

16 Explanations of Social Desirability and Interviewer Effects

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16.1 Introduction

Recent trends in the analysis of social data are closely intertwined with advances in structural equation modelling. In particular, testing a substantive theory and an auxiliary theory as advocated by Blalock (1969) and Costner (1969), is carried out by the method of structural equations.

This paper presents findings that purport to test a substantive theory about attitudes, norms, and behavior, and an auxiliary theory making provision for interviewer effects and response bias. The substantive theory is drawn from the writings of Ajzen and Fishbein; in the auxiliary scheme the effects of interviewer's status and age are assessed before and after introducing social desirability as a control variable. According to Ajzen and Fishbein (1980), how one behaves at any instant depends on one's beliefs about the consequences of one's actions, as well as on beliefs held by self and others about the right way to behave.¹ The expected costs and benefits of a given act and the motivation to conform to the opinions of others, also influence how one behaves generally. Because the theory holds that evaluated expectations underlie social acts, it has been called value-expectancy theory; as such, it can be interpreted as a version of rational choice theory (cf. Turner 1991).

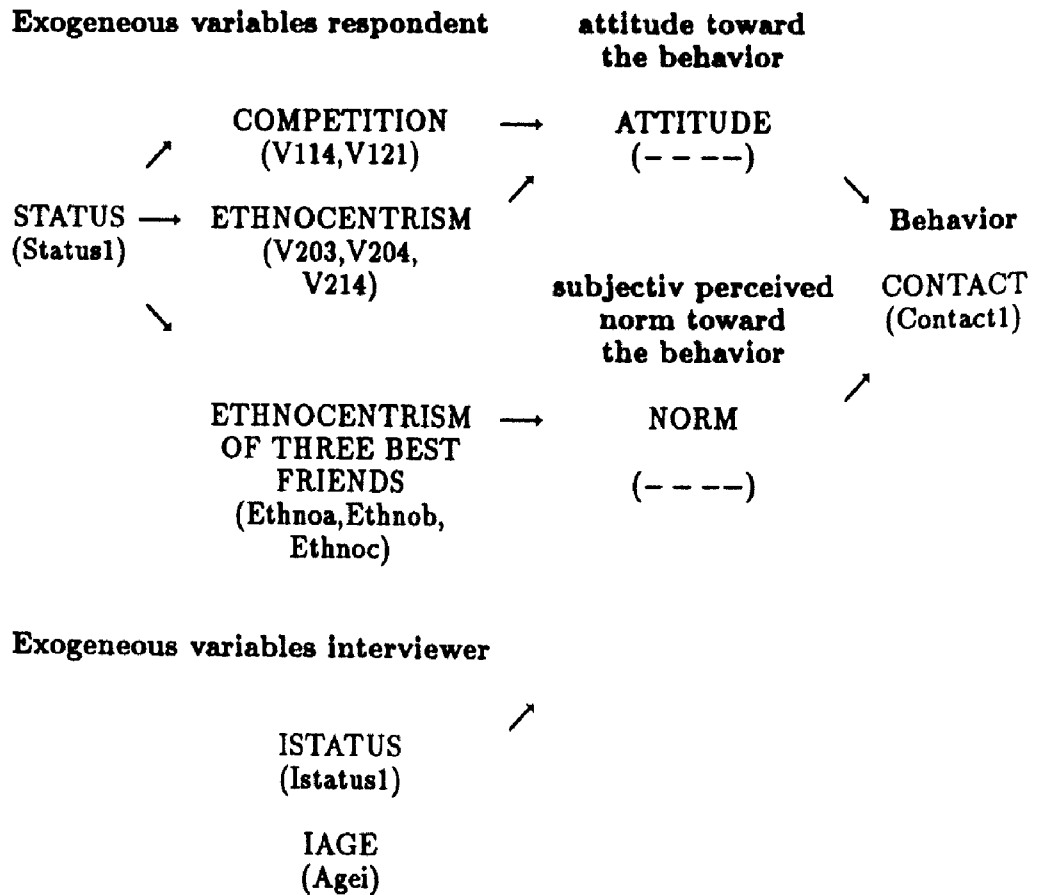
To the aforesaid distinction between beliefs of self and beliefs of others as determinants of action, we add a third, namely, ideas about what a person should do from the standpoint of the circumstances at the time. With this change, it is possible to include the interviewer variables as a possible influence on respondent's norms and thereby on his subsequent actions.

We turn now to our study of attitudes, norms and behavior in respect to foreigners in Germany.² As a preliminary, and before presenting our struc-

¹ The distinction of *self* and *others* can be proved by the research of Schuessler (1982), in which dimensions in "Social Life Feeling Scales" are differed in item formulation "I" and "Most People". In the research cited above, "attitudes about me and others in society" have been questioned, which correspond exactly with the categorization according to Fishbein. Contrasting to this, Ajzen and Fishbein say that empirical data has proved that the inclusion of personal normative ideas does not contribute to the understanding of the determinants of behavior intentions. They also cite problems of operationalization which, in our opinion, can be solved partly through the use of item formulations in the way Schuessler used them (cf. Ajzen & Fishbein 1978: 408, footnote 7).

² A foreigner is defined as an individual who is living and working in Germany for several months or years. These type of foreigner is named as "guest worker".

tural equation model, we list variables, arrange them by proximity to the dependent variable, classify them as latent or manifest, and also as substantive or auxiliary. These particulars are given in Figure 1. There we note that Contact1, a manifest variable, is the indicator of CONTACT, a latent variable; also that CONTACT is the behavior for which an explanation is sought.



xxx = Constructs used according to the model of Ajzen & Fishbein
 XXX = Construct to be measured (latent variable)
 (xxx) = Measured indicator (manifest variable)

Figure 1: Operationalization of the Theory of Reasoned Action and Interviewer Variables

The perception of foreigners as competitors (COMPET) has attitude toward workplace (V114) and attitude toward space (V121) as its indicators; ethnocentric feelings toward foreigners (ETHNO) has V203, V204, and V214 as its indicators; these three pertain generally to feelings about foreigners in respect to their "character" and social acceptability. Both COMPET and

ETHNO are external variables in the sense of Ajzen and Fishbein which are not directly related to a specific behavior.

Perceived hostility against foreigners in the primary milieu (ETHNOABC) is also an external variable. The indicators of ETHNOABC are Ethnoa, Ethnob and Ethnoc, each composed of four statements on ethnocentric attitudes in relation to three best relatives/friends/acquaintances.

Respondent's status (STATUS) is another external variable; the indicator of STATUS is Status1 based on respondent's education and profession.

Interviewer's status referring to interviewer's education and profession (ISTATUS) and his age (IAGE) represent the constructs of the extended Ajzen and Fishbein model. The indicator of ISTATUS is Istatus1 based on interviewer's education and profession; the indicator of IAGE is the age of the interviewer (Agei).

The theory of reasoned action, as sketched above, includes two more constructs, namely: the attitude toward certain behavior (ATTITUDE) and the subjective norm (NORM). They will be treated as MIMIC-variables in the structural equation model we want to examine since they have no measures in the data set.³ MIMIC modelling involves the introduction of so called phantom variables by means of which one can generally test constructs of any kind under the condition that the problem of identification is solved. The formulation (η s as MIMIC-variable) refers to the generalized linear model (cf. Graff & Schmidt 1982) and allows theoretical models to be tested at least indirectly where there are no direct measurements of the constructs and identification is given.

The substantive model can now be stated more precisely as follows: external variables, e.g. STATUS, explain various beliefs concerning social norms and specific attitudes. Persons with high status are more likely to be found in milieus friendly to foreigners, whereas persons with low status are more likely to be found in primary environments hostile to foreigners. This difference in life circumstances is directly related to attitude toward foreigners either as competitors at work or in inhabitants of the same living space. Since the more primary environments document hostility to foreigners, persons of low status are more likely to view foreigners as undesirable competitors. Furthermore, increasing feeling of competition and increasing expression of prejudice reduce the establishment of private contacts with foreigners (cf. Krauth & Porst 1984).

The method theory may be formulated as follows: subjective norm (NORM) is influenced by the situational factors during the process of interviewing. Respondents orient their responses not only to their attitudes and norms, but also to the characteristics of the interviewer. These characteristics may be more or less visible (e.g. age, gender), or they may relate to the interviewer's attitude. The problem is to find out in what way the respondent's norms are influenced by the interview situation. The interviewer's status (ISTATUS) and the interviewer's age (IAGE) serve as additional pre-

³ MIMIC stands for "Multiple Indicators Multiple Causes". Those variables are linear additive combinations of other latent variables without their being related to measured variables (cf. Jöreskog & Sörbom 1988: 142ff; Bollen 1989: 331).

dictors of NORM. Since ISTATUS and IAGE are not independent constructs, their influence is examined individually rather than jointly.

The hypotheses about relationships between the latent variables of the substantial model can be stated as follows:

- Respondent's status (STATUS) is negatively related to feelings of competition toward foreigners (COMPET, cf. Esser et al. 1983).
- Respondent's status (STATUS) is negatively related to ethnocentric attitudes in the primary milieu (ETHNOABC).
- Respondent's status (STATUS) and ethnocentric attitudes (ETHNO) are unrelated.
- The stronger the feeling of competition toward foreigners (COMPET), the stronger the attitude against having private contacts with foreigners (ATTITUDE).
- The stronger one's own ethnocentric attitudes (ETHNO), the stronger the attitude against having private contacts with foreigners (ATTITUDE).
- The stronger the ethnocentric attitudes in the primary milieu (ETHNOABC), the more salient the norm hostile toward foreigners (NORM).
- The stronger the attitude against contact with foreigners (ATTITUDE), the less likely the existence of private contacts to foreigners (CONTACT, cf. Krauth & Porst 1984).
- The stronger the existence of a norm hostile to foreigners (NORM), the less likely the presence of private contacts with foreigners (CONTACT, cf. Krauth & Porst 1984).
- Competition toward foreigners (COMPET), ethnocentric attitudes of respondent (ETHNO) and ethnocentric attitudes in the primary milieu (ETHNOABC) are interrelated. No causal relationships between these constructs are postulated, however.

Given the data, causal relations between some variables are problematic. Since statements about behavior, obtained by questionnaires, always record past behavior, the direction of the causality between these past behaviors and the attitudes or the characteristics which define the attitudes, resolved unequivocally. It is possible that the contact rate had already an influence on the ethnocentrism of the respondent and his feeling of competition. Here, as in many retrospective studies, we are limited by data that do not distinguish between various causal models for the explanation of the empirical covariance structure (according to the problem of equivalence of causal models cf. Jöreskog & Sörbom 1988: 221ff and the literature quoted there).

The hypotheses with respect to the relations of the latent variables of the substantive theory and the interviewer variables will be stated as follows:

- Interviewer's status (ISTATUS) has a negative influence on subjective norm (NORM), i. e., the higher the interviewer's status, the less the relevance of norms hostile to foreigners (in the interview situation).

- Interviewer's age (IAGE) has a positive influence on subjective norm (NORM), i. e., the older the interviewer, the greater the relevance of norms hostile to foreigners (in the interview situation).

As argued elsewhere (Reinecke 1991a) the interviewer becomes an significant other. One must assume that the respondent expects of an interviewer with a higher status, for example, that he/she is friendly toward foreigners. A possible interaction effect between the status and the age of the interviewer cannot be estimated because of the small number of interviewers in the contingency table.

16.2 Operationalization of the Respondent Behavior according to Social Desirability (SD) and the Formation of Subgroups

To measure respondent behavior according to social desirability an 10-item version of the Marlowe/Crowne SD-Scale (Schuessler 1982) was used. This scale, hereafter MCSD-Scale, is one-dimensional, according to factor analysis (Varimax rotation, criterion of eigenvalue > 1). MCSD-Scale scores range from 18 to 36; in our sample half of the respondents are on the interval 27 to 30.

The scale is mainly used to form groups of the respondents according to their tendency to respond desirable and to investigate possible conditions for the actualization of situational effects of bias. Social desirability is not defined as a construct and is not integrated in the structural equation model (cf. Reinecke 1985), but it functions as a parameter of the situational conditions. With the help of subgroups one can test the hypotheses of the substantive and method theory stated above (cf. the model in Figure 2).

Condition 1: low social desirability

$$A \xrightarrow{.80} B \xleftarrow{.20} C$$

Condition 2: high social desirability

$$A \xrightarrow{.20} B \xleftarrow{.80} C$$

Coefficients are hypothetical

A = Exogenous variable of the substantive theory

B = Endogenous variable of the substantive theory

C = Interviewer variable of the method theory

Figure 2: Model to Explain the Effects of Social Desirability

In particular, it will be possible to estimate

- (1) that the effect of an independent variable (A) on the dependent variable (B) is contingent on interviewer's characteristic (C) by various degrees of social desirability, and
- (2) that the explained variance of the dependent variable (B) changes after introducing the interviewer variable.

In keeping with our purposes, respondents were grouped by MCSD-Scale scores: one group of persons with low social desirability scores, one group of persons with middle social desirability scores, and one group of persons with high social desirability scores (cf. Table 1).

Table 1: Quartile Ranges

Formation of quartiles	Range	N	Designation
Low approval	18-26	30	SD-1
Medium approval	27-30	60	SD-2,3
High Approval	31-36	33	SD-4

Note: According to the analysis of Reinecke (1991b), respondents of the first quartile (SD-1) and of the fourth quartile (SD-4) stated tendencies for social desirability related to their specific norms. The actualization of different norms in the interview situation could be explained with the respondent's age (cf. Reinecke 1991b: 309ff): Younger respondents saw their need for social approval in the socially undesirable categories of the scale, while older respondents saw their need in the desirable categories. Also the interviewer played an influential role: if the respondent anticipated that the interviewer was hostile to foreigners, not only the social desirability of the respondent, but also the interviewer's attitude was decisive for the respondent's behavior.

For the respondents of the fourth quartile (SD-4) - mostly older respondents - an attitude hostile to foreigners is more likely to be desirable. The interviewer has an effect in that an interviewer's attitude which is hostile to foreigners explains a part of the variance of the respondent's ethnocentrism. For the respondents of the first quartile (SD-1) - mostly younger respondents - an attitude hostile to foreigners is most likely socially undesirable. Here the interviewer has the opposite effect: an interviewer's attitude friendly to foreigners explains part of the variance of the respondent's ethnocentrism. The results of SD-1 and SD-4 differ only in the content aspect of social desirability. The persons of SD-2,3 utter the weakest socially desirable respondent behavior, and the effect of interviewer is reduced to the stated contact rate to foreigners (Reinecke 1991b: 314).

Based on these results the model was fitted on SD-1 and SD-4 and comparisons were made between estimated parameters. The following hypotheses are stated for subgroups:

- SD-1 (desirable in the direction of friendliness toward foreigners).

- The higher the interviewer's status, the weaker the existence of the respondent's subjective norm of hostility toward foreigners. This correlation will be appreciable, if the need for social recognition is shown via friendly behavior to foreigners. An interviewer with a higher status will strengthen the friendliness to foreigners.
 - The older the interviewer the stronger the respondent's tendency to behave in hostile manner toward foreigners. This correlation will be negligible, if the need for social approval is shown via friendly behavior to foreigners. The age of the interviewer will have little influence on friendliness toward foreigners.
- SD-4 (desirable in the direction of hostility to foreigners)
 - The higher the interviewer's status, the weaker the respondent's subjective norm to behave in hostile way toward foreigners. This correlation will be *weak* if the need for social approval is shown via hostile behavior to foreigners. Even if the interviewer has a high status, the hostility to foreigners will remain.
 - The older the interviewer is, the stronger the subjective norm to behave in hostile manner to foreigners. This correlation will be *appreciable* if the need for social approval is shown via hostile behavior to foreigners. An older interviewer will strengthen hostility toward foreigners.

In the analysis, the assumption is made that substantive, and measurement theory are invariant across the groups. This means that the structure of interrelations among variables is taken to be identical in SD-1 and SD-4.

16.3 Sample and Measurements

16.3.1 Sample

The analysis of interviewer effects requires that interviewers differ in their characteristics. Table 2 show's that interviewers are equally divided between men and women, 6 are younger (≤ 30 years) and 4 are older (≥ 40 years). 6 are inexperienced, and 4 are experienced interviewers. Education and status are similar to other staffs of interviewers, shifted to a higher degree. The older interviewers have less education and, therefore, lower status; the younger interviewers have more education explained by their status as students.

Table 2: Description of the Interviewers

Nr.	Gender	Age	Profession	Status	Experience
01	m	46	Social Worker	high	yes
04	f	51	House Wife	low	yes
05	m	48	Van Driver	low	no
06	f	40	House Wife	low	yes
07	f	29	Social Worker	high	no
08	m	26	*Social Scientist	high	yes
09	f	26	*Social Scientist	high	no
11	m	28	*Social Scientist	high	no
12	f	25	*Architect	high	no
13	m	21	Non-military service	medium	no

* Aspired professions

With the help of the resident's registration office in Essen, a random sample was drawn from two districts of that city.⁴ The selected respondents were informed in a letter about the forthcoming survey and the visit of an interviewer. Interviewers received the addresses of persons who had been informed beforehand in letters. The assignment of addresses to interviewers was random. However, for practical reasons, no interviewer worked in two different districts.

The survey was conducted in spring, 1986. In the district Essen-Holsterhausen, 51 interviews and, in the district Essen-Altenessen-Nord, 74 interviews were completed for a total sample of 125.

Every interviewer filled in a questionnaire containing both attitude items and items on personal characteristics. On the basis of these data, it was possible to differentiate groups of respondents according to interviewer characteristics and possible to link between method constructs and substantive constructs.

16.3.2 Survey Questionnaire

The survey questionnaire contains the following items:

- Demography
- Professional situation/education
- Situation of life/feelings of competition
- Ethnocentrism

⁴ Essen-Holsterhausen is a district where only few foreigners live, whereas Essen-Altenessen-Nord is a district where many foreigners live. The different numbers of foreigners was meant to guarantee variance in the constructs ethnocentrism and primary milieu.

- Primary milieu
- Interethnic contacts
- Social Desirability
- Interviewer assessment/respondent perception

Demography includes gender and age, marital status and education; also the professional education and profession of respondent, and, in some cases, of husband or wife; and family situation (number of children, age of the children and the number of persons in the household).

The questions concerning profession or education are divided into the following categories: people no longer employed, people working full-time or part-time, and persons in school. The latter had only to state the goal of their education. The index Status1 is developed on the basis of these questions.

The items concerning the feeling of competition and the situation of life were taken from the study "Social-Economic Conditions for the Integration of Foreign Workers of the Ruhr Area" (Esser et al. 1983); of these items V114 and V121 are selected for the construct COMPET.

The 16 items on ethnocentrism are taken from several scales (e.g. Esser et al. 1983; ZUMA-Scalehandbook 1983); of these V203, V204 and V214 are selected for the construct ETHNO.

The questions concerning the primary milieu appear as items on ego-centered networks in the ALLBUS 1980 survey. Of the three best friends/relatives/acquaintances outside one's own household, demographic variables (sex, age, education), subjective estimations of the ethnocentrism of friends/acquaintances/relatives, the contact rate with these three persons and the connectivity of this network (cf. Schmidt & Wolf 1984) are obtained. The indices Ethnoa, Ethnob and Ethnoc are based on replies to these questions.

The questions on private contacts pertain to various situations: contacts at the places of work or school, contacts in the primary milieu, and contacts in the neighborhood. The index Contact1 is based on answers to these questions.

The items concerning social desirability are taken from the translated 10-item version of the Marlowe-Crowne-SD-Scale described in section 16.2.

After the interview was concluded, the interviewer recorded respondent's willingness to answer, the reliability of statements, the presence and possible intervention of third persons, the length of the interview, possible difficulties in responding, the interviewer's assessment and the perception of the respondent.

16.4 Structural Equation Model

Now we express the hypotheses about individual difference in contact behavior with foreigners in the form of a structural equation model (cf. Table 3). The substantive theory includes an exogenous construct (STATUS), three intervening constructs (ETHNOABC, COMPET, ETHNO) with measured indicators, two intervening constructs without measured indicators (ATTITUDE, NORM) and one endogenous construct (CONTACT). The method

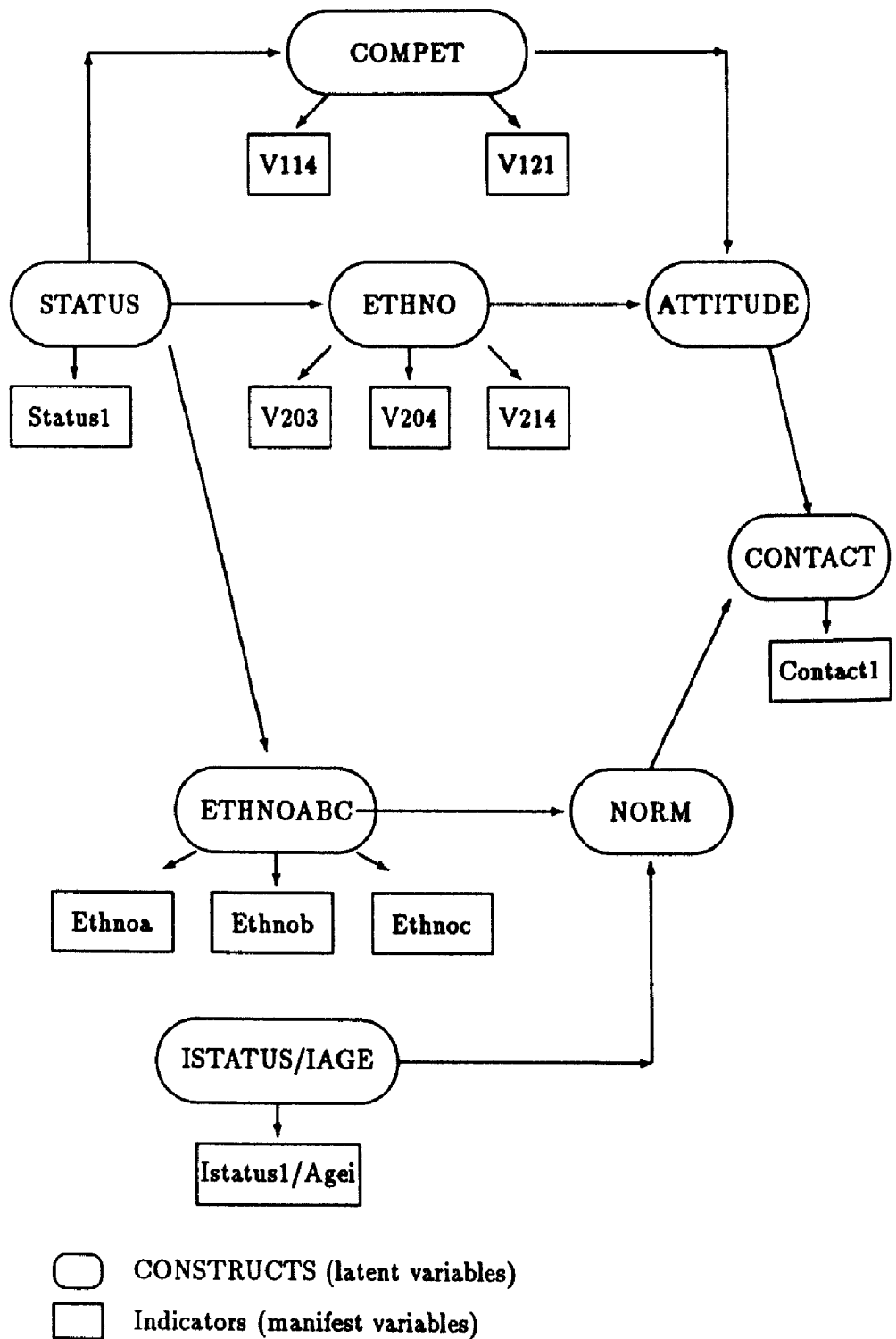


Figure 3: Structural Equation Model of Substantive and Method Theory

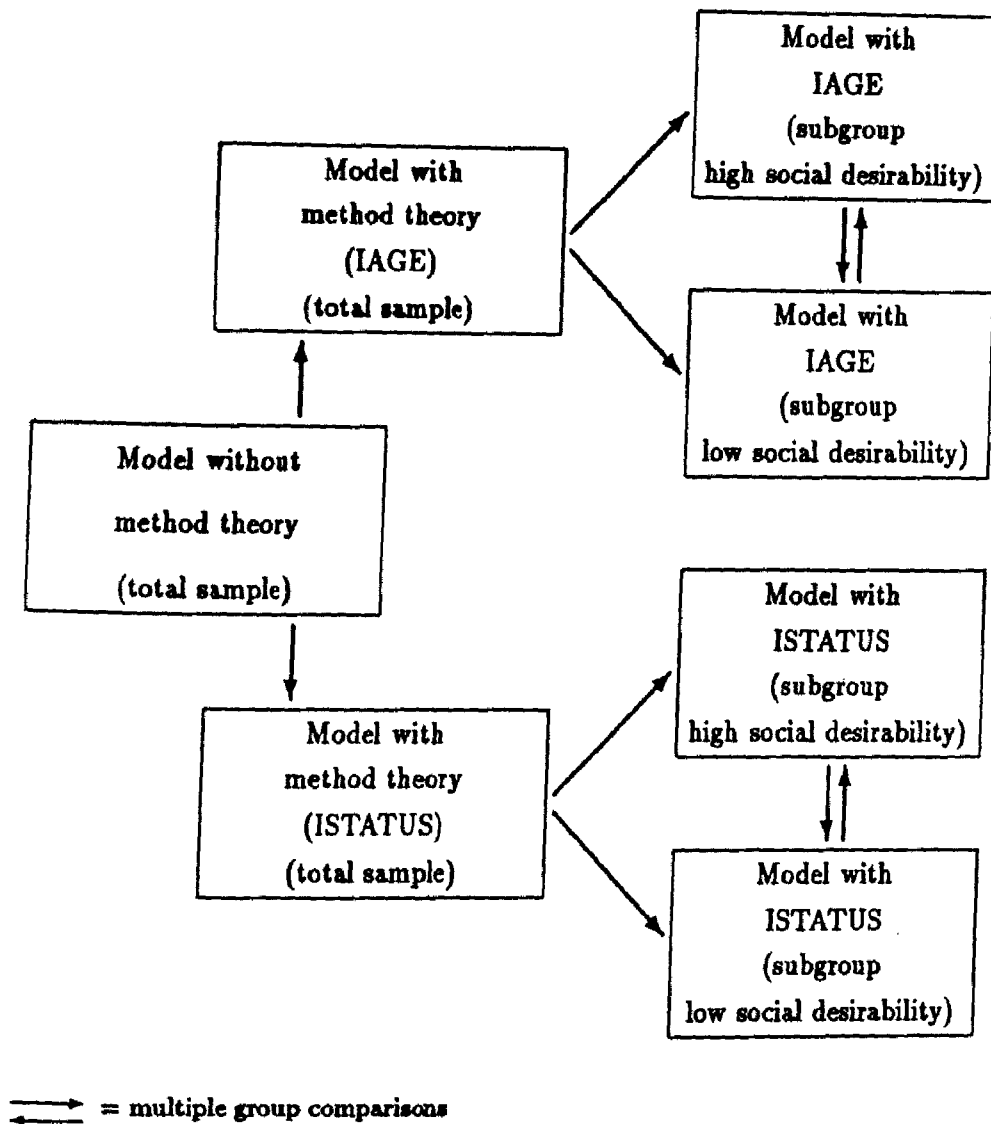


Figure 4: Sequence of Model Testing

theory includes the exogenous construct ISTATUS, with the measured indicator *Istatus1*, and exogenous construct IAGE, with the measured indicator *Agei*. For both constructs causal effects of the MIMIC-Variable *NORM* and residual covariance to the constructs *ETHNO* or *COMPET* are postulated.

In the following account, we give in detail the fit of the model in the total sample with no interviewer variables; next with the interviewer variables, and finally on subgroups (SD-1, SD-4). For purposes of model fitting we used the program LISREL (cf. Jöreskog & Sörbom 1988). For analyses based on the whole sample standardized coefficients are listed; for the analysis of subgroups unstandardized coefficients are listed. In testing hypothesis,

emphasis is placed on the structural coefficients, the residual variances and covariances.

16.4.1 Model without Method Theory

The hypotheses of the substantive theory are largely corroborated: The respondent's status (STATUS) has a negative effect on ethnocentrism of the three best friends (ETHNOABC, -.434) and feeling of competition (COMPET, -.190), ethnocentrism (ETHNO) and feelings of competition have positive effects on ATTITUDE (.874 and .177). ATTITUDE and NORM have negative effects on contact to foreigners (CONTACT, -.277, -.203). The postulated direct effect from respondent's status to ethnocentrism is not present. The need to introduce different external variables is indicated by the path coefficients from feelings of competition to ATTITUDE and from ethnocentrism to ATTITUDE. The respondent's hostility to foreigners has a stronger effect on ATTITUDE than his/her feeling of competition; suggesting that the intention to have private contact to foreigners is explained more by personal affection or dislike than by situational factors such as life space and workplace which are in some measure controlled politically.

The fit of the model is acceptable ($\chi^2=23.80$ with $df = 28$, GFI=.963). There are no significant differences between empirical and estimated covariances. The Modification Indices carry no hints for model improvement; therefore, the model of the substantive theory may be accepted for further analyses.

16.4.2 Fitting in the Total Sample with Interviewer Variables

Adding the interviewer's status (ISTATUS) and the interviewer's age (IAGE) to the model, in turn, changes the pattern of relations among variables hardly at all. Table 3 shows that respondent's status has a negative effect on ethnocentrism of the three best friends and feeling of competition (-.434 and -.185 for the model with ISTATUS; -.434 and -.187 for the model with IAGE), ethnocentrism and feeling of competition have positive effects on ATTITUDE (.743 and .342 for the model with ISTATUS; .870 and .181 for the model with IAGE). ATTITUDE and NORM are negatively related to contact to foreigners (-.293 and -.273 for the model with ISTATUS; -.268 and -.204 for the model with IAGE).

However, the status of the interviewer is an important predictor of the subjective norm: the higher the status, the weaker the norm of hostility toward foreigners. The hypothesis about the influence of the interviewer's age was not corroborated. On the other hand, there is a significant residual correlation between interviewer's status and feeling of competition and between interviewer's age and ethnocentrism.⁵ These results must be considered in relation to the effects of interviewer's status on NORM, and interviewer's

⁵ Relations between these constructs have been estimated with residual correlations. So the residual correlations can be interpreted like structural coefficients.

Table 3: Model with Interviewer's Status (ISTATUS) and Interviewer's Age (IAGE) for the Total Sample

Beta	Structural Model		
	STATUS	ETHNOABC	ETHNO
ETHNOABC	-.434 (-4.315)		
ETHNOABC	-.434 (-4.315)		
ETHNO	.009 (.091)		
ETHNO	.056 (-.564)		
COMPET	-.185 (-1.969)		
COMPET	-.187 (-1.964)		
ATTITUDE			.743
ATTITUDE			.870
NORM		.656	
NORM		.992	
Beta	Structural Model		
	COMPET	ATTITUDE	NORM
ATTITUDE	.342 (.532)		
ATTITUDE	.181 (.269)		
CONTACT		-.293 (-1.550)	-.273 (-1.569)
CONTACT		-.268 (-1.376)	-.204 (-1.718)
	ISTATUS/IAGE		
NORM	-.755 (-1.276)		
NORM	.126 (.267)		
Ψ	Error variances and residual correlations		
	ETHNOABC	ETHNO	COMPET
ETHNOABC	.812 (3.859)		
ETHNOABC	.812 (3.859)		
ETHNO	.508 (4.019)	1.000 (4.842)	
ETHNO	.477 (3.902)	.997 (4.736)	
COMPET	.466 (4.074)	.654 (5.132)	.966 (5.368)
COMPET	.467 (4.022)	.656 (5.098)	.965 (5.242)
ISTATUS			.150 (1.929)
IAGE		.301 (3.344)	
Ψ	Error variances and residual correlations		
	ATT./NORM	CONTACT	ISTATUS/IAGE
CONTACT		.786 (7.676)	
CONTACT		.824 (7.651)	
ISTATUS			1.000 (7.874)
IAGE			1.000 (7.874)

xxx = Model with interviewer's status
 xxx = Model with interviewer's age
 The t-values of the coefficients are given in parantheses.

age on NORM. Concerning the latter, the effects are in the hypothesized direction, but they are not significant. On the other hand, it is clear that

the interviewer variables have an influence on the attitude variables ethnocentrism and feeling of competition: feeling of competition is affected by the interviewer's status; hostility to foreigners is related to interviewer's age. The latter relation is as in line with findings from other empirical studies.

The fit of the models are acceptable ($\chi^2=32.93$ with $df = 36$ for the model with interviewer's status and $\chi^2=37.79$ with $df = 36$ for the model with interviewer's age). There are no greater deviations between empirical and estimated covariances. Therefore, the models of the substantive theory with interviewer variables included, can be accepted for the subgroup analyses.

We turn now to the fit of the model within subsamples by degree of social desirability.

16.4.3 Subgroup Analysis according to Social Desirability

Model with Interviewer's Status

Computations are again made with the program LISREL, with covariances within groups as input (cf. concerning the technique of multiple group comparison Jöreskog & Sörbom 1988; Sörbom 1979; Sörbom 1982). The input information for the different groups⁶ is computed simultaneously, advantage of which is that the correlations between variables can be tested explicitly according to stated criteria. The criterion, here, is the stronger or weaker tendency to give socially desirable answers.

The starting point of the multiple group comparison is what has come to be known as a "baseline-model" (cf. Sobel & Bohrnstedt 1985: 161ff). The baseline-model used here assumes no differences between SD-1 and SD-4 in their parameters. Accepting this model implies no difference between groups according to tendency to respond in a socially desirable manner. However, one may still wish to investigate the improvement in it when restrictions, some or all, are lifted.⁷

Table 4 clarifies this procedure and results based on it. The comparison of model variants is made as follows: The baseline-model (variant 1) is the starting point for the computation of χ^2 -differences. In the event of a significant χ^2 -improvement (Q-Ratio > 2)⁸ the less restricted model is accepted.

Table 4 shows no significant χ^2 -improvement from variant 1 to variant 2, which means that the influence of interviewer's status is not conditional on the tendency of social desirability. However, there are improvements from variant 1 to variant 3 and from variant 3 to variant 4, 5 and 6, respectively.

⁶ In multiple group comparisons information about the different grades of variability of the items is necessary so that it is always a covariance matrix which must be used as input matrix.

⁷ In multiple group comparisons the χ^2 -value indicate the overall fit of the model beyond the groups, whereas the GFI-Values (Goodness-of-Fit-Index) indicate the adjustment of the model to the respective subgroup. To fit the model parameters are set free. This means that the respective coefficients can be estimated differently beyond all groups and the structure of the model, however, remains.

⁸ Q-Ratio is the ratio of χ^2 -difference to df-difference between to nested models.

First, a difference in relation between respondent's status and ethnocentrism of the three best friends leads to a significant χ^2 -improvement (variant 3); second, the specification of residual covariances between particular measured variables leads to significant χ^2 -improvements (variant 4 and 5); third, the specification of a residual covariance between interviewer's status and feeling of competition (variant 6) leads to a further significant χ^2 -improvement which indicates that the influence of interviewer's status is contingent on social desirability.

The fit indices of variant 6 have similar values ($GFI_1 = .803$ und $GFI_2 = .814$) within subgroups. These values are low because of the model restrictions; however in neither group there are significant deviations (values in the matrix Normalized Residuals ≥ 2.0) between empirical and estimated covariances.

Table 4: Sequence of Model Testing in the Multiple Group Comparisons (Model with Interviewer's Status)

Type of model variants	Total fit		Fit of the subgroups	
	χ^2	df	GFI_1	GFI_2
1: LY=IN BE=IN GA=IN	151.83	84	.720	.755
2: LY=IN BE=PS GA=IN NEQ: ISTATUS - NORM	151.18	83	.721	.753
3: LY=IN BE=IN GA=PS NEQ: STATUS - ETHNOABC	146.12	83	.721	.766
4: LY=IN BE=IN GA=PS NEQ: STATUS - ETHNOABC RES: V214 - Ethnoa	123.97	81	.746	.792
5: LY=IN BE=IN GA=PS NEQ: STATUS - ETHNOABC RES: V214 - Ethnoa RES: V114 - V203 RES: V214 - V203	102.03	77	.792	.811
6: LY=IN BE=IN GA=PS NEQ: STATUS - ETHNOABC RES: V214 - Ethnoa RES: V114 - V203 RES: V214 - V203 RES: ISTATUS - COMPET	95.54	75	.803	.814

PS = Matrices BEta, GAMma and Lambda Y have the same causal structure but different coefficients across groups.

IN = Matrices BEta, GAMma and Lambda Y have the same causal structure and identical coefficients across groups.

NEQ = Not EQual means that the numerical relation between two constructs may differ across groups.

RES = RESidual Covariances between constructs or between measured variables may differ across groups.

Table 5: Variant 6 (Structural Coefficients)

Beta	Subgroup low MCSD-score (SD-1)		
	STATUS	ETHNOABC	ETHNO
ETHNOABC	-.436 (-4.332)		
ETHNO	-.003 (-.066)		
COMPET	-.104 (-1.885)		
ATTITUDE			1.000
NORM		1.000	
CONTACT			
	ISTATUS		
NORM	-.079 (-.750)		
	COMPET	ATTITUDE	NORM
ETHNOABC			
ETHNO			
COMPET			
ATTITUDE	-.541 (-1.604)		
NORM			
CONTACT		.393 (1.337)	-.403 (-2.723)
Beta	Subgroup high MCSD-score (SD-4)		
	STATUS	ETHNOABC	ETHNO
ETHNOABC	-.107 (-1.118)		
ETHNO	-.003 (-.066)		
COMPET	-.104 (-1.885)		
ATTITUDE			1.000
NORM		1.000	
CONTACT			
	ISTATUS		
NORM	-.079 (-.750)		
	COMPET	ATTITUDE	NORM
ETHNOABC			
ETHNO			
COMPET			
ATTITUDE	-.541 (-1.604)		
NORM			
CONTACT		.393 (1.337)	-.403 (-2.723)

xxx = Coefficients vary over the groups
The t-values in parantheses.

Table 5 shows that interviewer's status has a weak influence on subjective norm in both groups (-.185), which means that interviewer's status has no influence via NORM on the *behavior* construct contact to foreigners. But the results in Table 6 show an influence from interviewer's status on the *attitude* constructs ethnocentrism and feeling of competition. For the SD-1 are significant negative residual covariances between interviewer's status and feeling of competition (-.323) and interviewer's status and ethnocentrism (-.323).

This means that persons from the low social desirability group adjust their response behavior to the status of the interviewer: the higher the status of the interviewer, the lower the feeling of competition against foreigners and the lower the ethnocentrism against foreigners.

For SD-4 there are positive residual covariances, significant between interviewer's status and feeling of competition (.850) and non-significant between interviewer's status and ethnocentrism (.079). This means that persons from the high social desirability group adjust their response behavior in the opposite direction: the higher the status of the interviewer, the higher the feeling of competition against foreigners and the higher the ethnocentrism against foreigners.

The tentative conclusion at this juncture is that attitudes are more structured (higher residual covariance among individuals with low SD scores than among persons with high SD scores).

Table 6: Variant 6 (Residual Variances and Covariances)

Ψ	Subgroup low MCSD-score (SD-1)		
	ETHNOABC	ETHNO	COMPET
ETHNOABC	.670 (2.408)		
ETHNO	.423 (3.062)	.387 (3.797)	
COMPET	.653 (2.986)	.461 (3.610)	1.070 (4.036)
CONTACT			
ISTATUS		-.323 (-2.628)	-.323 (-2.030)
	ATT./NORM	CONTACT	ISTATUS
ETHNOABC			
ETHNO			
COMPET			
CONTACT		.512 (3.832)	
ISTATUS			1.994 (3.808)
Ψ	Subgroup high MCSD-score (SD-4)		
	ETHNOABC	ETHNO	COMPET
ETHNOABC	.567 (2.641)		
ETHNO	.229 (2.338)	.232 (2.704)	
COMPET	.278 (2.109)	.264 (2.405)	.719 (2.952)
CONTACT			
ISTATUS		.079 (.493)	.850 (2.632)
	ATT./NORM	CONTACT	ISTATUS
ETHNOABC			
ETHNO			
COMPET			
CONTACT		.270 (3.679)	
ISTATUS			3.710 (4.000)

xxx = Coefficients vary over the groups
The t-values in parantheses.

Model with Interviewer Age

The results of fitting nested models with interviewer's age - substituted for interviewer's status - shows that there is no significant difference between models (depending on same causal structures for the matrices) with identical coefficients across groups and models with different coefficients across groups, implying that a difference in the relation between interviewer's age and NORM leads to no significant improvement in fit as postulated. Again, a difference in the relation between respondent's status and ethnocentrism of the three best friends leads to a significant χ^2 -improvement; and again, the specification of residual covariances between particular measured variables leads to significant χ^2 -improvements. In contrast to the model with interviewer's status, the specification of a residual covariance between interviewer's age and feeling of competition leads to no χ^2 -improvement.

Table 7 shows the results of fitting nested models with interviewer's age substituted for interviewer's status: there is no significant difference between variant 1 and variant 2, implying that a difference in the relation between interviewer's age and NORM leads to no significant improvement in fit as postulated. Again, a difference in the relation between respondent's status and ethnocentrism of the three best friends leads to a significant χ^2 -improvement (variant 3); and again, the specification of residual covariances between particular measured variables leads to significant χ^2 -improvements (variants 5 and 6). In contrast to the model with interviewer's status, the specification of a residual covariance between interviewer's age and feeling of competition leads to no χ^2 -improvement (variant 7 in Table 7).

The fit indices of the accepted model (variant 6) have similar values ($GFI_1 = .819$ and $GFI_2 = .812$), the reason for the relatively low values of the fit indices being the pattern of restrictions.⁹

For both groups there are no statistically significant deviations between empirical and estimated covariances (values in the matrix Normalized Residuals ≥ 2.0).

There was no significant influence of interviewer's age on subjective norm in either group (.014), with the implication of no influence of interviewer's age via NORM on *behavior* contact to foreigners. But the results show particular influences of interviewer's age on *attitude* ethnocentrism; in both groups there are positive residual covariances between interviewer's age and ethnocentrism, non-significant (1.004) in SD-1, significant (1.509) in SD-4. This means that respondents adjust their response behavior to the age of the interviewer: the higher the age of the interviewer, the higher the ethnocentrism of the respondent; but the relation is significant only for persons with high social desirability scores.

⁹ Because of space restrictions the results of the accepted model are only explained in the following text.

Table 7: Sequence of Model Testing in the Multiple Group Comparisons (Model with IAGE)

Type of models	Total Fit		Fit of the subgroups	
	χ^2	df	GFI ₁	GFI ₂
1: LY=IN BE=IN GA=IN	142.45	84	.703	.757
2: LY=IN BE=PS GA=IN NEQ: IAGE - NORM	142.04	83	.708	.757
3: LY=IN BE=IN GA=PS NEQ: STATUS - ETHNOABC	137.49	83	.715	.764
4: LY=IN BE=PS GA=PS NEQ: STATUS - ETHNOABC NEQ: STATUS - ETHNO	136.50	82	.726	.766
5: LY=IN BE=PS GA=PS NEQ: STATUS - ETHNOABC NEQ: STATUS - ETHNO RES: V214 - Ethnoa	119.28	80	.785	.791
6: LY=IN BE=PS GA=PS NEQ: STATUS - ETHNOABC NEQ: STATUS - ETHNO RES: V214 - Ethnoa RES: V114 - V203 RES: V121 - V203	102.50	76	.811	.814
7: LY=IN BE=PS GA=PS NEQ: STATUS - ETHNOABC NEQ: STATUS - ETHNO RES: V214 - Ethnoa RES: V114 - V203 RES: V121 - V203 RES: IAGE - COMPET	101.20	74	.819	.812

PS = Matrices BEta, GAMma and Lambda Y have the same causal structure but different coefficients across groups.

IN = Matrices BEta, GAMma and Lambda Y have the same causal structure and identical coefficients across groups.

NEQ = Not Equal means that the numerical relation between two constructs may differ across groups.

RES = RESidual Covariances between constructs or between measured variables may differ across groups.

16.4.4 Comparisons of Explained Variances of the Models

Although none of the tested models were rejected, relations between the interviewer's status and interviewer's age, respectively, and subjective norm were not confirmed. Nor did group comparisons according to social desirability reveal significant differences in respect to the effect of interviewer variables on behavior (contact to foreigners) via the subjective norm. Two main results confirm the relevance of the analysis:

1. The interviewer attributes status and age are correlated with the competitive attitude and ethnocentrism of respondents
2. The degree of covariation between interviewer constructs and attitude constructs differs significantly between SD-1 and SD-4.

Comparing the explained variances of contact to foreigners for all tested models shows that the explained variance (cf. Table 8) is raised somewhat by method variables.

On the one hand the explained variance of contact to foreigners increases from .178 (model without interviewer variables) to .214 (model with interviewer's status). On the other hand, there is no increase in the explained variance (.176 for the model with interviewer's age).

The subgroup analysis shows similar tendencies. The explained variance increases from .178 (baseline-model) to .284 (interviewer's status, SD-1) and .266, respectively (interviewer's status, SD-4). Upon substituting age from status, the explained variance increases from .178 to .278 (interviewer's age, SD-1) and .331, respectively (interviewer's age, SD-4).

Failing to allow for the effects of interviewer characteristics and social desirability has two possible consequences: biased coefficients because of omitted variables and the underestimation of explained variances.

Table 8: Explained Variances for the Construct CONTACT

	Explained variance
Baseline-model no method theory (total sample)	.178
Model with interviewer's status (total sample)	.214
Model with interviewer's age (total sample)	.176
Model with interviewer's status (subgroup SD-1)	.284
Model with interviewer's status (subgroup SD-4)	.266
Model with interviewer's age (subgroup SD-1)	.278
Model with interviewer's age (subgroup SD-4)	.331

16.5 Summary and Conclusion

Let us now summarize the main results and draw some conclusions:

- *Theory* : We have used a general theory of action (Ajzen & Fishbein 1980) to model the relation of behavior to attitude and norm; to this model, we added a method theory to explain interviewer effects. We tested this model before and after controlling for social desirability. In an overall view the tested models have been proved, and we have given explanatory sketches why age and status of interviewers may change latent and therefore the reported attitudes and behaviors of respondents.
- *Method* : In line with recent trends, we have not relied crosstabulations and correlation coefficients but rather on structural equation methods to test via latent variables the effect of interviewer characteristics and social desirability on behavior. We have demonstrated how the specification and testing of such models can be performed and that only coefficients of the structural model (point estimates and explained variances) are affected. This will also change the reported attitudes and behaviors via the measurement model. Interestingly, the factor loadings of the items themselves stayed invariant for the subgroups (SD-1 and SD-4).
In further studies one should corroborate this finding and look additionally to the means of the observed and latent variables.
- *Social desirability and interviewer effects* : By simultaneously recording and testing social desirability and interviewer effects in a multiple group structural equation model it was possible to test both effects combined.
In the future one needs replications which test these combined effects and show how stable they are. To systematize the ongoing research one should compare a list of relevant interviewer characteristics for varying topics which show significant influences on reported attitudes and behaviors.
- *Design* : In our experimental design it was possible to vary some characteristics of the interviewers. Such a procedure may be prohibitively costly in some research projects. Still it might be possible to
 - a. use a short scale of social desirability;
 - b. use measurements of the most relevant demographic characteristics of interviewers (gender, age, education, income, professional status, interviewer experience) and a few central attitudes which are relevant to the ongoing research.

In this way one can test nested models much as we did in this paper. Such a procedure has been used in the German General Social Survey 1980 (ALLBUS, cf. Schanz & Schmidt 1984) and 1990. A comparison of findings based on many studies will reveal which effects are stable and predictable, and which are erratic and fortuitous.

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