Attitudes in Context:

Automatic, Systematic, and Lateral Minority and Majority Influence.

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Summary: This dissertation compiles three manuscripts that focus on attitude change and social influence. They discuss the potential of integrating recent innovations in attitude change research into theories about minority and majority influence and, reversely, how attitude change theories in general could benefit from this integration.

In the first manuscript *"Minority and Majority Influence on Attitudes"* (Dickel & Bohner, 2012) a general review of research on attitude change and minority and majority influence is given. Building on this background, we point out the benefits of including implicit measures of attitude into minority and majority influence research: Previously unobserved mechanisms of attitude change may be studied with implicit measures of attitude. Explicit self-report measures that are so far predominant in research on minority and majority influence rely primarily on controlled processes. In contrast, implicit measures may capture automatic processes to a larger degree and may therefore provide new insights (Manuscript 3 provides an example of how implicit measures could contribute to model indirect minority influence more parsimoniously and within a larger theoretical context at the same time). Furthermore, in Manuscript 1 we propose a continuum of explicitness of attitudes assuming not two distinct processes to cause either automatic or systematic changes, but rather a continuous amount of effort that may be put into evaluative judgments. When perceivers have ample motivation and opportunity to effortfully process (consensus) information they may activate internal representations associated with the presented concepts arrive at an evaluative judgment. The more concepts are integrated into the judgment that were not originally presented, the less the judgment will depend on the presentation context. However, when little effort is put into evaluative judgments, judgments may depend heavily on the external input that activates relevant concepts. Different contexts may activate different evaluations of consensus information and different implications for its use in evaluative judgments about a topic. This idea is followed up in an empirical study described in the second manuscript.

The second manuscript *"Consensus in Context – Activation of Prototypical Majority Sizes Moderates Majorities' Impact on Attitudes"* (Dickel & Bohner, under review) describes two empirical studies that test the implications of a context-oriented perspective on minority and majority influence. In the two experiments we found that consensus information is reconstructed differently depending on the activated context. Through a remembering task either an election context or a user evaluations context was activated. Each context implies different prototypical sizes of majorities: In the election context majorities are typically small, whereas in user evaluations high levels of consensus can be observed. In Expt. 1 context moderated accuracy of reconstructed consensus, so that consensus information matching the expected level could be reproduced more accurately. In Expt. 2, this effect was replicated and, moreover, affected evaluative judgments. Participants who were presented a majority source with consensus that matched the expected level evaluated a fictitious attitude object more positively. This effect was mediated by accuracy of the reconstructed consensus. Hence, consensus information has the largest impact on attitudes when its reconstruction matches the expected level, presumably because non-matching consensus causes distrust and is not used as a heuristic cue for an evaluative judgment of the topic.

Finally, in the third manuscript *"Lateral Attitude Change – Generalization and Compensation"* (Dickel, Liersch, Rees, Süssenbach, & Bohner, under review) the focus is broadened to side effects of attitude change in general. Inspired by research on indirect attitude change following minority influence as opposed to direct majority influence, two cases of lateral attitude change (LAC) are outlined in a novel theoretical framework: a transfer of evaluation change from a focal object to an associated "lateral" object, i.e. the case of a *generalization effect*, and change on the lateral object despite no observed change on the focal object, i.e. the case of a *compensation effect*. Both cases are illustrated by empirical evidence from various domains of attitude change, including minority and majority influence. In the LAC framework we postulate that both types of LAC are driven by automatic transfer of

evaluation from focal to lateral attitude objects: An automatically activated evaluation of a focal object co-activates (the evaluations of) associated lateral objects. When elaboration about the activated concepts brings additional information to mind, this can either affirm the automatic evaluations of focal and lateral object, resulting in generalization effects, or it can reject the automatic association toward the focal object but affirm change in the lateral objects, resulting in compensation effects. Moreover, subjective reasons for non-generalization may prevent lateral change. Memory decay of such subjective reasons can result in delayed lateral change.

While encompassing indirect effects of attitude change in general, this framework does also account for indirect minority influence and direct majority influence on attitudes. When people are persuaded by a majority source they typically are not motivated to hide their changed attitude which will be observed as direct attitude change. By contrast, when minorities induce attitude change perceivers may not want to display this change, because it may have negative consequences to do so, e.g. exclusion from the group. However, the accomplished change may evoke changes on other attitude objects that are related to the focal one, which will be observable in indirect minority influence. The LAC framework predicts that such indirect minority influence would be mediated by change observed with implicit measures of focal and lateral attitudes. Manuscript 3 thus explicates the benefits of including implicit measures into minority and majority influence research, as outlined in Manuscript 1.

Taken together, the three manuscripts contribute new theoretical ideas to the field of minority and majority influence and attitude change in general. They generate interesting new predictions, some of which are already on their way to being tested.

Attitudes in Context: Automatic, Systematic, and Lateral Minority and Majority Influence

Abstract

In this synopsis I discuss how the three manuscripts contribute to classic debates about attitude representation and attitude change processes. Specifically, the debate whether attitudes are constructed online or stored in memory is sketched and referred to connectionist modeling of attitudes. It is outlined how the two perspectives are relevant for each manuscript. The second contentious issue in attitude change research – whether distinct attitude change processes exist or not – is tracked and commented. Again, it is outlined how the topic is relevant for each manuscript. The three manuscripts share a construction perspective and a dual process assumption of attitude change following minority and majority influence. I argue for a pragmatic approach to theory building with the prior goal of generating novel research questions.

Keywords: construction of attitudes, dual- and single-process models of attitude change, connectionist models of attitudes

Attitudes in Context: Automatic, Systematic, and Lateral Minority and Majority Influence

A focus on automatic processes in social cognition together with new implicit measures of attitudes has stimulated a great body of research on attitudes during the last decades (e.g. De Houwer, Teige-Mocigemba, Spruyt, & Moors, 2009; Gawronski & Payne, 2010). The exciting opportunity to tap into automatic processes to some degree (Gawronski, 2007) pushed forward large and small scale theory building. For instance, new dual-process models have been proposed that distinguish between automatic and controlled processes in attitude change (e.g. Deutsch & Strack, 2006; Gawronski & Bodenhausen, 2006; Strack & Deutsch, 2004, see also Payne & Gawronski, 2010). Although they encompass a large range of findings, they do not predict exactly to what extent each process is activated in a given situation. These questions are addressed by formal models of implicit attitude measures like the Quad-model (Conrey, Sherman, Gawronski, Hugenberg, & Groom, 2005) or the process dissociation model (Jacoby, 1991; Payne, 2001, see also Sherman, Klauer, & Allen, 2010). In sum, implicit attitude measures have certainly raised more questions about whether or how automatic and controlled processes are distinct – and this may be their greatest merit. Intertwined with the question of whether there are distinct processes in attitude change or not is the question how context impacts attitudes: If the two types of measures are affected by context information differently, this could imply distinct processes at work; I will discuss this topic in the section on process distinction.

A long tradition of examining how certain contexts impact attitudinal judgments (e.g., Lavine, Huff, Wagner, & Sweeney, 1998; Schwarz & Clore, 1983; Schwarz & Strack, 1991; Tourangeau & Rasinski, 1988) was also enriched by studies that explored the conditions that lead to context-dependent outcomes on implicit attitude measures (e.g., Barden, Maddux, Petty, & Brewer, 2004; Payne & Gawronski, 2010, see also Petty, Brinol, Tormala, & Jarvis, 2006). For example, when Black (versus Asian versus White) faces were presented either in a

basketball court or in a technical classroom, explicit measures of attitudes as well as implicit measures showed to be context-sensitive (Barden et al., 2004, pp. Expt. 1): Blacks were evaluated most positively in the basketball court (followed by Whites and Asians), whereas Asians were evaluated most positively in the classroom setting (followed by Whites and Blacks). This study showed that implicit measures are not context-independent even when target groups are presented on a blank screen. In their representational account for context effects in attitudes measured implicitly, Gawronski and colleagues (Gawronski, Rydell, Vervliet, & De Houwer, 2010) showed that automatic evaluations are independent of the context when context-salience during enconding is low. By contrast, automatic evaluations were sensitive to context when context-salience during the enconding phase was high. If in a second learning phase new evidence of opposite valence for the attitude object is encountered, this evaluation is reproduced only in the specific context, whereas in other contexts the initial attitude is reproduced (see also Gawronski & Sritharan, 2010). Consequently, despite early hopes that implicit measures would tap into stable fundaments of attitudes (cf. Cunningham, Preacher, & Banaji, 2001; Greenwald & Banaji, 1995), context effects are still a matter that generates new questions of how (automatic) evaluative judgments are shaped.

Empirical evidence from implicit measures of attitude and theory building inspired by it has to date largely been ignored by research on minority and majority influence (but see Mucchi-Faina, Pacilli, & Pagliaro, 2011). The main focus of the manuscripts compiled in this dissertation is to outline the potential of integrating the new methods and theoretical insights from attitude change research into minority and majority influence research and how ideas derived from this conjunction can generalize to attitude change.

Perspectives on the Cognitive Representation of Attitudes

A common core of attitude definitions is that objects of thought are evaluated (Eagly & Chaiken, 1993, see also Bohner & Dickel, 2011), or put simply: “attitudes are likes and dislikes” (Bem, 1970, p. 14). Evaluations are commonly aggregated into a single numerical

index, ranging from negative to positive, that can be based either on responses to direct questions or on reaction-time differences toward attitude-related stimuli (see e.g. Schwarz, 2008). However, whether this general positive or negative evaluation is retrieved from memory as an object-evaluation association (Fazio, 1995, Fazio, 2007) or constructed on the basis of currently accessible knowledge structures associated with the object (Schwarz & Bohner, 2001; Wilson & Hodges, 1992) remains an issue of discussion (see Bohner & Dickel, 2011; Fabrigar, MacDonald, & Wegener, 2005).

Constructed Online Versus Stored in Memory

Models of attitudes and attitude change differ in the extent to which they endorse a memory position (e.g. Fazio, 1995, Fazio, 2007; Petty, Briñol, & DeMarree, 2007) or a construction position (e.g. Schwarz, 2007; Schwarz & Bohner, 2001). This question of whether attitudes are readily stored or constructed is not only interesting in itself but also relevant for the understanding of processes that lead to attitude change (see Bohner & Dickel, 2011; Fabrigar et al., 2005).

Attitudes can be understood as object-evaluation associations that are stored in memory (Fazio, 1995, Fazio, 2007). According to this conceptualization of attitudes, evaluations for all known attitude objects are readily available from memory. When asked how one likes a certain object or person or thought, one ‘pulls out’ the corresponding evaluation and reports it. For newly encountered attitude objects people have to acquire valence from scratch (Walther & Langer, 2008). The meta-cognitive model of attitudes (MCM, Petty et al., 2007) adds that attitude objects are not only memorized together with evaluations but can be tagged with meta-cognitive information (which is also stored in memory), e.g. negation tags that are assigned to no longer approved attitudes. Associations with negation tags are weaker than the object evaluation association in memory and, therefore, more effort is needed to retrieve them. This can lead to different outcomes in implicit and explicit measures of attitude.

On the other hand, attitudes can be conceptualized as being constructed in a given situation (Schwarz, 2007; Schwarz & Bohner, 2001; Wilson & Hodges, 1992, see also Gawronski & Bodenhausen, 2006). Situational context can render specific relevant pieces of information more accessible than others and, thus, more likely to get activated. Hence, depending on the context, different sets of information are taken into account. These different sets of information may imply different evaluations. For example, a politician may be evaluated differently depending on the topic she last commented on. Thus, attitudes are not stable representations of the world but flexibly tailored to the situation.

In the next three sub-sections I will outline for each manuscript to which degree and why a construction perspective is taken. I will also discuss if or how a memory perspective would change our assumptions. This will illustrate the strengths of each theoretical viewpoint.

Automatic to systematic consensus influence – constructed or stored in memory?

With the *automatic to systematic consensus influence* (ASCI) model we adopt a construction perspective on attitudes. We posit that "[…] external input and internal states determine automatic activation of concepts" (Dickel & Bohner, 2012, p. 261), and that "[…] propositions or heuristics are built upon the activated associations" (Dickel & Bohner, 2012, p. 262). Hence, an evaluative judgment is construed from the input that is at hand, i.e. activated. When people perceive, e.g., election poll results, most often they have to process consensus information given in percentages or visual proportions. Also, a general evaluation of politics may get activated along with more specific pieces of information, e.g. related to the topic of the poll or to the minorities or majorities that are reported. An attitude judgment will be made on the basis of the activated concepts and evaluations.

If we assumed that attitudes were stored in memory, a crucial role in minority and majority influence would be played by the encoding of consensus information, its evaluation and how it is linked with the attitude topic. Also, changed attitudes will only be reported if they are retrieved from memory. Models of implicit and explicit attitude change that

emphasize the memory perspective predict a dissociation between implicit and explicit measures of attitude, for example, when a negation tag is associated with an old positive attitude toward eating meat whereas a new negative attitude toward eating meat is established. Only when people process effortfully, the presumably weaker negation tag is retrieved from memory and will be reported in explicit measures of attitude. Implicit measures of attitude will reflect a blend of the old attitude and the new one, because the negation tag is not retrieved (Petty et al., 2007). In the mere consensus paradigm, however, concurrent effects would be predicted for implicit and explicit measures of attitude when the topic is fictitious. For a fictitious topic that is new to the perceiver, only weak associations in memory would be built unless arguments in favor of the topic were processed thoroughly and strong object-evaluation associations would be built.

In sum, both perspectives on representation of attitudes do fit with the ASCI model. A memory approach to attitudes would emphasize stability across contexts in attitudes as assessed with both implicit and explicit measures. Representation in memory gets complex, however, when it comes to explaining variability across contexts. Many different evaluations have to be represented in memory for each specific context. Stimuli associated with a specific context would trigger the retrieval of a context specific evaluation. On the other hand, a construction approach to attitudes elegantly accounts for variability across different context: Different evaluations depend on different pieces of information that get activated in the specific context and are evaluated differently. In Manuscript 2 we report two studies that tested the effect of context activation on the perception of consensus information and its impact on attitudes. Context priming affected the accuracy of reported consensus which in turn influenced the evaluation of a fictitious topic: The better the reconstructed majorities matched the context-implied size, the more positive was the impact on the evaluative judgment. The next section will discuss how these results map with a construction perspective or a memory perspective on attitudes.

Consensus in context effects – constructed or stored in memory?

As derived from the ASCI model in Manuscript 1 and the discussion above, context-effects on evaluative judgments are best explained when attitudes are viewed as online-constructions. This means that percentages per se do not have a fixed evaluative value, but it acquires its valence in the specific situation. A majority usually is, but does not have to be, a positive heuristic cue associated with the notion of accuracy (Mackie, 1987, see also Erb, Bohner, Hewstone, Werth, & Reinhard, 2006) or a social reward of being part of a large, powerful group (Crano, 2001). However, under certain conditions majorities may not be attractive (Imhoff & Erb, 2009). Depending on the context, an identical number can have completely different implications. When an election poll context is activated, different concepts associated with consensus information may get accessible than in a user evaluation context. Very large majorities, for instance, will not necessarily be associated positively in politics. For example, many people will associate 90%-majorities with fraud. But the concept of fraud will less likely be activated when a user evaluations context is activated. The activated pieces of information will serve as a basis for constructing an evaluative judgment.

Evaluations of previously unknown attitude objects – like the fictitious Curutao Lake – can be constructed not only on the basis of persuasive information or heuristic cues but also based on attitudes toward objects that are similar or otherwise associated with the object in question. In the studies presented in Manuscript 2 (Dickel & Bohner, under review), such associated attitude objects could be other touristic areas one has already visited. The evaluation of the known touristic area may be transferred to the new one. Such transfer of valence from known objects to associated objects is an example of a generalization effect as we describe it in our lateral attitude change framework (Manuscript 3, Dickel et al., under review).

Lateral attitude change – constructed or stored in memory?

How does the construal versus memory approach to attitudes bear on lateral attitude change? Mainly, the two perspectives imply different assumptions for a transfer of evaluation from the focal attitude to lateral attitudes. In our LAC framework we assume that the evaluation of a focal object is transferred automatically to lateral objects that are associated with the focal object. Via monitoring of their responses, people can still decide to censor this spread of evaluation.

Assuming that attitudes are constructed on-the-spot, an increasing overlap of two sets of activated information will also increase the degree of evaluative congruence (see Schwarz & Bohner, 2001). This does not only account for the stability of attitudes but also for the generalization of attitudes: If a set of features that sums up to a lateral attitude Y overlaps with a set of features summing to the focal attitude X, the evaluation of Y will largely correspond to the evaluation of X. Hence, construction of evaluations on the basis of similar sets of information will likely produce consistent outcomes (Schwarz & Bohner, 2001, see also Conrey & Smith, 2007).

Assuming that attitudes are stored, the relationship between objects has to be taken into account to explain how valence is transferred from a focal object X to a lateral object Y. If X changes and is strongly related to Y, then Y will probably change, too. How exactly can relationships between attitudes be thought of? Within a strict memory view of attitudes, representations of related attitude objects are stored separately, even if they differ only slightly. Links between separately stored attitudes will be stored in addition to the concepts and corresponding evaluations (Fazio, 1995). Thus, information about proximity of objects is stored.

In summary, as with the automatic to systematic consensus influence in Manuscript 1 and evidence of context-dependent consensus effects in Manuscript 2, the memory and the construal approaches can both account for LAC effects. However, the memory account needs

extra storage of the association strength between attitude objects, whereas in the construction view the strength of association between objects is a result from the the overlap between sets of information that are activated in a given situation.

A way to reconcile the two perspectives of online construction versus memory storage of attitudes is the assumption of sub-symbolic representation. When knowledge representation is an activation pattern distributed across many units, it can be re-accessed by re-constructing the pattern (Smith, 1996). This is possible through learned weights equivalent to storage in memory of connections between these units. Connections accessed more often will acquire increased weights. Such learned weights determine the 'attractor', an activation pattern to that the connected units settle to following an given input (Monroe & Read, 2008; Smith, 1996). This distributed sub-symbolic representation can be understood as both memory *and* construction simultaneously. The following section will introduce briefly the idea of sub-symbolic representation of attitudes and contrast it with the more traditional view of symbolic representation.

Symbolic Versus Subsymbolic Representation of Attitudes

In classic approaches to mental representation, each unit of information corresponds to one concept, which is thus represented at a *symbolic* level (e.g. Abelson & Rosenberg, 1958). Semantic network theories (Anderson, 1983; Anderson & Pirolli, 1984) assume that activation of such concept units spreads along interconnections that represent how closely the concepts are associated with each other. Hence, a classical network approach to attitudes assumes that activation spreads from an object to related concepts. This assumption can, for instance, account for context effects of retrieval (Judd, Drake, Downing, & Krosnick, 1991). Another way of modeling mental representations at a symbolic level is, for example, the 'bin model' of person memory (Wyer & Srull, 1981, 1986). The bin model assumes that all information referring to a (group of) person(s) is stored in bins that can be accessed according to content labels (Wyer & Srull, 1986, p. 323). Bins can be interrelated in such a way that the label of

one bin can consist of features stored in another bin (Wyer & Srull, 1986, p. 329). Thus, judgments may be based not only on the content of the judged bin but also on the content of related bins (Wyer & Srull, 1986, p. 329).

However, since the late 1980s the idea has become increasingly popular that mental concepts could be represented *sub-symbolically*, distributed across large networks of interconnected units (Rumelhart & McClelland, 1986). In these networks specific concepts correspond to specific activation patterns, thus, many different concepts are represented in the same set of units (Smith, 1996). Distributed connectionist models have been implemented for attitude change phenomena like persuasion (Siebler, 2002; van Overwalle & Siebler, 2005), cognitive dissonance (van Overwalle & Jordens, 2002), and attitude acquisition and generalization (Eiser, Fazio, Stafford, & Prescott, 2003). A general model of attitudes in sub-symbolic terms has also been formulated (Monroe & Read, 2008, see also Conrey & Smith, 2007). A feature of connectionist models that is crucial for LAC is prototype generation, which relies on the representation of similarity between concepts: Similar attitude objects activate a common core set of units with only marginally deviating activation patterns due to different details. As the similar attitude objects are stored in the same set of connections, their overlapping activation pattern will be reinforced and differences will be neutralized. Consequently, central features will be emphasized, resulting in a prototype representation (Smith, 1996, p. 896). This prototype will be used to generalize across instances of a category, when new instances of a category (e.g., new individuals from a known group) are encountered.

Today, many attitude researchers agree that connectionist attitude representation provides conceptual parsimony and works particularly well to model automatic processes of attitude change (Bassili & Brown, 2005, pp. 550–552; Fabrigar et al., 2005, p. 81; Fazio, 2007, p. 612; Gawronski & Bodenhausen, 2006, p. 693; Monroe & Read, 2008; Petty et al., 2007, p. 664; Siebler, 2002; Smith, 2009, for a collected volume see van Overwalle, 2007). I

think that connectionist modelling provides an opportunity to test different architectures of representation and how they bear on process outcomes without clinging to homunculus theories (for a critique of homunculus theorizing see Margolis, 1980). This method is an interesting endorsement of empirical testing of hypotheses about mental representation and processes.

How Many Processes Does a Model of Attitude Change Need?

Attitude theorists differ in their assumptions of whether attitude change is reached via one, two or even more processes. This question has been discussed extensively since the unimodel (Kruglanski & Thompson, 1999a) challenged the until then predominant dual-process models of attitude change, the elaboration likelihood model (ELM, Petty & Cacioppo, 1986) and the heuristic systematic model (HSM, Chaiken, 1987, for a comprehensive discussion of dual process theories in social cognition at the state of 1999 see Chaiken & Trope, 1999). With their unimodel, Kruglanski and colleagues (Kruglanski, Erb, Pierro, Manetti, & Chun, 2006b; Kruglanski & Thompson, 1999a) claimed that duality in information processing was an artifact derived from experimental designs that confound order of presentation and type of information. This way the easy-to-digest information was always presented first, and thus would influence judgments most when participants had little time or motivation to elaborate (Kruglanski & Thompson, 1999a). A vivid discussion on the methodological and theoretical grounds of process discrimination evolved (e.g. Bohner & Siebler, 1999; Chaiken, Duckworth, & Darke, 1999; Eagly, 1999; Kerkhof, 1999; Manstead & van der Pligt, 1999; Petty, Wheeler, & Bizer, 1999; Strahan & Zanna, 1999; Wegener & Claypool, 1999).

How can one generally detect which and how many processes are involved in an (attitude change) effect? As a main argument for a single-process account of persuasion, Kruglanski and Thompson (Kruglanski & Thompson, 1999a) claimed the functional equivalence of cue and message, i.e. the assumption that both categories of information would

essentially be affected in the same way by other variables. Only when other variables would interact with the process-defining variables, functional independence could be considered. According to Miller and Pederson (1999), "the case for process distinction is strong only when a statistical interaction […] is disordinal"(Miller & Pedersen, 1999, p. 152), because slope differences in ordinal interactions can be due to scaling differences: A scale which has units that are double-size of another one will have a steeper slope (such differences could of course be eliminated by *z*-standardization). A better way to assess processes and process distinctiveness is mediational analysis (Hogg & Abrams, 1993). It tests whether a specific effect is driven by a third variable. This third variable should be identified as a process measure before the experiment is run. If the process measure is affected by the experimental manipulation and affects the outcome while decreasing the effect of the independent variable mediation criteria are met (Baron & Kenny, 1986, see also Preacher & Hayes, 2004).

The discussion on process distinctiveness was revitalized when new dual-process models were proposed (associative propositional evaluation model, APE-model, Gawronski & Bodenhausen, 2006; reflective-impulsive model, RIM, Deutsch & Strack, 2006; Quad-model of implicit task performance, Conrey et al., 2005; Sherman, 2006) that discriminated between automatic, involuntary, or associative attitude change on the one hand, and elaborated, more effortful, or propositional attitude change on the other hand.

The unimodel authors answered that this distinction was obsolete just as the distinction between heuristic and systematic processing (Kruglanski et al., 2006a; Kruglanski et al., 2006b) because effortless or automatic and elaborating or deliberate judgments both follow the same inference process. This inference process takes perceived information as evidence for existing knowledge about the world. Such knowledge may be conceived of as rules, e.g., "experts give reasonable arguments". When people perceive information that fits into such rules they apply an if-then rule, e.g., "if she is an expert, then her arguments will be reasonable (and I do not have to read them)". From a unimodel perspective, associative

processing is functionally the same as propositional processing (Kruglanski & Dechesne, 2006). Kruglanski and Dechesne (2006) argue that even automatic evaluation as learned in evaluative conditioning paradigms, where neutral, conditioned stimuli (CS) acquire valence through the pairing with a priori valenced, unconditioned stimuli (US) (De Houwer, 2007) is the application of such rules: "[O]ne might infer that if positive affect was experienced in the presence of the CS, it may have been caused by the CS, warranting a re-experience of the affect on subsequent CS presentations." (p. 738, see also Mitchell, De Houwer, & Lovibond, 2009).

As Gilbert (Gilbert, 1999) writes, psychologists cannot identify the one valid model of the mind, because there are always other possibilities to invent an alternative design that is plausible. Following Popper's positivism (Popper, 1935), we can try to rule out by empirical testing which designs are implausible, but there may remain a number of models that are plausible. So, if we cannot say which of the models that are capable of explaining experimental evidence is the one and only, what other reasons can make us decide which ones we should pick for our research? Sometimes, researchers may be guided by human motivation. For instance, in dual-process models there is usually one mode that allows us not to be in charge of our behavior, which is more convenient than to be responsible for all our actions. I prefer to assume that such motives play only a subordinate role in theory building and will therefore focus on reasons for „lumping versus splitting" (Petty et al., 1999) processes that lead to better research. McGuire once said "ideally a theorist should be both a lumper and a splitter" (personal communication cited in Petty et al., 1999). This allows them to flexibly integrate or differentiate, depending on the level of their analysis. "You can […] see as quantitatively rather than qualitatively different [...] almost any psychological […] process depending on how you define the underlying continuum" (Petty et al., 1999, p. 162). In my view, this means that few psychological variables are naturally either continuous or categorical, but it depends on how they are measured and defined. Such defined measures

give us a clue about a theoretical concept. Neither a categorical nor a continuous level is given naturally, but variables must be defined to be categorical or to be continuous. As an example, consider the deletion practice of very short or long latencies in implicit measures: Even though a measurement scale in milliseconds is close to natural continuity, latencies below 300 ms and above 1000 ms are commonly deleted (e.g. Draine & Greenwald, 1998) because of the assumption that they reflect processes not of interest.

If one categorizes the amount of effort put into evaluative judgments to focus on the most interesting, diagnostic, or extreme cases (see also Manuscript 3, section on diagnosticity) one might lose information about the cases that lie outside that range. A problem with splitting processes into categories may lie in the potential miss-attribution of features to categories that are not yet verified but fit with implicit assumptions (see Moors & Houwer, 2006, p. 203). On the other hand, if one keeps in mind all cases, predictions might lose some of their conciseness (Chaiken et al., 1999). Researchers have to decide what is useful for their purposes, and which traps they want to avoid. Some landmarks in this navigation have been set: A theory should be capable to promote conceptual clarity (e.g. Bohner & Siebler, 1999), to generate new research ideas (e.g. Moskowitz & Li, 2006), and to derive unique predictions (e.g. Petty et al., 1999) without being too complex (cf. Chaiken et al., 1999).

Dual- and single-process models of attitude change both contribute to these goals. According to (Petty et al., 1999) the main benefit of splitting processes in persuasion is that unique predictions can be made. Yet, single-process models do generate new predictions, too. But they do not work with assumptions about concept disparity that may be premature (Moors & Houwer, 2006, see also Kruglanski et al., 2006a; Kruglanski & Thompson, 1999b). “[T]he value in these models lies not in identifying whether there are one, two, three, or four processes, the value lies in their ability to point out what we should be looking for and considering in our research.” (Moskowitz & Li, 2006, p. 230). I think letting go the goal to

discover the one real theory about attitude change would result in less agitation and competition of authors and would pave the way for many inspiring research programs.

The three manuscripts presented here tend toward a dual-process assumption because this allowed us (a) to present a relatively simple framework of consensus effects including outcomes on implicit measures (Manuscript 1), (b) to speculate about conditions that foster context-dependent consensus effects (Manuscript 2), and (c) to make a parsimonious prediction about whether attitude generalization or compensation effects would occur (Manuscript 3). The ASCI model (Manuscript 1) assumes a continuum of explicitness in evaluative judgments. However, introducing implicit measures of attitudes into minority and majority influence research makes most sense when they can catch something different than the measures used so far. Indeed, we assume that implicit measures may help to discover automatic processes that could contribute, e.g., to explaining indirect minority influence (this aim is further pursued in Manuscript 3). Although the experiments reported in Manuscript 2 that study context-induced consensus expectations do not explicitly address the question of whether or not qualitatively distinct processes are at work in matching consensus effects, the assumption that the effect may only show up under conditions of low effort led us to hold processing effort constant at a relatively low level. Further research has to address whether the matching hypothesis is facilitated by low-capacity processing. A clear-cut process distinction is adopted in the LAC framework (Manuscript 3) to predict the occurrence of generalization versus compensation effects. Whereas a spread of activation is assumed for all evaluative information, under certain conditions we assume that people monitor this generalization tendency, e.g. when it seems inappropriate to generalize because group members are said to be very heterogeneous (see Ranganath & Nosek, 2008).

Processes Assumed by the ASCI Model

In the first manuscript we review single- and dual-process models of minority and majority influence and set them into perspective with single- and dual-process models of

persuasion and attitude change. Building on the two debates about process distinction in attitude change, the ASCI model proposes a "continuum of explicitness" in evaluative judgments following minority and majority influence. Judgments can concern the attitude topics as well as the source, and they may interact. For example, arguments may be viewed as persuasive whereas a minority may be evaluated negatively (Moscovici, 1980). When both cases concur this may increase the persuasiveness of the arguments (Bohner, Dykema-Engblade, Tindale, & Meisenhelder, 2008). How evaluative judgments are affected at implicit and explicit levels of measurement is discussed in Manuscript 1 by applying assumptions from the associative-propositional evaluations model (Gawronski & Bodenhausen, 2006) to the case of minority and majority influence (see also Manuscript 3).

Hence, the ASCI model adopts two features of other dual-process models: (a) a distinction between associative and propositional processing (c.f. Gawronski & Bodenhausen, 2006), and (b) a continuum from automatic to systematic influences reflected in attitude measures (c.f. quad model, Conrey et al., 2005; Sherman, 2006, see also Klauer, Voss, Schmitz, & Teige-Mocigemba, 2007). (A) A distinction between associative and propositional processing in terms of the APE model allows for a detailed meditational analysis (this is further outlined in the LAC framework in Manuscript 3). (B) With our continuum of explicitness (c.f. ELM's elaboration continuum, Petty & Cacioppo, 1986) we claim that evaluative judgments as measurable can be driven by a blend of automatic and deliberate processing.

As described above, the ASCI model emphasizes that that activation of knowledge structures and its evaluation depend heavily on the present context. This contextual input hypothesis should primarily work when information is processed without effort, because fewer pieces of information are activated that are chronically accessible and therefore less context dependent (see Schwarz, 2007; Schwarz & Bohner, 2001).

Processes Assumed to Underlie Consensus in Context Effects

The consensus-in-context experiments are based on the contextual input hypothesis in the ASCI model. In the case that consensus information is given in percentages, identical numbers can be associated with very different concepts in different situations. We assume that this is especially the case at a very low level of effort. Therefore, in the consensus-in-context experiments we presented the attitudinal topic and consensus information for a fixed time period of 10 s. This way, the given information could not be processed thoroughly, and processing was probably heuristic or partly automatic. Our matching hypothesis was corroborated under these conditions: We found that reconstruction of consensus level was more accurate in a matching context, even though participants barely had the chance to properly encode consensus information. Studies following up on this effect should, for instance, study whether processing effort moderates the matching effect. Such studies will vary the opportunity and motivation to process, e.g. by manipulating the presentation time or giving participants a cognitive load task. Evidence from other studies points to the direction that context may be less impactful when more effort is put into the processing of information and context is not salient (Gawronski et al., 2010; see also Rydell & Gawronski, 2009)

Processes Assumed by the LAC Framework

In the LAC framework we adopted a dual process view, because this allowed us to predict the occurrence of generalization versus compensation effects. We assume that compensation effects – as compared to generalization effects – are generally based on the same process of spreading activation. But with compensation effects, an additional monitoring process results in a censored focal attitude whereas the lateral attitudes are still changed and not monitored. Such monitoring requires a perceiver to have noticed the attitude change. Hence, the LAC framework is heavily built on the assumption of process distinguishability.

Where exactly the threshold lies between noticing and not noticing focal attitude change may vary inter-individually and across situations. Automatic change processes can be

made accessible for conscious elaboration. For instance, participants who were asked to focus on their gut feeling when answering self-report attitude questionnaires showed increased correlations with implicit measures of attitude (e.g. Banse, Seise, & Zerbes, 2001; Gawronski & LeBel, 2008). Deliberate thinking of a certain attitude object is often involuntary, too (see Wegner, Schneider, Carter, & White, 1987). However, with explicit measures of attitudes, people have a better chance to monitor their answers. So, measurement outcomes may rely to different degrees on people's opportunity to monitor their responses.

General Discussion

Building on earlier theories that integrated minority and majority influence into broader frameworks of attitude change and persuasion (see Baker & Petty, 1994; Bohner et al., 2008; Erb & Bohner, 2001; Kruglanski & Mackie, 1990), this thesis is concerned with the integration of more recent developments in attitude (change) research into minority and majority influence research. The manuscripts compiled for this dissertation explore the potential of theories on implicit and explicit attitude change to further explain minority and majority influence. From three different perspectives, the manuscripts illustrate how research on attitude change and social influence can inspire each other. The ASCI-model addresses which role automatic activation of evaluations may play in minority and majority influence (Manuscript 2, Dickel & Bohner, 2012). As implicit measures of attitude have only very rarely been implemented in minority and majority influence research (Mucchi-Faina et al., 2011), ample opportunities for new research questions follow from our considerations. A particularly interesting question would be whether automatic evaluations of minority or majority sources can predict the evaluative judgment of an advocated topic. And if so, does increased opportunity to process decrease the effect? Furthermore, I would like to explore whether indirect minority influence is (partly) mediated by automatic evaluations and the automatic spread across associative structures (see also Manuscript 3, Dickel et al., under review). In an empirical study on context-dependency of mere consensus effects we show that

majority influence can be moderated by the activated context. Only in conditions where presented consensus matches the prototypical majority size, majorities have a positive influence on the attitudinal topic. This effect illustrates the malleability of evaluative associations with very abstract stimuli and thus contributes to a large body of context effects on attitudes (Gawronski et al., 2010). A test whether this matching effect generalizes to minority influence would be the next stept to take.

A general theoretical framework for lateral attitude change (LAC) effects (Manuscript 3, Dickel et al., under review) was inspired by a critique on Crano and colleagues' leniency contract (Alvaro & Crano, 1997; Crano & Chen, 1998). The LAC framework derives predictions about the occurrence of generalization versus compensation effects, i.e. whether attitude change on a focal attitude object transfers to a lateral object or whether lateral attitudes are changed despite no observable (explicit) change on the focal attitude. The framework can be applied for many areas of attitude research like e.g. intergroup attitudes or ideologies. It predicts that secondary transfer effects from positive intergroup contact (see Pettigrew, 2009) may still occur or even be increased if participants suppose an attitude change motive behind the contact setting and are resistant against change toward the target group. They will monitor their focal attitude while losing out of sight related groups. The attitude toward these related groups will still be affected by the intervention. Taken together these three manuscripts are a collection of travelling plans for a discovery tour on what minority and majority influence may not be (see Gilbert, 1999).

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13

Minority and Majority Influence on Attitudes

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1. Introduction

1.1. What is an attitude?

In a complex world a quick evaluation of objects and situations is very helpful. It can guide our attention and behavior toward the things that matter to us. Attitudes are such evaluations. They can refer to anything one can conceive of: individuals and groups, products, music, or even smells, as well as suggestions and ideas. For example, when we meet someone new, we form an attitude toward our new acquaintance within seconds. Often, we do not know where this affective reaction comes from.

Attitudes can be formed in various ways: Imagine you are browsing the Internet for a holiday destination. You will find hundreds of different offers for package tours: how do you decide which one to book? You may like the pictures of the sea or of people relaxing in a bar. Maybe the web advertisement claims that 89% of costumers were highly satisfied with the holiday. Or, if it is very important to you not to spend too much money, you will elaborate carefully on which services are included. Eventually, you will come up with a summary evaluation regarding which offer is the best, and, if you consider the price to be appropriate, perhaps buy it. As this example illustrates, many different aspects can impact the evaluation of an object. A spontaneous affective reaction is immediately activated (in this case that could be a positive reaction to sunny pictures), heuristic inferences are made, for instance, "if 89% were happy it must be quite good", or very systematic thinking about the concrete features of the offer results in a judgment of whether this holiday suits you or not (see Erb, et al., 1998, expt. 2).

1.2. How to measure attitudes?

Social psychologists invented a large range of measurement paradigms that tap into different aspects of attitudes and attitude change. The simplest way to assess an attitude is to just ask people how they like something, on a scale, for instance, from "not at all" (1) to (7) "definitely like it," or to ask whether or not they agree with statements in favor or disfavor of the attitude object (Likert scale; Likert, 1932). Those are examples of self-report measures of attitudes that will be referred to as explicit attitudes in this chapter. When attitudes are measured by asking people explicitly how the object of interest is liked, respondents are usually able to answer this question. However, the outcome is also subject to impression management and may not cover all aspects like spontaneous affective reactions. To eliminate effects of social desirability on attitude measures social psychologist developed several

"tricks". They used feigned lie detectors (bogus pipeline, Jones & Sigall, 1971), word fragment completion tests (Gilbert & Hixon, 1991), and numerous other paradigms.

A relatively new class of attitude measures concentrates on reaction time effects of attitude stimuli. In a nutshell, attitudes are inferred from effects of interference or facilitation on very fast evaluative responses. These paradigms allow to measure spontaneous, difficult-to-control reactions that will be referred to as implicit attitudes in this chapter. Two paradigms have been predominantly applied: the implicit association test (IAT, Greenwald, et al., 1998) and the evaluative priming task (Fazio, et al., 1995; for a review see De Houwer, et al., 2009). When answering an IAT, participants classify stimuli via key-presses with respect to a target category or to their valence. Two sorts of experimental blocks are conducted with several trials each: in a "compatible" block, the target categories and positive or negative answers share response keys according to their presumed association. For example, participants press the left key for insects or negative stimuli, and the right key for flowers or positive stimuli. In an "incompatible" block, one of the key-assignments is reversed (insects or positive – left; flowers or negative – right). Differences in response times between the two blocks (incompatible minus compatible) indicate the difference in implicit attitudes toward the two concepts. More positive implicit attitudes toward flowers (versus insects) result in shorter reaction times in the compatible block and longer ones in the incompatible block, thus resulting in a positive difference. For more information about implicit measures of attitudes we refer the reader to other volumes (see e.g. De Houwer et al. 2009; Gawronski & Payne, 2010), as a full discussion would exceed the range of this chapter.

In sum, we have seen that attitudes can be measured in different ways. Attitudes have consequences on how we think and act (Allport, 1935). Thus, measuring different aspects of attitudes can help to predict how people eventually act. The prediction of both spontaneous and deliberate aspects of behavior may improve when applying both implicit and explicit measures of attitude (Friese, Hofman, & Wänke, 2008).

2. Attitudes and Attitude Change

As in other fields of social cognition, the notion of automaticity was central to attitude research within the last two decades (Bargh, 2007). Although implicit measures are probably not the "bona fide pipeline" (Fazio, et al., 1995) to attitudes, they do provide the means to investigate automatic evaluative responses that are often not easily accessible to introspection – and therefore cannot be easily reported in questionnaires. A great number of studies employing several variants of implicit measures of attitudes aimed to disentangle the processes underlying spontaneous attitude formation and change (e.g. Conrey, et al., 2005). Concerns, with respect to internal and construct validity of implicit measures discussed have been extensively discussed (e.g. Rothermund & Wentura, 2004; Moors & De Houwer, 2006). Meta-analysis suggests that implicit and explicit attitudes are generally related, but higher levels of elaboration can reduce correlations (see Hofmann, et al., 2005). For the purposes of this chapter we will assume that implicit measures tap more or less into spontaneous affective reactions, while explicit measures reflect more effortful thinking including self-presentational issues.

Several models have been proposed to integrate results from implicit and explicit measures, including the meta-cognitive model (Petty, et al., 2007) and the reflective-impulsive model (Strack & Deutsch, 2004). We will concentrate here on one of the most influential models, the associative-propositional evaluations model (APE model, Gawronski & Bodenhausen, 2006a).

2.2. Explicit attitude change: How many routes to persuasion?

An early explanation for attitude change was cognitive dissonance theory (Festinger, 1957). Cognitive dissonance emerges when interrelated cognitions contradict each other. For example, if I drink a coffee with my colleagues after every lunch although I do not like coffee in general, this would give rise to dissonant feelings about coffee. On the one hand, I don't like the taste, but on the other hand, I drank it, so I must like it (Bem, 1972). When individuals have a reason to which they can attribute their behavior, this reason can be added as dissonance-reducing cognition and no attitude change is necessary. In the coffee example, such additional cognitions could be "it's nice and sociable to have a coffee together" or "drinking a coffee makes me alert enough to concentrate on my work". When no external justification and no other way to resolve dissonance can be found, attitudes are often changed to regain cognitive consistency. In this example, the attitude toward coffee would become more positive. This effect was shown with participants who were asked to tell another participant that a boring experiment they had just attended was in fact exciting (Festinger & Carlsmith, 1959). They were either paid 1 $ or 20 $ for lying. The group who received the large amount of money did not change their attitude toward the experiment, whereas the group who received only 1 $ liked the experiment more. Here, the relatively large amount of money served as external justification for the positive statement about the experiment. If only little money was received this was not sufficient to resolve dissonance, so attitudes were changed.

Dual-process models of persuasion – the elaboration likelihood model (ELM, Petty & Cacioppo, 1986) and the heuristic-systematic model (HSM, Chaiken, 1987) – emphasize that attitude change can be due to low-effort or high-effort processing, termed peripheral and central route in the ELM and heuristic and systematic processing in the HSM. Which processing style occurs depends on a person's current motivation to hold a correct attitude and limits to processing capacity. Low motivation or scarce capacity will result in peripheral/heuristic processing, whereas high motivation and ample capacity lead to central/systematic processing of the arguments. The ELM emphasizes that any variable in the persuasive setting can function in "multiple roles" (Petty & Wegener, 1998). Take, for example, the presentation of a car by an attractive model: People may either process effortlessly, misattributing the positive affect elicited by the model to the car, or they may apply more processing effort, thus realizing that the attractiveness of the model does not say anything about the quality of the car. Moreover, the attractiveness of the model could also trigger motivation to associate oneself with her by liking the car she drives and thus motivation to find reasons to like the car by increased central processing. The ELM also predicts that the amount of central processing an individual engages in is positively related to the strength of resulting attitudes (Petty, et al., 1995).

The HSM assumes that both heuristic and systematic processing may serve multiple motives: accuracy, impression, and defense motivation. Accuracy-motivated individuals strive to hold correct attitudes, thus systematic processing is increased. When the impression motive is high, social needs will be served through expressing socially acceptable views; thus, impression-motivated processors will need to determine which attitude is most socially desired. Defense-motivated processing tends to confirm a person's self-relevant views and to avoid or reject opposing views. The HSM also features hypotheses about the co-occurrence and interplay of heuristic and systematic processing (Bohner, et al., 1995; Chaiken, et al., 1989): The *bias hypothesis* predicts that heuristics may lead to systematic processing in line with the valence of a heuristic cue. For instance, Chaiken and Maheswaran (1994) found that, under conditions of high task-importance, systematic elaboration of ambiguous arguments was biased by source credibility cues. Thus, readers' evaluation of a fictitious answering machine was more positive when ambiguous reasons to buy came from an independent test magazine rather than when the same arguments were stated in a retail chain's advert. Evaluative judgments were mediated by the valence of listed thoughts, indicating that systematic processes were indeed biased by cue information. A mirror-image of the bias hypothesis is the *contrast hypothesis*, which assumes that source cues can bias message processing in a direction opposite to the evaluative implications of cue valence. This effect was shown with expert and lay communicators giving strong versus weak arguments on a tunnel project (Bohner, et al., 2002). When experts promoted the tunnel with only weak arguments, participants' attitudes were less favorable than when the same weak arguments came from a lay person. Conversely, strong arguments presented by a lay person (vs. an expert) tended to be more persuasive. Presumably, when argument quality violates expectancies derived from source information, the results is a contrasting evaluation of the topic.

Despite their ability to predict attitude change in persuasion research, dual-process models of persuasion were challenged by the unimodel (Kruglanski & Thompson, 1999). The unimodel claimed that differential effects for cue versus message processing were due not to qualitatively distinct *processes* but rather to the different *nature of the information*. In typical persuasion experiments, cues were relatively short and easy to process, whereas arguments typically consisted of longer texts that consume more effort and time to read. Therefore, unsurprisingly, it takes more effort to process lengthy message arguments than, for instance, a short sentence about source expertise. Moreover, in research on dual-process models, persuasion cues were typically presented at the beginning, and arguments followed later. Kruglanski and Thompson (1999) argue that all processing of attitude-relevant information could be conceptualized better via a single underlying mechanism of syllogistic reasoning: When a recipient reads a persuasive message, she will compare the information with available relevant knowledge. For instance, if an expert from a renowned 'Institute for Natural Energy Resources' claims that oil is becoming scarce, every part of the sentence will run through a check-up with relevant knowledge. A major premise (i.e. prior knowledge) in this case may be "experts know a lot about their field and are usually right", and the minor premise taken from the persuasive information could be "this is an expert on the topic", and the conclusion will then be "… so she is probably right, and oil is indeed becoming scarce". Similar inferences can be made about specific arguments of the message. In

this case, one of the arguments could be that oil prices are constantly rising, which can be related to knowledge about price increases following the scarcity of a product. The unimodel postulates that some parts of information may be processed relatively easily, whereas some inferences may require relatively large amounts of effortful thinking. How much effort is put into processing of a persuasive message is determined by motivation and capacity to process. If motivation or capacity to process is low, elaboration will end relatively early. Consequently, information that is presented first – like cue-information in studies on dual-processes in persuasion – will affect the evaluative judgment more strongly than identical information that is presented later. In sum, the unimodel does account for evidence that had been interpreted in terms of dual-process models; moreover, it explains additional effects of order of presentation (see e.g. Erb, et al., 2007), which dual-process models could not easily explain.

As models of persuasion were primarily concerned with the explanation of effects on explicit evaluative judgments, they cannot be directly applied to findings from studies employing implicit measures of attitudes (but see Petty & Wegener, 1998). The next section will introduce a model that integrates findings from explicit and implicit attitudes.

2.3. Integration of implicit attitudes and explicit attitude change

Based on a constructionist concept of attitudes (Schwarz & Bohner, 2001; see also Bohner & Dickel, 2011), the APE model (Gawronski & Bodenhausen, 2006a) discusses the interplay between changes on implicit and explicit measures. It proposes two general, distinct processes of attitude change: associative change, i.e. change in the automatic activation of cognitions associated with an attitude object, which is largely reflected in changes on implicit measures, and propositional change, which is characterized by the process of consciously ascribing a truth value to a thought about an object; the latter is captured mostly by explicit attitude measures.

Associative structure is modeled based on connectionist theory (for connectionist conceptualizations of attitudes see Conrey & Smith, 2007; Monroe & Read, 2008; Smith, 1996). "Connectionism is an approach to cognitive modeling that uses linked networks of concepts to represent cognitive structures. In these networks, activation flows between nodes and changes the activation of individual cognitions" (Monroe & Read, 2008, p. 735). The APE model assumes that *associative change* – as captured by implicit attitudes – relies either on changes in the associative structure or on changes in the activation pattern of associations. When a stimulus is perceived, associated cognitions are activated automatically, irrespective of the personal approval of an association. According to the APE model, the prototypical case of change in associative structure is evaluative conditioning, a procedure by which an originally neutral stimulus acquires valence when perceived together with a positive or negative stimulus. For example, in a study on evaluative conditioning with children, unknown cartoon characters were repeatedly presented paired either with ice cream or with Brussels sprouts (Field, 2006). Afterwards, the children liked the characters more when they had been presented together with ice-cream than when they had been presented with Brussels sprouts. The APE model assumes that procedures like this change the associative structures and therefore produce change on implicit attitudes. Associative change can also occur due to changes in pattern

activation, this means, accessible parts of the associative structure are activated situationally. For illustration, consider a consumer who usually buys the same brand of a chocolate bar, because he likes the sweetness, color of packaging, texture, etc. When he is on holiday he might associate completely different aspects related to chocolate than usual, which have become more accessible through the unfamiliar situation. For instance, when it is hot, chocolate might be considered to melt easily, or different product alternatives might be available. Depending on the context – home versus holiday – different aspects are highly accessible: at home the usual association of the bar as being smooth and sweet is likely to be activated, whereas on holiday, when it is hot, the sticky aspect of melting chocolate might take priority. After all, our consumer will perhaps buy some olives instead. Hence, different contexts can render certain aspects accessible, i.e. the pattern of activation can differ depending on the context. A research example for context-effects on implicit attitudes is an IAT-study by Foroni and Mayr (2005), who showed a reversed pattern of liking for insects and flowers after participants imagined a fictional post-nuclear war scenario, where insects were the only healthy nutrition and flowers were contaminated (for more evidence of context-sensitivity of implicit attitudes see e.g. Barden, Maddux, Petty & Brewer, 2004). The APE model emphasizes that associations are activated automatically independent of personal approval.

In contrast, *propositional change* of attitudes, according to the APE model, is based on careful thinking about a topic. Every thought is given a positive or negative truth value. Consequently, the set of considered propositions can be consistent or inconsistent. Evaluative implications of automatic associations are set into proportion to propositions and will be either approved or rejected. The amount of propositions that is generated or considered is determined by motivation and opportunity to process. Longer engagement in propositional evaluation will result in more propositions, which, in turn, increases the likelihood of imbalance within the set of propositions. In our example on oil prices, additional thoughts like "distributors may have deliberately flowed less oil to increase prices" could weaken our earlier reasoning that rising oil prices allude to significant scarcity of natural oil resources, and would call into question the expertise of the communicator and her statement. These new propositions are added to the set of considered propositions and might result a higher degree of inconsistency. Individuals can adopt several strategies to reconcile inconsistent propositions (see Festinger, 1957). Inconsistency can be resolved either by rejecting an inconsistent proposition as false or by finding new propositions that resolve the inconsistency. Only the first strategy will result in explicit attitude change.

According to the APE model, attitude change can occur independently via both processes, and one process can also be mediated through the other, respectively. However, the default case is approval of the associative evaluation, as individuals usually invest as little cognitive effort as possible (see also the "cognitive miser", Fiske & Taylor, 1991). If motivational factors lead to further elaboration, automatic evaluations can be rejected, or systematic thinking can bring propositions to mind that reflect on associative structure, for instance with the activation of incidents like the crash of the oil rig "deepwater horizon", which was associated with destruction of nature, thus presumably activating negative associations.

The assumption that processes of implicit and explicit change differ qualitatively from each other has been questioned (Kruglanski & Dechesne, 2006) – a discussion resembling that between dual-process models and the unimodel in persuasion research. In particular, the view that activation of an association is independent of assigning a truth value to it, and that evaluative conditioning is a paradigmatic case of associative change has been much debated (Kruglanski & Dechesne, 2006; Mitchell, et al., 2009). Against the view that the activation of associations can be thought of as rule-based ("if … then rules" like in the unimodel, Kruglanski & Thompson, 1999), Gawronski and Bodenhausen (2006b) hold that associative pattern activation may well follow rules, but these do not have to be consciously represented by individuals; instead, they can be inferred by researchers observing behavioral data. With respect to evaluative conditioning, a recent approach postulates a merely propositional process to underlie evaluative conditioning (De Houwer, 2009). Despite these controversies, for our analysis it seems crucial that implicit measures of attitude capture very quick reactions that reflect more difficult-to-control affective reactions to an object (Hofmann, Friese, & Strack, 2009), whereas explicit measures of attitude capture more reflective, controlled evaluations (see also Strack & Deutsch, 2004).

Having introduced major theories of attitude concepts and attitude change in general, we will now turn to a highly interesting special case of attitude change – social influence on attitudes exerted by minorities and majorities. On the one hand, it will be very helpful to have theories of attitude change as a background for analyzing effects of minority and majority communication. On the other hand, sometimes paradoxical findings in minority and majority influence research provide the chance to test the applicability and limits of recent attitude change theories. In the last part of the chapter this discussion will converge into a new model of consensus effects.

3. Minority and Majority influence

Although the origins of majority and minority influence research started with the investigation of the malleability of perceptual judgments, most studies conducted since the late 1980s have concentrated on how attitudes are influenced by minority and majority sources. We will nevertheless start with a short discussion in honor of the seminal works by Solomon Asch (1952, 1956) and Serge Moscovici and his colleagues (1969, 1980), because most studies still refer to the methods and assumptions introduced by them.

3.1. The roots of social influence research: Conformity and nonconformity in perceptual judgments

3.1.1. Nothing but conformity?

Under the impression of the Holocaust, social psychology used to focus very much on effects of group pressure. Solomon Asch asked whether we may "simply conclude that [groups] can induce persons to shift their decisions and convictions in almost any desired direction [...]" (Asch, 1956, p. 2). In his seminal studies on conformity (1956, Exp. 1) he investigated whether even simple perceptual judgments could be affected by a contradictory majority claim. A confederate majority of eight students and a minority of one participant engaged in a line judgment task that compared the length of a standard line to a set of three

comparison lines. The line of equal length should be identified and stated out loud. In critical trials, the majority unanimously gave an evidently wrong answer. Compared to a control condition, where participants and confederates wrote down their answers silently, the likelihood of wrong answers in critical trials increased the dramatically when participants answered in public.

Asch's work started up a whole field of research in social psychology. Many studies investigated the circumstances that cause conformity and the processes that underlie conforming behavior. A meta-analysis conducted on 133 studies that employed the line judgment task (Bond & Smith, 1996) showed conformity to be stronger in collectivist countries than in individualist countries. Other moderators of conformist behavior were (a) type of stimulus material: the more ambiguous the material the greater the influence by the majority (e.g. Crutchfield, 1955), (b) out-group versus in-group status: out-group majorities had significantly less influence than in-group majorities (e.g. Abrams, et al., 1990), and (c) the proportion of female respondents: a larger proportion of females in the sample increased the size of the majority effect (see Bond & Smith, 1996, p. 120).

In summary, although at least half of Asch's sample can also be said to have acted sensibly by just occasionally giving in to signal their willingness to cooperate with the majority (see Hodges & Geyer, 2006), most researchers in the 1950s to 1970s including Asch himself saw overwhelming evidence for non-rational conformist behavior (Milgram, Bickman, & Berkowitz, 1969; for a review see Cialdini & Trost, 1998). This prevailing perspective provoked Moscovici and his colleagues to challenge the one-way reasoning on social influence processes by investigating how minorities can exert influence on majority members.

3.1.2. The rehabilitation of the minority

If conformity were the dominant principle in groups and societies, a complete synchronization of thoughts, actions and attitudes would result, and no societal change would ever happen. Thus, new ideas that are usually supported by minorities at the beginning would never succeed. However, there are numerous examples from history that social change is possible, and hence minorities do exert some influence. A very successful social movement that was supported by a minority of people at the beginning was, for example, the environmental movement. Thirty years ago the use of recycling paper and saving energy was rather exotic, but today has become rather common.

Moscovici and his colleagues wanted to find experimental evidence that minorities also could exert substantial influence on majority members' judgments. For this purpose, a perception task was used (Moscovici & Personnaz, 1980): Predominantly blue slides with little proportions of green were projected on a white wall. A confederate and a participant were asked to publicly name the color of the slides and then, in private, to name the color of the afterimage that appeared on the white background after the stimulus had disappeared. Due to features of human vision, the color of this afterimage is complementary to the originally perceived color. The confederate answers (always "green") were allegedly either associated with a minority of 18% or with a majority of 82% from earlier experimental trials. As a result, public responses on the color of the slide did not differ between the minority and majority condition. However, color judgments of the afterimage given in

private tended to be closer to the afterimage of green in the minority condition than in the majority condition (Moscovici & Personnaz, 1980). Studies on the afterimage effect constituted the core endorsement of Moscovici's conversion theory (1980), which assumes that minority and majority influence engender two different processes: individuals confronted with a majority engage in a comparison process, which compares their own tendency to answer with the majority's response, but do not consider in detail the reasons behind the majority statement. The detection of differences between one's own answer and the predominant answer results in public compliance, but not in private change. Minority positions, in contrast, due to their distinctiveness, set off a validation process that strives to understand why the minority's response is different. Minorities, thus, can cause private change that is usually not stated publicly, as people do not want to be associated with a minority (see Mugny, 1982).

The afterimage studies and conversion theory have been most influential in social influence research and induced several research projects on the impact of minorities (e.g. Mugny, 1982; Nemeth, 1986). However, despite its large influence, the original studies turned out to be difficult to replicate (see Wood et al., 1994, who found authorship effects with higher levels of indirect minority influence for studies conducted by Moscovici or his students as compared to other research groups, p. 335). Several criticisms concerning the methodology of the after-image studies lead to rejection of the evidence from the afterimage paradigm (see Martin & Hewstone, 2001). Still, – much like conversion theory itself assumes – the afterimage studies and their precursors, initially being a minority position in the scientific field, directed attention toward the impact of minorities and have stimulated a lot of research, of which a selection will be reviewed in the next section.

3.2. How many routes to minority and majority effects on explicit attitudes?

Much like in persuasion research generally, there are two lines of modeling processes of minority and majority influence. On the one hand, approaches based on Moscovici's conversion theory assume two distinct cognitive processes underlying minority and majority influence (e.g. Crano & Alvaro, 1998; Nemeth, 1986). While minorities urge people to think carefully about the positions and agree rather privately than in public, majorities cause public conformity without much systematic thinking. On the other hand, some models posit the same underlying process for minority and majority influence, with power of influence proportionate to the level of support (e.g. Doms & van Avermaat, 1983; Kruglanski & Mackie, 1990). Although the implementation of paradigms from persuasion studies in minority and majority influence research (e.g. Baker & Petty, 1994; Erb et al., 1998; Maass & Clark, 1983; see also Bohner, et al., 1995) allowed for a more direct assessment of the amount of processing that was triggered by each source, as we will see, the findings are mixed (see Wood et al., 1994). This is mainly due to different experimental designs and operationalizations, which will be discussed.

3.2.1. Dual-process accounts

Most of the dual-process models of minority and majority influence assume that minorities – due to their distinctiveness – attract larger amounts of attention toward their positions (Moscovici, 1980; Nemeth, 1986). If not derogated per se, e.g. because the minority belongs to an out-group (Mugny, 1982), minority statements will be elaborated more intensely than majority issues (Crano & Alvaro, 1998). More

intense elaboration of strong arguments should result in greater change, especially when no prior judgment has to be defended (Crano & Hannula-Bral, 1994; Petty & Cacioppo, 1986). This change, however, is often not expressed as people often do not want to be associated with a minority. Change on the focal judgment can also be blocked and transferred to indirectly related judgments. In a series of studies, Crano and his colleagues (Alvaro & Crano, 1997; Crano & Alvaro, 1998) employed an indirect measure of minority and majority influence. Attitude change following in-group minority communication emerged on topics that were only indirectly related to the focus of persuasion, with the participants being unaware of this relation (cf. Mackie, 1987, who found change on related topics following both minority and majority communication).

Since the formulation of dual-process models of persuasion, pronounced parallels to social influence research have become evident (Bohner, et al., 1995; Maass & Clark, 1983; Nemeth, 1986). Both systematic processing (HSM) and the central route to persuasion (ELM) comprise careful scrutiny of available information, which can be seen as similar to the presumed validation process triggered by minority communication. Also, low effort processing modeled by HSM and ELM are comparable to low-effort compliance to majority statements. Thus, minority and majority influence research could benefit from methodological advancements, such as systematic variations of argument quality, to investigate more directly the processes at play.

In an experiment using a thought listing technique, Maass and Clark (1983) assessed which kind of processing route (in terms of the ELM) participants would engage in after minority and majority communication. Following simultaneous exposure to minority and majority argumentation on gay rights (with positions counterbalanced across experimental groups), participants completed a questionnaire either in private or in the expectation that it would be presented publicly to a discussion group. Much in line with conversion theory, attitudes moved toward the majority if expressed publicly and toward the minority if recorded privately (exp. 1 and 2). Thought listings on the topics showed – interestingly – the same level of cognitive activation (i.e. number of thoughts) for both minority and majority sources. As predicted by conversion theory along with the ELM, persistent attitude change was mediated by level of cognitive activity (central route processing), but compliance was not (expt. 2).

Inspired by the HSM (Chaiken, 1987; Chaiken, et al., 1989) and attribution theory (Kelley, 1967, 1973), Bohner, et al. (1996) conducted a study which addressed the role of distinctiveness information in minority and majority influence. Conversion theory (Moscovici, 1980) promotes distinctiveness – besides consistency – as one of the central factors that exclusively increase minority persuasion because it attracts attention to the issue and the minority's position, which should be scrutinized more systematically as a consequence. However, distinctiveness in terms of conversion theory (Moscovici, 1980) differs substantially from distinctiveness as employed by attribution theory (Kelley, 1967): Moscovici concentrates on the salience of the minority members, whereas Kelley focuses on which opinion is salient. The framework of the covariation model, hence, predicts high levels of persuasion when distinctiveness, consistency, *and* consensus are high. Under these conditions high levels of persuasion are mediated by entity attributions (to the facts concerning the

persuasive topic). Predictions by attribution theory were supported, showing a disadvantage for minority (as compared to majority) persuasion if distinctiveness and consistency are constant for both conditions. Ironically, Moscovici was right to identify distinctiveness and consistency as powerful mediators of persuasion, although, this applies to both minority and majority sources. However, these results do not speak to the question of whether high levels of distinctiveness lead to more systematic processing. This was further clarified by another experiment (Bohner, Frank & Erb, 1998) which found independent main effects of argument strength and distinctiveness, indicating that distinctiveness in itself did not affect the level of systematic processing.

Evidence by Nemeth and colleagues suggests that it is rather the *type* of thinking than the amount of attention which is guided by consensus information (Nemeth, 1986). In a figure-comparision task where all patterns that contained a standard figure should be identified, participants found more alternative solutions after they had seen a minority (rather than a majority) member find a solution that differed from the most obvious solution (Nemeth & Wachtler, 1983). Thus, following minority influence participants found more alternative solutions, which Nemeth (1986) interpreted as due to a *divergent thinking* style, whereas majority influence prompted mere reproduction of the demonstrated solution, which Nemeth interpreted as due to *convergent thinking*. Further results indicating divergent thinking following dissent were found with other dependent variables like word-associations (Nemeth & Kwan, 1985) and free recall (Nemeth, et al., 1990). Evidence for divergent thinking was also found by Erb and colleagues (1998), who analyzed the content of thought listings following minority communication in a persuasion paradigm: Independent of valence, consensus information predicted the novelty of thoughts. Nemeth (1986) attributed the larger creativity to the fact that being confronted with a minority is generally less stressful than being confronted with a majority. Moreover, when levels of stress are high, more attention is driven to the central task, peripheral aspects are neglected. Thus, the lower levels of stress experienced when confronted with a minority widens the focus and allows for more creative solutions (see also Gawronski & Bodenhausen, 2006a, p. 700). According to the mere consensus approach, a more general explanation for increased levels of divergence following minority communication may be priming unusualness. Minorities – due to their inherent property of being unusual – will make more creative solutions more accessible.

In summary, the adoption of persuasion paradigms by social influence studies has ruled out largely the assumption of high- versus low-effort processing as attached to minority and majority communication. Rather, minority sources (as compared to majority sources) elicit a different focus of thinking: Minority communication seems to widen the focus of the addressee whereas majority communication narrows the focus. Alternatives to social influence models that assume two different modes of processing have proposed a single modus at operation irrespective of the minority versus majority status of the communicator.

3.2.2. Single-process accounts

Single process accounts assume a general influence process for both minority and majority sources (Doms & van Avermaet, 1980; Latané & Wolf, 1981; Tanford & Penrod, 1984). With their social impact model, Latané and Wolf (1981) criticized

that minority and majority influence could not be compared validly in many studies to that date, because the direction of influence was either from an active majority to a passive minority or vice versa and was often confounded with power of the source. They proposed that the influence of both sources should instead be studied simultaneously and be defined merely by their numerical differences. As a result, consensus is disentangled from power and other factors that may affect level of influence. The remaining difference in support for a topic can be estimated as a function of numerical group size. Hence, a unitary influence by majorities as well as minorities is predicted by three factors: strength, closeness, and size of a group (Latané & Wolf, 1981). A study on social impact in electronic groups (Latané & L'Herrou, 1996), investigated how spatial relations between people affect the spread of influence and maintenance of diversity. It showed that complex geometries (with clustering in families, etc.) and boundaries to communications (like rivers, walls etc.) promote influence by minorities, whereas open social networks without spatial boundaries foster larger majority influence.

In her studies, Mackie (1987) specifically questions the core assumption of most dual-process accounts, that majority sources elicit less elaboration of the topic than minority sources do. She argues that high consensus usually indicates correctness, and hence, if it differs from one's own position it is worth spending some thought on the majority's statement (see also Bohner, et al., 1998). She had participants listen to tape-recorded discussions with arguments for both sides. Arguments were counterbalancedly attributed to either a minority or a majority; consequently participants were exposed to minority and majority position simultaneously (exp. 1 and 2). Attitudes toward the topic were assessed privately both before and after the message and again with a week's delay. In addition to the focal attitude, related topics were tested. Those participants who had been opposed to the majority's opinion significantly changed their mind in the direction of the majority position, whereas all others did not. Majority-induced attitude change generalized to related topics. Also, the recall and amount of elaboration of arguments predicted immediate attitude change. Thus, participants did process systematically what the majority said. In a similar vein, Baker and Petty (1994, Expt. 2) found that both processing of minority positions and of majority positions can be enhanced when their arguments contradict source-related expectations. That is, majorities that claimed positions opposed to prior attitudes held by participants as well as minorities stating the participant's position were surprising and thus gave rise to scrutinity.

In response to this challenge to dual-process explanations, it could be argued that single-process approaches did not include measures of latent influence that should emerge primarily following minority positions, and therefore the differential impact of minorities (compared with majorities) could not be detected (Maass & Clark, 1984; Nemeth, 1986). Some studies (e.g. Mackie, 1987) considered this aspect by including measures of indirect attitude change, but still did not confirm a duality of processes.

3.2.3. Discussion of both approaches

Kruglanski and Mackie (1990) offered a framework for examination of whether minority and majority influence are driven by distinct processes or rely on the same principles. According to their analysis, strongest evidence for process

distinctiveness would be given if a factor affected minority influence in a different way than majority influence. For example, if high behavioral distinctiveness increased only minority influence but decreased majority influence, two different mediating processes could be assumed. As we have seen, however, distinctiveness does not moderate minority versus majority influence (Bohner et al., 1996; Bohner et al. 1998). Factors that necessarily covary with relative source size and mediate the persuasive outcome would also support the duality assumption. In their review, Kruglanski and Mackie (1990) identified only one variable that is necessarily tied to consensus information, namely the applicability of the consensus heuristic ("majorities are usually right"). No other strong cases for process distinctiveness were observed. However, even in cases when source impact moderates the outcome, it is not compulsory to assume two processes at operation (see also Kruglansi & Thompson, 1999, and Miller & Pederson, 1999).

In their meta-analysis, Wood and her colleagues (1994) found mainly quantitative differences between minority and majority influence. Solely for studies with perceptual measures of social influence, a superior minority influence could be shown. However, as mentioned above, due to their methodological flaws these studies should not be counted as evidence for duality of processes in minority and majority influence. A large variety of experimental designs makes direct comparison between studies on minority and majority influence difficult. Minority and majority status was sometimes implemented in combination with power (Mugny, 1982), prior attitudes were either moderate or opposed to the persuasive message (e.g. Mackie, 1987), sources had in- or out-group status (David & Turner, 1999), and other factors were varied (see Wood et al, 1994). At the same time various operationalizations were used, including fictitious (Erb et al., 1998) versus real topics (Maass & Clark, 1983; Alvaro & Crano, 1997), or real groups (Moscovici, et al., 1969) versus reported poll results (Thoben & Erb, 2010). These diverse paradigms complicate a generalization of findings across studies.

However, with their mere consensus approach, Erb and Bohner (2001, 2010) propose to study minority and majority influence detached from all other factors. They argue that "… even if messages are not discrepant and influence groups are not socially relevant to individuals, consensus can have profound effects on message-related processing and subsequent attitude judgments" (2001, p. 43). Responses to high consensus are predicted to be usually more positive than responses to low consensus. This initial evaluative response is said to bias processing of the message. Message processing might also be biased with regard to novelty of thoughts. With messages that comprise several intermediate arguments and few weak and strong arguments, and thus vary argument quality within participants, the biasing effect of consensus information on message processing can be detected more sensitively (mixed-message method, Erb, et al., 2005). Erb and colleagues (1998) report biasing consensus effects even with a pure numerical definition of minorities and majorities, and with fictitious topics where no prior attitudes exist. Majorities do evoke more positive evaluations of attitude objects and cognitive responses. Consequently, consensus in and of itself has a profound influence on social judgments, independent of conflict, power, or prior attitudes.

Of all things, distinctiveness and consistency do not seem to enhance minority influence exclusively (Moscovici, 1980); instead, these factors generalize to majority

influence as well (Bohner, et al., 1996; see also Doms & VanAvermaet, 1980). Still, there are factors that seem to moderate whether minority or majority influence prevails: opinion discrepancy (Baker & Petty, 1994; Erb, et al., 2002), in-group versus out-group status (Crano & Alvaro, 1998), need for uniqueness (Imhoff & Erb, 2009), risk priming (Erb, et al., 2009), and motivational states (Bohner, et al., 2008). According to our analysis, these moderating effects of motivation and context are rather due to activation of different aspects that are associated with minorities and majorities than to distinct underlying processes. This idea will be discussed in the remaining sections.

4. Automatic to systematic consensus influence (ASCI) model

With our model of minority and majority influence on implicit and explicit attitudes we argue that introducing automatic processes to minority and majority influence can open a new perspective to the field and generate new predictions. Drawing on the associative and propositional evaluations (APE) model (Gawronski & Bodenhausen, 2006a) and on assumptions about the impact of motivational states on systematic processing, as proposed in the heuristic-systematic model (e.g. Bohner, et al., 1995), we assume that evaluation of minority and majority positions is shaped by the context of presentation and inner motivational and emotional states (see also Kruglanski & Mackie, 1990), at both an implicit and explicit level of information processing.

Figure 1 depicts a schematic illustration of the ASCI model. We will elucidate from the perspective of the ASCI model how information from persuasive settings with minority or majority sources is processed. The level of explicitness is conceptualized as continuous rather than dichotomous, ranging from very fast, spontaneous (or automatic) reactions over the effortless application of heuristics to any desired level of effortful thinking ('continuum of explicitness' in Figure 1). When a perceiver first sees the text with a minority or majority cue and the persuasive message, external input and internal states determine automatic activation of concepts related to the text. External input could be consensus information, message content, the way and the situation in which the text is presented, etc. Internal states can facilitate processing of matching external input as well as activate concepts from memory. For instance, the need to affiliate with others is likely to render majority sources more positive as they provide a larger basis of social support. Other motivational states include the need to be accurate or for a positive self-concept. Automatically activated concepts related to majorities could be: 'safe', 'correct', 'boring', or even 'repressive', etc. For minorities, concepts like 'rare', 'deviant', 'alternative', or 'risky' might be activated. The affective component of automatic associations is assessed via implicit measures of attitude.

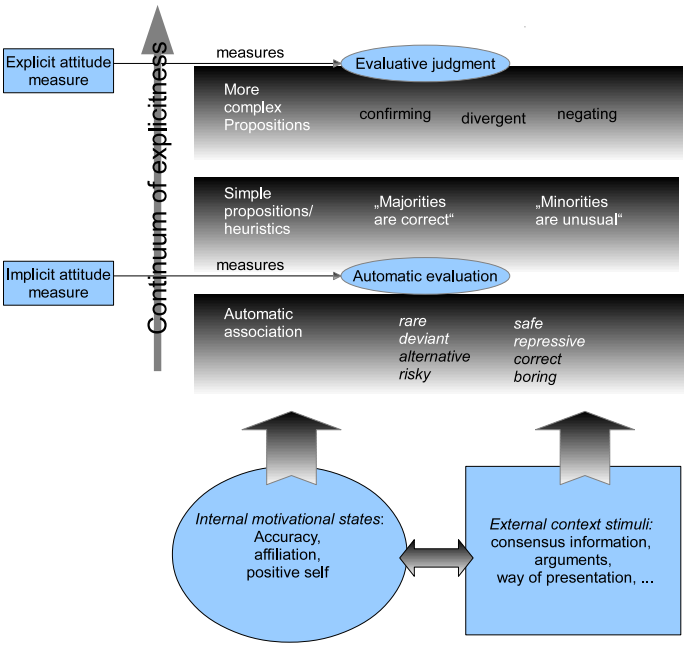

Fig. 1: Motivational states and external context determine automatic associations, simple heuristics and systematic thought about consensus information and persuasive content.

When the level of elaboration increases, simple propositions or heuristics are built upon the activated associations. When motivation to process is high enough, more complex inferences about the relation of consensus information, message content, and other relevant evidence will be built. At all levels of explicitness, evaluative processing is shaped by external input and inner motivational states. Evaluative judgments measured with self-report questionnaires are assumed to reflect high levels of elaboration about the persuasive setting. Moreover, processing of information can be either broad or narrow; we assume that minority cues trigger divergent processing of information at all levels of explicitness. These assumptions by the ASCI model will be outlined and illustrated in the following sections.

4.1. Implicit minority and majority influence

Implicit measures of attitudes provide the possibility to tap (more or less) into effortless, difficult-to-control or automatic manifestations of attitude change (e.g. Moors & DeHouwer, 2006). So far, implicit reaction-time based measures of attitudes have been applied only in very few studies on minority and majority influence. Extending on mere consensus studies (Erb et al., 1998), we added an implicit measure of the target attitude to investigate whether minority or majority persuasion would emerge at an automatic level (Dickel, 2011). Either a minority of 14% or a majority of 86% recommended a fictitious holiday area (the 'Curutao Lake') quoting several arguments of mixed strength (see Erb et al., 2005). Later,

participants engaged in an evaluative priming task, where they categorized target words via left-hand and right-hand key-presses according to their valence. Target words were preceded either by the standard primes 'rain' or 'sun', or by the name of the recommended holiday region 'Curutao'. Interestingly, although explicit attitudes were more positive in the majority condition (compared to the minority condition), the implicit measure of the target attitude was not affected by source status. That is, the 'Curutao' prime did not facilitate responses to positive target words or negative target words in either condition. Yet, automatic evaluation of standard evaluative primes ('rain' versus 'sun') was reversed in the minority condition, i.e. participants that had read the minority position on the lake, responded faster to positive targets that were preceded by the 'rain' prime, indicating, that they evaluated 'rain' positively, whereas 'sun' was automatically evaluated negatively. Following majority communication, the usual evaluation of sun and rain was found at an automatic level. This pattern was interpreted as divergent processing at an automatic level (see also Nemeth, 1986) which could be grounded in a creative mindset (see Galinsky & Moskowitz, 2000) activated by minority cues. To corroborate our view, further studies have to be conducted.

To assess automatic evaluation of minorities and majorities per se, Mucchi-Faina, Pacilli, and Pagliaro (2011) had participants complete an implicit measure of attitude. In a lexical decision task participants decided via key-presses if a letter string was a word or not. Letter strings were preceded by very short (15ms) masked presentation of the labels "minority" and "majority". Response to positive words was facilitated by majority primes, whereas minority primes did not affect target classification. The results indicate a positive connotation of the word "majority", whereas the word "minority" is not unitarily evaluated.

On the basis of these preliminary results from implicit measures and recent theorizing on attitude change, we propose a theoretical reframing of studies that showed an increased impact of consensus information under conditions of low processing effort. Traditionally, such results have been interpreted in terms of heuristic processing. For instance, when argument quality is not considered by participants, indicating that elaboration effort was low, consensus information becomes more predictive of thought valence and evaluative judgments (e.g. Erb et al., 1998). The application of heuristics like "majorities usually hold correct opinions" would require active thought or – in terms of the APE model – pro-positional thinking. However, increased impact of minority versus majority status when processing effort is low could also be explained by assuming (partial) implicit or automatic processing and evaluation of consensus information. The positive automatic reaction to the majority would then mediate the positive attitude toward the persuasive topic.

Moreover, recent studies (Bohner, et al., 2008; Erb, et al., 2009; Imhoff & Erb, 2009) found low effort influence by minorities and majorities on attitudes that was affected by context information or current motives of the perceiver. For example, when participants' need for uniqueness (Snyder & Fromkin, 1977) was high, participants judged minority positions to be more and majority positions to be less attractive even when there were no explicit arguments (Imhoff & Erb, 2009, exp. 1). Here, in our view, the current motivational state shaped processing of consensus information to serve the need for uniqueness – even at an automatic level. As being

affiliated with minority sources provides the possibility to enhance one's own unusualness, minority stimuli were automatically evaluated more positively. Finally, the evaluative judgment was based on this positive automatic evaluation of consensus (see APE, case 1). In another study, minority positions were more attractive when participants had been subtly primed with risk-related concepts (Erb et al., 2009). As statements endorsed by minorities are more risky in the sense that they are not as socially approved as majority positions, participants can gain the valuable position of being one of the few 'clever ones' who were correct – but this outcome is fraught with uncertainty. Consequently, minority positions should be more attractive when people are in a "risky" mindset (Erb et al., 2009). Because participants were not aware of the risk-priming, it is plausible to assume that the priming shifted the automatic evaluation of consensus information. The explicit measures employed in the research just described do not speak to the potential impact of automatic evaluations, but, they may well reflect a blend of automatic and heuristic processing.

In the following sections we will take a closer look at how implicit evaluations of consensus information are formed and changed and how they can impact on more explicit evaluative judgments. Building on the APE model, we assume that the pattern of spontaneous activation of concepts (see e.g. Smith, 1996) related to consensus and the persuasive topic is shaped by contextual input and internal motivational states. Which aspects are activated depends on the current accessibility of concepts, which in turn depends on the context of presentation and on motivational or emotional states within the perceiver. Applied to minority and majority influence, context will render specific aspects of consensus information (or parts of information from the arguments) more accessible. For example, in the context of elections large majorities of more than 90% would likely be associated with cheating, whereas in online customer evaluations a consensus of 99% is quite usual and associated positively. In a study that investigated the effects of large minorities and small majorities – at least outside the context of elections – Erb, et al. (2006) found increased minority influence and decreased majority influence when explicit consensus information was larger for minorities (e.g., 48%) and smaller for majorities (e.g., 52%) than the consensus inferred in conditions where no explicit percentages were provided.

Presumably even more powerful than contextual input, internal motivational states can also shift automatic activation of associations (Ferguson & Bargh, 2004). Aspects that are functional to reach current goals will be highly accessible. For example, when a person's need to be unique is high (Fromkin & Snyder, 1977), associations toward minority cues such as “special” or “rare” might be rendered more accessible because they are goal relevant in the sense that being associated with a minority makes a person more unique (Imhoff & Erb, 2009). Hence, high accessibility of positive aspects related to minorities will result in a more positive implicit attitude toward them. In the same vein, when people are highly accuracy motivated, associations between high consensus and correctness (Bohner et al., 2008; Mackie, 1987) will become more accessible and lead to a positive implicit attitude toward majorities.

To organize the motivational impact on automatic activation of associations toward minorities and majorities we will adopt a catalogue of goals by Cialdini and

Goldstein (2004): accuracy in ones judgments, affiliation to others, and maintaining a positive self-concept. When motivation to hold accurate attitudes is high, presumably valid and important information in the persuasive setting is functional to reach the goal, thus, corresponding concepts are activated (e.g. majorities = correct; scientific study = approved). High motivation to affiliate with others will highlight socially relevant aspects that help to reach the goal of affiliation. For example, the aspect that majorities comprise a large source of support might be activated automatically. Ingroups should be evaluated even more positively under high affiliation motivation. When the motivation to maintain a positive self-concept is dominant, aspects that support own held beliefs will be more accessible.

Research from the domain of stereotype reduction (Sassenberg & Moskowitz, 2005) suggests that automatic perception of minority and majority cues might not only impact accessibility of concepts related to consensus information, but could also be capable to affect the *way* in which information is processed (Nemeth, 1986) – even at an automatic level. A creative (versus thoughtful) mindset was activated when participants described three instances where they had been creative (versus thoughtful). Subsequently, a lexical decision task with facial primes of African and European Americans was completed to reveal racial stereotypes of African Americans. Stereotype activation was significantly reduced for participants in a creative mindset (Sassenberg & Moskowitz, 2005). Relating this to our finding, discussed above, that the automatic evaluation of standard words was reversed following minority communication (Dickel, 2011), we assume that considering minority arguments might result in divergent processing that operates at a non-conscious level.

In sum, we argue that automatic associations of consensus cues affect the persuasive outcome – either at an implicit level or by indirectly affecting explicit evaluative judgments (Figure 1). How automatic associations can affect explicit judgments will be outlined next.

4.2. Explicit minority and majority influence

We assume that more systematic processing minority and majority communication can be measured with explicit self reports – like propositional processes in the APE model and systematic processing in the HSM. In line with the APE model we assume that the most common case of propositional thinking is approval of the automatic affective reaction. When motivation and opportunity are sufficiently high to elaborate further, automatic evaluations are compared with inferences about the information. For example, the association "majority = correct = positive" could be questioned when propositions like "majorities also supported genocides" come into play. Such a consideration would create cognitive inconsistency (Festinger, 1957), which could be reconciled by rejecting the association on the basis of strong arguments. The amount of propositions that are taken into account is affected by the amount of time new propositions are considered, which in turn can depend on (a) current processing goals that define whether the actual level of confidence in the judgment is sufficient or not (Bohner et al., 1995), (b) context effects, e.g. how clearly the information is presented, and (c) available processing capacity. Hence, changes in the considered set of propositions result in changes in explicit evaluative judgments. The content of propositions can – like automatic associations – depend on processing goals and context of presentation.

For example, when accuracy motivation is high, the automatic reaction to the majority label could be positive (see above). Because accuracy-motivated individuals are likely to consider a large range of propositions, they might bring to mind instances where the majority heuristic was misleading. When arguments are strong, this might attenuate the heuristic value of consensus information for accuracy-motivated individuals (see attenuation hypothesis Bohner et al., 1995) – resulting in rejection of the automatic affective reaction – and guide their attention toward other information in the persuasive setting. Thus, when processed with the goal of accuracy, attitudes should be determined by argument quality. However, when arguments are ambiguous, participants with high accuracy motivation presumably accepted the positive automatic reaction toward the majority as a valid source for correct attitudes (Bohner et al., 2008, accuracy conditions), and moderately agreed with the majority. Importantly, if the goal to affiliate or to maintain a positive self-concept is active, the set of considered propositions may differ according to their relevance for the current motive.

The motive to affiliate with others, too, will affect the considered set of propositions that are aggregated in an evaluative judgment or explicit attitude. In general, individuals will strive to identify and adopt attitudes and arguments that are socially accepted. Participants with a highly activated affiliation motive (Bohner et al., 2008, affiliation conditions) accepted the majority's position – irrespective of argument quality. In our terms, they presumably based their judgment predominantly on the positive automatic evaluation of the majority cue as a large source of social support. As motivation to discount majority arguments was presumably low, search for more thoughts was ended relatively early, not bringing to mind conflicting propositions. In contrast, minority positions were scrutinized for valid arguments. As being associated with a minority is usually seen as opposed to the goal to affiliate (see Mugny, 1982), minority arguments have to be really convincing to be adopted.

A study by Erb et al. (2002) illustrates how the need for a positive self-concept can shape propositional processes in minority and majority influence. The authors found more systematic processing of majority messages than minority messages when participants' prior attitudes were moderate; however, when participants' prior attitudes were opposed to the message's position, minority messages were considered more extensively than majority messages. When prior attitudes oppose persuasive arguments, the motivation to maintain a positive self and to reject the arguments is likely to be high. Thus, as it serves the current motivational state, participants will consider a selection of propositions that can easily be discounted and dismissed – resulting in regained consistency between considered thoughts. Here, consensus information can corroborate inferences that the information given is invalid. The aspect of minorities' being deviant and incorrect is highlighted. Consequently, searching for the flaws in minorities' argumentation may appear more fruitful than scrutinizing majorities' messages – higher levels of systematic thinking are thus more likely for opposing minority views (Erb et al., 2002, p. 1180). However, when arguments are strong, and thus validated to be correct, the proposition that the minority is probably incorrect has to be rejected, to re-establish consistency among propositions. Moreover, an additional proposition might be generated like 'a correct minority is brighter than the majority and brave', which should contribute to the positive evaluation of strong arguments. On the other

hand, when arguments are weak, source status implies a simple new proposition that can resolve inconsistency between recipients' own attitudes and views communicated by minorities: Arguments dysfunctional to maintain a positive self-concept can be rejected on the basis that the source is probably incorrect anyway.

Attitude change through effortful thinking following minority and majority communication emerges not only via consideration of different sets of thoughts and motivated rejection of certain parts of the active set of thoughts, it can also be due to changes in the strategy to reconcile contradicting propositions into a consistent judgment (see Gawronski & Bodenhausen, 2006a, p. 701). For instance, by giving example to solve tasks in an unconventional manner, minority sources will highlight the possibility to think outside the box. Although this point should generally transfer to majorities, minorities seem to trigger a processing style that may be characterized as creative or divergent (see above). Thus, contradicting propositions may be more easily reconciled when a person is thinking in a more creative or open way (for theoretical frameworks of processing styles see e.g. Förster & Dannenberg, 2010). Thinking more creatively may well be grounded in automatic processes. On the basis of automatic divergent associations (Dickel, 2011; Galinsky & Moskowitz, 2000; Sassenberg & Moskowitz, 2005) creative thoughts might be more accessible. Also, if group status is manipulated between participants, the existence of more than one alternative group beside a minority could be inferred by the participants, setting a higher norm of general divergence. This reasoning is less likely for (large) majorities (see also Naumer, 1996). Strategies to reconcile contradicting propositions can, again, be shaped by motives and context.

How automatic associations can affect explicit judgments beyond mere approval or disapproval of their evaluative implications will be considered in our assumptions on the interplay of automatic and systematic processing of minority or majority communication.

4.3. Interplay of automatic and systematic processing in minority and majority influence

From the perspective of the APE-model changes in associative structure and/or pattern activation can influence propositional thinking when the automatic association is considered a valid or invalid basis to form an evaluative summary (case 1). Conversely, change in propo-sitions can mediate associative processes by bringing propositions to mind that activate automatic associative reactions (case 4). These cases appear to be conceptualized in the APE model as additive influences with varying weights on associations and propositions. For example, in the evaluative conditioning study described above (Field, 2006), where children liked cartoon characters more after they had been presented together with ice-cream (than with brussels sprouts), the APE model would assume a change in associative structure of the character's representation. Corresponding change on explicit measures would be due to the approval of the associative implication (Gawronski & Bodenhausen, 2006a).

By contrast, we assume that automatic associations can trigger assimilating and contrasting biases in propositional thinking. Consensus information and dominant features of the message will automatically activate certain aspects of the concepts. Which aspects will be activated depends on the context of presentation and on the

perceiver's motivational state. For example, a majority cue could activate the concept 'correct' or 'safe' when an accuracy goal prevails. Based on these active concepts effortful thinking will bring to mind inferences about source implications and the topic. Thus, once a majority cue has been evaluated positively (e.g. due to the perceiver's motivational state), the perceiver will be more likely to generate thoughts that will support the majority's arguments. Hence, the valence of thoughts will be assimilated to the initial automatic affective reaction. We assume that an assimilating bias in effortful thinking will occur only when message arguments are open to interpretation to some extent. If, however, message arguments violate the implications of initial associative reactions to the source, these initial reactions will be actively rejected, and the result will be a contrasting bias in effortful thinking (see Bohner et al., 2008).

4.4. New predictions

Implicit attitudes toward consensus information and toward the message topic change according to motivational states and context factors. When accuracy motivation prevails, high consensus usually activates positive (goal-serving) associations of correctness, whereas low consensus activates negative associations of incorrectness. When affiliation motivation prevails, minority and majority stimuli will activate different aspects of the concept: Belonging to a majority will usually satisfy the need to be connected more effectively than being associated with a minority. When the motivation to maintain a positive self-concept prevails, consensus information can be functional to discount or corroborate a perceiver's own views, which will trigger appropriate automatic associations. Depending on the information given in the context, different associations can be activated.

Explicit attitudes toward consensus information and toward the message topic also change according to motivational states and context factors. When accuracy motivation prevails, evaluative judgments will usually be based on argument quality. When arguments are unclear, however, individuals can rely on consensus information as indicating the level of support for the message position. Thus, arguments will be assimilated to (automatic) source evaluation. If arguments clearly violate such initial evaluations, more effortful judgments of the issue will be contrasted to them. Correlations between implicit and explicit change will increase when assimilating bias occurs, and decrease when contrasting bias occurs. When affiliation motivation prevails, perceivers will bring to mind or highlight thoughts that are functional for social affiliation. When the motivation to maintain a positive self-concept prevails, consensus information can be functional to discount or corroborate the perceiver's own views, which will trigger appropriate thoughts. Depending on the information given in the context, different thoughts will be brought to mind.

The amount of listed thoughts is a function of motivation strength and opportunity to process the information of interest. The larger the gap between perceivers' actual and desired confidence in their own judgment, the greater will be the perceivers' effort to scrutinize given information and to generate thoughts (see sufficiency threshold, e.g. Bohner et al., 1995).

The content of both thought listings and automatic associations is influenced by more divergent processing following minority than majority communication.

Whether this is due to different levels of arousal or the activation of different mindsets should be investigated further. Instruments that assess the novelty of concepts (Vinokur & Burnstein, 1974) or self-generated arguments (Bohner & Schwarz, 1993) can be applied to address this question.

4.6. Discussion

We acknowledge that, to date, much of our analysis is speculative and many of our conclusions are based on plausible inferences rather than on empirical findings. Thus, the predictions outlined above have to undergo extensive testing. However, we hope to have demonstrated the exciting opportunities of integrating theorizing on automatic associations into the study of minority and majority influence.

Going beyond the APE model and the HSM, we have outlined in detail how automatic associations may bias systematic thinking. This is specified for the case of consensus effects on persuasion. Although the APE model mentions that motivational states affect propositional thinking (Gawronski & Bodenhausen, 2006a, p. 711) and automatic associations (p. 700), they do not explain in detail how motivational states affect attitude change. We assume that motivational states affect both implicit and explicit attitudes by making goal appropriate associations and/or propositions more accessible. Moreover, we allow for and predict assimilating and contrasting bias in the interplay of automatic and systematic processing.

Different from the APE model and the HSM, we do not assume two distinct processes but rather a continuum of implicitness versus explicitness in the processing of consensus and message information.

5. Conclusion

In conclusion, we argue that – as persuasion research has cross-fertilized research on minority and majority influence – new methodological and theoretical paradigms in attitude research have the potential to generate new insights into minority and majority influence processes. Applying implicit measures of attitude to majority and minority influence can enhance our understanding of which cognitive processes are affected by consensus information. In particular, the use of response-time based paradigms may enhance our understanding of the extent to which consensus information and messages aspects may be processed automatically. The assumption of a continuum of explicitness may help us to generate and test new hypotheses about consensus effects. More generally, the concept of gradually changing explicitness of evaluations (instead of dichotomous implicit versus explicit evaluations) could provide a noteworthy extension for attitude change theories.

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Consensus in Context: Activation of Prototypical Consensus Levels Moderates Majorities' Influence on Attitudes

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Abstract

People's representations of prototypical majority sizes vary across contexts. For example, a prototypical majority in an election context may be 51 %, whereas a prototypical majority in product ratings may be 80 %. Experiments 1 and 2 showed that participants' retrospective reports of presented consensus were more accurate if presented consensus levels matched (vs. mismatched) prototypical expectations. Experiment 2 additionally showed that majority influence on attitudes was higher when presented and prototypical consensus level matched (vs. mismatched). This effect was mediated by accuracy of reported consensus. Applied implications for the use of consensus information in advertising are discussed.

(98 words)

Keywords: advertising; attitude change; consensus; majority influence; prototypes.

Consensus in Context: Activation of Prototypical Consensus Levels Moderates Majorities' Influence on Attitudes

In modern life we are exposed to polls and surveys on a daily basis. A common example are election surveys. Especially in the run-up to large elections, the media frequently release survey results providing information about the support, in percentages, for a particular party or candidate. How much would you be surprised or get suspicious if you read about a predicted majority of 89 % for a presidential candidate? We assume that your surprise or suspicion would ground in the fact that such high percentages stand in contrast to the prototypical consensus in an election context: Political majorities are usually not much larger than 50 %. A different kind of survey is represented by user evaluations. These may consist of the proportion of customers supporting a given product, such as a hotel on a website that lists several hotels in the area. In the context of user evaluations, low numerical support would not be expected for a good hotel, and potential customers would normally look for a high support of at least 80 %, which is the mean recommendation rate of hotel guests (see Stiftung Warentest, 2010). Hence, in each context, different sizes of supporting majorities are common: The level of consensus in favor of political parties or candidates is usually relatively low, whereas the percentages of costumers recommending a certain product are usually relatively high.

Effects of Consensus Information

Mere numerical support for an issue may influence attitudes toward that issue even in the absence of any other socially relevant information (Erb & Bohner, 2001, Erb & Bohner, 2010). With their mere consensus approach, Erb and Bohner (2001, 2010) argue that investigating consensus effects in such an abstract way – without other social variables (e.g., conflict, ingroup favoritism) interfering – can reveal the pure impact of proportional support for a topic. For example, in a study that tested the influence of mere consensus information on attitudes toward a fictitious issue (Erb, Bohner, Schmälzle, & Rank, 1998, Expt. 1),

participants reported more favorable attitudes when they had read arguments that were presented by a merely numerical majority of 85% (vs. numerical minority of 15% vs. no influence group). A second study (Erb et al., 1998, Expt. 2) showed that mere consensus effects were mediated via biased processing of message content in line with consensus-based expectations (see Bohner, Moskowitz, & Chaiken, 1995).

Another experiment employing the mere consensus paradigm (Bohner, Dykema-Engblade, Tindale, & Meisenhelder, 2008) revealed biased message processing following consensus-based formation of expectations about the validity of the message. After subtle priming of an accuracy motive, participants expected to read more convincing arguments when these were presented by a majority rather than a minority (see Mackie, 1987). When the presented arguments were ambiguous and thus amenable to varying interpretations, attitudes toward the topic were assimilated to the consensus information, resulting in greater influence by the majority than the minority. Hence, consensus information can cause expectations about the quality of associated information that guide the formation of attitude judgments.

Recent studies employing the mere consensus approach showed that people may also form expectations about the level of consensus information itself. They may then use their prototypical expectations regarding minority and majority size, respectively, as comparison standards when they are exposed to consensus information (Erb, Bohner, Hewstone, Werth, & Reinhard, 2006): When participants read about a majority that was smaller than their prototype, majority influence on their attitude was decreased, and when participants read about a minority that was larger than their prototype, minority influence on their attitude was increased. Erb and his colleagues argue that these effects are driven by people's comparing the presented consensus with their prototype. A positive correlation between excess of presented consensus over the prototype and positive influence on the attitude topic is predicted.

However, increased minority influence and decreased majority influence following consensus information that exceeded or fell short of expected levels (Erb et al., 2006) can be

re-interpreted as a selective influence by consensus information: Presented consensus influenced the evaluative judgment only when it matched the expected consensus level. The conditions that were used in the experiment only featured minorities that were larger than expected and majorities that were smaller than expected and compared them with consensus of expected levels and no specific consensus level. We assume that in the non-matching conditions participants may not have taken the consensus information as a valid heuristic cue, because of the mismatch between presented and prototypical consensus. If so, minority consensus did not have its usual negative influence on attitudes, and majority consensus did not have its usual positive influence on attitudes, because consensus information per se may not have been used for the evaluation of the attitude topic in either case. To test the alternative hypothesis that consensus has more positive influence the larger it is ("correlation hypothesis"), against the hypothesis that consensus affects judgments (positively for majorities and negatively for minorities) only if it matches the expected level ("matching hypothesis"), a majority larger than expected or a minority smaller than expected would have to be included. To test these alternative explanations of Erb and colleagues' results (2006), in a first step we looked at majorities and manipulated the prototypical size via context priming crossed with consensus level (high versus low) to allow the same percentages to either exceed or fall short of the expected level of consensus. If the correlation hypothesis holds, majority consensus that is larger than expected should always lead to more positive attitudes. In contrast, if the matching hypothesis holds, majority consensus that exceeds the prototypical level should be less influential. To achieve conditions in which small vs. large prototypical majorities are expected, we implemented two variants of a context priming task.

Effects of Context on Prototypical Consensus Size

We argue that specific expectations about the size of majorities (or minorities) and respective evaluations should be triggered by context information (Dickel & Bohner, 2012, see also Erb et al., 2006, p. 230). Certain situations imply their own prototypical consensus

levels. For example, in polls regarding which candidate would be elected, or in actual political elections, small majorities just above 50% are routinely observed (e.g., French presidential election, May 2012[1]: Sarkozy, 48.1% vs. Hollande, 51.9%; U.S. presidential election, November 2012[2]: Romney, 47.8% vs. Obama, 50.6%; popularity poll regarding candidates for German chancellor, November 2012[3]: Merkel, 53% vs. Steinbrück, 36%). In other contexts such as user evaluations, larger majorities are common (e.g., Hotel Reservation Service website: best ratings from 78% to 92%, amazon: best ratings ca. 75% to 99%, ebay seller evaluations: 99% to 100%). We propose that majority consensus information will be most persuasive if it matches the expected level of consensus in a particular situation. For example, in an ad for shampoo that says a majority of all testers was highly satisfied with the product, the optimally effective percentage should be just at the right level for this context, presumably around 85%. Less intuitively, in election polls where relatively small majorities are common, low levels of consensus just above 50% should exert more influence than very large majorities, which may instead elicit unwanted negative influence.

Consensus information that matches the contextual expectation should have more impact on attitudes than consensus information that does not match these expectations because matching information appears appropriate and trustworthy and may therefore be used as a valid heuristic cue (Chaiken, 1987; Mackie, 1987) for the issue at hand. Non-matching consensus information, by contrast, may provoke surprise or mistrust. If a consensus cue is mistrusted it will not be used as valid cue (Vries, 2006). A potential mechanism underlying a blocking of influence in non-matching conditions may be that more attention is devoted to unexpected consensus information (Stangor & McMillan, 1992), which may direct attention

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1 Official election result in the run-off 6th May 2012.

2 Preleminary results retrieved on Wikipedia on 14.11.2012

3 Source: Tagesschau.de retrieved on 14.11.2012

to the persuasion attempt and lead to judgmental correction (Wegener & Petty, 1995). However, under conditions of very low attention – as may be typical for watching television commercials – it is more likely that consensus information is not retrieved from memory but reconstructed on the basis of the prototypical consensus in the particular situation (Dijksterhuis & van Knippenberg, 1995), as we outline in the next section.

Memory for Schema-congruent vs. Schema-incongruent Consensus Information

Memory research offers two perspectives on schema-congruent versus schema-incongruent information. On the one hand, studies on the recall of congruent (or expected) versus incongruent (or unexpected) information revealed that people are better able to recall unexpected information than expected information (Hastie, 1981; Stangor & McMillan, 1992). On the other hand, people tend to memorize new information better when they can connect it to an existing schema (Markus, 1977; van Kesteren, Ruiter, Fernández, & Henson, 2012, see also Schützwohl, 1998). A moderator between the two outcomes seems to be whether people have enough cognitive resources available during encoding: When only little capacity is freely available, schema-congruent information is recalled more accurately than schema-incongruent information (Dijksterhuis & van Knippenberg, 1995).

In their study on large minorities and small majorities, Erb et al. (2006) report evidence for better memory of schema-incongruent consensus information: Latencies for consensus recall were shorter in mismatching conditions. The authors interpret this as evidence for more elaboration during encoding, which built more cognitive links and thus led to higher accessibility of the memorized consensus information. However, this would probably not hold under conditions of low attention (see Dijksterhuis & van Knippenberg, 1995; White & Carlston, 1983) as are typical for an advertising context, where people do not pay close attention and therefore do not build enough cognitive links to significantly increase the accessibility of incongruent information. Instead, when asked to retrospectively report a

majority's size, people will reconstruct the level of consensus on the basis of their context-specific schema. (see, e.g., Judd & Kulik, 1980).

Hypotheses of the Present Research

In sum, we assume that numeric majority sources have their greatest impact on attitudes if the presented level of consensus matches the expected level; this is because only an appropriate level of consensus will be accepted as a valid heuristic cue for evaluative judgments. In two experiments, we tested whether presented consensus information impacts the evaluation of an attitude topic most when it matches the prototypical consensus size in the given situation. Moreover, this effect should be mediated by the accuracy with which people reconstruct the presented level of consensus; the more accurate people reconstruct the consensus level the better they will be able and willing to use consensus information as a heuristic cue.

Experiment 1

We designed Experiment 1 to show that a priming of different contexts would trigger different representations of prototypical numerical consensus. The experiment followed a 2 (context priming: election polls vs. user evaluations) by 3 (majority size: small vs. medium vs. large) design with the latter factor varying within participants. Participants first underwent a context priming task; then they were exposed to several slides containing majority information regarding various topics. Importantly, these were presented in quick succession so that participants could not process them thoroughly. We predicted that those consensus levels that matched the activated context would be recalled particularly well: After the election poll priming smaller majorities should be recalled more accurately than larger majorities, whereas after the product rating priming larger majorities should be recalled more accurately than smaller majorities. Furthermore, we predicted that attitudes toward the presented issues would be most positive in those conditions where consensus levels matched the activated context.

Method

We manipulated numerical majority sizes as well as the activated context in which they were perceived. Simulating an advertisement setting, we implemented short presentation spans and a sequence of several "information sites" (see also Thoben, 2011) to create similarly low levels of attention.

Participants and procedure. The experiment was conducted at the beginning of an introductory social psychology lecture early in the students' first year, before they had learned about attitudes and social influence. A total of 107 students attended, but 13 participants did not write down at least one situation during the context priming task. Their data were excluded, leaving a final sample of 94 participants (78 female, 16 male; age range: 18–66).

First, during the priming task, participants described up to three situations in which they had thought about or discussed either election poll results or user evaluations. This was intended to activate a context in which either small or large majorities are prototypical. The priming task was followed by an automated presentation of slides that each contained information on a real or fictitious attitude issue (e.g., whether children's rights should be integrated in the constitution or a tunnel should be built in Rotterdam).

Context priming. To prime prototypical majority sizes, we asked participants to remember three situations in which they had thought about or discussed either election poll results or user evaluations. This task was introduced as part of a research project on how people perceive survey results.

Presentation of majority information. After completing the context priming task, participants watched a series of color slides. Each slide provided text and pictures related to one particular attitudinal issue, along with either a bar chart or pie chart depicting relatively realistic numerical support for the issue (e.g., showing that 87% of the people surveyed had their children vaccinated, see Appendix A). Each slide was presented for 10s, and a white screen of 2 s was interspersed between stimuli. Importantly, the slides contained too much

information for participants to read the full text, so participants could do little more than to notice the issue and numerical consenus associated with it. Three slides each provided charts presenting either small (51–63%), medium (64–79%), or large (80–100%) majorities.

Attitude and consensus judgments. After the slide presentation, the students completed a short questionnaire consisting of 18 items: one attitude item and one consensus item for each of the nine issues that had been shown. Attitude items were followed by a response scale from 1, "do not agree at all" to 7, "completely agree" Consensus was to be reported as a percentage figure. The questionnaire ended with some demographic questions.

Results

Retrospectively reported consensus. Reported consensus was pooled for the three majority sizes representing each level (small, medium, and large, respectively). Then a 2 (context priming) by 3 (majority size) analysis of variance (ANOVA) with repeated measurement on the second factor was conducted, using the pooled consensus judgments as the dependent variable. A significant main effect of majority size, $F(2, 90) = 281.23$, $p < .001$, $eta^2 = .86$ revealed that participants reported approximately correct consensus sizes overall ($M_{low} = 53.40$, $M_{medium} = 71.72$, $M_{high} = 78.71$; for cell means and standard deviations see Table 1). No other effects were significant, all $p > .5$.

Accuracy of reported consensus. We computed inaccuracy scores for reported consensus, again pooled over the three issues that represented a given level of majority size, as the absolute difference between presented consensus and reported consensus. To test our directional interaction hypothesis that smaller (larger) majorities would be reported more correctly in the election poll (user evaluation) priming condition, we defined linear contrasts of opposite sign within each priming condition. Contrast analysis supported our hypothesis, $F(1, 91) = 4.47$, $p < .05$, $eta^2 = .05$; with all means patterning exactly as predicted (see Table 1 and Figure 1).

Attitude judgments. A 2 (context priming) by 3 (majority size) mixed ANOVA on attitude judgments yielded a significant main effect of consensus information, $F(2, 91) = 63.15$, $p < .05$, $eta^2 = .58$, with attitudes more positive the higher consensus was ($M_{low} = 3.16$, $M_{medium} = 3.87$, $M_{high} = 4.05$). No other effects were significant, Fs < 1. Thus, our hypothesis that predicted an interaction effect of majority size and context priming on issue-related attitudes was not corroborated.

The effect of consensus on attitudes was not mediated by retrospective report of consensus. Reported consensus and attitude judgments are uncorrelated at all three levels of presented consensus, all rs < .17, ps > .8 (see Judd, Kenny, & McClelland, 2001 for mediation analysis in within-subjects designs).

Discussion

In this experiment we could demonstrate that retrospective reports of majority size were relatively accurate overall. More importantly, variations in the accuracy of consensus reports depended on the prototypes of majorities that had been contextually primed. Specifically, consensus levels that matched expectations based on the activated context were reported more accurately than consensus levels that did not match such unexpectations. The good overall accuracy of reported consensus may have been caused by the relatively realistic consensus information that was paired with each presented topic. Nonetheless, the most interesting finding is the interaction effect in accuracy of reported consensus, as it suggests an adapted reconstruction of the consensus information. Such reconstruction of consensus information may build the ground for its use as a heuristic cue for evaluative judgments.

However, despite the emergence of an interaction effect in the accuracy of reported consensus, which was fully as predicted, we did not observe the predicted interaction pattern in attitude judgments. Thus, there was no evidence for increased influence in conditions that presented consensus information matching the primed prototype. This may partly be due to the within-subjects design that was owed to the lecture setting: As consensus size was not

counterbalanced across issues, we could not analyze the full impact of consensus information on attitudes in this experiment. Consensus varied across issues but not within issues because all participants watched the same presentation at the same time. Hence, the issues themselves, many of which were real or at least realistically linked to existing content areas, may have affected attitudes most and may have overshadowed the potential effect of consensus information in context.

To investigate the impact of the match between context-triggered expectation about the size of a majority and the actually presented level of consensus on social influence we conducted a second experiment that manipulated context and size of majority in a fully between-subjects 2 x 2 design.

Experiment 2

Experiment 2 featured a 2 (context priming: election polls vs. user evaluations) by 2 (majority size: small vs. large) between-subjects design. This provided the opportunity to explore more systematically the impact of consensus information on attitudes in the two contexts. In Experiment 1 we had shown that people reconstruct consensus information on the basis of context-specific prototypical majority sizes. This effect should be increased if the attitude object is new and consensus level cannot be inferred from the object itself. Therefore we used a fictitious touristic area – the "Curutao Lake" – as the attitude object (see Erb et al., 1998).

As in Experiment 1, reported consensus should be more accurate if the presented size of majority matches the prototypical size suggested by the primed context. The absolute difference between reported consensus and presented consensus should thus be smallest in the election poll context when small majorities were presented and in the product ratings context when large majorities were presented. We further assumed that, with a fictitious attitude object and a between-subjects variation of majority size, the second hypothesis from Experiment 1 would be supported. Evaluations of the attitude object should thus be more

positive when consensus information matches rather than mismatches the primed prototypical size. This means that evaluations should be most positive in the election poll context when a small majority is presented and in the user evaluations context when a large majority is presented. Finally, attitude positivity should be mediated by accuracy of reported consensus, because people will use reconstructed consensus information when it is an appropriate heuristic cue.

Method

Experiment 2 was conducted online. Participants were invited via e-mail and twitter to take part in an online-study on “automatic text comprehension”. As a reward they could take part in a lottery for online shopping coupons. Anonymity was guaranteed, and participants gave their informed consent by clicking on a "proceed" button before the anonymous data collection started. Prototypical majority sizes were activated via the same priming task as in Experiment 1. Then participants were shortly exposed to an “information site” about a fictitious touristic area. Size of the majority in favor of the touristic area was manipulated with a bar chart depicting consensus as a percentage (see Appendix B).

Participants and procedure. A total of 93 participants completed the experiment online. Participants were randomly allocated to one of the four experimental conditions. Of the 93 participants, 58 correctly recalled that a majority was in favor of the touristic area. Only their data were retained for further analyses. Dropout was independent of conditions, χ^2 (df = 1, N = 93) = .27, *ns*. Of the final sample, 17 participants were male and 41 female; age ranged from 18 to 57 years.

Context priming. After reporting demographic information, participants underwent the same priming task as in Experiment 1, with the only exception that instead of writing by hand they were asked to type their texts regarding either election polls or user evaluations in boxes appearing on the screen.

Manipulation of majority size. Later, participants were informed that they would be shown an information website about a touristic area for 10 s. They then saw an information screen about the (fictitious) touristic area 'Curutato Lake' (see Erb et al., 1998). The site was identical with one of the slides used in Experiment 1. It contained three columns of text about the area and a photograph of a Brasilian lake. The text comprised eight arguments in favor of the area (see Erb, Büscher, Bohner, & Rank), but as it was presented for only 10 s, participants were unable to read all the arguments. Also, a bar graph was shown depicting a majority of people who recommended the touristic area. In the small majority condition, the graph showed 53% consensus; in the large majority condition, it showed 89% consensus (see Appendix B).

Dependent variables. After presentation of the information website, the following dependent variables were assessed: (a) attitude toward Curutao Lake, (b) retrospectively reported consensus, (c) and accuracy of reported consensus. Reported consensus was assessed by asking participants how large (in percent) the group was that recommended the touristic area as depicted in the bar chart. Accuracy of reported consensus was again computed as the absolute difference between reported consensus and actually presented consensus. Participants' attitude toward Curutao Lake was assessed by 11 Likert-type items (e.g. “The Curutao Lake is generally a worthwhile holiday destination.” or “The Curutao Lake area is particularly save.”), each followed by a response scale from 1, “do not agree at all,” to 7, “completely agree” (Cronbach’s $\alpha = .87$). In the end, participants were debriefed and then redirected to another website if they wanted to take part in the lottery.

Results

Each dependent variable was analyzed using a 2 (context priming) by 2 (majority size) ANOVA. For all condition means, see Table 2.

Retrospectively reported consensus. The ANOVA revealed that participants in the election poll conditions recalled a significantly smaller size of majority ($M = 63.83\%$) than

did participants in the user evaluation conditions (M = 79.64%), F (1, 54) = 45.91, p < .001, eta^2 = .46. No other significant effects were observed, all ps > .5.

Accuracy of reported consensus. Replicating the findings of Experiment 1, only a significant interaction effect of context priming and majority size emerged for the accuracy scores, F(1, 54) = 46.26, p < .001, eta^2 = .46. As predicted, reports were more accurate in those conditions where the primed prototypical consensus size matched the presented consensus size (see Table 2). For all other effects, p > .1.

Attitude. A significant interaction of context priming and majority size emerged, F (1, 64) = 4.05, p < .05, eta^2 = .06. As predicted, attitudes were more positive in those conditions where the primed prototypical consensus size matched the presented consensus size (see Table 2). For all other effects, p > .5.

Attitude strength. An ANOVA on the attitude strength measure revealed a significant interaction of context priming and majority size, F (1, 54) = 5.45, p < .05, eta^2 = .09. Attitudes were stronger in those conditions where the primed prototypical consensus size matched the presented consensus size (see Table 2). For all other effects, p > .2.

Mediation analyses. The interaction effect of context priming and majority size on attitudes was not mediated by reported consensus size, as might have been expected based on previous mere consensus experiments. In fact, none of the bivariate correlations among the respective interaction contrast, reported consensus, and attitudes toward Curutao Lake was significant (rs < .1). Instead, as predicted, the interaction effect of context priming and majority size on attitudes was mediated by the accuracy of reported consensus, z = 1.92, p = .05, Sobel test (see Figure 2). Hence, the data suggest that matching (vs. non-matching) conditions produced more accurate reconstruction of consensus levels, which in turn led to more positive attitudes.

Discussion

In Experiment 2 we found increased influence of consensus information on the attitude toward a fictitious topic in the conditions presenting a consensus level that matched (vs. did not match) the primed prototype. We could show that this effect was mediated by the accuracy of retrospectively reported consensus. A plausible explanation for this mediation would be that a reconstruction of consensus information that better matches a highly accessible prototype increases social influence because consensus levels that deviate from the prototype appear inappropriate and are thus not be used as a heuristic cue for evaluating the issue at hand. Intriguingly, less influence of a majority position on attitudes was observed not only when the presented level of consensus fell short of a high prototype, but even when the presented level of consensus exceeded a low prototype. Hence, depending on the situation majorities may be too large to be persuasive.

General Discussion

Two experiments provided evidence for the context-dependency of mere consensus effects. Majorities' influence may depend on the fit between presented consensus size and situationally reconstructed consensus size. When presented consensus information fits with the contextually activated prototype of consensus, the majority is accepted as a valid cue for evaluative judgments (Bohner et al., 2008; Chaiken & Stangor, 1987; Erb et al., 1998). This pattern supports our matching hypothesis, which states that consensus information has to be appropriate to the context to show maximal influence; it is incompatible, however, with the hypothesis of a linear increase in influence with increasing consensus levels of consensus (Erb et al., 2006; Latané & Wolf, 1981).

As we compared only majority conditions varying in size and contextual fit, our experiments do not speak yet to the question whether the matching hypothesis also applies to minority consensus. At a first glance, Erb and colleagues (2006) found evidence that contradicts the matching hypothesis when minorities that exceeded the prototype had more

positive influence on attitudes. However, in the mere consensus approach minorities usually have negative influence on attitudes (cf. Imhoff & Erb, 2009), hence the mismatching consensus may have blocked the use of the minority cue for attitude judgments. In order to test this idea of blocked negative minority influence, contexts in which a particular level of minority consensus is prototypical (and negative) must be identified and systematically varied along with consensus level. But, the case of minority influence is more complex than majority influence, because different from majorities which are evaluated positively in most cases, minorities are evaluated more ambiguously (Mucchi-Faina, Pacilli, & Pagliaro, 2011)

More research is needed to pinpoint the processes underlying the increased influence of matching consensus information. Although a mediation of the matching effect via accuracy of the reported consensus was found, we cannot say based on the current data why exactly the accuracy of reported consensus predicts attitudes. We assume that better matching reconstructed consensus is more likely to be regarded as a valid heuristic cue for evaluating the issue. People may use mainly schema-congruent consensus information because this indicates validity of the heuristic cue.

Presumably, these findings are most relevant for applications in election campaigns. According to our data, election campaigners should emphasize only poll results that provide sound majorities. Should they be in the unlikely situation that their party already enjoys an unusually large majority support, it might be better not to emphasize the exact numerical level of consensus; instead, stating only that the party is supported by a majority would trigger suitable inferred consensus sizes and should thus be more persuasive. Another real world application that often employs consensus information are advertisements. For advertisers that use consensus information as a persuasive cue our research would imply that consensus information should be tailored to the context to have optimal impact. For instance, when consensus is presented as a result of product testing, presenting very high percentages of users that recommend a product would be most effective.

In sum, our experiments show that the effects of social consensus depend on contextual expectations. Sometimes consensus can be too high to be effective, and small majorities may be more convincing.

Table 1

Reported Consensus, Accuracy of Reported Consensus, and Standardized Attitudes by Context Priming Condition and Majority Size (Experiment 1)

	Majority size			
	low	medium	high	*n*
Election polls				
Reported consensus	53.70 (5.19)	71.98 (8.97)	78.07 (9.04)	52
Accuracy[a]	8.39 (4.60)	9.96 (6.11)	10.36 (7.24)	52
Attitudes	–0.09 (0.70)	–0.08 (0.66)	–0.01 (0.49)	52
Users ratings				
Reported consensus	52.52 (8.87)	72.08 (8.29)	79.15 (9.14)	41
Accuracy[a]	10.98 (6.88)	10.59 (6.83)	9.15 (8.02)	41
Attitudes	0.06 (0.60)	0.10 (0.55)	.05 (0.43)	42

Note: Standard deviations in parentheses.

[a] Deviation scores: Lower scores indicate greater accuracy of reported consensus.

Table 2

Reported Consensus, Accuracy of Reported Consensus, Standardized Attitudes, and Attitude Strength by Context Priming and Majority Size Conditions (Experiment 2)

	Majority size			
	Low		high	
Election polls				
Reported consensus	63.44	(8.97)	64.29	(8.65)
Accuracy[a]	6.31	(8.33)	24.71	(8.65)
Attitudes	4.66	(0.97)	4.12	(0.61)
Attitude strength[b]	1.06	(0.25)	1.13	(0.49)
User evaluations				
Reported consensus	80.36	(5.33)	79.18	(10.41)
Accuracy[a]	22.36	(5.33)	10.76	(9.37)
Attitudes	4.10	(0.54)	4.48	(0.96)
Attitude strength[b]	1.30	(0.49)	.90	(0.30)

Note. Standard deviations in parentheses.

[a] Deviation scores: Lower scores indicate greater accuracy of reported consensus.

[b] Individual standard deviation across 11 attitude items: Lower scores indicate greater attitude strength.

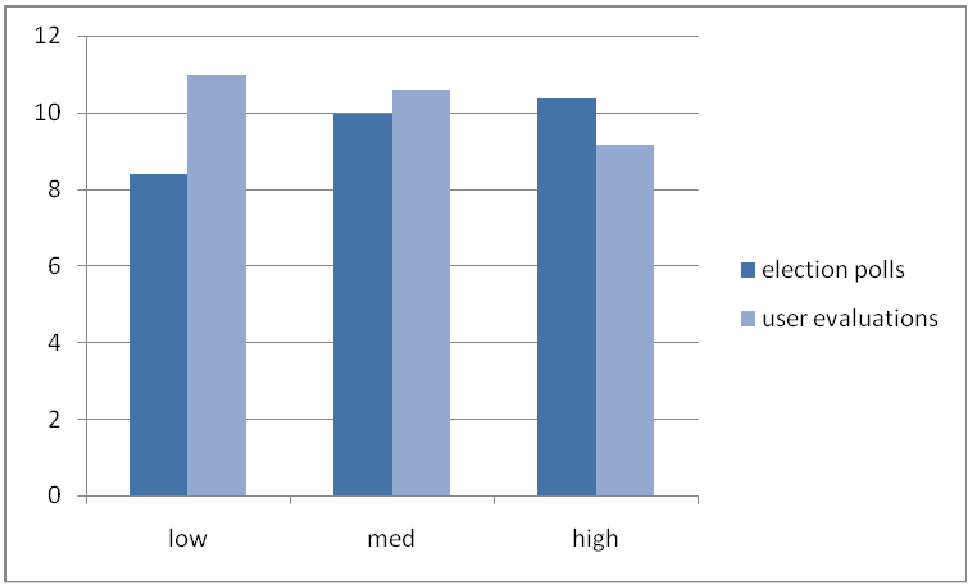

Figure 1. Accuracy of reported consensus (with lower values indicating higher accuracy) as a function of presented majority size and context priming.

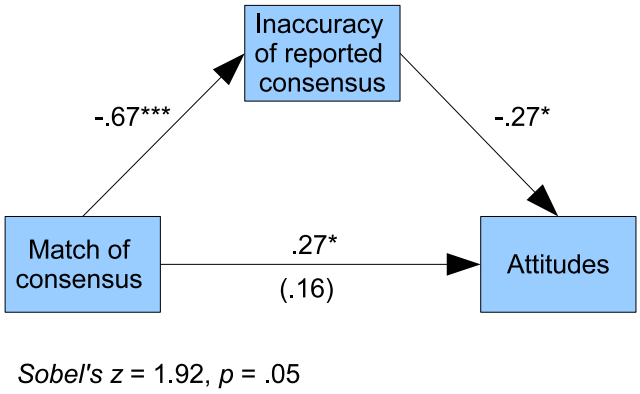

Figure 2. Mediation of the effect of match of consensus (interaction contrast of context priming by consensus size) on attitudes toward Curutao Lake via accuracy of reported consensus. Lower values on the accuracy index indicate higher accuracy. Statistics shown are beta coefficients; the coefficient for the direct (unmediated) effect appears in parentheses. *$p < .05$, *** $p < .001$.

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Appendix A: Examples of slides in experiment 1

Kinderärztliche Praxis
Soziale Pädiatrie und Jugendmedizin

KIRCHHEIM

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Die meisten Eltern lassen ihre Kinder nach der Empfehlung der Ständigen Impfkommission (STIKO) impfen

Impfungen gehören zu den wichtigsten und wirksamsten präventiven Maßnahmen, die in der Medizin zur Verfügung stehen. Moderne Impfstoffe sind gut verträglich und unerwünschte Arzneimittelnebenwirkungen werden nur in seltenen Fällen beobachtet. Unmittelbares Ziel der Impfung ist es, den Geimpften vor einer ansteckenden Krankheit zu schützen. Bei Erreichen hoher Impfquoten ist es möglich, einzelne Krankheitserreger regional zu eliminieren und schließlich weltweit auszurotten. Die Elimination der Masern und der Poliomyelitis sind erklärte und erreichbare Ziele nationaler und internationaler Gesundheitspolitik. Für Poliomyelitis ist dieses Ziel u.a. in Europa bereits erreicht worden. Die Internetseiten des Robert Koch-Instituts zum Impfen informieren zu vielen Aspekten dieses wichtigen Themas. Sie finden auf den Internetseiten unter Impfempfehlungen: die Empfehlungen der Ständigen Impfkommission mit den Impfungen für Säuglinge, Kleinkinder, Jugendliche und Erwachsene und mit der Tabelle der Indikations- und Auffrischimpfungen. Neben den aktuellen Empfehlungen enthält diese Rubrik auch das Archiv aller vorhergehenden Empfehlungen der STIKO, den Geimpften vor einer ansteckenden Krankheit zu schützen.

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Texte schreiben oder Informationen recherchieren in bunten Polstersesseln, bequemen Sitzsäcken oder zwischendurch auch mal am Stehtisch? Kein Problem im neuen Lernzentrum im Bauteil B1 der Universität. Wer nach den Semesterferien das Informationszentrum der Bibliothek betritt, stellt fest: Hier hat sich einiges geändert. „Wir haben rund 60 Regale abgebaut und die Bestände verlagert", erklärt Monika Brückner, Leiterin des Informationszentrums. Der frei gewordene Raum von 350 Quadratmetern bietet 70 neue Gruppenarbeitsplätze und die Möglichkeit, in einer entspannten Atmosphäre neue Lern- und Arbeitsformen auszuprobieren. Dazu gehören flexible Möbel, die viel Gestaltungsraum für individuelle Lernbedürfnisse lassen, und professionelle Beratungsangebote, die Studierende beim Arbeiten in Gruppen oder bei der Nutzung der Bibliothek unterstützen.

„Bei einer Gruppenarbeit sitzen Studierende oft auf der Galerie oder in der Cafeteria. Aber viele hätten dafür gerne ruhigere und bequemere Arbeitsplätze, an denen sie sich besser konzentrieren können", weiß Christian Tietze. Der 23-Jährige studiert Philosophie, Soziologie, Mathematik und Informatik und arbeitet mit im Projekt Peer Learning des Arbeitsbereichs Lehren & Lernen. Dort werden zusammen mit Studierenden neue Formen des Zusammenarbeitens beim Lernen entwickelt und umgesetzt. Der Wunsch nach geeigneten Gruppenarbeitsplätzen ist ein Ergebnis einer Umfrage, die das Team Peer Learning im letzten Sommer- und Wintersemester unter Studierenden durchführte. „Es reicht nicht mehr, den Studierenden einen Tisch und einen Stuhl hinzustellen. Durch die neuen Studienmodelle entstehen auch neue Lernformen, die wir noch stärker unterstützen wollen", erklärt Barbara Knorn, Dezernentin für Bibliotheks-

Appendix B: Operationalization of presented consensus size in experiment 2

Urlaubsziel Brasilien: Der Curutao-See

Das Gebiet um den Curutao-See ist touristisch gut erschlossen. Einige Restaurants und Souvenirläden laden zum Verweilen und Bummeln ein.

Die weitere Landschaft um den See ist in einigen Teilen nahezu unberührt und gilt als Tipp unter Urlaubern. Es wird erwogen, die Tierwelt der Umgebung in ihren ursprünglichen Artenreichtum zurückzuversetzen. Dies wird einige Möglichkeiten für Fotoausflüge bieten.

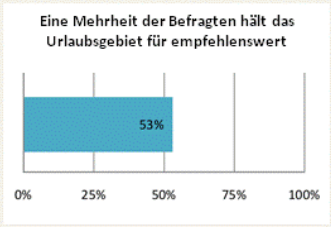
Das Urlaubsgebiet Curutao-See wird zwar nicht direkt angeflogen, es lässt sich jedoch mit einer achtstündigen Bahnfahrt erreichen. Insofern sind schnelle An- und Abreise gewährleistet.

Das Gebiet entspricht modernen ökologischen Standards. Eine Stadtverordnung verbietet den Verkauf von Speisen in Einwegverpackungen.

Der See bietet ein Angebot für Wassersportler. Im klaren Wasser des Sees finden sich viele Stellen mit Unterwasserlandschaften, die zum Schnorcheln und Tauchen einladen. Tauch- und Surfkurse werden ebenfalls angeboten.

Die Kriminalitätsrate in der Region ist besonders niedrig. Aufgrund der guten sozialen Situation der lokalen Bevölkerung, die vom Tourismus profitiert, ist die Kriminalitätsrate geringer, als in deutschen Urlaubsgebieten vergleichbarer Größe.

Wie ganz Brasilien, so ist auch das Gebiet um den Curutao-See besonders für preisbewusste Urlauber geeignet. Ein Urlauber bezahlt nur etwa 50€ pro Nacht.



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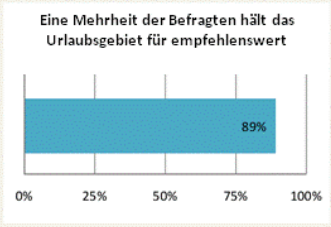
Die Kriminalitätsrate in der Region ist besonders niedrig. Aufgrund der guten sozialen Situation der lokalen Bevölkerung, die vom Tourismus profitiert, ist die Kriminalitätsrate geringer, als in deutschen Urlaubsgebieten vergleichbarer Größe.

Wie ganz Brasilien, so ist auch das Gebiet um den Curutao-See besonders für preisbewusste Urlauber geeignet. Ein Urlauber bezahlt nur etwa 50€ pro Nacht.



Lateral Attitude Change: Generalization and Compensation Effects

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Abstract

The authors propose a framework distinguishing two types of lateral attitude change (LAC): (1) *generalization effects*, where attitude change toward a focal object transfers to related objects, and (2) *compensation effects*, where only related attitudes change but the focal attitude does not change. The authors outline the conditions and underlying processes of each type of effect and bring together examples of LAC from various domains of research. Compared to established theories of attitude change, the LAC framework focuses on lateral instead of focal attitude change and encompasses both generalization and compensation. Novel predictions and designs for studying LAC are presented. (100 words)

Keywords: attitudes, attitude change, lateral attitude change, generalization, compensation

Lateral Attitude Change:

Generalization and Compensation Effects

What is Lateral Attitude Change?

Change of an attitude toward a certain object often goes along with side effects such as changed evaluations of related attitude objects. Sometimes the evaluation of lateral attitude objects changes even though there is apparently no change in the focal attitude. Such side effects often go unnoticed, although their study could deepen our understanding of evaluative processing. They will thus be the topic of this review.

Let us consider some examples: (1) A person's friendly encounter with a member of a derogated group, e.g., an illegal immigrant, will typically change not only the person's attitude toward the target group but also her attitudes toward other groups, e.g., homeless people, which are perceived to be similar to the original group (Harwood, Paolini, Joyce, Rubin, & Arroyo, 2011; Pettigrew, 2009). (2) People who have repeatedly been exposed to certain faces show increased liking of similar faces of strangers (Zebrowitz, White, & Wieneke, 2008). (3) Majority members who listen to minorities advocating a certain topic may change their evaluation primarily of related topics – but not of the message's central topic (Alvaro & Crano, 1997).

Findings like these are not in the focus of classic theories of persuasion and attitude change, which typically deal with the phenomenon of a social agent (A) trying to change a recipient's (R) attitude or with a recipient perceiving information (I) in certain circumstances that generate a change in the attitude toward a given object (X). Across theoretical approaches, the preferred explanantia cover variables related to A, R, I, or X (McGuire, 1985; Smith, Lasswell, & Casey, 1946), whereas the explanandum typically is more narrowly identified as change in the focal attitude (toward X). In some instances, researchers have also

addressed change in other attitudes (toward Y, Z, etc.) as a result of change in the focal attitude (Fazio, Eiser, & Shook, 2004; Shook, Fazio, & Eiser, 2007) or in the absence of observed change in the focal attitude (Alvaro & Crano, 1997; Crano & Chen, 1998).

With respect to such situations, we broadly define change in R's implicit or explicit evaluation of objects Y, Z, etc. that is caused by processes (e.g., encoding of a persuasive message, evaluative conditioning) related to a different object X as *lateral attitude change* (LAC, see Figure 1). Hence, in cases when an influence agent is involved, LAC may constitute unintended side effects of influence attempts; but LAC may also be an influence agent's strategic goal (e.g., if a direct influence attempt appears inappropriate). This opens interesting perspectives for research on social influence. However, the focus of this review is broader, addressing attitude change processes in general.

For the purposes of this review, we define the term attitude broadly as an evaluation of an object of thought (see Bohner & Wänke, 2002). We are aware that many theorists ascribe more substance to the attitude construct, such as structure (e.g., Fabrigar, MacDonald, & Wegener, 2005), or action readiness (e.g., Ajzen & Fishbein, 2005; Glasman & Albarracín, 2006). Moreover, representation of attitudes can also be conceptualized in different ways. The two most prominent perspectives on attitude representation, the construction perspective (Schwarz, 2007; Schwarz & Bohner, 2001), which assumes that attitudes are constructed based on situationally activated information, and the memory perspective (Petty, Brinol, & DeMarree, 2007), which assumes that evaluations are stored readily in memory, (for a review see Bohner & Dickel, 2011), can both accommodate LAC. Our focus here is on the transfer of evaluations between attitude objects and hence on the construction of evaluative judgments, but we also discuss memory-based processes in the LAC framework. However, we do not accord any special status to information recalled from memory as opposed to newly encountered information in LAC processes (Bohner & Dickel, 2011; Schwarz & Bohner, 2001). We also take a broad perspective on attitude change, defining it as any observable

change in the evaluation of an object of thought, which includes such phenomena as forming new evaluations toward unfamiliar objects and changes in the valence of stereotype content.

To illustrate LAC effects, let us consider an example (Fig. 1): A recipient (R) notices new information (I), e.g., a leaflet on the benefits of car-sharing (object X). In one case, the recipient may adopt the evaluation implied by the information. In another case, the recipient will stick to his own view of X and will not adopt the implied evaluation. However, we assume that in both cases lateral attitude change to related topics may occur automatically – in our example positive automatic evaluations (e.g., activated when seeing happy people sharing cars) toward car-sharing transfer toward the use of bicycles (Y) or public transportation (Z). If the evaluation of X changes in the first place, we assume that this change may generalize to related topics Y and Z – we call this class of LAC-effects *generalization effects*. However, when R resists change in X, such lack of focal change may still be accompanied by change on related topics – we call this class of LAC effects *compensation effects*. We propose that generalization and compensation effects can be parsimoniously explained within one theoretical framework involving automatic and deliberate processes.

<Insert Figure 1 about here.>

In the following, we will outline a framework specifying the same basic processes of LAC as underlying both generalization and compensation effects. From this novel perspective, published research examples for the two classes of effect will be reviewed. Furthermore, established models of attitude formation and change will be examined with respect to their ability to accommodate LAC phenomena. Drawing on a variety of research findings and theoretical models, we will close by outlining new predictions derived from the LAC framework.

The LAC Framework

We argue that compensation effects are based on the same basic principles as generalization effects. More specifically, we assume that generalization as well as

compensation effects are based on the automatic activation of associative structures related to the focal attitude: When an automatic evaluation of X is activated, related concepts Y, Z, etc. are activated in line with this evaluation. However, explicitly self-reported evaluations of X and Y can differ from one another: For instance, at a deliberate level, people may generate subjective reasons not to transfer an evaluative judgment from a focal attitude object to a lateral attitude object. In the case of compensation effects, explicit expression of attitude change on the focal attitude may be deliberately avoided – even though the automatic evaluative association with X is activated. Such short-term change in the automatic evaluation of X may still spread to related concepts and be expressed at an explicit level, producing a compensation effect.

To account for both generalization and compensation of focal attitude change we propose the following postulates in the LAC framework:

(1) When information about the focal object (X) is perceived, a general evaluation of the object is automatically activated.

(2) Concepts associated with the focal attitude object – i.e. lateral attitude objects (Y, Z, etc.) – are also activated automatically. Value spreads from X to Y, Z, etc.

(3) Deliberate thinking about the activated concepts may bring additional information to mind.

(4) Such deliberate thinking can either affirm the automatic evaluations of X, Y, and Z, resulting in generalization effects,

(5) or it can reject the automatic association toward X but affirm change on Y and Z, resulting in compensation effects.

(6) Additionally, subjective reasons not to generalize may be generated and corrected for, resulting in a lack of lateral change.

(7) Reasons to reject the automatic association as well as reasons not to generalize can become inaccessible in memory, and such memory decay can contribute to delayed change on

the focal or lateral attitude(s).

Consequently, when an evaluation is generalized from the focal attitude object to lateral attitude objects, the automatic evaluation associated with the focal object spreads to lateral objects and forms the basis for explicitly expressed attitudes – as long as no reason for rejection is identified. Generalization effects will also be observed when people think deliberately about the relation between focal and lateral object and find a subjective reason to generalize. Such a subjective reason could be a consciously recognized similarity between two objects. If, on the other hand, subjective reasons not to generalize across attitude objects are identified, the attitude will not be deliberately transferred to a related attitude. This can result in a pattern with explicit evaluation change on the focal attitude object and no explicit evaluation change on the lateral attitude object. Over time, however, memory of these reasons may decay, potentially resulting in delayed generalization.

Another, perhaps more interesting case of LAC are compensation effects: These will occur when the explicit evaluation of the focal attitude object is deliberately defended against change, while at the same time automatic evaluations of X are activated involuntarily. This activation spreads automatically to associated attitude objects Y and Z. Lateral attitude objects Y and Z may not be in the perceiver's focus of attention and, therefore, may not be monitored for the expression of change. Hence, the spread of automatic activation from X to Y should mediate explicit lateral attitude change. Furthermore, because activation of implicit evaluations is difficult to suppress, the typical compensation pattern – no change on the focal attitude, but change on the lateral attitude – should be found predominantly on explicit measures of attitude, whereas on implicit measures one should observe generalization.

Moderators of LAC

According to the LAC postulates, the main factor influencing whether generalization or compensation will occur is the perceiver's motivation not to change and therefore to monitor the evaluation of the focal attitude object. If people are motivated not to change their

evaluation of the focal object, they may still show compensation effects on lateral attitudes. If they are open to change on the focal attitude, this change will most likely generalize to lateral attitudes. We next discuss factors that influence the likelihood of LAC effects.

Diagnosticity of Focal Attitude

Change in evaluations of objects that are especially diagnostic for a category should be more likely to transfer to other objects from the same category. One feature that increases diagnosticity is the negativity of information (for a review see Skowronski & Carlston, 1987). Negative evaluations of X should therefore generalize or be compensated more likely than positive evaluations (Rozin & Royzman, 2001). Negative information usually attracts attention (Dijksterhuis & Aarts, 2003; Pratto & John, 1991) and is highly salient in the environment (Wentura, Rothermund, & Bak, 2000) because it is potentially threatening (Öhman, Lundqvist, & Esteves, 2001). This mechanism may be an evolved adaptation geared toward recognizing and thus avoiding a threat. Thus, if a lateral object is associated with a negatively evaluated focal object, transfer of the evaluation may be more adaptive than for positive focal objects, because the cost of failing to avoid threats is generally higher than the benefit of approaching rewards (Baumeister, Bratslavsky, Finkenauer, & Vohs, 2001, see also Haselton, Buss, & Haselton, 2000; Williams, 2009). Hence, we predict an asymmetry of generalization in favor of negative focal attitudes.

However, under certain conditions positive information can also acquire high diagnostic value (Skowronski & Carlston, 1989): In environments where negative behaviors are the norm and only certain (good) people perform good actions, positive behavior is highly diagnostic for identifying good people. Such an environment may be present when ability judgments are made: outstanding performances will only be achieved by very capable persons.

Similarly, stimuli that are evaluated as extreme or display other extreme features should also be diagnostic (see Skowronski & Carlston, 1987): Due to their higher salience and

recognition potential they may be more accessible. We assume that – like extremity – other parameters that contribute to attitude strength (see Krosnick, Boninger, Chuang, Berent, & Carnot, 1993; Pomerantz, Chaiken, & Tordesillas, 1995), e.g., centrality, will also increase LAC. The amount of generalization or compensation that an attitude causes may even be considered a novel indicator of attitude strength.

The common denominator of negativity, extremity, and under certain circumstances positivity is that they constitute non-normative or unexpected information within the given context. We acknowledge that in most real world settings negativity, extremity, and unexpectedness are mutually related. Disentangling them experimentally (e.g., Bohner, Bless, Schwarz, & Strack, 1988) should provide interesting insights into the mechanisms of LAC effects. In sum, the negativity, extremity, or unexpectedness of incoming information should result in stronger LAC effects.

Hierarchical Level of Focal Change

We assume that focal change at higher levels of the cognitive architecture should render LAC more likely. If new objects Y or Z can be identified as belonging to a subcategory of X, then their evaluations can be inferred from the evaluation of the superordinate category X (see Wyer & Srull, 1986). This logic applies to LAC: If the evaluation of a superordinate focal object X changes, then the evaluation of subordinate lateral objects Y and Z may be inferred from the changed focal attitude and thus change as well. The relation between two attitude objects can be conceived of either as at the same level of hierarchical organization or as spanning different levels. Whereas a parallel association between two objects should produce symmetrical transfer effects between X and Y, hierarchical relations between attitudes should produce asymmetrical LAC effects.

One prominent example of how attitudes toward different objects may be hierarchically linked in a person's mind is via ideologies (Jost, 2006). Ideologies are thematically consistent cognitive structures in which more specific attitudes are embedded, as

in a classic cognitive network (Anderson, 1983; Anderson & Pirolli, 1984). People may thus derive an attitude toward a novel political issue from more general values they hold (e.g., Converse, 1964; Kinder & Sears, 1985). For instance, an individual holding freedom (equality) as a core value may derive a negative (positive) attitude toward the wearing of school uniforms.

Moreover, knowledge of the structural properties of the underlying ideological network (e.g., strength and directionality of links between concepts) allows for specific predictions regarding the strength of LAC effects to be made. For example, if we assume that a person's attitude toward the homeless (A_H) is connected to her attitude toward immigrants (A_I) only indirectly via both concepts' link to social dominance orientation (Sidanius & Pratto, 1999), then it follows that an LAC effect on A_I should be larger if the persuasive message targets this person's level of social dominance orientation than if the message targets A_H (for mathematical models specifying how changes in evaluative beliefs may affect other beliefs within a hierarchical structure, see McGuire, 1981; Wyer, 1970, Wyer, 1974). Accordingly, we assume that change at higher levels of the cognitive hierarchy, for instance change in the individual level of social dominance orientation, affects a greater number of lateral attitude objects and is therefore more effective, than change in evaluations toward specific groups.

Strength of Association Between Focal and Lateral Attitude

We propose that the extent of change on the lateral attitude (Y) is a function of the strength of X's association with Y. Different formalizations of associative links have been discussed: Associations between two objects of thought can be defined in terms of accessibility (Greenwald, McGhee, & Schwartz, 1998; but see Fiedler, Messner, & Bluemke, 2006): The degree to which the perception of one object increases the accessibility of another object reflects the strength of the association between the two objects. Individuals are not always aware of such associations (Greenwald & Banaji, 1995). Stronger associations

presumably go along with higher likelihood for generalization and – if unnoticed – also with higher likelihood for compensation.

Perceived similarity can be seen as a special case of association that relies on the amount of overlapping features of the attitude objects in question (for measures of similarity see Ashby & Perrin, 1988; Shepard, 1987; Tversky, 1977). For example, individuals may repeatedly buy electronic devices only of a single brand (Fournier, 1998) because they attribute good quality to the brand. The devices are then similar in terms of sharing a relevant feature – the brand which guarantees good quality. Higher levels of similarity go along with higher likelihood for generalization across attitudes.

However, for compensation effects, we assume a bell-shaped relationship between perceived similarity and change on the lateral attitude: While the focal object does not change in explicit evaluation, opposite implicit evaluations of X can be activated automatically for a short time span. If lateral objects are high in similarity, they too may be affected by deliberate resistance toward generalization; if, however, similarity is moderate, the association may go unnoticed and the evaluation automatically transferred from X to Y will be accepted explicitly for the lateral object without resistance. Finally, if similarity is too low, no transfer of evaluation will occur in the first place.

Mere association below the level of conscious awareness seems to affect primarily the transfer of evaluation from focal to lateral objects as captured with implicit measures (see also Gawronski & Quinn, in press; Otten, 2002; Ranganath & Nosek, 2008). When minimal associations are created that do not provide subjective reasons for the transfer of attitudes, people often generalize automatically. In many real-world settings, where similar objects are often associated in space and time, or belong to the same category, this ability of automatic generalization may be adaptive because it releases cognitive resources for other tasks. Thus, it may make perfect sense to generalize automatically across attitude objects that are associated.

Striving for Consistency

We assume that individuals who strive for consistency within their cognitions are more likely to show LAC effects. Although early theorists assumed that people in general exhibit a preference for holding consistent attitudes, beliefs, and cognitions (Festinger, 1957; Heider, 1958), the tendency to seek consistency within cognitions differs across people. These individual differences can be assessed with the Preference for Consistency scale (Cialdini, Trost, & Newsom, 1995; see also Heitland & Bohner, 2010). Inconsistency is detected by means of an uncomfortable feeling, which prompts individuals to re-establish consistency (see also Festinger, 1957). In the case of LAC, attempts at accomplishing consistency after a change in the focal attitude can either involve changing the evaluation of the lateral attitude object (i.e., maintenance of linkage), or weakening the association between the focal and lateral attitude, thus preserving the simultaneous inconsistent evaluations of focal and lateral attitude object . If weakening of associations is unlikely, individual differences in preference for consistency should moderate LAC effects, with people scoring high on the trait exhibiting higher levels of LAC once the focal attitude has changed.

Processing Effort

Persuasion theories agree that greater processing effort expended on a topic will lead to more attitude change in line with the valence of object-related thoughts generated (e.g., Bohner, Moskowitz, & Chaiken, 1995; Kruglanski & Thompson, 1999; Petty & Cacioppo, 1981). Moreover, as attitude strength is likely to moderate attitude generalization (Krosnick & Petty, 1995, see also Fazio et al., 2004; Mackie, 1987, pp. exp. 3), processing effort may affect LAC because higher levels of elaboration lead to stronger attitudes (McGuire, 1964; Petty & Cacioppo, 1981). However, we assume that higher levels of elaboration lead to higher degrees of (explicit) generalization only if the cognitive effort involved is concerned with constructing subjectively logical relations between the focal and lateral attitude object.

On the other hand, when great effort is put into defending the focal attitude, this may

produce compensation effects if the perceiver loses sight of the lateral attitude object(s). In our example (see Figure 1), while R is considering specific reasons against car-sharing, she may lose sight of the arguments aiming at features that overlap with other transportation means such as the value of car-sharing for environmental protection. The evaluation of this aspect may change as a result. However, distinct aspects of car-sharing, like sharing the vehicle with strangers, may be weighted heavily, so the overall evaluative judgment of X could be negative even though the importance of environmental protection was increased by the persuasive arguments. For lateral attitude objects such as biking, no negative aspects may be considered, resulting in a more positive evaluation of the lateral object even though the focal evaluation was not changed.

Empirical Examples for LAC

The Default Case of LAC: Generalization Effects

Empirical evidence for attitude generalization comes, for example, from research on the contact hypothesis (Allport, 1954), which states that positive contact with an outgroup target reduces prejudice toward both the target and the target's group. But positive contact effects may generalize even further: Reduced prejudice toward a particular group may transfer to non-contacted outgroups (Harwood et al., 2011; Pettigrew, 1997; Pettigrew & Tropp, 2006; Tausch et al., 2010; van Laar, Levin, Sinclair, & Sidanius, 2005). Like direct contact, imagined contact effects (Turner, Crisp, & Lambert, 2007) also generalize to other outgroups: For example, after American participants had imagined a positive contact episode with an illegal immigrant, they reported more positive attitudes not only toward illegal immigrants, but also toward other, similar outgroups such as Mexican Americans (Harwood et al., 2011, see also Hewstone & Brown, 1986). As expected, such “secondary transfer effects” (Pettigrew, 2009) were mediated by change in the focal attitude toward the contacted outgroup as well as moderated by the perceived similarity between the target group and other outgroups.

Member-to-group generalization as in intergroup contact theory can also be found in models of person perception (Brewer, 1988; Fiske & Neuberg, 1990). For instance, Crawford, Sherman, and Hamilton (Crawford, Sherman, & Hamilton, 2002) showed that trait inferences about individual group members affect group impressions. Traits known about an individual are integrated into the group stereotype with subsequent application or "transference" (p. 1076) of that stereotype (i.e., the positive or negative trait) to unknown group members. "Many prejudiced people have never encountered the objects of their antipathy. Instead, attitudes are often based on prior experiences with similar attitudinal objects, on second-hand information, or on mere associations" (Walther, 2002, p. 921). Numerous other studies found a transfer of evaluations from individuals to other individuals (Niemeier, 2011; Lewicki, 1985; Zebrowitz et al., 2008), from individuals to groups (Crawford et al., 2002), from groups to individuals (Bless, Schwarz, Bodenhausen, & Thiel, 2001), or from groups to other groups (e.g., Heitland & Bohner, 2011).

Diagnosticity of Focal Attitudes and Generalization

Past research (Fazio et al., 2004; Shook et al., 2007) supports the proposed generalization asymmetry with stronger LAC effects for negative, extreme, or otherwise unexpected information (Skowronski & Carlston, 1987): In a computer game participants first learned the valences of beans that differed in shape and number of spots. In a second phase, participants categorized new beans as good or bad. New beans were more likely to be categorized as good (or bad) if their shape and number of spots were close to those of previously presented positive (or negative) beans. Generalization was, however, more likely to occur if new beans were similar to negative beans than if they were similar to positive beans (BeanFest paradigm, Fazio et al., 2004).

Interestingly, in the same BeanFest paradigm (Fazio et al., 2004) extreme attitudes were found to generalize more likely than moderate ones. Moreover, when extremity of valence of the presented beans was manipulated (Shook et al., 2007) the generalization

asymmetry between positive and negative stimuli was partly overruled by evaluative extremity (see also Skowronski & Carlston, 1989). This illustrates our hypothesis that extremity is a crucial moderator of generalization. We assume that other aspects of focal objects that are unexpected like stereotype-disconfirming information, e.g., a warm-hearted carrier woman (Cuddy, Fiske, & Glick, 2004), should lead to higher likelihood of generalization as well.

Hierarchy of Focal and Lateral Attitudes and Generalization

In intergroup and prejudice research, the idea of a generalized rejection of outgroups can be traced back to Allport (1954; see also Adorno, Frenkel-Brunswik, Levinson, & Sanford, 1950). He argued that, for certain individuals, "all out-groups comprise one undifferentiated menace" (Allport, 1954, p. 67), or, phrased differently, fall into the same superordinate category. Ideologies such as social dominance orientation and right-wing authoritarianism (Adorno et al., 1950; Altemeyer, 1981; Carvacho, 2010; Duckitt, 2006; Duckitt & Sibley, 2007; Sidanius & Pratto, 1999) provide an organizing structure for people's attitudes toward a variety of outgroups. For example, high social dominance orientation may imply negative attitudes toward low-status outgroups such as immigrants and the homeless. Based on the concept of social dominance orientation, prejudiced attitudes toward one outgroup should be linked to attitudes toward other outgroups "because they all mirror a generalized devaluation of outgroups" (Zick et al., 2008, p. 364). Indeed, in large representative samples, negative attitudes toward several outgroups (e.g., xenophobia, racism, devaluation of homeless people) were substantially correlated (Zick et al., 2008, see also Aosved, Long, & Voller, 2009; Süssenbach & Bohner, 2011). A reduction of social dominance orientation therefore should generalize broadly to lateral attitudes. Indeed, participants who were placed in a socially dominant position via false feedback about their ability to lead groups displayed higher scores of social dominance orientation (Guimond, Dambrun, Michinov, & Duarte, 2003, expt. 3). This change in the focal belief also affected

various measures of prejudice, such as sexism and negative bias against Arabs and Blacks.

Strength of Associative Links Between Focal and Lateral Attitudes and Generalization

Some studies suggest that mere association, like spatio-temporal co-occurrence, can be sufficient to produce LAC effects: Research on evaluative conditioning typically addresses how associations between objects and evaluations can be formed by affective experience with an object. Following the pairing of a neutral stimulus (CS) with a liked or disliked stimulus (US), a change in the liking of the formerly neutral stimulus can be observed (De Houwer, Field, & Baeyens, 2005). Numerous studies on evaluative conditioning have confirmed this formation of new object-evaluation associations (Hofmann, De Houwer, Perugini, Baeyens, & Crombez, 2010). However, an object-evaluation association can also be established indirectly via association of the CS with a third object: Walther (2002) demonstrated that even minimal requirements led to a transfer of valence to non-targeted objects: Adding on the typical evaluative conditioning effect (US to CS1), valence originating in the US was also transferred to a second CS2 that was merely associated with CS1 but never paired with the US. Such transfer of valence could even be found when CS2 was not actually paired but only *said* to have been paired with CS1 (Gast & De Houwer, in press), which points to the operation of propositional processes in evaluative conditioning (Mitchell, De Houwer, & Lovibond, 2009).

Associative strength as indexed by the degree of perceived similarity also moderated the likelihood of generalization in the BeanFest paradigm (see above, Fazio et al., 2004; Shook et al., 2007). In this study, similarity was operationalized by the Euclidean distance in a matrix spanned by the beans' number of spots and their shape. The smaller the distance in this matrix – i.e. the higher the similarity – between learned and new beans, the more likely was generalization across attitudes. In some studies the degree of similarity between focal and lateral attitude object was manipulated by informing participants that members of a target group were generally similar (vs. not similar) to each other (Crawford et al., 2002), which resulted in higher (vs. lower) levels of generalization. Other studies simply asked participants

how similar focal and lateral attitude objects were, and these responses predicted the extent of generalization. For example, secondary transfer effects in intergroup contact were stronger to the extent that non-contacted outgroups were seen as similar to a contacted outgroup (Pettigrew, 2009, see also Harwood et al., 2011; Rees, Allpress, & Brown, in press).

In a study on automatic generalization effects (Gawronski & Quinn, in press) participants first read positive or negative statements about a White male and saw his face. After a short distracter task, participants viewed the original face and two additional faces – one a 50%-morph with another face, the other highly dissimilar – as primes in an evaluative priming paradigm. The learned evaluation of the first face was found in an affective priming task and generalized (slightly attenuated) to the morphed face but not to the dissimilar one. We interpret these results as evidence for an automatic spread of activation that is moderated by association, in this case via similarity, even at a relatively low level. However, a more fine-grained variation of similarity would be useful to test our prediction that generalization is a *linear* function of similarity whereas compensation is a *bell-shaped* function of similarity.

Striving for Consistency Between Focal and Lateral Attitudes and Generalization

The idea that generalization effects are a motivated by striving for cognitive consistency is evident in a series of studies by (Gawronski & Walther, 2008): When people were introduced to a source that made positive or negative statements about a third person they transferred this evaluation back to the source. This transfer effect was found on implicit measures of attitude and was mediated by self-reported attitudes. According to the authors, this can be regarded as evidence that the process to regain cognitive balance (Heider, 1958) is propositional and not purely associative. In a similar vein, (Gawronski & Strack, 2004) argue that dissonance reduction also must be propositional because its operation depends on the ascription of truth values.

By contrast, studies implementing IAT measurement showed that imbalanced cognitive triads (Heider, 1958) correlate with implicit lateral change rather than with explicit

transfer of attitudes (Greenwald et al., 2002). Greenwald and colleagues hypothesized that two implicit associations (e.g., self – positive and self – female) would predict the association of the remaining combination within the triad (i.e., female – positive in this case). For example, if an individual holding positive self-evaluation joins a new group, out of the associations “self+positive” and “self+new group” a new association between the new group and "positive" will be formed. Or, vice versa, an individual may evaluate himself more positively after joining a positively evaluated group (Greenwald et al., 2002). Consequently, if lateral attitudes do not conflict with a focal attitude, LAC may represent associative change toward a consistent cognitive structure.

Evidence for differential generalization effects depending on the individual degree of preference for consistency can be found in a study that used cognitive dissonance to improve intergroup attitudes (Heitland & Bohner, 2010): German participants who were at least moderately prejudiced against Turks were led to publicly generate arguments in favor of integrated housing for Germans and Turks. Pre- and post-intervention attitudes on integrated housing improved especially when participants perceived high choice to argue for the topic and scored high on preference for consistency. Moreover, this effect generalized to attitudes toward Turks, and our reanalysis of Heitland and Bohner's data showed that correlations between focal and lateral attitudes tended to be higher under high (vs. low) preference for consistency. Hence, preference for consistency appears to moderate generalization effects.

Content of High-Effort Processing and Generalization

Support for increased or decreased generalization depending on the content of information processing is evident in experiments on minority and majority influence (Mackie, 1987;Crano & Chen, 1998). When individuals systematically processed strong majority arguments on the US' miltary role, they tended to change their attitude on this focal issue, and this change generalized to a related issue (Mackie, 1987 Expt. 1 and 2). However, when only source consensus information was given but no arguments, and thus participants could not

process systematically, they changed their focal attitude somewhat, but this change did not generalize to the lateral issue (exp. 3 and 4). Similarly, in the majority source conditions, evaluation of the focal issues as well as of a related topic changed more following strong arguments (Crano & Chen, 1998). In these two studies the focal change and its generalization to the lateral attitude object depended on the overall valence of issue-related thoughts.

High effort information processing can also be concerned with whether or not generalization is appropriate. In an experiment by Ranganath and Nosek (Ranganath & Nosek, 2008), participants were introduced to an individual from one of two fictitious groups after they had read a positive (negative) description of another member of that same group. Moreover, they were informed that the groups were substantially diverse; thus, they could infer that generalization from the first member to the second would not be valid. Indeed, only weak generalization was observed in self-reports. A few days later, when only the mutual group membership was remembered, however, explicit attitudes did not differ between the two group members any more.

Delayed Generalization

Empirical evidence for delayed generalization following memory decay can be found in the above mentioned experiment by (Ranganath & Nosek, 2008), who observed little explicit attitude transfer from one group member to another as long as differentiating information was remembered. However, in an IAT, evidence of similar automatic evaluations of the two group members was found. These results support our assumptions that a person may resist a deliberate transfer of attitude, in this case from one target group member to another, although evaluative associations may automatically be transferred between those same objects simultaneously. Importantly, after a week's delay participants showed as much explicit as implicit LAC with regard to their attitude toward the second target. The authors explain this delayed generalization on explicit measures as due to memory decay that led participants to confuse the two characters from the same group. From the perspective of the

LAC framework, delayed explicit generalization results when people construct their explicit evaluation based on automatic associations (see also Gawronski & Bodenhausen, 2006) while at the same time thoughts rejecting the automatic associations cannot be accessed any more.

A Special Case of LAC: Compensation Effects

As we have seen, the generalization of attitudes is a straightforward case of LAC, for which many research examples can be cited. As outlined above, we argue that a different class of effects, which we call compensation effects, can be explained by the same principles but has not been connected to the literature on generalization so far. At first glance, compared to generalization effects, compensation effects appear paradoxical: The evaluation of a lateral object changes although no change in evaluation for the focal object can be observed (at least not immediately).

A compensation pattern is reported in an early persuasion experiment (Steele & Ostrom, 1974): Participants read two criminal case descriptions, first a case of arson, then a bomb threat, or vice versa. After reading the first case they learned that the actual punishment in this case was a harsh prison sentence of 9.5 years. Then they read the second case and finally rated the appropriate sentence for both cases. Results showed that sentencing judgments were harsher regarding the second case than regarding the first case, even though the two crimes were comparable. We interpret this pattern as a result of participants monitoring the expression in the first (= focal) case, because they are reactant to the obvious influence attempt; whereas participants may not monitor their judgment of the second (= lateral) case.

Other examples for compensation effects can be found in research on minority influence: Conversion theory (Moscovici, 1980) proposes that minorities exert influence primarily in an indirect way. As minorities typically lack power, they cannot bring about compliance, but must provoke active thought about an issue. Indeed, some studies found indirect effects of minority communication (for a meta-analysis see Wood, Lundgren,

Oullette, Busceme, & Blackstone, 1994) although majority sources were more influential in general (see also Dickel & Bohner, 2012). In a study by Alvaro and Crano (1997), participants read arguments for the exclusion of gay men from the US military that were ostensibly generated by an in-group minority (vs. out-group minority vs. majority). Participants did not change their opinion on the focal topic. However, participants changed their attitude toward a related topic – rejection of the legal prohibition of guns. According to pre-testing, participants had not been aware of the relation between the two topics despite their proximity in multidimensional semantic space. Moreover, after a delay of several days, the focal attitude also changed. This effect was replicated and shown to be moderated by processing effort (Crano & Chen, 1998, study 3): Following ingroup-minority arguments, persistent change on the lateral attitude increased as a result of considering strong arguments (compared to weak arguments). Hence, high processing effort can contribute to the occurrence of compensation effects. Remarkably, in both experiments delayed evaluative change on the focal topic was observed.

One of the factors that can block or even reverse evaluative change on a focal judgment is awareness of a potential influence: Individuals who assume an influence on their evaluative judgments will correct for this influence (see Strack & Hannover, 1996; Wegener & Petty, 1995). In one pertinent study, participants were primed with one of two evaluatively opposite traits and later read a person description that was ambiguous with respect to the primed traits (Strack, Schwarz, Bless, Kübler, & Wänke, 1993). Participants' evaluative judgments about the target person reflected the primed trait except when participants were reminded of the priming, which resulted in a contrast effect. Hence, when perceivers are aware of a potential influence on the focal attitude they may correct for it, which results in a lack of focal change or even change opposite to the suspected influence. However, on lateral attitude objects this lack of change may be compensated for.

Studies on stereotype suppression also present a phenomenon linked to compensation

effects. Deliberate suppression of specific stereotypes often results in a post-suppressional rebound (e.g., Macrae, Bodenhausen, Milne, & Jetten, 1994): Participants who had been asked to suppress their negative stereotypes when describing a day in the life of a skinhead (focal object X) later expressed significantly more negative stereotypic thoughts when describing a second skinhead (lateral object Y) than did participants in a no-suppression condition. Originally, this rebound effect was explained as being due to constant monitoring that keeps the stereotype highly accessible (Wegner, Schneider, Carter, & White, 1987). However, further studies (Förster & Libermann, 2001) showed that when participants could attribute their difficulties to suppress stereotypic answers to situational factors, the rebound effect disappeared. Conversely, participants who could not attribute their stereotypic descriptions to situational factors may have believed they were biased anyway and stopped monitoring. Thus, in our view, these results represent a compensation-like pattern which is due to monitoring of a focal object and free expression of evaluations of a lateral object.

Another experiment on stereotype suppression suggests that under certain conditions even compensation may be fully blocked (Sassenberg & Moskowitz, 2005, Expt. 2): After being primed with a creative (*vs.* thoughtful *vs.* no) mindset, participants' reactions in a lexical decision task to targets that were semantically related to a prime were not facilitated. Such a block of any semantic association may disrupt the automatic spread of evaluations to lateral attitude objects, and consequently, could be a means to prevent compensation on lateral attitude objects.

In sum, only few studies have demonstrated compensation effects so far. This may be due to the fact that most researchers measure exclusively the focal attitude of interest, but only rarely lateral attitudes. For this reason, many studies that found no (explicit) change on a focal attitude object may have overlooked compensation effects on lateral attitude objects. Therefore, we encourage researchers to assess potential lateral attitudes along with the focal attitude when compensation effects seem likely, e.g., because a strong motive to monitor

explicit change on the focal attitude object is present.

LAC From the Perspective of Current Models

Generalization Effects

Consistency theories. Theories of cognitive consistency emphasize individuals' preference for a state of consistency among their cognitions to explain inter-attitudinal relations (Festinger, 1957; Heider, 1946, Heider, 1958; Osgood & Tannenbaum, 1955, for a recent review see Harmon-Jones, 2007). The common principle of cognitive consistency theories lies in achieving or keeping harmony among cognitions. Applying principles of cognitive consistency to LAC explains attitude generalization well: If the evaluation of the focal attitude object is changed, e.g., by a persuasion attempt, it may become inconsistent with evaluations of lateral objects. Hence, to re-establish a comfortable equilibrium, attitudes toward associated objects may be recalibrated.

According to the theory of cognitive dissonance, inconsistent relations between two cognitions are states in which one cognition implies the opposite of the other (Festinger, 1957, p. 13). Such states are assumed to be unpleasant, and, therefore, motivate change in the cognitive system to re-establish consistency. To this end, three possible ways to re-establish consistency are available: substracting one of the cognitions – usually the least important one – or substituting one by a new cognition, or adding cognitions that resolve the inconsistency.

Some researchers propose that striving for consistency is an exclusively propositional process (Gawronski & Strack, 2004; for a review see Gawronski & Strack, 2012). They argue that by mere definition a dissonant state with one cognition implying the opposite of the other can only be assessed at a propositional level, because truth values have to be ascribed to the cognitions involved. Consistent with this view, studies in which participants wrote a counter-attitudinal essay under conditions of low situational pressure (i.e. high cognitive dissonance) (Gawronski & Strack, 2004) showed changes in explicit attitudes only. Findings from a study on person perception (Gawronski & Walther, 2008, see above) corroborated the view that

rebalancing triads of evaluations toward persons (Heider, 1958) is a propositional process: Change in implicit attitudes was fully mediated by change in explicit attitudes (but see Greenwald et al., 2002).

In sum, with respect to LAC, principles of striving for consistency may be particularly useful to explain how explicit change in a focal attitude may transfer to other attitude objects. Thus, consistency theories may accommodate explicit generalization. However, if cognitive dissonance can only be recognized when a set of cognitions is checked carefully, compensation effects as we described them appear to be out of the range of consistency theories, because without explicitly detected change on the focal attitude no state of dissonance would arise.

Persuasion models. Classic persuasion theories such as the elaboration likelihood model (ELM, Petty & Cacioppo, 1981) and the heuristic-systematic model (HSM, Chaiken, 1987) have identified crucial boundary conditions for the change of a focal attitude. For instance, high involvement increases cognitive effort and thereby – if arguments are strong – results in focal attitude change (Petty, Cacioppo, & Goldman, 1981).

Hypotheses regarding the interplay of heuristic and systematic processing, as proposed within the HSM (Bohner et al., 1995), may be useful to explain LAC: According to the HSM's bias hypothesis, heuristic cues sometimes trigger evaluatively biased systematic processing (e.g., Chaiken & Maheswaran, 1994). This may increase the likelihood of generalization, as it may bring to mind related concepts in a consistent way. According to the HSM's contrast hypothesis, heuristic cues can also trigger systematic processing that is biased in the opposite way. This is the case when message content violates expectations elicited by a heuristic cue (Bohner, Ruder, & Erb, 2002; see also Bohner, Dykema-Engblade, Tindale, & Meisenhelder, 2008). Systematic processing that contrasts the evaluative implications of a heuristic cue may then highlight aspects related to the focal topic that will be evaluated consistent with the changed focal attitude, resulting in generalization effects, too. Hence, the

HSM's bias and contrast hypotheses may accommodate our assumption that processing effort moderates generalization effects depending on the content of thoughts.

Beyond hypotheses about biased processing, the HSM also describes multiple motives relevant for monitoring the focal attitude (Bohner et al., 1995; Chaiken, Giner-Sorolla, & Chen, 1996; see also Bohner & Dickel, 2011, fig.3). Accordingly, people may strive for judgmental accuracy, making a favorable impression, or defending their existing views. All three motives may be relevant for our reasoning about compensation effects, because they can all contribute to a lack of explicit change on the focal attitude. Hence, a focal attitude may be monitored, e.g., to make a positive impression on others or to correct for untrustworthy influence attempts. If it is not socially (or otherwise) desirable to express focal evaluative change, for example in response to a minority position, the focal attitude will not be expressed in public. It may be acceptable, however, to express change in attitudes that are indirectly related to the focal topic (Crano & Alvaro, 1998). Thus, although the HSM does not address compensation effects explicitly, its motives for monitoring attitude change may be used to derive useful assumptions of when such effects should be expected.

The unimodel (Kruglanski, Erb, Pierro, Manetti, & Chun, 2006; Kruglanski & Thompson, 1999), which was introduced as a single-process alternative to explain attitude change and persuasion, may also accommodate a generalization of evaluation from the focal to a lateral object. According to the unimodel, the basic process underlying all attitude change is syllogistic reasoning: New information is linked with relevant prior knowledge – e.g., the proposition that "saving resources is necessary to keep the earth a place worth living in," and the proposition that "car-sharing saves resources" may jointly result in the conclusion that "car-sharing is a good thing to do." Thinking about the resource-saving aspect of car-sharing should increase the accessibility of that feature in lateral objects of thought like using public transportation, and thus evaluative change on the focal object should generalize to lateral objects.

In sum, persuasion models appear to be able to accommodate generalization effects. However, compensation effects are more difficult to accommodate within these frameworks. We assume that this is because they lack a clear distinction between automatic and deliberate processes.

Models of implicit and explicit attitude change. Since the introduction of response-time based (or implicit) measures of attitude (like the implicit association test, Greenwald et al., 1998; or the evaluative priming task, Fazio, Sanbonmatsu, Powell, & Kardes, 1986; for a review see De Houwer, Teige-Mocigemba, Spruyt, & Moors, 2009), several theorists have tried to integrate evidence from implicit and explicit measures of attitude (e.g., Conrey, Sherman, Gawronski, Hugenberg, & Groom, 2005; Gawronski & Bodenhausen, 2006; Petty et al., 2007). An influential attempt at integration, the associative-propositional evaluations (APE) model (Gawronski & Bodenhausen, 2006), proposes two distinct processes of attitude change: Associative change, which encompasses changes in involuntary or spontaneous affective reactions toward attitude objects that can roughly be assessed with implicit measures of attitude, and propositional change, which relies on personal approval of cognitions and evaluations of the attitude object that can roughly be assessed with explicit measures of attitude (cf. Conrey et al., 2005; Sherman, Klauer, & Allen, 2010 for a discussion on the pitfalls of interpreting the different types of measure as process-pure}). According to the APE model, change on implicit measures of attitude is caused either by changes in the associative structure (e.g., by evaluative conditioning) or by the temporary activation of associations in a specific context. In contrast, change of explicit attitudes is based on changes in the set of considered cognitions, where each thought is given a positive or negative truth value. Inconsistencies between propositions can be reconciled by adding new or negating existing propositions (see section on consistency theories above). Associative and propositional processes may operate independently or be mediated via each other (Gawronski & Bodenhausen, 2006, see also Bohner & Dickel, 2011).

How may the APE model account for LAC? As we have detailed in the LAC framework, the interplay of associative and propositional change in terms of the APE model can accommodate both generalization and compensation effects: Whereas automatic generalization across associated concepts accounts for generalization of implicitly assessed attitudes, affirmation versus rejection of the automatic evaluation at a propositional level may disentangle generalization and compensation effects on explicit measures of attitude. Thus, generalization and compensation effects do fit into the APE model satisfactorily, although the model does not specify the boundary conditions of generalization and compensation phenomena.

In sum, including theories about change in implicit attitudes to explain LAC phenomena seems very fruitful, as these theories may explain how evaluation spreads without being detected at an explicit level. We make use of assumptions from the APE model to explain generalization and compensation within our framework. Although the APE model does not directly speak to generalization and compensation findings, we posit that many of its assumptions may be applied to the study of LAC.

Compensation Effects

Models of minority influence. The ‘leniency contract’ is a model designed specifically to account for indirect minority influence, which represents a compensation effect. Crano and colleagues (Alvaro & Crano, 1997; Crano, 2001; Crano & Alvaro, 1998; Crano & Chen, 1998) propose that majority recipients follow an implicit ‚leniency contract‘ between the majority and ingroup minorities: Because of high identification with ingroup members, the majority tolerates the presentation of the minority’s perspective; in exchange for this tolerance, however, majority members reject to adopt the minority's position. Nonetheless, they process the minority message to some extent. Because of the predetermined rejection of the minority’s position, they put little effort into the defense of their existing views, but elaboration of the minority's arguments may create inconsistencies in recipients'

belief systems, which they resolve by a change of related attitudes.

The leniency contract model explains compensation effects only under very specific circumstances: minority influence exerted by ingroups. Also, within the leniency contract model we do not see a full explanation of how inconsistencies within the cognitive system arise following the processing of minority arguments without changing the focal attitude. Instead, we argue that compensation can be explained within a more general framework: Revisiting the compensation findings by Crano and his colleagues (Alvaro & Crano, 1997; Crano & Chen, 1998), we assume that the changed evaluation on the focal object was monitored because participants did not want to be associated with a minority (see Dickel & Bohner, 2012), whereas the lateral attitude was changed because automatic associations activated during the course of listening to the arguments spread to lateral attitudes. Explicit evaluations of the lateral topic are partly built on the basis of these generalized automatic associations – and therefore do change although there was no explicit change observed on the focal topic. After a few days participants may have forgotten the source of the arguments and thus did not monitor the focal attitude any more, which would explain delayed change on the focal attitude.

Studies that reported compensation effects did, indeed, observe delayed focal change (see Alvaro & Crano, 1997; Crano & Chen, 1998). This pattern resembles research on the sleeper effect, where delayed persuasion has been explained via selective forgetting of a "discounting cue" (e.g., an untrustworthy source) being associated with the message (Hovland & Weiss, 1951; Kumkale & Albarracín, 2004). We believe that the assumption of differential memory decay may explain both delayed focal change and delayed generalization effects. Subjective reasons for suppressing evaluation change on the focal attitude or on the lateral attitude can get inaccessible, and explicit evaluations will then be based on automatic associations.

Explanations for stereotype rebound. When participants are asked not to express

racist attitudes toward a target person they are able to successfully monitor their explicit attitude expression. Monitoring may be absent, however, in relation to a second target person if participants attribute the initial difficulties to monitor their attitudes to external causes (see Förster & Libermann, 2001). Hence, the stereotype rebound effect is an example of a monitored evaluation toward a focal object and a lack of monitoring regarding the evaluation of a lateral object. This example points to the possibility that compensation effects may be caused by similar monitoring processes, too.

In sum, theoretical explanations for compensation (-like) effects have been tailored to very specific areas (indirect minority influence; stereotype rebound effect. In contrast, the LAC framework does explain compensation effects within a broader perspective, making general assumptions regarding the focal and lateral attitude objects involved. It may thus integrate the domain-specific explanations.

Conclusions and Outlook

Empirical evidence from different fields of social psychology illustrates the assumption of the LAC framework that attitudes generalize according to their degree of association, whereas studies that found compensation effects are rare. We attribute the scarcity of reported compensation effects to the fact that researchers did not assess lateral attitudes and instead focused on the exclusive assessment of the focal attitude.

Formation of New Attitudes: A Case of LAC

When attitude formation is seen as a special case of attitude change – from no evaluation to a newly formed evaluation (see Bohner & Dickel, 2011), then generalization can be seen as the default case of attitude formation. Evaluations of new attitude objects are derived from related attitudes. For instance, in evaluative conditioning experiments a new evaluation toward a CS (e.g., a comic character) is derived from the evaluation of a US that is associated with it (e.g., Brussels sprouts; Field, 2006). This transfer can be either automatic or deliberate (Hofmann et al., 2010; Mitchell et al., 2009).

New Predictions Based on the LAC Framework

When does generalization occur, when compensation? From the LAC framework we may derive specific predictions for the occurrence of generalization versus compensation effects. Most importantly, low versus high resistance to explicit change should differentiate between generalization and compensation effects. Individuals who are highly motivated to resist attitude change are likely to show compensation effects, whereas individuals who are motivated to accept attitude change are likely to show generalization effects (see, e.g., Briñol, Rucker, Tormala, & Petty, 2004; Knowles & Linn, 2004). Hence, when the level of resistance to change is high, as for example in an intergroup contact study where participants suspect and resent an attempt to reduce their prejudice (cf. Amir, 1969), no positive effects of intergroup contact on explicit evaluation of the contacted group should be observed. However, the LAC framework would still predict a positive effect on attitudes toward non-contacted outgroups that are associated with the focal group. Importantly, we predict dissociation between implicit and explicit attitudes toward the focal attitude object, but a positive association between implicit and explicit attitudes toward the lateral object. When memory for monitoring reasons decays, the evaluation of the contacted group (X) may show delayed change.

Moderators of LAC. We have discussed several potential moderators; regarding the structural properties of attitudes, those were association and similarity between focal and lateral attitude object, hierarchical relation and consistency among focal and lateral attitude, as well as aspects of diagnosticity of the focal attitude. Regarding processes that may moderate LAC, researchers should consider implicit versus explicit generalization, processing effort, situational (re-)categorization, and preference for consistency. In the following we sketch some new studies designed to investigate potential moderators of LAC.

Extending on Ranganath and Nosek (2008) we propose to disentangle feature similarity and surface similarity. In their experiment, surface similarity of two group

members' names was confounded with explicit group membership, as the names were composed of an individual part and a part designating group membership (e.g., “Bosaalap” and “Reemolap” for two “Laapians”). Participants could be instructed to focus either on name similarity or on group membership, and a condition with non-overlapping names could be added. We assume that implicit generalization should decrease if association via name similarities is missing and, hence, delayed explicit generalization would also decrease.

Another operationalization of similarity between groups as attitude objects could take advantage of the stereotype content model (SCM Cuddy, Fiske, & Glick, 2007), using its core dimensions of warmth and competence to define degrees of similarity. Such a theory-based approach would address similarity at the level of cognitive representation rather than merely at the empirical level of surface features (cf. Pettigrew, 2009; Tausch et al., 2010).

Moreover, processing effort could be varied in combination with a focus on (dis-) similarities. We predict that higher processing effort should result in higher levels of LAC if thoughts focus on similarities rather than dissimilarities between focal and lateral attitude object.

When should delayed effects occur? When either focal or lateral explicit change is not observed, we predict delayed explicit change to the extent that reasons for monitoring get less accessible. When subjective reasons against generalizing or for monitoring the focal attitude become less accessible, explicit evaluations will be based on automatic associations. Mediational analyses should reveal whether delayed focal or lateral change is in fact driven by implicit generalization at an earlier point in time.

When should LAC fail to occur? Neither generalization nor compensation should occur when there is neither implicit nor explicit change on the focal attitude. A way to induce such a pattern could be to block associative links per se (see Sassenberg & Moskowitz, 2005). Also, when implicit attitudes do not change – as in dissonance reduction paradigms – compensation effects should not emerge.

Conclusion

We presented a theoretical framework for LAC that encompasses generalization as well as compensation effects on lateral attitude objects that are associated with a focal attitude object. In seven postulates we described the processes underlying LAC based on the interplay between automatic and deliberate processes. Potential moderators of LAC such as processing effort, strength of association between focal and lateral attitude object, and individual preference for consistency were discussed. Research examples from diverse areas of social psychology were presented. The present analysis provides a framework for the study of evaluative change on lateral attitude objects, focusing on generalization and compensation effects. In sum, we are confident that taking a closer look at side effects of attitude change will shed light on important aspects of attitude construction and attitude change processes, generate new hypotheses, and stimulate new research.

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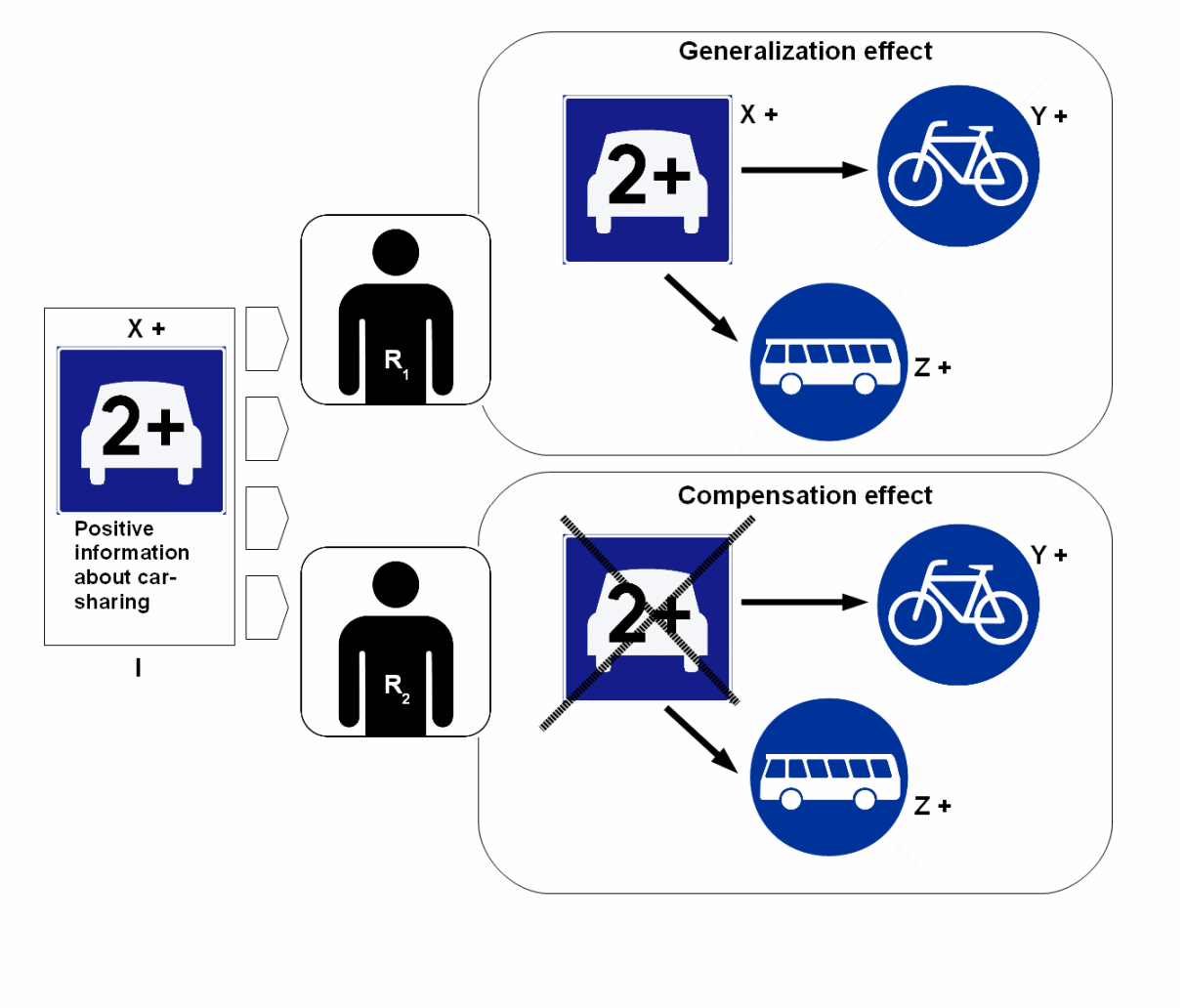

Caption

Figure 1: Recipients (R1 and R2) perceive information (I) about the benefits of a car sharing project (X). R1 adopts the evaluative implications of I about X resulting in *generalization effects* on lateral objects (Y and Z). R2 is reactant and keeps his a priori view of X but still evaluation change is automatically transferred to Y and Z resulting in *compensation effects*.