (2004). Decision making in individualistic and collectivistic cultures. *Online Readings in Psychology and Culture, Unit 4*. Retrieved from http://scholarworks.gvsu.edu/orpc/vol4/iss1/3

Gurland, S. T., & Grolnick, W. S. (2005). Perceived threat, controlling parenting, and children's achievement orientations. *Motivation and Emotion*, *29*, 103–121.

Gutman, L., & Feinstein, L. (2008). Children's well-being in primary school: pupil and school effects. Research report No. 25., Centre for Research on the Wider Benefits of Learning, Institute of Education, University of London.

Hair, J. F., Anderson, R. E., Tatham, R. L., & Black, W. T. (1998). *Multivariate data analysis* (5th ed.). Englewood Cliffs, NJ: Prentice Hall.

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate Data Analysis. A Global Perspective* (7th ed.). Upper Saddle River, NJ: Pearson.

Hampel, P., & Petermann, F. (2005). Age and gender effects on coping in children and adolescence. *Journal of Youth and Adolescence, 34*(2), 73–83.

Hampel, P., Petermann, F., & Dickow, B. (2000). *Stressverarbeitungsfragebogen von Janke und Erdmann angepasst für Kinder und Jugendliche (SVF-KJ)* [The German Coping with Stress Questionnaire by Janke and Erdmann adapted for children and adolescents]. Göttingen, Germany: Hogrefe.

Heymann, S. J., & Earle, A. (2000). Low-income parents: How do working conditions affect their opportunity to help school-age children at risk? *American Educational Research Journal, 37*, 833–848.

Hill, N. E., & Tyson, D. F. (2009). Parental involvement in middle school: A meta-analytic assessment of the strategies that promote achievement. *Developmental Psychology, 45*(3), 740–763.

Hoff-Ginsberg, E., & Tardif, T. (1995). *Socioeconomic status and parenting.* In M. H. Bornstein (Ed.), *Handbook of parenting* (2nd ed., pp. 161–188). Mahwah, NJ: Lawrence Erlbaum.

Hofstede, G. (2000). *Culture's consequences: Comparing values, behaviors, institutions, and organizations across nations* (2nd ed.). Thousand Oaks, CA: Sage.

Holodynski, M. (1995). Vorstudie zur Bewältigung von Prüfungsereignissen [Preliminary study for the management of test events]. Unveröffentlichtes Manuskript, Universität Bielefeld, Bielefeld.

Hoover-Dempsey, K.V., Bassler, O. C., & Brissie, J. S. (1992). Explorations in parent-school relations. *Journal of Educational Research, 85*, 287–294.

Hoover-Dempsey, K. V., Battiato, A. C., Walker, J. M. T., Reed, R. P., DeJong, J. M., & Jones, K. P. (2001). Parental involvement in homework. *Educational* Psychologist*, 36*, 195–209.

Hoover-Dempsey, K. V., & Sandler, H. M. (1995). Parental involvement in children's education Why does it make a difference? *Teachers College Record, 97*(2), 310–331.

Hoover-Dempsey, K. V., & Sandler, H. M. (1997). Why do parents become involved in their children's education? *Review of Educational Research, 67*(1), 3–42.

Hoover-Dempsey, K. V. & Sandler, H. M. (2005). *Final Performance Report for OERI Grant#R305T010673: The Social Context of Parental Involvement: A Path to Enhanced Achievement.* Presented to Project Monitor, Institute of Education Sciences, U.S. Department of Education, March 22, 2005.

Hoover-Dempsey, K. V., Wilkins, A. S., Sandler, H. M., & O'Connor, K. P. (2004). *Parental Role Construction for Involvement: Interactions Among Theoretical, Measurement, and Pragmatic Issues in Instrument Development*. Paper presented at the Annual Meeting of the American Educational Research Association in San Diego, CA, April 2004.

Huebner, E. S. (1994). Preliminary development and validation of a multidimensional life satisfaction scale for children. *Psychological Assessment, 6*(2), 149–158.

Jöreskog, K. G., & Sörbom, D. (2002). *LISREL 8.53: User's reference guide.* Chicago, IL: Scientific Software International.

Katz, I., Kaplan, A., & Buzukashivily, T. (2011). The role of parents‘ motivation in students’ autonomous motivation for doing homework. *Learning and Individual Differences, 21*(4), 376–386.

Knollmann, M. (2005). *Die Genese und Regulation von Emotionen in Lernkontexten* [The genesis and regulation of emotions in learning contexts]. Unveröffentlichte Dissertation, Universität Bielefeld, Bielefeld.

Knollmann, M. (2006). Kontextspezifische Emotionsregulationsstile. Entwicklung eines Fragebogens zur Emotionsregulation im Lernkontext Mathematik [Emotion regulation in learning contexts: development of a questionnaire measuring emotion regulation during math learning]. *Zeitschrift für Pädagogische Psychologie, 20*, 113–123.

Knollmann, M., & Wild, E. (2007a). Quality of parental support and students’ emotions during homework: Moderating effects of students’ motivational orientations. *European Journal of Psychology of Education, 22*(1), 63–76.

Knollmann, M., & Wild, E. (2007b). Alltägliche Lernemotionen im Fach Mathematik: Die Bedeutung emotionaler Regulationsstrategien, motivationaler Faktoren und der Instruktionsqualität [Daily learning emotions in mathematics: The role of emotion regulation, motivation, and quality of instruction]. *Unterrichtswissenschaft, 35*(4), 334–354.

Lall, M., Campbell, C., & Gillborn, D. (2004). Parental involvement in education (No. 31). Sheffield, UK: Centre for Regional Economic and Social Research, Sheffield Hallam University.

Landry , R., Whipple, N., Mageau, G. A., Joussemet, M., Koestner, R., DiDio, L., Gingras, I., Bernier, A., & Haga, S. M. (2008). Trust in organismic development, autonomy support, and adaptation among mothers and their children. *Motivation and Emotion, 32*, 173–188.

Laupa, M., & Tse, P. (2005). Authority concepts among children and adolescents in the island of Macao. *Social Development, 14*, 652−663.

Laurent, J., Catanzaro, S. J., Joiner, T. E., Jr., Rudolph, K. D., Potter, K. I., Lambert, S., Osborne, L., & Gathright, T. (1999). A measure of positive and negative affect for children: Scale development and initial validation. *Psychological Assessment, 11*, 326–338.

Lee, J., & Bowen, N. (2006). Parent involvement, cultural capital, and the achievement gap among elementary school children. *American Educational Research Journal, 43,* 193–218.

Lorenz, F., & Wild, E. (2007). Parental involvement in schooling: Results concerning its structure and impact on students’ motivation. In M. Prenzel, & Allolio-Näcke (Eds.). *Studies on the educational quality of school: The final* *report on the DFG priority program* (pp. 299–316). Münster, Germany: Waxmann.

Lynch, E. W., & Stein, R. C. (1987). Parent participation by ethnicity: A comparison of Hispanic, Black and Anglo families. *Exceptional Children, 54*(2), 105–111.

Malecki, C. K., & Demaray, M. K. (2002). Measuring perceived social support: Development of the child and adolescent social support scale (CASSS). *Psychology in the Schools, 39*, 1–18.

Markus, H. R., & Kitayama, S. (2003). Culture, self, and the reality of the social. *Psychological Inquiry, 14*(3), 277–283.

Markus, H. R., Kitayama, S., & Heiman, R. J. (1996). Culture and basic psychological principles. In E. T. Higgins, & A. W. Kruglanski (Eds.), *Social psychology: Handbook of basic principles* (pp. 857–913). New York, NY: Guilford.

Milfont, T. L., & Fischer, R. (2010). Testing measurement invariance across groups: Applications in cross-cultural research. *International Journal of Psychological Research, 3*, 112–131.

Miller, J. G. (1997). Cultural conceptions of duty: Implications for motivation and morality. In D. Munro, J. F. Schumaker, & A. C. Carr (Eds.), *Motivation and culture* (pp. 178–192). Boston, MA: Routledge Kegan Paul.

Niemiec, C. P., Lynch, M. F., Vansteenkiste, M., Bernstein, J., Deci, E. L., & Ryan, R. M. (2006). The antecedents and consequences of autonomous self-regulation for college: A self-determination theory perspective on socialization. *Journal of Adolescent, 29*, 761–775.

OECD. (2011). What can parents do to help their children succeed in school?. *PISA in Focus 2011/10 (November), 1–4*. Retrieved from http://www.oecd.org/dataoecd/4/1/49012097.pdf

Patrick, B. C., Skinner, E. A., & Connell, J. P. (1993). What motivates children's behavior and emotion? Joint effects of perceived control and autonomy in the academic domain. *Journal of Personality and Social Psychology, 65*, 781–791.

Pekrun, R., Goetz, T., Titz, W., & Perry, R. P. (2002). Academic emotions in students' self-regulated learning and achievement: a program of qualitative and quantitative research. *Educational Psychologist, 37*(2), 91–105.

Pomerantz, E. M., Grolnick, W. S., & Price, C. E. (2005). The role of parents in how children approach school: A dynamic process perspective. In A. J. Elliot, & C. S. Dweck (Eds.), *The handbook of competence and motivation* (pp. 259–278). New York, NY: Guilford.

Pomerantz, E. M., Moorman, E. A., & Litwack, S. D. (2007). The how, whom, and why of parents' involvement in children's academic lives. *Review of Educational Research, 77*(3), 373–410.

Quadling, D. A. (1982). How important is learning mathematics? *Prospects: Quarterly Review of Education, 12*(4), 411–419.

Reeve, J. (2009). Why teachers adopt a controlling motivating style toward students and how they can become more autonomy-supportive. *Educational Psychologist, 44*(3), 159−175.

Renshaw, P. D., & Gardner, R. (1990). Process versus product task interpretation and parental teaching practice. *International Journal of Behavioral Development, 13*(4), 489–505.

Research School "Education and Capabilities". (2010). Documentation of student and parent questionnaires for the Panel Study at the Research School "Education and Capabilities" in North-Rhine-Westphalia: PARS. Unpublished manuscript, Bielefeld University and TU Dortmund University.

Rosebrock, C. (2006). Socio-economic background and reading: Reading attitudes, fluency, and literacy education in the German Hauptschule. Retrieved from http://www.coe.int/t/dg4/linguistic/Publications_EN.asp#P194_11186

Rudy, D., & Grusec, J. E. (2006). Authoritarian parenting in individualist and collectivist groups: Associations with maternal emotion and cognition and children's self-esteem. *Journal of Family Psychology, 20*(1), 68–78.

Ryan, R. M., & Connell, J. P. (1989). Perceived locus causality and internalization: Examining reasons for acting in two domains. *Journal of Personality and Social Psychology*, *57*, 749–761.

Ryan, R. M., Connell, J. P., & Deci, E. L. (1985). A motivational analysis of self-determination and self-regulation in education. In C. Ames, & R. E. Ames (Eds.), *Research on motivation in education: The classroom milieu* (pp. 13–51). New York, NY: Academic.

Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist, 55*, 68–78.

Ryan, R. M., Deci, E. L., Grolnick, W. S., & La Guardia, J. G. (2006). The significance of autonomy and autonomy support in psychological development and psychopathology. In D. Cicchetti & D. J. Cohen (Eds.), Developmental psychopathology (2nd ed., Vol. 1). Hoboken, NJ: Wiley

Sacher, W. (2008). *Elternarbeit: Gestaltungsmöglichkeiten und Grundlagen für alle Schularten* [Parental involvement: Scope for design and basic principles for all school types]. Bad Heilbrunn: Klinkhardt.

Schreiber, J. B., Nora, A., Stage, F. K., Barlow, E. A., & King, J. (2006). Reporting structural equation modeling and confirmatory factor analysis results: A review. *Journal of Educational Research*, *99*(6), 323–337.

Schwinger, M., Steinmayr, R., & Spinath, B. (2009). How do motivational regulation strategies affect achievement: Mediated by effort management and moderated by intelligence. *Learning and Individual Differences, 19*, 621–627.

Sheldon, K. M., Ryan, R. M., Deci, E. L., & Kasser, T. (2004). The independent effects of goal contents and motives on well-being: It's both what you pursue and why you pursue it. *Personality and Social Psychology Bulletin, 30*, 475–486.

Shumow, L., & Lomax, R. (2002). Parental efficacy: Predictor of parenting behavior and adolescent outcomes. *Parenting: Science and Practice, 2,* 127–150.

Shumow, L., & Miller, J. D. (2001). Parents' at-home and at-school academic involvement with young adolescents. *Journal of Early Adolescence, 21,* 68–91.

Soenens, B., & Vansteenkiste, M. (2005). Antecedents and outcomes of self-determination in 3 life domains: The role of parents' and teachers' autonomy-support. *Journal of Youth and Adolescence, 34*(6), 589–604.

Steenkamp, J. E. M., & Baumgartner, H. (1998). Assessing measurement invariance in cross-national research. *Journal of Consumer Research, 25*, 78–90.

Taylor, L. C., Clayton, J. D., & Rowley, S. J. (2004). Academic socialization: Understanding parental influences on children's school-related development in the early years. *Review of General Psychology, 8*(3), 163–178.

Ullmann, C. (1996). Ausdrucksminiaturisierung und Emotionsregulation bei Frauen und Männern [Miniaturization of expression and emotion regulation in women and men]. Unveröffentlichte Diplomarbeit, Universität Bielefeld, Bielefeld.

Vahedi, S., Mostafafi, F., & Mortazanajad, H. (2009). Self-regulation and dimensions of parenting styles predict psychological procrastination of undergraduate students. *Iranian Journal of Psychiatry, 4,* 147–154.

Vansteenkiste, M., Zhou, M., Lens, W., & Soenens, B. (2005). Experiences of autonomy and control among Chinese learners: Vitalizing or immobilizing? *Journal of Educational Psychology, 97*, 468–483.

Walker, J. M. T., Wilkins, A. S., Dallaire, J. P., Sandler, H. M., & Hoover-Dempsey, K. V. (2005). Parental involvement: Model revision through scale development. *Elementary School Journal, 106*(2), 85–104.

Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of Positive and Negative Affect: The PANAS Scales. *Journal of Personality and Social Psychology, 54*, 1063–1070.

Wild, E. (1999). Elterliche Erziehung und schulische Lernmotivation [Parenting and school learning motivation]. Unveröffentlichte Habilitation, Universität Mannheim, Mannheim.

Wild, E., & Gerber, J. (2007). Charakteristika und Determinanten der Hausaufgabenpraxis in Deutschland von der vierten zur siebten Klassenstufe [Characteristics and determinants of doing homework in Germany from fourth to seventh grade]. *Zeitschrift für Erziehungswissenschaft, 10*(3), 356–380.

Wild, E., & Gerber, J. (2009). Lernlust statt Lernfrust: Evaluation eines Elterntrainings zur Verringerung von Hausaufgabenkonflikten bei Schülern mit Lernschwierigkeiten [Learning pleasure rather learning frustration: Evaluation of parental training to reduce conflicts with homework for students with learning difficulties]. *Psychologie in Erziehung und Unterricht*, *56*, 303–318.

Wild, K. P., & Krapp. A. (1995). Elternhaus und intrinsische Lernmotivation [Parents' house and learning motivation]. *Zeitschrift für Pädagogik, 41*, 579–595.

Wild, E., & Lorenz, F. (2010). *Elternhaus und Schule* [Parents' house and school]. Paderborn, Germany: Schöningh.

Wild, E., Rammert, M., & Siegmund, A. (2003). *Arbeitsbericht an die DFG über das Forschungsprojekt «Die Förderung selbstbestimmter Formen der Lernmotivation in Elternhaus und Schule»* [Report to the German Research Foundation on the research project "Fostering self-determined forms of learning motivation at home and in school"]. Unveröffentlichtes Manuskript, Universität Bielefeld.

Wild, E., Rammert, M., & Siegemund, A. (2006). Die Förderung selbstbestimmter Formen der Lernmotivation [Fostering sel-determined forms of learning motivation]. In M. Prenzel, & L. Allolio-Näcke (Eds.), *Unersuchungen zur Bildungsqualität von Schule* (pp. 370–297), Münster, Germany: Waxmann.

Wild, E., & Remy, K. (2002). Quantität und Qualität der elterlichen Hausaufgabenbetreuung von Drittklässlern in Mathematik [Quantity and quality of parental homework supervision in third grade mathematics]. *Zeitschrift für Pädagogik, 45*, 276–290.

Wild, E., Remy, K., Gerber, J., Exeler, J., Rammert, M., Siegmund, A., & Knollmann, M. (2001). *Die Förderung selbstbestimmter Formen der Lernmotivation in Elternhaus und Schule− Dokumentation der Skalen und Itemauswahl für den Elternfragebogen* [Fostering self-determined learning motivation at home and in school: Documentation of scales and item selection for the parent questionnaire]. Unveröffentlichtes Manuskript, Universität Bielefeld.

Wild, E. & Yotyodying, S. (2012). Studying at home: With whom and in which way? Homework practices and conflicts in the family. In: Richter, M. & Andresen, S. (Eds.), *The politicization of parenthood: Shifting private and public responsibilities in education and child rearing* (pp. 165–180). Dordrecht: Springer.

Wittler, C. (2009). Lernlust statt Lernfrust: Evaluation eines Elterntrainings zur Förderung autonomieunterstützender Instruktionsstrategien im häuslichen Lernkontext [Learning pleasure rather learning frustration: Evaluation of parental training to promote autonomy-supportive instructional strategies at the context of home-based family involvement]. Unveröffentlichte Dissertation, Universität Bielefeld, Bielefeld.

Wolters, C. A. (1999). The relation between high school students' motivational regulation and their use of learning strategies, effort, and classroom performance. *Learning and Individual Differences, 3*(3), 281–299.

Wolters, C.A. (2003). Regulation of motivation: Evaluating an underemphasized aspect of self-regulated learning. *Educational Psychologist, 38*(4), 189–205.

World Bank. (2010). World development indicators database. Retrieved from http://databank.worldbank.org/ddp/home.do?Step=12&id=4&CNO=2

Xu, M. (2008). The relationship between parental involvement, self-regulated learning, and reading achievement of fifth graders: A path analysis using ECLS-K database. Unpublished doctoral dissertation, University of Akron, Akron.

Yamauchi,J., Kumagai, Y., & Kawasaki, Y. (1999). Perceived control, autonomy, and self-regulated learning among Japanese high school students. *Psychological Reports, 85*(3), 779−798.

Zimmerman, B.J. (1989a). A social cognitive view of self-regulated academic learning. *Journal of Educational Psychology, 81*(3), 329–339.

Zimmerman, B. J. (1989b). Models of self-regulated learning and academic achievement. In B. J. Zimmerman, & D. H. Schunk (Eds.), *Self-regulated learning and academic achievement: Theory, research, and practice* (pp. 1–25). New York, NY: Springer-Verlag.

Zhou, M., Ma, W. J., & Deci, E. L. (2009). The importance of autonomy for rural Chinese children's motivation for learning. *Learning and Individual Differences, 19*, 492–498.

Appendices

Appendix A

Parent Scales

1. Parental Conceptions of Responsibility

	Stem for the three following subscales: Eltern können sich in unterschiedlicher Weise einbringen, wenn es um die schulischen Belange Ihres Kindes geht. Wie ist es bei Ihnen? พ่อแม่ผู้ปกครองอาจมีส่วนร่วมในการเรียนของบุตรหลานในหลายรูปแบบ ท่านมีความคิดเห็นเกี่ยวกับเรื่องนี้อย่างไร
	Parent-Focused Responsibility (7 items; alpha DE = .75; alpha TH = .70)
Pf1	Ich sehe es als meine Aufgabe an, über Entwicklungen in der Schule informiert zu sein. ฉันถือว่า มันเป็นหน้าที่ของฉันที่จะต้องสอบถามข้อมูลเกี่ยวกับความเคลื่อนไหวในโรงเรียน
Pf2	Ich bin dafür zuständig, mit meinem Kind schwierige Hausaufgaben durchzugehen. ฉันมีหน้าที่ช่วยลูกเวลามีการบ้านยากๆ
Pf3	Es liegt an mir, dafür zu sorgen, dass mein Kind in der Schule klar kommt. มันเป็นความรับผิดชอบของฉันที่จะต้องดูแลให้ลูกมีชีวิตการเรียนที่ราบรื่น
Pf4	Es ist meine Aufgabe, die Lernfortschritte meines Kindes im Blick zu haben. ฉันมีหน้าที่ต้องสอดส่องดูแลเกี่ยวกับพัฒนาการทางการเรียนของลูก
Pf5	Wenn mein Kind in der Schule Schwierigkeiten hat, ist es meine Aufgabe, mich darum zu kümmern. ฉันมีหน้าที่ต้องดูแลเอาใจใส่ เมื่อลูกมีปัญหาที่โรงเรียน
Pf6	Ich fühle mich dafür verantwortlich, mein Kind beim Lernen für Prüfungen zu unterstützen. ฉันรู้สึกว่าฉันมีหน้าที่ต้องช่วยลูกในการอ่านหนังสือเตรียมสอบ
Pf7	Ich sehe es als meine Aufgabe an, in regelmäßigem Kontakt mit den Lehrkräften meines Kindes zu bleiben. ฉันถือว่าฉันมีหน้าที่ที่ต้องติดต่อกับครูของลูกอย่างสม่ำเสมอ
	Partnership-Focused Responsibility (4 items; alpha DE = .72; alpha TH = .64)
Pn1	Ich denke, eine enge Zusammenarbeit zwischen Elternhaus und Schule wäre für das Wohl der Schüler ideal. ฉันคิดว่า นักเรียนคงจะมีความสุขที่สุด ถ้าพ่อแม่และทางโรงเรียนร่วมมือและประสานงานกันอย่างใกล้ชิด
Pn2	Ich bin die erste, die sich engagiert, wenn die Schule/ Lehrkräfte auf Eltern zugehen und an einer Zusammenarbeit interessiert sind. เวลาที่ครูหรือโรงเรียนติดต่อพ่อแม่และเสนอให้มีการจัดกิจกรรมร่วมกัน ฉันจะเป็นคนแรกที่มีเข้าร่วมกิจกรรมนี้
Pn3	Ich bin immer froh, wenn es zu einer sinnvollen Zusammenarbeit mit Lehrkräften kommt. ฉันยินดีเสมอถ้าได้ทำกิจกรรมดีๆ ร่วมกับคุณครู
Pn4	Eltern und Lehrer sollten an einem Strang ziehen. พ่อแม่ผู้ปกครองและครูควรจะร่วมมือร่วมใจกัน
	School-Focused Responsibility (4 items; alpha DE = .63; alpha TH = .70)
Sf1	Ob mein Kind Lernfortschritte macht, hängt in erster Linie von ihm/ihr und

	den Lehrkräften ab. ลูกจะมีความก้าวหน้าในการเรียนหรือไม่นั้น มันขึ้นอยู่กับตัวเขาเองและครูผู้สอนเป็นอันดับแรก
Sf2	Es ist die Aufgabe der Lehrer, die Hausaufgaben so zu formulieren, dass mein Kind sie verstehen kann. มันเป็นหน้าที่ของครูที่ต้องเรียบเรียงโจทย์การบ้านให้ลูกของฉันสามารถเข้าใจได้
Sf3	Wenn mein Kind in einem Fach nicht zu recht kommt, ist es die Aufgabe der jeweiligen Lehrkraft, es so zu unterstützten dass es wieder mitkommt. เมื่อลูกของฉันเรียนวิชาใดวิชาหนึ่งไม่เข้าใจ ครูผู้สอนมีหน้าที่ดูแลให้ลูกของฉันเข้าใจเนื้อหาวิชานั้นอีกครั้ง
Sf4	Es sind die Lehrkräfte, die sicherstellen müssen, dass kein Kind den Anschluss im Unterricht verliert. มันเป็นหน้าที่ของครูผู้สอนที่ต้องดูแลให้แน่ใจว่าไม่มีนักเรียนคนใดเลยที่เรียนตามไม่ทันที่สอน

Note.
Parental Conception of Active Responsibility = Parent-Focused Responsbility and Partnership-Focused Responsbility.
Parental Conception of Passive Responsbility = School-Focused Responsibility.

2. Parental Role Conceptions in Learning Situations

	Stem for the two following subscales: Eltern haben unterschiedliche Einstellungen zur Schule. Wie halten Sie es mit der Schule? พ่อแม่/ผู้ปกครองอาจมีทัศนคติต่อโรงเรียนที่แตกต่างกันไป แล้วท่านมีทัศนคติอย่างไรต่อโรงเรียน
	Goal Orientation Towards Learning **(5 items; alpha DE = .65; alpha TH = .72)**
Pc1	Ich will, dass mein Kind Sachen nicht nur auswendig lernt, sondern sie auch wirklich versteht. ฉันไม่ต้องการให้ลูกเรียนแบบท่องจำเพียงอย่างเดียว แต่อยากให้เขาเข้าใจเนื้อหาอย่างถ่องแท้ด้วย
Pc2	Ich finde es toll, wenn mein Kind Sachen, die es in der Schule gelernt hat, zu Hause ausprobiert. ฉันคิดว่าการที่ลูกนำสิ่งที่ได้เรียนในโรงเรียนมาทดลองทำที่บ้านเป็นเรื่องที่ดี
Pc3	Ich finde es wichtig, dass mein Kind im Unterricht aufpasst, damit es alles richtig versteht. ฉันคิดว่ามันเป็นสิ่งสำคัญที่ลูกต้องเอาใจใส่การเรียนในชั้นเรียน เพื่อที่จะได้เข้าใจเนื้อหาครบถ้วน
Pc4	Ich ermuntere mein Kind, im Unterricht Fragen zu stellen, wenn es etwas nicht verstanden hat. ฉันสนับสนุนให้ลูกตั้งคำถามในชั้นเรียนหากมีอะไรที่ไม่เข้าใจ
Pc5	Ich sehe es gerne, wenn sich mein Kind aus Interesse noch über die Hausaufgaben hinaus mit schulischen Dingen beschäftigt. ฉันดีใจถ้าเห็นลูกสนใจเรื่องอื่นๆ ในโรงเรียนด้วย นอกเหนือจากการบ้าน
	Goal Orientation Towards Achievement **(10 items; alpha DE = .80; alpha TH = .80)**
Pd1	Ich bin über eine schlechte Note meines Kindes enttäuscht egal wie gut oder schlecht die Arbeit insgesamt ausgefallen ist. ไม่ว่าลูกจะได้คะแนนรวมดีหรือไม่ก็ตาม แต่ถ้ามีคะแนนส่วนใดส่วนหนึ่งไม่ดี ฉันก็รู้สึกผิดหวัง
Pd2	Ich erwarte gute Leistungen von meinem Kind, egal wie sehr es sich dafür anstrengen muss. ฉันคาดหวังว่าลูกจะมีผลการเรียนที่ดี ไม่ว่าลูกจะต้องพยายามเรียนอย่างหนักเท่าใดก็ตาม
Pd3	Ich lege Wert darauf, dass mein Kind im Unterricht mitmacht, damit der Lehrer/die Lehrerin einen guten Eindruck von ihm bekommt. ฉันเห็นว่ามันเป็นสิ่งสำคัญที่ลูกจะต้องขยันเรียนในห้อง เพื่อที่คุณครูจะได้รู้สึกดีกับเขา

Pd4	Ich erwarte, dass mein Kind seine Hausaufgaben immer vollständig erledigt. ฉันคาดหวังว่าลูกต้องทำการบ้านให้ถูกต้องครบถ้วนเสมอ
Pd5	Ich lege Wert darauf, dass mein Kind seine Hausaufgaben ordentlich macht. ฉันให้ความสำคัญกับการที่ลูกจะต้องทำการบ้านให้เรียบร้อย
Pd6	Es ist mir wichtig, dass mein Kind bessere Noten in der Schule bekommt als andere Kinder. ฉันเห็นว่าการที่ลูกได้เกรดดีกว่านักเรียนคนอื่นๆ เป็นเรื่องสำคัญ
Pd7	Ich empfinde es als Versagen, wenn mein Kind in der Schule nicht so gut wie andere Kinder ist. ฉันถือว่าถ้าลูกเรียนได้ไม่ดีเท่านักเรียนคนอื่นเป็นความล้มเหลว
Pd8	Ich möchte, dass die anderen mein Kind klug finden. ฉันอยากให้คนอื่นๆ มองว่าลูกของฉันเป็นเด็กฉลาด
Pd9	Wenn ich einen Fehler in den Hausaufgaben meines Kindes fände, würde ich ihn selbst korrigieren, bevor der Lehrer ihn findet. ถ้าฉันพบว่าลูกทำการบ้านข้อใดผิด ฉันจะแก้ข้อผิดนั้นเองก่อนที่ครูจะเจอ
Pd10	Es ist mir wichtig, dass mein Kind Hausaufgaben vorlegt, die möglichst zu 100% korrekt sind. ฉันถือว่าเป็นเรื่องสำคัญที่ลูกจะต้องส่งการบ้านที่ทำถูกร้อยเปอร์เซ็นต์เต็มถ้าเป็นไปได้

3. Parental Teaching Efficacy Beliefs

	General Sense of Teaching Efficacy (5 items; alpha DE = .81; alpha TH = .79)
	Stem: Im Folgenden geht es um Ihre Selbsteinschätzung. Bitte bedenken Sie, daß es keine richtigen oder falschen Antworten gibt und Sie so spontan wie möglich antworten. ต่อไปนี้เป็นคำถามเกี่ยวกับตัวท่านเองซึ่งไม่มีคำตอบที่ถูกหรือผิด ดังนั้น โปรดตอบคำถามที่ตรงกับความรู้สึกของท่านมากที่สุด
Ef1	Ich habe eine klare Vorstellung, wie ich mein Kind unterstützen kann, damit es in r Schule zurecht kommt. ฉันมีแนวคิดที่ชัดเจนว่าจะช่วยให้ลูกมีชีวิตการเรียนที่ราบรื่นอย่างไร
Ef2	Ich weiß genau, wie ich mein Kind motivieren kann zu lernen. ฉันทราบดีว่าจะกระตุ้นให้ลูกตั้งใจเรียนได้อย่างไร
Ef3	Ich denke, meine Bemühungen, meinem Kind beim Lernen zu helfen, sind erfolgreich. ฉันคิดว่าฉันประสบความสำเร็จในการช่วยเหลือลูกด้านการเรียน
Ef4	Wenn ich mich anstrenge, kann ich meinem Kind auch sehr komplizierte Dinge verständlich machen. ถ้าฉันพยายามดีๆ ฉันก็สามารถอธิบายการบ้านที่ยากมากๆ ให้ลูกเข้าใจได้
Ef5	Meine Bemühungen, meinem Kind beim Lernen zu helfen, sind erfolgreich. ฉันประสบความสำเร็จในการพยายามช่วยเหลือลูกในด้านการเรียน
	Domain-Specific Sense of Teaching Efficacy (4 items; alpha DE = .88; alpha TH = .69)
	Stem: Wie ist es speziell beim Fach Mathematik? ท่านรู้สึกอย่างไรกับการดูแลการบ้านของลูกในวิชาคณิตศาสตร์

Efm1 (re)	Ich habe das Gefühl, mit der Hausaufgabenbetreuung meines Kindes im Fach Mathematik überfordert zu sein (reverse). ฉันรู้สึกหนักใจที่ต้องช่วยลูกทำการบ้านวิชาคณิตศาสตร์
Efm2	Ich denke, ich kann meinem Kind sehr gut bei seinen Mathe-Hausaufgaben helfen. ฉันคิดว่าฉันสามารถช่วยลูกทำการบ้านวิชาคณิตศาสตร์ได้เป็นอย่างดี
Efm3 (re)	Ich zweifle oft ob ich kompetent genug bin, um meinem Kind beim Mathe-Lernen zu helfen (reverse). ฉันไม่มั่นใจว่าฉันมีความสามารถพอที่จะสอนวิชาคณิตศาสตร์ให้กับลูกหรือไม่
Efm4	Ich fühle mich kompetent genug, um meinem Kind beim Mathe Lernen zu helfen. ฉันรู้สึกว่าตนมีความสามารถเพียงพอที่จะสอนวิชาคณิตศาสตร์ให้กับลูก

4. Specific Invitations to Involvement

	Stem for the two following subscales: Nun geht es um die Gründe, warum Sie sich um die schulischen Belange Ihres Kindes kümmern. ต่อไปนี้ เป็นคำถามว่าเพราะเหตุใด ท่านจึงดูแลรับผิดชอบเรื่องการเรียนของบุตรหลานของท่าน
	Invitation From the Child to Involvement (6 items; alpha DE = .64; alpha TH = .71)
Inc1	Mein Kind bittet mich immer mal wieder, ihm/ihr etwas bei den Hausaufgaben zu erklären. ลูกขอร้องให้ฉันสอนการบ้านอยู่เสมอ
Inc2	Es kommt häufiger vor, dass mich mein Kind bei den Hausaufgaben um Rat fragt. ลูกขอคำแนะนำฉันอยู่บ่อยๆ เวลาที่ทำการบ้าน
Inc3	Mein Kind erzählt mir ganz regelmäßig von seinem Schultag. ลูกเล่าให้ฉันฟังเกี่ยวกับที่โรงเรียนอยู่เสมอ
Inc4	Mein Kind erwartet, dass ich mich für seine schulischen Belange interessiere. ลูกคาดหวังว่าฉันจะต้องสนใจเกี่ยวกับเรื่องที่โรงเรียนของเขา
Inc5	Mein Kind vertraut sich mir an, wenn es Probleme in der Schule gibt. ลูกไว้วางใจและปรึกษาฉันเวลามีปัญหาในโรงเรียน
Inc6	Mein Kind zeigt mir, dass es meine Hilfe beim Lernen zuhause schätzt. ลูกแสดงให้ฉันเห็นว่าเขาชื่นชมที่ฉันช่วยเขาทำการบ้าน
	Invitation From the School and Teachers to Involvement (4 items; alpha DE = .75; alpha TH = .66)
Int1	Die Schule bietet auf ihrer Homepage viele interessante Informationen an. โรงเรียนนำเสนอข้อมูลที่น่าจะสนใจในเว็บไซต์ของโรงเรียน
Int2	Man spürt an dieser Schule, dass man als Eltern willkommen ist. ทุกคนรู้สึกได้ว่าโรงเรียนนี้ให้การต้อนรับผู้ปกครองเป็นอย่างดี
Int3	Es gibt immer wieder Veranstaltungen an dieser Schule zu denen Eltern und Lehrer zusammenkommen. โรงเรียนจัดกิจกรรมให้พ่อแม่ผู้ปกครองและครูทำร่วมกันอยู่เสมอๆ
Int4	Die Lehrer geben einem das Gefühl, dass man sich nicht nur bei Leistungsproblemen an sie wenden kann. ครูทำให้ฉันรู้สึกว่าฉันสามารถปรึกษาเรื่องอื่นๆ ที่นอกเหนือจากเรื่องปัญหาการเรียนของลูกได้

5. Life Context

	Time and Energy for Involvement (3 items; alpha DE = .63; alpha TH = .50)
	Stem: Im Folgenden geht es um Ihre Selbsteinschätzung. Bitte bedenken Sie, daß es keine richtigen oder falschen Antworten gibt und Sie so spontan wie möglich antworten. ต่อไปนี้เป็นคำถามเกี่ยวกับตัวท่านเองซึ่งไม่มีคำตอบที่ถูกหรือผิด ดังนั้น โปรดตอบคำถามที่ตรงกับความรู้สึกของท่านมากที่สุด
Te1	Ich finde genügend Zeit, mit meinem Kind über seinen /Ihren Schultag zu sprechen. ฉันมีเวลาเพียงพอที่จะพูดคุยกับลูกเกี่ยวกับเรื่องที่โรงเรียน
Te2 (re)	Ich habe öfters nicht genügend Zeit oder Energie, um meinem Kind bei den Hausaufgaben zu helfen (reverse). ฉันมักจะไม่มีเวลาและเรี่ยวแรงพอที่จะสอนลูกทำการบ้าน
Te3	Ich finde genügend Zeit, um mich mit den Lehrern meines Kindes inhaltlich auszutauschen. ฉันมีเวลาเพียงพอที่จะพูดคุยแลกเปลี่ยนความคิดเห็นกับครูของลูกเกี่ยวกับเนื้อหาวิชา
	Valence Towards School (7 items; alpha DE = .83; alpha TH = .83)
	Stem: Nun geht es um Ihre eigenen Schulerfahrungen. คำถามต่อไปนี้ เป็นคำถามเกี่ยวกับประสบการณ์ในอดีตของท่านเกี่ยวกับโรงเรียน
Val1	Meine Schule…(fand ich sehr schlecht 1 2 3 4 fand ich sehr gut) ฉันคิดว่าโรงเรียนของฉัน….(แย่มาก 1 2 3 4 ดีมาก)
Val2	Meine Lehrer…(waren unfreundlich 1 2 3 4 waren sehr freundlich) คุณครูของฉัน….(ไม่เป็นมิตรเลย 1 2 3 4 เป็นมิตรมาก)
Val3	Meine Erfahrungen in der Schule…(waren schlecht 1 2 3 4 waren gut) ประสบการณ์ของฉันในโรงเรียน….(แย่ 1 2 3 4 ดี)
Val4	Ich habe mich in der Schule…(unwohl gefühlt 1 2 3 4 wohl gefühlt) ตอนอยู่ที่โรงเรียน ฉันรู้สึก….(ไม่มีความสุข 1 2 3 4 มีความสุข)
Val5	Meine gesamte Erfahrung…(war erfolglos 1 2 3 4 war erfolgreich) ประสบการณ์โดยภาพรวมของฉันในโรงเรียน….(ประสบความล้มเหลว 1 2 3 4 ประสบความสำเร็จ)
Val6	Lernen war für mich…(schwierig 1 2 3 4 einfach) สำหรับฉันแล้ว การเรียนเป็นสิ่งที่….(ยาก 1 2 3 4 ง่าย)
Val7	Freiwillig gelernt…(habe ich nie 1 2 3 4 habe ich oft) การเรียนแบบสมัครใจ….(ฉันไม่เคยทำ 1 2 3 4 ฉันทำบ่อย)

Appendix B

Pupil Scales

1. Authoritative Parental Instruction

	Autonomy-Support **(6 items; alpha DE = .72; alpha TH = .59)**
	Stem: Wenn ich in Mathe *eine schlechtere Note* als sonst bekommen habe,…….. เมื่อฉันได้คะแนนในวิชาคณิตศาสตร์*แย่*กว่าปกติ....
Aut1	...fragen mich meine Eltern, wie sie mir helfen können. คุณพ่อคุณแม่จะถามว่าท่านจะช่วยฉันได้อย่างไร
Aut2	...versuchen meine Eltern, gemeinsam mit mir den Grund für die schlechte Note herauszufinden. คุณพ่อคุณแม่จะช่วยฉันคิดหาสาเหตุว่าเพราะอะไรคะแนนจึงไม่ดี
Aut3	...erklären mir meine Eltern, ohne Druck zu machen: wenn ich nicht regelmäßig lerne, wird es mir immer schwerer fallen, mitzukommen. คุณพ่อคุณแม่จะไม่กดดันฉัน แต่จะอธิบายว่าหากฉันไม่อ่านหนังสือเรียนอย่างสม่ำเสมอ ต่อไปฉันก็จะได้คะแนนแย่ยิ่งกว่านี้
	Stem: Wie sehr stimmst du folgenden Aussagen zu, wenn deine Eltern dir bei den *Mathe-Hausaufgaben* helfen? เมื่อคุณพ่อคุณแม่ช่วยนักเรียนทำ*การบ้านวิชาคณิตศาสตร์*ข้อความต่อไปนี้ตรงกับสถานการณ์ของนักเรียนมากน้อยเพียงใด
Aut4	Meine Eltern ermuntern mich immer, erst einmal selbst die richtige Lösung zu finden. คุณพ่อคุณแม่จะให้กำลังใจฉันให้ลองหาคำตอบที่ถูกต้องด้วยตนเองก่อนเสมอ
Aut5	Wenn ich allein nicht mit den Aufgaben klar komme, nehmen sich meine Eltern immer Zeit für mich. ถ้าฉันทำการบ้านเองไม่ได้ คุณพ่อคุณแม่จะสละเวลามาช่วยฉันเสมอ
Aut6	Meine Eltern ermutigen mich weiterzumachen, wenn ich bei schwierigen Aufgaben nahe daran bin, aufzugeben. คุณพ่อคุณแม่จะให้กำลังใจฉันให้ทำการบ้านต่อไปเวลาที่ฉันมีการบ้านที่ยากจนเกือบจะถอดใจไม่อยากทำต่อ
	Responsiveness **(7 items; alpha DE = .82; alpha TH = .71)**
	Stem: Wie sehr interessieren sich deine Eltern für die Schule? คุณพ่อคุณแม่ของนักเรียนสนใจเกี่ยวกับเรื่องที่โรงเรียนมากน้อยเพียงใด?
Res1	Meine Eltern sind immer für mich da, wenn ich mich in der Schule über etwas geärgert habe. คุณพ่อคุณแม่มีเวลาให้ฉันเสมอ เวลามีเรื่องโมโหที่โรงเรียน
Res2	Meine Eltern fragen mich, wie es in der Schule war. คุณพ่อคุณแม่ถามฉันว่าไปโรงเรียนมาเป็นอย่างไรบ้าง
Res3	Wenn ich in der Schule einige Probleme habe, kann ich mit meinen Eltern darüber reden. เมื่อฉันมีปัญหาที่โรงเรียน ฉันสามารถคุยกับคุณพ่อคุณแม่ในเรื่องนั้นได้

Res4	Meine Eltern fragen mich, was wir in der Schule gemacht haben. คุณพ่อคุณแม่ถามฉันว่า พวกเราทำอะไรที่โรงเรียนบ้าง
Res5	Wenn ich über das Ergebnis einer Klassenarbeit enttäuscht bin, machen mir eine Eltern Mut für das nächste Mal. เมื่อฉันผิดหวังเพราะได้คะแนนสอบไม่ดี คุณพ่อคุณแม่จะให้กำลังใจฉันในการสอบครั้งต่อไป
Res6	Meine Eltern interessieren sich dafür, was ich in der Schule lerne. คุณพ่อคุณแม่สนใจเกี่ยวกับสิ่งที่ฉันเรียนที่โรงเรียน
Res7	Wenn ich mit meinen Eltern lerne, fühle ich mich verstanden und unterstützt. เวลาที่ฉันอ่านหนังสือกับคุณพ่อคุณแม่ ฉันรู้สึกว่าท่านเข้าใจและสนับสนุนฉัน

2. Authoritarian Parental Instruction

	Parental Control (6 items; alpha DE = .71; alpha TH = .64)
	Stem: Wenn ich in Mathe *<u>eine schlechtere Note</u>* als sonst bekommen habe,…….. เมื่อฉันได้คะแนนในวิชาคณิตศาสตร์*<u>แย่</u>*กว่าปกติ....
Con1	...lassen meine Eltern mich so lange zu Hause lernen, bis ich alle meine Aufgaben erledigt habe. คุณพ่อคุณแม่จะให้ฉันทำการบ้านอยู่ที่บ้านจนกว่าจะเสร็จหมดทุกข้อ
Con2	...schimpfen meine Eltern mit mir und verlangen von mir, mehr zu lernen. คุณพ่อคุณแม่จะดุว่าฉันและบังคับให้ฉันอ่านหนังสือมากขึ้น
Con3	...drohen meine Eltern mit Strafen (z.B. Fernsehverbot, Nintendoverbot,…), wenn ich in der nächsten Zeit nicht hart arbeite und meine Note verbessere. คุณพ่อคุณแม่จะขู่ทำโทษฉันเช่น ห้ามไม่ให้ดูทีวีหรือเล่นเกมส์ ถ้าครั้งต่อไปฉันไม่ขยันหมั่นเพียร หรือได้คะแนนดีขึ้น
Con4	...werfen mir meine Eltern vor, zu viele andere Dinge im Kopf zu haben und mich nicht genug um die Schule zu kümmern. คุณพ่อคุณแม่จะตำหนิว่าฉันใส่ใจในเรื่องอื่นมากเกินไปและไม่สนใจเรื่องการเรียนเท่าที่ควร
	Stem: Wie sehr stimmst du folgenden Aussagen zu, wenn deine Eltern dir bei den <u>Mathe-Hausaufgaben</u> helfen? เมื่อคุณพ่อคุณแม่ช่วยนักเรียนทำการบ้านวิชาคณิตศาสตร์ ข้อความต่อไปนี้ตรงกับสถานการณ์ของนักเรียนมากน้อยเพียงใด
Con5	Wenn ich nicht sofort tue, was meine Eltern wollen, dann gibt es ein Donnerwetter. ถ้าคุณพ่อคุณแม่ต้องการอะไรแล้วฉันไม่ทำตามทันที ท่านจะโกรธหัวฟัดหัวเหวี่ยง
Con6	Meine Eltern bestehen darauf, dass ich gehorche, wenn sie mir sagen, was ich für die Aufgaben machen soll. คุณพ่อคุณแม่ยืนกรานว่าฉันต้องเชื่อฟังเวลาท่านบอกว่าฉันควรจะทำการบ้านอย่างไร
	Parents' Provision of Structure (4 items; alpha DE = .57; alpha TH = .50)
	Stem: Weißt du genau, was deine Eltern von dir erwarten?

	นักเรียนทราบแน่ชัดหรือไม่ว่าคุณพ่อคุณแม่คาดหวังอะไรจากตัวนักเรียน?
Str1	Wenn ich für einen Test lerne, weiß ich ganz genau, wie viel Anstrengung meine Eltern von mir erwarten. ถ้าฉันอ่านหนังสือสอบ ฉันทราบแน่ชัดว่าคุณพ่อคุณแม่คาดหวังให้ฉันทุ่มเทกับการอ่านมากน้อย เพียงใด
Str2	Wenn ich eine Klassenarbeit mit nach Hause bringe, weiß ich schon vorher, ob meine Eltern enttäuscht sein werden. ถ้าฉันนำข้อสอบกลับมาบ้าน ฉันเดาล่วงหน้าได้เลยว่าคุณพ่อคุณแม่จะผิดหวังหรือไม่
Str3	Wenn ich in der Schule etwas angestellt habe, weiß ich schon vorher, wie meine Eltern reagieren werden. ถ้าฉันทำอะไรไม่ดีไว้ที่โรงเรียน ฉันเดาล่วงหน้าได้เลยว่าคุณพ่อคุณแม่จะมีปฏิกริยาอย่างไร
Str4	Ich weiß genau, was meine Eltern in der Schule von mir erwarten. ฉันทราบอย่างชัดเจนว่าคุณพ่อคุณแม่คาดหวังให้ฉันทำอะไรบ้างที่โรงเรียน

3. Autonomous Learning Motivation

	Intrinsic Regulation (6 items; alpha DE = .95; alpha TH = .89)
	Stem: Warum strengst du dich im *Mathe-Unterricht* an? ทำไมนักเรียนจึงตั้งใจเรียนใน*ห้องเรียนวิชาคณิตศาสตร์*?
It1	Weil ich großes Interesse an Mathe habe. เพราะฉันสนใจวิชาคณิตศาสตร์มาก
It2	Weil ich gerne rechne. เพราะฉันชอบคิดเลข
It3	Weil mir der Mathe-Unterricht Spaß macht. เพราะฉันสนุกกับชั้นเรียนคณิตศาสตร์
	Stem: Warum strengst du dich bei den *Mathe-Hausaufgaben* an? ทำไมนักเรียนจึงตั้งใจทำ*การบ้านวิชาคณิตศาสตร์*?
It4	Weil das Lösen meiner Mathe-Aufgaben mir Spaß macht. เพราะฉันรู้สึกสนุกกับการแก้โจทย์วิชาคณิตศาสตร์
It5	Weil ich es genieße, mit Mathe-Aufgaben zu knobeln. เพราะฉันเพลิดเพลินกับการแก้โจทย์ปัญหาวิชาคณิตศาสตร์
It6	Weil mich Mathe interessiert. เพราะฉันสนใจในวิชาคณิตศาสตร์
	Identified Regulation (6 items; alpha DE = .87; alpha TH = .78)
	Stem: Warum strengst du dich im *Mathe-Unterricht* an? ทำไมนักเรียนจึงตั้งใจเรียนใน*ห้องเรียนวิชาคณิตศาสตร์*?
Id1	Weil ich den Stoff verstehen möchte. เพราะฉันต้องการเข้าใจเนื้อหาของวิชา
Id2	Damit ich mehr verstehe. เพื่อที่ฉันจะได้เข้าใจมากขึ้น
Id3	Weil es für mich wichtig ist, gut rechnen zu können เพราะฉันเห็นว่าการคิดเลขให้เก่งเป็นเรื่องสำคัญ
	Stem: Warum strengst du dich bei den *Mathe-Hausaufgaben* an?

	ทำไมนักเรียนจึงตั้งใจทำ*การบ้านวิชาคณิตศาสตร์*?
Id4	Weil es für mich wichtig ist, meine Mathe-Aufgaben zu machen. เพราะฉันเห็นว่าการทำการบ้านวิชาคณิตศาสตร์เป็นเรื่องสำคัญ
Id5	Weil ich den Stoff verstehen möchte. เพราะฉันต้องการเข้าใจเนื้อหาวิชา
Id6	Weil es für mich wichtig ist, gut rechnen zu können. เพราะฉันเห็นว่าการคิดเลขให้เก่งเป็นเรื่องสำคัญ

4. Controlled Learning Motivation

	Introjected Regulation (13 items; alpha DE = .87; alpha TH = .82)
	Stem: Warum strengst du dich im *Mathe-Unterricht* an? ทำไมนักเรียนจึงตั้งใจเรียนในห้องเรียนวิชาคณิตศาสตร์?
Ij1	Weil ich möchte, dass mein Lehrer mich für einen guten Schüler/eine gute Schülerin hält. เพราะฉันอยากให้คุณครูมองว่าฉันเป็นนักเรียนที่ดี
Ij2	Weil ich möchte, dass meine Mitschüler mich gut finden. เพราะฉันอยากให้เพื่อนร่วมชั้นเรียนเห็นว่าฉันเก่ง
Ij3	Weil ich mich schlecht fühlen würde, wenn ich mich nicht auf den Unterricht konzentriere. เพราะฉันจะรู้สึกแย่ ถ้าไม่ตั้งใจเรียนในห้อง
Ij4	Damit ich stolz sein kann. เพื่อที่ฉันจะได้ภาคภูมิใจในตัวเอง
Ij5	Damit mich die anderen in der Klasse gut finden. เพื่อที่คนอื่นๆในห้องจะได้เห็นว่าฉันเก่ง
Ij6	Weil es mir peinlich wäre, dabei ertappt zu werden, „geschlafen“ zu haben. เพราะฉันจะรู้สึกอับอาย ถ้าถูกจับได้ว่าแอบนอนหลับ
	Stem: Warum strengst du dich bei den *Mathe-Hausaufgaben* an? ทำไมนักเรียนจึงตั้งใจทำ*การบ้านวิชาคณิตศาสตร์*?
ij7	Weil ich möchte, dass meine Eltern mich für eine gute Tochter/einen guten Sohn halten. เพราะฉันต้องการให้คุณพ่อคุณแม่เห็นว่าฉันเป็นลูกที่ดี
Ij8	Weil ich mich sonst schlecht fühlen würde. เพราะฉันจะรู้สึกแย่ถ้าไม่ตั้งใจ
Ij9	Weil ich dann auf mich stolz sein kann. เพราะฉันจะได้ภูมิใจในตัวเอง
Ij10	Damit mich die anderen in der Klasse gut finden. เพื่อที่เพื่อนร่วมชั้นเรียนจะได้เห็นว่าฉันเก่ง
Ij11	Weil ich sonst ein schlechtes Gewissen hätte. เพราะฉันจะรู้สึกผิดถ้าไม่ตั้งใจ
Ij12	Weil ich damit andere in der Klasse beeindrucken kann. เพื่อที่เพื่อนร่วมชั้นเรียนจะได้ประทับใจในตัวฉัน
Ij13	Weil ich mich schämen würde, wenn ich nicht mein Bestes geben würde.

	เพราะฉันจะรู้สึกละอายใจ ถ้าไม่ได้พยายามทำให้ดีที่สุด
	External Regulation **(6 items; alpha DE = .74; alpha TH = .72)**
	Stem: Warum strengst du dich im *Mathe-Unterricht* an? ทำไมนักเรียนจึงตั้งใจเรียนในห้องเรียนวิชาคณิตศาสตร์?
Ex1	Weil es von mir erwartet wird, dass ich mich im Unterricht anstrenge. เพราะฉันถูกคาดหวังว่าจะต้องตั้งใจเรียน
Ex2	Damit ich keinen Ärger mit meinem Lehrer bekomme. เพื่อที่คุณครูจะได้ไม่โกรธฉัน
Ex3	Damit mich mein Lehrer lobt. เพื่อคุณครูจะได้ชมฉัน
	Stem: Warum strengst du dich bei den *Mathe-Hausaufgaben* an? ทำไมนักเรียนจึงตั้งใจทำ*การบ้านวิชาคณิตศาสตร์*?
Ex4	Weil von mir erwartet wird, dass ich meine Mathe-Aufgaben mache. เพราะฉันถูกคาดหวังว่าจะต้องทำการบ้านวิชาคณิตศาสตร์
Ex5	Damit meine Eltern mein Taschengeld erhöhen werden, wenn ich meine Mathe-Aufgaben gut gemacht habe. เพื่อที่คุณพ่อคุณแม่จะได้เพิ่มเงินค่าขนมให้ฉัน ถ้าฉันทำการบ้านได้ดี
Ex6	Damit ich keinen Ärger mit meinen Eltern bekomme. เพื่อที่คุณพ่อคุณแม่จะไม่โกรธฉัน

5. Academic Well-Being

	School Satisfaction **(5 items; alpha DE = .85; alpha TH = .85)**
	Stem: Wie ist deine Meinung? Gib an, wie sehr du mit diesen Aussagen übereinstimmst. นักเรียนมีความคิดเห็นอย่างไร จงบอกว่านักเรียนเห็นด้วยกับข้อความต่อไปนี้มากน้อยเพียงใด?
Sa1	Mir macht die Schule normalerweise Spaß. โดยปกติแล้ว ฉันสนุกที่ได้ไปโรงเรียน
Sa2	Ich gehe grundsätzlich gerne zur Schule. ปกติแล้ว ฉันชอบไปโรงเรียน
Sa3	Ich habe Spaß am Lernen. ฉันรู้สึกสนุกกับการเรียน
Sa4	Ich bin in der Schule meistens guter Laune. ส่วนใหญ่ ฉันจะอารมณ์ดีที่โรงเรียน
Sa5	Ich fühle mich wohl an meiner Schule. ฉันรู้สึกดีเวลาอยู่ในโรงเรียน
	Positive/Negative Academic Emotions **(10 items; alpha DE = .75; alpha TH = .80)**
	Stem: Bitte denk über das letzte Mal nach, als du deine Mathe-Hausaufgaben zusammen mit deinen Eltern gemacht hast. Wie hast du dich gefühlt? Bitte lies alle Aussagen genau durch und gib zu jeder Aussage eine Meinung ab.

	ให้นักเรียนลองนึกถึงตอนที่ได้ทำการบ้านกับคุณพ่อคุณแม่ในครั้งล่าสุด นักเรียนมีความรู้สึกอย่างไร? โปรดอ่านข้อความต่อไปนี้อย่างละเอียดนักเรียนคิดอย่างไรกับข้อความต่อไปนี้
	Positive Academic Emotions
Pa1	Ich fühlte mich froh. ฉันรู้สึกดีใจ
Pa2	Ich fühlte mich stolz. ฉันรู้สึกภูมิใจ
Pa3	Ich fühlte mich hoffnungsvoll. ฉันรู้สึกมีความหวัง
Pa4	Ich fühlte mich erleichtert. ฉันรู้สึกโล่งใจ
Pa5	Ich fühlte mich entspannt. ฉันรู้สึกผ่อนคลาย
	Negative Academic Emotions
Na1	Ich fühlte mich ängstlich. ฉันรู้สึกกลัว
Na2	Ich fühlte mich verärgert. ฉันรู้สึกโกรธ
Na3	Ich fühlte mich beschämt. ฉันรู้สึกละอายใจ
Na4	Ich fühlte mich gelangweilt. ฉันรู้สึกเบื่อ
Na5	Ich fühlte mich mutlos. ฉันรู้สึกท้อแท้

6. Regulation of Academic Motivation

	Stem for the two following subscales: Manchmal hat man bei den *Mathe-Hausaufgaben* keine Lust mehr, weiter zu machen. Wenn es dir so ergeht, was tust du dann? บางครั้ง คนเราอาจไม่มีอารมณ์จะทำ*การบ้านวิชาคณิตศาสตร์*ต่อไป นักเรียนจะทำอย่างไร ถ้าอยู่ในสถานการณ์เช่นนี้ ?
	Interest Enhancement **(4 items; alpha DE = .79; alpha TH = .77)**
Ien1	Ich versuche meine Aufgaben spielerisch zu lösen. ฉันจะพยายามแก้โจทย์เลขให้เหมือนเป็นการเล่นเกม
Ien2	Ich versuche mich davon zu überzeugen, dass es Spaß machen kann an den Mathe-Aufgaben zu knobeln. ฉันจะพยายามโน้มน้าวใจตัวเองว่าการขบคิดแก้โจทย์เลขเป็นเรื่องสนุก
Ien3	Ich überlege mir, wie meine Aufgaben mit Spaß zu Ende zu bringen sind. ฉันจะลองคิดดูว่าจะทำการบ้านให้เสร็จด้วยความสนุกได้อย่างไร
Ien4	Ich mache mir das Lösen meiner Aufgaben angenehmer, indem ich probiere, es spielerisch zu gestalten. ฉันจะทำให้ตัวเองรู้สึกดีขึ้นกับการทำการบ้าน ด้วยการทำให้มันเหมือนเป็นเกมอย่างหนึ่ง
	Self-Consequating **(5 items; alpha DE = .79; alpha TH = .66)**
Sfc1	Ich verspreche mir, dass ich etwas Schönes machen kann, wenn ich mit

	meinen Aufgaben fertig bin. ฉันจะสัญญากับตัวเองว่าจะทำอะไรสนุกๆ ถ้าทำการบ้านเสร็จแล้ว
Sfc2	Ich mache mit mir ab, dass ich etwas Tolles machen kann, wenn ich einen bestimmten Teil meiner Aufgaben erledigt habe. ฉันจะตกลงกับตัวเองว่าจะหาอะไรสนุกๆ ทำ ถ้าทำการบ้านเสร็จบางส่วน
Sfc3	Ich verspreche mir eine Belohnung, wenn ich meine Aufgaben erledigt habe. ฉันสัญญาจะให้รางวัลตัวเองถ้าทำการบ้านเสร็จ
Sfc4	Ich sage mir, dass ich später etwas Interessantes machen kann, wenn ich jetzt meine Aufgaben durchführe. ฉันจะบอกกับตัวเองว่าเดี๋ยวฉันก็ได้ทำอะไรที่น่าสนใจได้แล้ว ถ้าฉันเริ่มทำการบ้านในตอนนี้
Sfc5	Ich setze mir ein Ziel, wie viele Aufgaben ich erledigen muss und verspreche mir eine Belohnung, wenn ich das Ziel erreiche. ฉันตั้งเป้าหมายกับตัวเองว่าจะต้องทำการบ้านให้เสร็จแค่ไหนและสัญญาว่าจะให้รางวัลกับตัวเอง ถ้าฉันบรรลุเป้าหมายที่ตั้งไว้

7. Regulation of Positive Academic Emotion

	Stem for the three following subscales: Wenn ich eine <u>schwierige *Mathe-Aufgabe*</u> gut gelöst habe… ถ้าฉันแก้โจทย์<u>การบ้านวิชาคณิตศาสตร์</u>ที่ยากได้อย่างดี
	Self-Reinforcement **(7 items; alpha DE = .85; alpha TH = .75)**
Rpe1	…möchte ich am liebsten einen Luftsprung machen. ฉันอยากจะกระโดดให้ตัวลอยเป็นที่สุด
Rpe2	…gönne ich mir etwas Schönes. ฉันจะให้อะไรดีๆแก่ตัวเอง
Rpe3	…könnte ich zur Feier des Tages anderen etwas spendieren. ฉันจะเลี้ยงคนอื่นๆ เพื่อเป็นการเลี้ยงฉลองให้วันนี้
Rpe4	…könnte ich vor Freude jubeln und tanzen. ฉันจะร้องไชโยและเต้นรำอย่างเบิกบานใจ
Rpe5	…könnte ich mir einen langersehnten Wunsch erfüllen. ฉันจะทำในสิ่งที่ฉันหวังมานานเสียที
Rpe6	…gönne ich mir erst mal etwas. ฉันจะให้รางวัลกับตัวเองเป็นอันดับแรก
Rpe7	…ist mir nach Feiern zumute. ฉันจะไปเลี้ยงฉลอง
	Social-Affirmation **(7 items; alpha DE = .88; alpha TH = .80)**
Rpe8	…würde ich am liebsten anderen erzählen, wie erfolgreich ich war. ฉันอยากจะเล่าให้คนอื่นฟังว่าฉันประสบความสำเร็จแค่ไหน
Rpe9	…könnte ich mir die Aufgabe immer wieder anschauen. ฉันจะหยิบการบ้านนั้นออกมาดูแล้วดูอีก
Rpe10	...stelle ich mir vor, wie mich andere beglückwünschen werden. ฉันจะลองจินตนาการดูว่าคนอื่นจะมาแสดงความยินดีกับฉันอย่างไร
Rpe11	…denke ich immer wieder an den Moment, in dem ich von meinem Erfolg erfahren habe. ฉันจะนึกย้อนไปถึงนาทีที่ฉันรู้ว่าตนเองประสบความสำเร็จอยู่บ่อยๆ

Rpe12	…denke ich daran, dass andere mich bestimmt für meine Leistung loben werden. ฉันจะคิดว่าคนอื่นจะต้องชื่นชมกับความสามารถของฉันแน่ๆ
Rpe13	…könnte ich immer wieder von neuem darüber sprechen. ฉันจะคุยถึงเรื่องนี้ได้โดยไม่มีวันจบ
Rpe14	…habe ich den Augenblick, in dem ich von meinem Erfolg erfahren habe, immer wieder vor Augen. ฉันจะเก็บวินาทีที่รู้ว่าตนเองประสบความสำเร็จไว้ในใจตลอดไป
	Self-Affirmation (4 items; alpha DE = .80; alpha TH = .71)
Rpe15	…denke ich „das habe ich gut gemacht“. ฉันจะคิดว่า "ฉันทำได้ดี"
Rpe16	…fühle ich mich durch meine Leistung bestätigt. ฉันจะรู้สึกมั่นใจในความสามารถ
Rpe17	…lobe ich mich selbst. ฉันจะชมตัวเอง
Rpe18	…macht mir das Mut für die nächsten Aufgaben. ฉันจะให้กำลังใจตัวเองในการทำการบ้านครั้งต่อไป

8. Regulation of Negative Academic Emotion

	Stem for the three following subscales: Wenn mich etwas im *Mathe-Unterricht* unter Druck setzt und ich ganz aufgeregt bin… ถ้าฉันรู้สึกกดดันใน*ห้องเรียนวิชาคณิตศาสตร์*และรู้สึกตื่นเต้นเป็นกังวล
	Situation Control (4 items; alpha DE = .82; alpha TH = .72)
Rne1	...mache mir einen Plan, wie ich das Problem lösen kann! ฉันจะวางแผนว่าจะแก้ปัญหาได้อย่างไร
Rne2	...versuche ich herauszufinden, was das Problem ist! ฉันจะลองคิดดูว่าปัญหาคืออะไรกันแน่
Rne3	...überlege ich, was ich tun kann! ฉันจะลองคิดดูว่าฉันจะทำอะไรได้บ้าง
Rne4	...mache ich etwas, was das Problem löst! ฉันจะทำอะไรบางอย่างที่ช่วยแก้ปัญหาได้
	Positive Self-Instructions (4 items; alpha DE = .83; alpha TH = .72)
Rne5	...sage ich mir: Ich weiß, dass ich das Problem lösen kann! ฉันจะบอกกับตัวเองว่าฉันรู้ว่าจะแก้ปัญหาได้อย่างไร
Rne6	...sage ich mir: Ich kriege das in den Griff! ฉันจะบอกกับตัวเองว่าฉันจัดการกับมันได้
Rne7	...mach ich mir klar, dass ich das zu einem guten Ende bringen kann! ฉันจะบอกกับตัวเองอย่างชัดเจนว่าฉันจะสามารถทำให้เรื่องนี้จบลงได้ด้วยดี
Rne8	...sage ich mir: Damit werde ich fertig! ฉันจะบอกกับตัวเองว่า…แล้วฉันก็จะทำได้
	Seeking Out of Social Support (4 items; alpha DE = .85; alpha TH = .80)
Rne9	...lasse ich mir von jemandem helfen!

	ฉันจะหาคนมาช่วย
Rne10	...frage ich jemanden um Rat! ฉันจะขอคำแนะนำจากคนอื่น
Rne11	...frage ich jemanden, was ich machen soll. ฉันจะถามคนอื่นว่าควรจะทำอย่างไร
Rne12	...rede ich mit jemandem darüber! ฉันจะลองคุยเรื่องนี้กับคนอื่น

Appendix C

Example Syntax for a Multiple Group Analysis with LISREL

```
MULTIPLE GROUP ANALYSIS Full Model Full Constrains (10, 11, 12, 13 Feb 2011)
Antecedents of the quality of home-based family involvement and its impact on students' learning motivation, academic well-
being and academic self-regulation competencies: A German-Thai comparison
(Form LY GA BE PS TE IN)

GERMANY
DA NG=2 NI=29 NO=288 MA=KM
LA
AUTO1 RESS2 CONTR3 STRU4 ITMOTIV5 IDMOTIV6 IJMOTIV7 EXMOTIV8 SATIS9 PANAS10 INENH11 SCON12
SFREW13 SOCON14 SFCON15 SICON16 SFINS17 SOSUP18 ACRESP1 PSRESP2 GOALPC3 GOALPD4 GEFFC5
MEFFC6 INC7 INT8 TE9 VAL10 FSES11
KM
1.000

0.625   1.000

-0.218  -0.290  1.000

0.155   0.010   0.410   1.000

0.173   0.245   -0.039  -0.050  1.000

0.241   0.363   -0.014  0.103   0.612   1.000

0.284   0.355   0.076   0.224   0.420   0.516   1.000

0.045   0.047   0.402   0.391   0.152   0.310   0.487   1.000

0.258   0.348   -0.140  -0.102  0.437   0.372   0.283   -0.025  1.000

0.316   0.407   -0.218  -0.082  0.265   0.327   0.265   0.030   0.366   1.000

0.288   0.261   0.023   0.057   0.431   0.327   0.398   0.158   0.360   0.331   1.000

0.288   0.345   0.073   0.140   0.294   0.261   0.461   0.299   0.259   0.263   0.450
        1.000

0.201   0.159   0.124   0.225   0.066   0.088   0.360   0.308   0.147   0.161   0.262
        0.400   1.000

0.207   0.181   0.136   0.145   0.205   0.184   0.448   0.315   0.155   0.123   0.289
        0.383   0.677   1.000

0.231   0.247   0.037   0.185   0.140   0.260   0.482   0.295   0.198   0.156   0.329
        0.433   0.519   0.627   1.000

0.387   0.394   -0.028  0.218   0.258   0.336   0.356   0.188   0.333   0.215   0.385
        0.380   0.324   0.238   0.355   1.000

0.315   0.355   0.020   0.175   0.313   0.390   0.323   0.177   0.377   0.223   0.357
        0.414   0.350   0.303   0.405   0.661   1.000
```

```
0.348  0.333  -0.046  0.165  0.060  0.184  0.277  0.126  0.187  0.157  0.220
       0.196  0.260   0.261  0.288  0.472  0.346  1.000

0.098  0.155  -0.088  -0.050  0.122  0.107  0.064  -0.016  0.125  0.077  0.113
       0.020  -0.009  0.054   0.094  0.047  0.041  0.132   1.000

-0.056  0.004  -0.037  0.037  0.007   0.040   -0.031  0.053  -0.057  0.070  -0.001
-0.013  0.058  0.076   0.065  -0.023  -0.046  -0.018  0.179  1.000

0.005  0.047  0.044  0.073  0.098  0.065  0.060  0.018  0.135  0.040  0.114
       0.066  0.012  0.066  0.086  0.061  0.071  0.051  0.345  0.222  1.000

-0.159  -0.161  0.288  0.191  0.045   0.098   0.114   0.206   -0.055  -0.049  -0.022
-0.030  0.067   0.081  0.009  -0.008  -0.007  -0.009  -0.047  0.179   0.227   1.000

0.134  0.151  -0.116  -0.014  0.199  0.116  0.153  0.003  0.104  0.161  0.076
       0.034  -0.001  0.020   0.033  0.137  0.164  0.096  0.240  0.040  0.229
       0.044  1.000
0.145  0.189  -0.064  0.061   0.247  0.132  0.157  -0.004  0.130  0.084   0.107
       0.148  0.069   -0.016  0.103  0.254  0.230  0.173   0.174  -0.023  0.054
-0.046  0.246  1.000
0.094  0.176  -0.100  -0.041  0.072  0.016  0.128  -0.060  0.133  0.105  0.144
       0.053  0.033   0.077   0.133  0.092  0.071  0.140   0.318  0.114  0.290
       0.018  0.352   0.101   1.000
0.068  0.026  -0.100  -0.085  0.037   0.000  -0.011  -0.121  0.086  0.019   0.042
       0.017  -0.053  -0.079  -0.008  0.024  0.109   0.081   0.276  -0.077  0.156
-0.099  0.290  0.143  0.183  1.000
0.251  0.246  -0.123  0.007  0.210  0.139  0.152  0.068  0.201  0.136   0.136
       0.100  0.013   0.029  0.071  0.156  0.166  0.116  0.293  -0.012  0.116
-0.104  0.431  0.211  0.345  0.295  1.000
-0.050  -0.073  0.049   -0.039  0.040   -0.021  -0.051  -0.078  -0.054  -0.026  -0.103
-0.159  -0.075  -0.053  -0.107  -0.044  0.006   -0.026  -0.063  0.020   0.060   0.156
        0.022   0.177   -0.057  -0.003  0.008   1.000
0.192  0.053  -0.140  0.011   -0.044  -0.039  -0.090  -0.182  0.063  0.011   0.088
       0.006  -0.056  -0.155  -0.030  0.142   0.041   0.089   0.141  -0.113  0.067
-0.265  0.049  0.184  0.082  0.049  0.101  0.027  1.000
ME
2.362 3.739 2.514 2.375 2.933 3.527 2.113 2.781 2.708 1.185 1.923 2.908 2.790 2.642 4.563 2.375 2.543 3.014 4.993 3.662
6.514 3.629 3.379 4.085 5.340 3.639 3.179 3.477 4.271
SD
0.479 0.596 0.863 0.491 1.031 0.711 0.465 0.747 0.784 0.272 0.820 0.928 0.885 0.899 1.332 0.603 0.615 0.871 0.553 0.570
0.619 0.839 0.595 1.130 1.070 0.664 0.626 0.679 1.293
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VA .63 TE(9,9)
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FR PS(7,7)
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FR PS(3,1)
FR PS(5,3)
FR PS(6,1)
FR PS(4,3)
FR PS(6,4)
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FR TE(18,17) TE(4,1)  TE(5,3) TE(15,13) TE(8,3) TE(9,5)
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FR TH(3,16)
LE
ATTT1 ATTR2 AUMOTIV3 COMOTIV4 SWB5 MORS6 EMRS7
PD
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OU SE RS EF FS TV MI MR SS ND=3 SC AD=OFF


THAILAND
DA NI=29 NO=494 MA=KM
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AUTO1 RESS2 CONTR3 STRU4 ITMOTIV5 IDMOTIV6 IJMOTIV7 EXMOTIV8 SATIS9 PANAS10 INENH11 SCON12
SFREW13 SOCON14 SFCON15 SICON16 SFINS17 SOSUP18 ACRESP1 PSRESP2 GOALPC3 GOALPD4 GEFFC5
MEFFC6 INC7 INT8 TE9 VAL10 FSES11
KM
1.000

0.591  1.000

0.105  -0.032  1.000

0.219  0.158  0.396  1.000

0.248  0.265  0.045  0.073  1.000

0.350  0.365  0.071  0.255  0.556  1.000

0.154  0.165  0.217  0.231  0.201  0.225  1.000

0.109  0.109  0.297  0.300  0.124  0.208  0.687  1.000

0.156  0.144  0.068  0.068  0.341  0.251  0.186  0.077  1.000

0.111  0.163  -0.235  -0.075  0.183  0.157  -0.112  -0.168  0.122  1.000

0.274  0.206  0.151  0.150  0.428  0.381  0.234  0.154  0.262  0.099  1.000

0.320  0.262  0.179  0.180  0.253  0.311  0.316  0.244  0.234  -0.032  0.453
       1.000

0.226  0.244  0.159  0.199  0.228  0.285  0.293  0.224  0.163  0.041  0.359
       0.541  1.000

0.227  0.228  0.177  0.162  0.295  0.210  0.369  0.278  0.241  0.010  0.344
       0.438  0.621  1.000

0.291  0.321  0.104  0.190  0.280  0.367  0.175  0.146  0.196  0.124  0.335
       0.423  0.465  0.477  1.000

0.335  0.296  0.112  0.176  0.385  0.413  0.206  0.159  0.355  0.067  0.469
       0.428  0.372  0.369  0.426  1.000

0.327  0.297  0.139  0.186  0.424  0.425  0.290  0.238  0.343  0.071  0.458
       0.421  0.395  0.378  0.417  0.591  1.000

0.232  0.198  0.085  0.072  0.075  0.169  0.224  0.179  0.106  0.012  0.180
       0.298  0.326  0.355  0.311  0.248  0.133  1.000

0.185  0.122  0.001  0.084  0.025  0.072  -0.010  0.021  0.018  -0.006  0.041
       0.102  0.048  -0.001  0.068  0.048  0.112  0.021  1.000

0.027  0.080  0.027  -0.013  -0.001  -0.015  0.029  0.037  0.022  0.019  0.010
       0.038  0.065  0.076  -0.008  0.030  0.063  0.007  0.266  1.000

0.112  0.153  -0.083  0.105  -0.008  0.075  -0.048  -0.009  0.036  -0.079  0.043
       0.052  -0.020  -0.098  0.077  0.092  0.072  -0.001  0.488  0.207  1.000
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```
-0.008   -0.006   0.079    -0.063   0.102    0.000    0.101    0.043    0.110    0.001    0.061
         0.018    0.077    0.103    0.024    0.038    0.060    0.037    0.084    0.260    0.106
         1.000
0.079    0.079    -0.048   -0.044   0.083    -0.013   -0.019   -0.038   0.006    0.116    0.111
         0.021    0.028    0.002    0.055    0.032    0.020    -0.011   0.276    0.167    0.164
         0.212    1.000
0.085    0.018    -0.027   0.079    0.074    0.046    -0.036   -0.026   -0.049   -0.001   0.019
-0.014   -0.067   -0.064   0.036    -0.026   -0.024   -0.043   0.045    -0.171   0.017    -0.044
         0.243    1.000
0.081    0.171    -0.057   0.005    0.049    0.106    -0.023   0.028    0.106    0.060    0.051
         0.074    0.047    -0.024   0.161    0.084    0.094    -0.027   0.393    0.151    0.295
         0.109    0.399    0.100    1.000
0.070    0.042    -0.055   -0.061   0.029    0.006    0.041    0.108    0.061    0.074    0.022
         0.065    0.037    0.053    0.075    0.021    -0.002   0.057    0.229    0.133    0.118
         0.150    0.357    0.058    0.412    1.000
0.085    0.156    -0.090   0.009    0.042    0.036    -0.075   -0.063   0.057    0.038    0.001
         0.027    0.013    -0.055   0.049    -0.004   0.003    -0.019   0.399    0.068    0.330
-0.028   0.254    0.084    0.405    0.144    1.000
0.116    0.049    -0.077   -0.006   0.134    0.108    -0.012   -0.014   0.079    0.018    0.119
         0.105    0.043    0.027    0.098    0.058    0.072    0.069    0.251    0.016    0.177
-0.063   0.200    0.101    0.131    0.137    0.234    1.000
0.175    0.085    -0.018   0.152    -0.098   0.054    -0.042   0.002    0.008    -0.039   0.097
         0.083    0.029    -0.087   0.058    0.104    0.083    0.031    0.201    -0.206   0.256
-0.175   0.053    0.059    0.140    -0.063   0.255    0.155    1.000
ME
1.857 2.892 2.281 2.180 3.335 3.584 2.946 2.207 2.465 1.540 3.107 4.234 2.615 3.497 2.633 2.197 3.018 3.120 5.074 3.597
5.620 3.768 3.473 5.298 4.130 3.190 3.156 4.009 4.220
SD
0.316 0.467 0.524 0.419 0.768 0.610 0.778 0.516 0.540 0.329 0.751 0.958 0.599 0.793 0.429 0.376 0.542 0.753 0.514 0.625
0.636 0.753 0.625 1.124 0.624 0.527 0.562 0.601 1.441
MO NX=11 NY=18 NE=7 GA=IN BE=IN LY=IN PS=IN TE=IN
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FR TH(10,2)
FR TH(8,8)
FR TH(6,14)
FR TH(3,14)
FR TH(3,16)
LE
ATTT1 ATTR2 AUMOTIV3 COMOTIV4 SWB5 MORS6 EMRS7
PD
OU
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Appendix D

Short Vita

Sittipan Yotyodying
(born in Chonburi, Thailand)
E-mail: sittipan.yotyodying@googlemail.com

Education

07/2012
Dr.phil. in Psychology

04/2012
Completed Doctoral Study Program (101 Credit Points), International NRW-Research School "Education and Capabilities", Bielefeld University and TU Dortmund University

12/2008 – 04/2012
Doctoral Studies in Educational Psychology, International NRW-Research School "*Education and Capabilities*", Bielefeld University
Dissertation Topic: The Quality of Home-Based Parental Involvement: Antecedents and Consequences in German and Thai Families

04/2006 – 11/2008
Doctoral Studies in Educational Sciences, International Education Doctorate Program (INEDD), University of Siegen

06/2005
M.Ed. in Educational Research
Master Thesis Topic: Factors Affecting Decision Making on University Choice of Graduate Students in Education: A Multiple Discriminant Analysis

06/2003 – 04/2005
Postgraduate Studies in Educational Research, Department of Educational Research and Psychology, Faculty of Education, Chulalongkorn University (TH)

03/2003
B.Ed. in Secondary Education

06/1999 – 04/2003
Undergraduate Studies in Secondary Education (Majors: Biology and General Science), Department of Secondary Education, Faculty of Education, Chulalongkorn University (TH)

Scholarships

12/2011–04/2012
STIBET-Förderung, the German Academic Exchange Service (DAAD) via the International Office, Bielefeld University

12/2008–11/2011
Full-Time Scholarship at the International NRW-Research School "Education and Capabilities", Bielefeld University, a Doctoral Research and Study Program Funded by the Ministry of Innovation, Science, Research, and Technology of the State of North-Rhine-Westphalia, Germany

Awards

06/2011
The Third Price for "The Ph.D. Challenge – 2011", as organized by The PhD-Talent, The Career Fair Paris, 23−24 June 2011, Paris (FR); in the collaboration with Ksenia Kuzmina, Simone A. Gerwert, Johanna M. Gold, and Grace SE. Chng

10/2002
The Outstanding Teaching Trainee in Biology, Faculty of Education, Chulalongkorn University (TH)

Professional Experience

Summer Semester 2011 (04–07/2011)
Lecturer, seminar entitled "Parenting and its Effects", Department of Psychology, Faculty of Psychology and Sports Science, Bielefeld University

09/2005 – 02/2006
Temporary Academic Staff, the Office for National Education Standards and Quality Assessment (TH)

06/2003 – 11/2004
Student Assistant, Department of Educational Research and Psychology, Faculty of Education, Chulalongkorn University (TH)

06/2001 – 02/2006
Student Assistant, the Enrichment Program for the Gifted and Talented, Chulalongkorn University Demonstration Primary School (TH)

05–10/2002
Teaching Trainee, Chulalongkorn University Demonstration Secondary School (TH)

Published Papers

Wild, E. & Yotyodying, S. (2012). Studying at home: With whom and in which way? Homework practices and conflicts in the family. In: Richter, M. & Andresen, S. (Eds.), *The politicization of parenthood: Shifting private and public responsibilities in education and child rearing* (pp. 165–180). Dordrecht: Springer.

Yotyodying, S. (2006). Factors affecting decision making on university choice of graduate students in education: A multiple discrimination analysis**.** *Journal of Research Methodology, 19*(2), 215–248.

Manuscript in Preparation

Yotyodying, S., & Wild, E. (in prep.). Factors affecting the quality of home-based parental involvement in Germany and Thailand: Similarities and differences. *Learning, Culture, and Social Interaction*.

Conference Papers/Presentations

Yotyodying, S. (2011, November). Antecedents of the quality of home-based family involvement and its impact on students' learning motivation, academic well-being, academic self-regulation competencies: A German-Thai comparison. Poster presented at the 2nd International Conference of the Research School Education and Capabilities "Schools as Gate-Keepers", Dortmund (DE).

Yotyodying, S. (2011, September). Understanding students' unequal opportunities to learn at home: An investigation into determinants of quality of parental instruction in Thai families. Paper presented at the Symposium on "Social justice as a challenge for practices and preferences in education" as a part of European Conference on Educational Research (ECER) 2011, Berlin (DE).

Yotyodying, S. (2011, September). Exploring determinants of authoritative and authoritarian parental instruction in learning at home: A cross-cultural comparison between Germany and Thailand. Paper presented at Emerging Researchers' Conference as a part of European Conference on Educational Research (ECER) 2011, Berlin (DE).

Yotyodying, S., & Wild, E. (2011, August). Why do parent adopt different instructional strategies for children's scholastic learning at home? Paper presented at the Junior Researchers of European Association of Research on Learning and Instruction (JURE) Pre-Conference 2011, Exeter (UK).

Yotyodying, S. (2009, August). The role of familial socialization in facilitating self-determination of learning and well-being in school-age children. Paper Presented at the Pre-Conference of the International Social Work & Society Academy (TISSA) 2009, Vilnius (LT).