

**What you get is what you see?**  
**Comparisons influence the social induction of affect**

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## Introduction

“Lach, und die Welt lacht mit Dir! Wein, und Du schläfst allein!” – Laugh, and the world laughs with you! Cry, and you sleep alone! This statement is part of a song by German diva Georgette Dee. Apart from its potential validity in times of troubled relationships it carries important assumptions: emotions can be contagious, but not in every situation! It might oftentimes be the case that seeing a close other elicits a positive affect in a person, but there are situations when this effect does not occur. Another example might be considered: Going out with other people is usually fun. To see the others laughing and joking usually produces or enhances one’s own positive affect. However, everybody knows a situation where the other’s positive mood just does not spill over or, even worse, one starts feeling bad.

In our daily lives we are constantly faced with pictures of others. This can be a movie on TV, a picture in a newspaper, or an ad-campaign at the bus stop. Moreover we also have to constantly interact with others. Therefore, it can be of great importance to know the mechanisms behind the transfer of affect between persons.

Thus, oftentimes other people’s expressed feelings seem to affect us. However, this does not always put us in a similar affective state. In some situations our feelings seem to be quite contrary to those of the person we interact with. This raises questions: Why do other people’s

expressed feelings have an influence on us? When do we feel similar to the other person and when do we feel different? These questions are not trivial. Many different lines of research have tried to answer them. The research presented tries to find support for an approach that attributes an important role to comparison processes in explaining these phenomena.

## **Theoretical part**

### ***Socially induced affect: Theoretical overview***

When thinking about *how* and *why* affect is induced socially several lines of research have to be taken into account. Classical theories of affect and emotions, current theories on embodiment in social psychology, social comparison theory, and research on the perception-behavior link all contribute to the understanding of the phenomenon. Although there have been a number of studies investigating the issue, the questions remain: How and why do people converge in their own affective experience to that of target person? And when and why does the opposite occur?

Socially induced affect has been defined as an incidental and unintended transfer of feelings from a model to an observer (McIntosh, Druckman & Zajonc, 1994). The single components of this definition already point to the complexity of the phenomenon. It is important to note, that the above definition does neither explicitly state that the

perception of positive affect has to elicit positive affect in the perceiver, nor does the perception of negative affect necessarily lead to negative affect in the perceiver. According to McIntosh and colleagues (1994) their conception of socially induced affect involves two types of outcomes: *concordant* affect and *discordant* affect. Concordant affect refers to all cases where the perceiver shows an affective shift into the direction of the perceived person's displayed affect. Discordant affect refers to the opposite case, namely an affective shift into the other direction. A similar distinction has been made by Hatfield, Cacioppo and Rapson (1994). Whenever a perceived emotion of another person elicits the same emotion in the perceiver this is called emotional contagion. The opposite case, the elicitation of a discordant emotional state, would be called counter-contagion. It is important to keep in mind, that Hatfield and colleagues (1994) refer to the transfer of specific emotions, while McIntosh and colleagues (1994) focus on affect in general.

Research in the area of emotional contagion seems to provide support for the transfer of specific emotions from one person to another (Hatfield, Cacioppo, & Rapson, 1992). A classic experiment often cited in that context was conducted by Schachter and Singer (1962). In that experiment either injecting adrenalin or a placebo drug was used to manipulate participants' physiological arousal. Thereafter participants were either provided with an appropriate physiological explanation for their arousal, or they were misinformed about the symptoms, or no



explanation was given at all. Subjects who were provided with the physiological symptoms had an explanation for their feelings. This was not the case for participants in the other two conditions. Here own thoughts or external cues had to be relied on to interpret the arousal. In a next phase of the experiment participants either interacted with an angry or a euphoric other person. The results showed that subjects who were un- or misinformed about their physiological arousal tended to feel either euphoric (when confronted with a euphoric confederate) or angry (when confronted with an angry confederate). Despite the author's controversial explanation of their findings and the massive critique that followed (see Reisenzein, 1983 for a review), the experiment is often taken as evidence for emotional contagion (Hatfield et al., 1994). Specific emotions seem to have been transferred between the confederate and the participants. However, there are some problems with this assumption. Postulating that specific emotions are transferred between persons on the one hand and stating that persons are not consciously aware of the reasons for the affective change do not fit together. Emotions require persons to know about the source of their feelings (Ortony & Clore, 1989; but see Stepper & Strack, 1993), while mood does not presuppose such insights. The distinction between mood and emotion is an important one. As outlined by many theorists, moods are not related to any object but are object free. They are experienced constantly while emotions are related to an object and are experienced for a limited time (Russell, 2004). However, the latter point does not imply that people are consciously aware of the affect-

eliciting object. An illustration of the assumption that bodily states and knowledge must go together to produce a full-blown emotion is a finding by Stepper and Strack (1993). They showed that for the induction of pride it is not a sufficient precondition to put participants in a posture typical for this emotion (i.e. an up-right seating position). Instead participants' had to receive additional positive feedback for a task to experience pride. The external feedback and the internal state had to be compatible to find the effect (see also Förster and Strack, 1996). Therefore it might be difficult if not impossible to induce specific emotional states by the mere perception of another person. A more likely assumption is the transfer of rather unspecific moods (Neumann & Strack, 2000). A second potential problem in assuming the transfer of specific emotions from one person to another is raised by the phenomenon of counter-contagion. There have been some demonstrations of this phenomenon. Putting participants into competition with a confederate in stock market game led them to mainly focus on their own pleasure or pain. Connected outcomes between participants and confederate in this game lead participants to imitate the confederate's displayed affect (Englis, Vaughan, & Lanzetta, 1981). Further conditions for the occurrence of counter-contagion have been proposed (Hsee, Hatfield, Carlson, & Chemtob, 1990; Zillman & Cantor, 1977). However, from a theoretical point of view it is not easy to deduce a specific hypothesis about a potential outcome of a study of counter-contagion. What is the opposite of the feeling of joy? Sadness, displeasure or fear? The answer to this question can be found in referring to models of

emotion dimensions, the most prominent of these models being the circumplex-model by Russell (1980). But there has been a considerable amount of criticism with regard to these models (e.g. Larsen & Diener, 1992). One might have an easier time in making specific predictions about the outcome of an experiment investigating counter-contagion, when looking at unspecific affect instead of complex emotions.

The concept of unspecific affect has recently received more attention in emotion research (Russell, 2003). The term "core affect" has been introduced. It refers to "a neuropsychological state that is consciously accessible as a simple, non-reflective feeling that is an integral blend of hedonic (pleasure-displeasure) and arousal (sleepy-activated) values" (Russell, 2003, p. 147). This concept is similar to the concept of mood as it is seen as object-free. Specific emotions are seen as the result of a more complex interplay of several components (Russell, 2003). In line with previous findings (Neumann and Strack, 2000) it might therefore be more suitable to assume that moods instead of specific emotional patterns are transferred between people. This assumption yields the advantage to make testable predictions both for cases where an affective convergence between two persons is expected and for cases where affective divergence is predicted.

From the theoretical considerations above it can be concluded, that an individual's affective state is likely to be influenced by another person's

expressed affective reaction. However, not specific emotions are being transferred, but an unspecific affect. The affective state of the individual can then either converge to or diverge from the perceived affective reaction of the other person.

### ***Components of socially induced affect***

After these conceptual clarifications an overview of different lines of research being involved in the study of socially induced affect will be presented. Referring to the theoretical definition by McIntosh and colleagues (1994) and the work regarding emotional contagion the focus will be on four major questions: Is socially induced affect an automatic process? How is mimicry related to socially induced affect? What role do social comparison processes play in the generation of socially induced affect? Which factor determines whether an affective convergence or divergence is the result of an affective transfer between persons?

### **Automatic components and mechanisms in affect transfer**

People are oftentimes not aware that they are influenced by another person's affective state and the influence can be very subtle. Therefore it has been suggested that this transfer is a largely automatic process (Neumann & Strack, 2000). In recent years the term *perception-behavior link* was introduced to explain how very subtle cues influence an individual's behavior (Bargh, Chen, & Burrows, 1996; see Dijksterhuis & Bargh, 2000 for a review). Originally, the idea of perception directly influencing behavior has been proposed by Lotze (1852) and James

(1890). This concept became known as the *ideomotor principle*. More recently it has been argued in cognitive psychology that sensory input and movements of the body are represented in common codes. So the pure perception of a behavior of another person can lead to the activation of similar action codes in the observer (Prinz, 1990).

In a well-known experiment it was demonstrated that the activation of the stereotype of the elderly (by primes like "Florida", "Bingo" and other associated ones) reduces the walking speed of the participants (Bargh et al., 1996). Numerous demonstrations of how perception influences behavior in very subtle ways have replicated and extended that effect (e.g. Chartrand & Bargh, 1999; Dijksterhuis & Van Knippenberg, 1998; Macrae & Johnston, 1998). Similar findings are also reported for affective reactions. Seeing another person smiling can immediately elicit positive affect in a perceiver (Berridge, & Winkielman, 2003; Winkielman & Berridge, 2004). The assumption of non-intentionality of this phenomenon is included in the definition of socially induced affect (McIntosh et al., 1994). In social cognition research non-intentional processes are seen as one of the basic features of automaticity. Other important features are that automatic processes do not require conscious awareness, that they are efficient, and they cannot be controlled by an individual (Bargh, 1994; 1996). When taking these basic assumptions into account, it is not far fetched to consider the transfer of mood to be an automatic process. It is by definition a non-intentional process. The

assumption of non-intentionality is even more justified in light of the finding that the transfer of mood between persons occurs outside of conscious awareness (Neumann & Strack, 2000).

In the area of research on affect Neumann and Strack (2000) were the first to truly investigate the automaticity of the social induction of affect. Their work builds on the idea of the perception-behavior link, namely that mere perception of another person's displayed affect can elicit a change in the affective state of the perceiver. In their studies participants were exposed to an audio-taped text that was spoken in either a slightly happy, neutral or sad voice. When asked about their mood, participants adapted their own affective state to the mood of the speaker. This finding was surprising for several reasons. First, participants were unaware of having been influenced by the mood of the speaker. Second, they displayed a shift in their own affective state into the direction of the speaker's mood. Third, they did so without interacting with the speaker but only listening to the tape. A direct imitation of the speaker's facial expressions was therefore impossible. The authors proposed a two-step model to explain their results. After perceiving the speaker's affect, participants unintentionally start to imitate the target's vocal expressions. This imitation leads to the related mood state<sup>1</sup>. So here a perception-behavior link is assumed, but also the processes behind are outlined.

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<sup>1</sup> It is important to note, that an imitation of the speaker is assumed although the perceiver has not interacted or even seen the speaker. This assumption is in line with theories on embodied cognition (e.g. Barsalou, 1999) which are to be outlined below.

Thinking about the automaticity of social affect induction also yields the necessity to refer to another related finding, namely affective priming. The basic idea is that minimal input can elicit an affective reaction (Zajonc, 1980). In a seminal experiment, Murphy and Zajonc (1993) found that the subliminal presentation of affective stimuli influenced the evaluation of subsequently presented neutral stimuli. Thus, presenting a happy human face subliminally can elicit a positive evaluation of a formerly neutral stimulus (Murphy & Zajonc, 1993). However, this effect was only found if the affective stimuli were presented subliminally but not if they were clearly visible to the participants. The authors explain this result by arguing that due to the subliminal presentation of the stimulus the diffuse affective quality of the prime spilled over to the target. In the case of a clearly visible prime other cognitive processes or appraisals influence this process. The affective quality of the prime becomes less diffuse and will be clearly attributed to the prime, but not to the target. The affective priming effect has been widely replicated (e.g. Niedenthal, 1990; Rotteveel, Groot, Geutskens, & Phaf, 2001; Winkielman, Zajonc, & Schwarz, 1997). It has to be mentioned that the prime must not necessarily be presented subliminally, but a connection between prime and target must not be perceived.

In the context of socially induced affect, affective priming has to be considered as a mechanism that contributes to the transfer of moods between persons. The displayed affective reactions of other persons might

serve as an affective prime. However, its influence seems to be limited to certain conditions. In most studies of socially induced affect the participants were clearly aware of the stimulus presented.

In the previous section commonalities between socially induced affect and automatic behavior have been outlined. It was illustrated why socially induced affect can be conceptualized as an automatic process. To understand how imitation by itself leads to the display of concordant affect, research on the bi-directional link between the body and affective states has to be considered.

### **Embodied cognition and socially induced affect**

In explaining emotional contagion, the subject of imitation or mimicry of other people's behavior has always been an important topic (Hatfield et al., 1994). As has been outlined before Hatfield and her colleagues attribute a central role to mimicry in the occurrence of emotional contagion. They propose that the perceiver unconsciously imitates the person perceived and thereby the emotional state of the perceiver changes. Therefore, merely imitating another person has to have a direct influence on a one's own affect. Such a claim has significant consequences, because it has an important implication: the bodily state influences a person's feelings. This is often seen as counter-intuitive, since it is at first sight not easy to understand why the activation of muscles that are responsible for smiling should also lead people to be happier. However, this claim has already been made in what became known as the



James-Lange theory of emotion (James, 1890, see also LeDoux, 1996 for an overview). Moreover, the notion of a bi-directional link between an affect and cognition on the one side and bodily states has recently received considerable attention in social psychology (see Niedenthal, Barsaolu, Winkielman, Krauth-Gruber, & Ric, in press; and Strack & Deutsch, 2004 for recent summaries). The classic theoretical assumption behind that is a link between emotions and the body as it has already been suggested by James (1890).

Recent evidence from neuroscientific research supports the assumption of a bi-directional link between bodily states and cognitive processes. Recent support for this assumption comes from neuroscientific research. With the discovery of "canonical neurons" (di Pellegrino, Fadiga, Gallese, & Fogassi, 1992) and "mirror neurons" in non-human primates (e.g. Rizzolatti, Fadiga, Fogassi, & Gallese, 2002) brain structures likely to be responsible for imitation have been found. Canonical neurons are activated when viewing an object and when grasping it. Mirror neurons are activated when an action is observed and when this action is performed. Although these findings are up to now largely limited to non-human primates, some studies suggest the existence of similar structures in the human brain (e.g. de Gelder, Snyder, Greve, Gerard, & Hadjihikani, 2004; Singer, Seymour, O'Doherty, Kaube, Dolan, & Smith, 2004).

How can these findings from different research traditions be integrated? Current theories on embodiment (e.g. Barsalou, 1999; Niedenthal, et al, in press; Smith & Semin, in press) provide a suitable framework for the explanation and integration of findings from neuropsychology, social psychology, and cognitive psychology. Niedenthal and her colleagues outline an approach that is closest to the explanation of phenomena like the automatic transfer of moods between persons. They assume that cognition and emotions are influenced by embodiment not only in the interaction with actual social objects but also by the mere mental representation of interacting with them. Going back to the experiment by Neumann and Strack (2000) it now becomes clear why the authors proposed that participants show mimicry behavior although they just listened to a slightly happy or sad voice. It is likely that participants in these particular studies (mentally or actually) simulated the speaker. This simulation of a happy or a sad person can then lead to the affective change.

In social psychology, there have been some demonstrations of how bodily expressions are connected to social information processing. In a classic experiment Strack, Martin and Stepper (1988) demonstrated this link. Participants were unobtrusively instructed to activate the Zygomaticus muscle by holding a pen in the mouth. This muscle is usually involved in smiling. When activated in the manner described it led participants to judge cartoons to be more humorous than participants in

the control condition did. Even more important for the present theme is the finding that similar effects can be found when participants' own affective state serves as the dependent variable (Stepper & Strack, 1993). With regards to socially induced affect one can therefore conclude, that imitating another person's smile or posture (and thereby activating the respective muscles) will lead to a congruent mood state in the perceiver.

In the light of findings described above, the question about the reasons for mimicry behavior arises. The imitation of another person's behavior is frequently found and has adaptive functions (Bavelas, Black, Lemery, & Mullett, 1987). It has been shown that mimicking the other can lead to increased interpersonal bonds between the two people (Chartrand & Bargh, 1999). People also tend to imitate laughter (Young & Frye, 1966). Mimicking others might therefore be a way to induce pro-social behavior. Repeating the order of the guests in a restaurant earned the waitress a larger tip compared to two control conditions (Van Baaren, Holland, Steenart and Van Knippenberg, 2003). A more crucial test of the assumed automaticity of mimicry behavior would be the imitation of aggressive instead of pro-social behavior. Here, social desirability concerns in the explanation of mimicry could be ruled out. Unfortunately no studies investigating that issue exist.

However, although mimicry is a very powerful mechanism in social interaction it does not always occur and its intensity varies. The goal to affiliate with another person increases people's tendency to mimic that

person (Lakin & Chartrand, 2003). It has also been shown that people are more likely to imitate the laughter of a friend than that of a stranger (Smoski & Bacharowski, 2003). Thereby, interactions between social partners are reinforced. Consequently, it is not surprising that both mimicry and socially induced affect have been strongly related to the concept of empathy (Hatfield et al., 1994). Participants who have been instructed to imagine how another person feels in a specific situation have shown an affective change (Stotland, 1969). This finding is important because participants did not see the other person. In light of an embodied cognition approach (Niedenthal and colleagues, in press), this is not surprising. Participants might have just mentally simulated the perceiver's affective state and thereby their own affective state changed.

A useful terminological distinction has been recently been made (Niedenthal et al., in press). They propose two kinds of embodiment: on-line and off-line embodiment. In the context of socially induced affect on-line embodiment refers to cases where people interact with a concrete referent (e.g. person). All mimicry studies would fit into that category. Off-line embodiment on the other hand refers to cases where the referent is not actually presented but represented in memory. The experiment by Stepper and Strack (1993) described earlier would be an example for this latter type of embodiment.

Thus far, embodied cognition seems to be a very promising account of how affect might be socially induced. The perception of another person seems to activate mental simulations in a perceiver. Due to common brain structures for perception and action an affective change results. However, it remains unclear whether people always show an affective shift toward the perceived target. It does not seem very adaptive to imitate other persons in all situations. For example a person that has lost against a now celebrating winner, might be unlikely to feel happy even though he or she perceives the other person's positive affective reactions (e.g. Englis et al., 1981). Another illustration of this argument is the existence of the emotion of *Schadenfreude* (e.g. Leach, Spears, Branscombe, & Doosje, 2003). It is the very essence of this emotions that people experience pleasure (a positive affective state) from another person's suffering (a negative affective state). These examples demonstrate that people not necessarily converge. Therefore, searching for variables that influence individual's tendency to mimic can be regarded as an important

In the context of research on mimicry behavior, conditions have been specified under which people show mimicry behavior or not (see Chartrand, Maddux, & Lakin, 2005 for a recent overview). But this is not the only domain that tries to find determinants for cases where people tend to be similar to others or tend to be different. Social comparison research has also contributed to the understanding of related phenomena.

## **Social comparison processes and socially inducing affect**

For a long time, it has been a very prominent assumption in social psychology that social comparison and socially induced affect are related. Early work was based on the attempt to transfer social comparison theory (Festinger, 1954) to the area of affiliation and emotion outlined by Schachter (1959). The major focus then was on the role of threat and novel situation. Schachter proposed that whenever individuals are threatened or face a new situation, they tend to affiliate with others. However, this need for affiliation is not a general one, but specifically the company of individuals facing the same threat or situation should be preferred. Schachter proposed self-evaluation to be a key mechanism in that context. Individuals experience uncertainty about the new situation and about being aroused in that situation. To interpret their own feelings, individuals attend to others experiencing the same threat. This was summarized in the "emotional similarity hypothesis", which states that novel situations induce a need for self-evaluation and thereby social comparisons with similar others arise (Schachter, 1959; see also Kulik & Mahler, 2000).

With regards to the phenomenon of emotional contagion, Schachter's (1959) idea has an interesting implication. If two people show a discrepant reaction in facing the same threat, then Schachter assumed a pressure towards an affective convergence to arise (see also Kulik & Mahler, 2000). This assumption has never been investigated directly,

though. A possible mechanism of how such a convergence can be achieved could be a direct interaction of the two persons in the form of a discussion. More recently this view of affective convergence has been contrasted with the research linking emotional contagion and behavioral mimicry. An integrative model proposing a combined influence of mimicry and comparison processes on emotional contagion has been developed (Kulik and Mahler, 2000). This idea is supported by the finding that confronted with a threat individuals were more likely to facially mimic others who were facing the same rather than a different threat (Gump & Kulik, 1997).

As it has been outlined most research in the domain of social comparison processes focused on the influence of others on an individual's reaction in the face of threat (Kulik, Mahler, & Earnest, 1994; Kulik, Mahler, & Moore, 1996). The general assumption is that affective convergence between individuals in a threat situation is the default result. Comparison processes determine how strong the influence of another person's affective reaction on the self is. It has thus far only been speculated about the other possible finding, namely that individuals do not experience the same affective reaction at all. Kulik and Mahler (2000) hypothesize that in the case of asynchronous affective reaction of another person the individual might become less susceptible to emotional contagion and an individual's emotional involvement is reduced.

To summarize, social comparison research in the area of socially induced affect has tried to specify the conditions under which people attend to other's affective reactions in order to interpret their own. Usually this was done in some threatening situation. Almost no research has addressed the question of what kind of affective reaction is elicited in this context. The subtle distinction between mood and emotion did not play a role, nor did cases in which an affective divergence is likely to occur.

### **Determinants of affective convergence and divergence**

Affective convergence and divergence can both result after being exposed to the affective response of another person. A very specific example of the latter is the experience of "Schadenfreude" or malicious pleasure. Seeing the German soccer team losing can elicit rather positive affect in a Dutch soccer fan (Leach et al., 2003). An own emotional quality is therefore connected with affective divergence.

On a more subtle level affective divergence has been shown in affective priming research. Adding gender-specific features to an affective prime can result in a contrastive evaluation of the target (Stapel, Koomen, & Ruys, 2002). To explain this finding a comparison process has been proposed. The default affective priming effect is one of assimilation. However, increasing the distinctiveness of a prime might elicit a comparison process between prime and target and therefore result in a contrastive outcome (see also Ruys, 2004). This example shows that an affective contrast reaction can be elicited on a very subtle level. Another



(but less subtle) example for affective contrast is that opponents in a game tend to affectively diverge from one another (Englis et al., 1982).

### **A social comparison frame-work for socially induced affect**

Research on social comparison and social judgment has identified important processes and antecedents of assimilation and contrast. There also been a wide controversy under which conditions people assimilate to or contrast away from a given standard (see Mussweiler, 2003 for a review). Sometimes people seem to shift in their self-evaluation towards a standard (Lockwood & Kunda, 1997; Pelham & Wachsmuth, 1995). At other times people show the opposite (Morse & Gergen, 1970; Wills, 1981). They contrast away from the standard. To integrate and explain a number of opposing results in research on social judgments Mussweiler (2003) proposed the selective accessibility model. The model heavily builds on the concepts of knowledge accessibility (Higgins, 1996) and hypothesis testing (Trope, 1996). It is assumed that the outcome of judgment crucially depends on two variables: the judgmental standard and the hypothesis the person is testing. Mussweiler (2003) distinguishes two general types of standards, moderate and extreme standards. If people compare themselves with a moderate standard they tend to test the hypothesis that the standard is similar to themselves. Therefore relevant self-knowledge in support of this hypothesis is activated. If for example a female college student in a writing class compares her creative

abilities to a fellow other female student, it is therefore likely that she will activate self-knowledge that indicates that her creative potential is somehow similar to that other student. A similarity hypothesis is tested and therefore assimilation is likely to result. In other words the student will judge herself to be similar to the other student. This is a very common case. And it can be shown that assimilation of judgmental standard and target is the default outcome in social judgment (Mussweiler, 2003). Therefore similarity testing also seems to be the default mechanism. In the case of extreme standards a different process is working. If a standard is classified as extreme people test the hypothesis that the standard is dissimilar to themselves. They activate corresponding self-knowledge and the judgmental outcome is contrast. In the case of the female college student an extreme standard might be recent Nobel Prize winner Elfriede Jelinek. If the student compares her creative abilities to that standard, this might result in a rather different outcome than in the former example. The student might judge her creative potential not to be that promising. So the very same person might judge herself to be creative at one moment and not to be creative at the next (see also Mussweiler & Strack, 2000).

The question remains how similarity and dissimilarity testing processes are triggered. How does a person decide whether a standard is extreme or moderate? And are there other conditions than standard extremity that lead persons to engage in similarity or dissimilarity testing?

For the first question Mussweiler (2003) proposed a process that precedes the mechanism described. Before people start to test one or the other hypothesis an initial holistic evaluation of the comparison standard takes place. People automatically evaluate, whether the standard is similar or dissimilar to themselves. Depending on the outcome of this very fast and rough estimation, the actual hypothesis testing process begins. If a standard is classified as moderate, people start to test a similarity hypothesis and search for similarities between themselves and the standard. If the standard is classified an extreme, they test a dissimilarity hypothesis.

However, the question of similarity/dissimilarity between the judge and the comparison standard goes beyond standard extremity. If a person classifies a given standard as belonging to another social category, the very same results as in the case of extreme standards occur. A dissimilarity hypothesis is tested. When the female college student is comparing herself to a fellow male student and the gender category is salient, she might start to search for dissimilarities although it is a moderate standard. Thereby she also might start to contrast her writing abilities away from that standard. As group membership plays a central role in our daily life (Caporael & Baron, 1997; Turner, Oakes, Haslam, & McGarty, 1994), this is of particular importance. Whenever non-shared group memberships between a judge and a standard in social comparison

are salient, it is likely that a dissimilarity hypothesis is being tested. Thereby a contrastive judgmental outcome is likely to occur.

The processes described occur without a person's explicit knowledge. People do not need to be instructed to compare to their fellow students. The assumption is that whenever people have to evaluate themselves on a given dimension they will do this in a comparative manner (Mussweiler, 2003). The foundations of this idea were already laid by Festinger (1954). He proposed that whenever objective standards are lacking, people would start to compare themselves to others to evaluate their own abilities. The crucial question then is who to compare with. It can be shown that the mere activation of a comparison standard is enough to trigger a hypothesis testing process as has been described before. If a person has to judge her creativity and the writer Elfriede Jelinek has been activated, it is very likely that Elfriede Jelinek will be used as a standard of comparison. Making a standard accessible only by subliminal priming (Mussweiler, Rüter, & Epstude, 2004a) also leads to the described effects.

This idea has been extended in several ways. Since similarity and dissimilarity testing are procedures procedural priming influences them. Following the logic of Smith (1994) the likelihood of similarity or dissimilarity testing is influenced by the amount of practice a participant has. Mussweiler (2001) asked participants to compare two sketches. One

group of participants was asked to search for similarities between the two pictures while the other group had to search for differences between the two. Those who searched for similarities were more likely to engage in similarity testing in an ostensibly unrelated judgmental task than those who search for differences.

The model described might provide a framework for explaining convergent and divergent affective reactions towards a target. As outlined above, both affective convergence and affective divergence have been found in previous studies (McIntosh et al., 1994). The mechanisms for the occurrence of one or the other are not clear, yet. However, there seems to be considerable link between comparisons and affective experiences (Stapel et al., 2002). Following that line of reasoning, the question arises whether the same processes that elicit assimilative and contrastive judgments can account for the occurrence of affective convergence and divergence. Do comparisons play a role in the transfer of affect between persons? Does focusing on similarities or dissimilarities influence how one is influenced by another person's affect? Which role do self-knowledge and its selective activation have during the social induction of affect? Can the processes that have been shown to predict judgmental assimilation and contrast be applied to explain affective convergence and divergence?

In the next section six studies will be presented that test the assumption that comparative processes are an important determinant of socially induced affect.

## **Empirical part**

### ***Experiment 1***

The aim of the first experiment is to find empirical support for the notion that comparisons are related to the likelihood of social affect induction. As described before, there have been studies testing the role of social comparisons in that context (Kulik & Mahler, 2000). However, no experiment has thus far examined whether comparisons do actually trigger the automatic transfer of affect between people. Neumann and Strack (2000) have already shown that affect transfer is a largely automatic process. They propose a perception-behavior link explanation for the phenomenon of emotional contagion. In their view the automatic transfer of (congruent) affect between people is a two-step process. In a first step another person's affective reaction is perceived by an individual and in a second step the other's bodily expression is imitated. At first site, comparisons are not important in this line of argumentation. However, the participant's affective response can be either concordant or discordant to the stimulus (McIntosh et al., 1994). To explain the direction of affect of the affective response, comparisons might be a very adequate concept. In support of this claim is the finding that comparisons occur quite frequently and even outside of the conscious awareness (e.g. Mussweiler et al., 2004a). People seem to have a general tendency to compare themselves

to others (see also Festinger, 1954). If comparisons are considered to be the basis of social affect induction, then the processes have to be specified. One could assume that another person's displayed affect serves a comparison standard. The perceiver starts to compare to the other person. Based on the selective accessibility account outlined above it is assumed that this comparison can have two opposing outcomes: the perceiver's affect can either converge to or diverge from the affective response observed in the standard. Whether affective convergence or divergence occurs depends of the type of self-knowledge that is activated by the perceiver. Self-knowledge that indicates similarity between the perceiver and the person perceived should lead to affective convergence, while self-knowledge indicating dissimilarity should lead to affective divergence. Analogously to the findings in the social judgment literature it is assumed that affective divergence is the default outcome when confronted with a mild affective reaction of another person (Mussweiler, 2003). This assumption is indirectly supported by the literature on socially induced affect. Concordant affective reactions in response to other person's displayed emotions have been found more frequently than discordant reaction (McIntosh et al., 1994).

In a first step it has to be explored whether the assumption that comparisons influence social affect induction is correct. It can be argued that increasing our tendency to compare also increases the likelihood of another person's displayed affect to influence us. The present experiment

is based on a procedural priming logic (Smith, 1994). Participants practice a procedure, which is expected to be relied on in a subsequent ostensibly unrelated task. The priming applied in the present experiment was already used in a series of our own studies (Mussweiler & Epstude, 2005). Participants were asked to compare two pictures and write down all similarities as well as all differences between the two. In the control condition they just described the two pictures separate from one another. The stimulus materials were two copper stitches by Albrecht Dürer depicting medieval scenes. It has been shown that the usage of comparisons can be enhanced by this procedural priming technique. It is important to point out, that it is not assumed that comparisons take place only due to the priming technique. Rather the priming will enhance the use of comparative processing in the respective condition. Participants in the comparison condition are therefore expected to show a larger tendency to catch another person's affect than those in the control condition. As it was been outlined before, the central assumption is that affective convergence is the default. Therefore participants are expected to generally assimilate their affective state to that of the target.

## **Hypotheses**

The dependent variables are the participant's judgments of their current mood states. The following hypotheses will be tested:



- H1: Participants' mood judgment depends on whether they have been primed to engage in an enhanced comparative or in a more absolute information processing and on the pictures they have been exposed to.
- H1.1: In the comparative information processing condition participants are expected to indicate a better mood after having seen faces expressing positive affect than after having seen faces expressing negative affect
- H1.2: In the absolute information processing condition no effect of the affective quality of pictures is expected.

## **Design**

A 2 (procedural priming: comparison vs. description) x 2 (type of displayed affect: positive vs. negative) was realized. Both factors were varied between participants.

## **Method**

### *Participants*

Thirty-seven students from the University of Würzburg took part in the experiment. Up to three persons participated at a time. They were

approached in the cafeteria and asked whether they would like to take part in a short experiment. They received an ice cream as compensation for participation.

### *Materials and Procedure*

Upon agreement to take part in the experiment participants were led to a separate room. They were seated in front of a portable notebook. They were unable to see each other. The experimenter explained to them that they were going to take part in a series of smaller unrelated studies on perception. The first part of the experiment consisted of a procedural priming task previously used by Mussweiler and Epstein (2005). Participants received two sketches of copperplate prints by Albrecht Dürer. In the experimental condition they received the task to compare these two pictures and write down similarities as well as dissimilarities between the two pictures. The two sketches were printed on the same sheet of paper. In the control condition the two sketches were presented separately. It was pointed out in the instructions, that each picture should be described in terms of the depicted scenes and persons. After seven minutes the experimenter asked the participants to come to an end with the task. The ostensibly unrelated next part of the experiment was a computer-based experiment. Participants were told that they were going to see a number of pictures for 15 seconds each. Furthermore they were told that for every picture they would have to judge the quality on two dimensions: sharpness and brightness.

The set consisted of 14 pictures. All were taken from the International Affective picture system (IAPS; Lang, Bradley, & Cuthbert, 1997). On every picture, there was at least one human face. Seven of these faces had an affectively neutral expression. The seven other pictures depicted persons with an affectively unequivocal expression. In one condition these 7 facial expressions were affectively negative. In the other condition these expressions were affectively positive. Each picture was presented for 15 seconds on the whole screen. After the 15 seconds the two bogus judgments for brightness and sharpness had to be made before the next picture appeared. After having seen the 14 pictures, participants were told that this part of the experiment is over and only some standard questions about themselves still need to be answered. First, they were asked about their present mood state ("How do you feel right now?"). Responses were given on a 10 point-scale from 1 (*good*) to 10 (*bad*). Next, they were asked about how they feel on six specific emotional dimensions: cheerful, angry, anxious, sad, bored, and happy. Responses were also given on a 10-point scale ranging from 1 (*very much*) to 10 (*not at all*).

After the mood measures, participants had to answer a number of other questions. The questionnaires were included for explorative reasons to be explained below. The first were the 11 items of the German version of the social comparison orientation (SCO) scale (Gibbons & Buunk, 1999;

German version by Jonas & Mikula, 2005) in a computerized manner. The scale consists of statements like "I often compare how I am doing socially (e.g. social skills, popularity) with other people" or "I often try to find out what others think who face similar problems as I face". Participants have to indicate how much they agree to each statement on a 6-point scale ranging from 1 (not at all) to 6 (very much). According to Gibbons and Buunk (1999) the scale measures people's general tendency to compare to others. It can be assumed that people who often compare to others might show a larger general susceptibility to other person's affective reactions. The SCO scale was therefore included as a control measure. Finally, participants also received one of the subscales of the German version of the Self-Consciousness Inventory by Fenigstein, Scheier and Buss (1975) (German Version by Filipp and Freudenberg, 1989), namely the private self-consciousness scale (PSCS)<sup>2</sup>. The scale consists of thirteen items that are supposed to measure "private" self-consciousness. It was administered in a computerized manner. This questionnaire was included to check for the possibility that self-consciousness can account for automatic behavioral effects. Previous findings indicate that only people with a high level of private self-consciousness show behavioral priming effects. This is explained by a higher accessibility of self-knowledge that is then influenced by a priming stimulus (Hull, Slone, Meteyer, and Matthews, 2002) At the end of the experiment participants were thanked and fully debriefed.

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<sup>2</sup> Due to a technical problem the PCSC could not be completed by one participant.

## Results

The dependent variables are the different measures of participants' present mood state. I hypothesized that exposure to the pictures displaying affective facial expression leads to a congruent mood state only in the comparative processing condition. In the absolute information processing condition no effect of the affective stimuli on participants' mood state was expected.

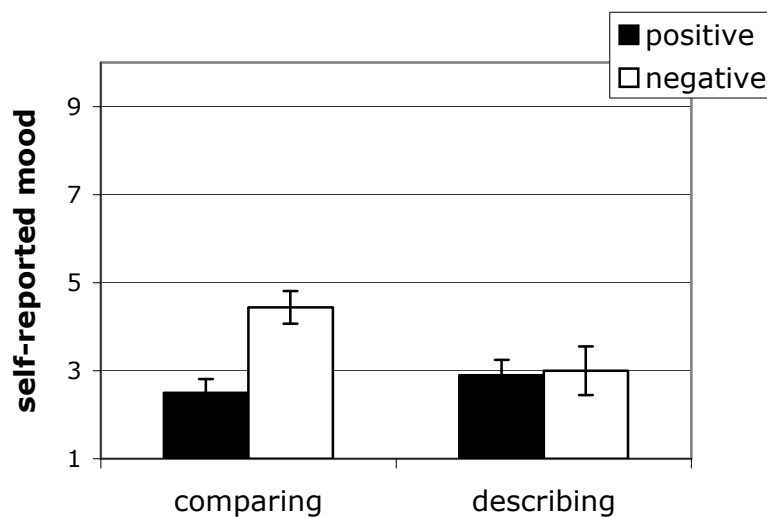


Figure 1: Participants self-reported mood on a scale from 1 (*good*) to 10 (*bad*)

At first, the data for general mood item were analyzed. Here participants had to indicate how they presently felt. As can be seen from Figure 1, participants in the comparative information processing condition who have been exposed to faces displaying positive affect reported a better mood ( $M = 2.50$ ) than those having been exposed to faces displaying a negative affect ( $M = 4.44$ ),  $t(33) = 3.45$ ,  $p < .01$ . In the

absolute information processing condition no such differences occurred (positive:  $M = 2.90$ ; negative faces:  $M = 3.00$ ,  $t(33) = .06$ , *n.s.*).

This pattern produced a significant interaction effect in a 2 (processing mode: comparative vs. absolute) X 2 (affective stimuli: positive vs. negative) analysis of variance (ANOVA) using the general mood item as the dependent measure,  $F(1, 33) = 5.16$ ,  $p < .05$ ,  $\eta_p^2 = .14^3$ . The main effect of the mood manipulation also reached significance ( $F(1, 33) = 6.45$ ,  $p < .05$ ,  $\eta_p^2 = .16$ ) indicating that overall participants in the positive displayed affect condition felt better ( $M = 2.68$ ) than those in the negative mood condition ( $M = 3.72$ ). From the inspection of Figure 1 it can be seen that this main effect is mostly driven by the large difference in the comparison condition. There was no main effect of the priming manipulation  $F < 1.8$ . Taken together the above analysis of the general mood item supports Hypotheses 1, 1.1 and 1.2.

The analyses of the more specific emotional adjectives (cheerful, angry, anxious, sad, bored, happy) revealed no systematic pattern. Only two effects reached significance: the main effects of the priming manipulation for the items "sad" and "happy". People in the comparison condition reported to be sadder ( $M = 6.42$ ) than those in the description condition ( $M = 8.44$ ),  $F(1, 33) = 5.49$ ,  $p < .05$ ,  $\eta_p^2 = .14$ . A similar pattern emerged for the item "happy". People in the comparison condition indicate to be less happy ( $M = 5.63$ ) than those in the description

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<sup>3</sup> Partial Eta square as computed by SPSS 11.5

condition ( $M = 4.33$ ),  $F(1, 33) = 7.53$ ,  $p < .01$ ,  $\eta_p^2 = .19$ . All other effects in the analysis of the six dimensions produced no significant effects, all  $F_s < 3.2$ .

*Social comparison orientation.* Before summarizing the eleven items two of them (items 5 and 11) had to be recoded in a reversed manner. Gibbons and Buunk (2000) suggest calculating a sum score of the 9 original and the 2 reversed items. Reliability analysis revealed a sufficiently high score, Cronbach's  $\alpha = .75$ . Therefore, it was possible to summarize the eleven items into one sum score. In this experiment participants were primed to either rely more on comparative or on absolute information processing. Gibbons and Buunk (1999) assume that people possess a general tendency to compare to other persons. It is not clear whether the experimental priming is influenced by people's general tendency to compare to others. To control for that statistically, an Analysis of Covariance (ANCOVA) was conducted. Again, the general mood item was taken as dependent variable, while mood condition and priming served as fixed factors. The sum score of the SCO scale was used a covariate. In this analysis the relevant interaction effect of mood condition and priming remains significant,  $F(1, 32) = 5.37$ ,  $p < .05$ ,  $\eta_p^2 = .15$ . The same is true for the main effect of displayed affect,  $F(1, 32) = 5.45$ ,  $p < .05$ ,  $\eta_p^2 = .15$ .

*Self-consciousness.* A sum score of the 13 items of the PSCS was calculated. Reliability analysis revealed a sufficiently high score (Cronbach's  $\alpha = .80$ ) To test the assumption that private self-consciousness plays a role in automatic processes (Hull et al., 2002) this sum score was included in an ANCOVA just like described for the SCO, only this time with the PSCS as a covariate. Here too, all the previously found effects remained significant: the interaction between mood condition and priming,  $F(1, 31) = 5.38, p < .05, \eta_p^2 = .15$ , and the main effect of the mood condition,  $F(1, 31) = 5.45, p < .05, \eta_p^2 = .15$ .

## **Discussion**

The results generally confirm the hypothesis that comparisons are a precondition for the social induction of affect. In this experiment participants were either induced to rely on a more comparative or on a more absolute information processing strategy (Mussweiler & Epstude, 2004). It was expected that when socially induced affect is a product of comparison processes, then the enhanced use of comparisons should facilitate affect induction. Relying on a more absolute information processing strategy should not have an influence on participants affect.

The results are in line with this reasoning. Only the mood of participants in the comparative information processing condition was affected by the display of positive or negative facial expressions of others. Participants who were primed to rely on a more comparative information



processing strategy indicated a better mood when being exposed to more positive facial expressions of others compared to being exposed to more negative facial expressions. In the absolute processing condition no such difference occurred. The described effect has only been found on the item that was supposed to measure participants' general mood. No such effect has been found for items that were believed to measure specific emotional reactions. Therefore, it is possible that the experimental manipulations only influenced participants' general mood.

An unexpected finding was that participants in the comparative information processing condition rated themselves to be sadder and less happy than those in the absolute processing condition. It is unclear whether this might be an effect of the priming material. As outlined above, the pictures used in this task were copper prints by Albrecht Dürer depicting more or less religious scenes. A possible explanation for the effect could be that comparing the two pictures leads to a more intensive processing of the picture content with the possible side effect of feeling less happy and sadder. However, as no such effect has been found on the general mood item these two effects should not be over-interpreted.

The results of this experiment are neither influenced by people's general tendency to engage in social comparisons nor by their private self-consciousness. Both constructs were seen as potentially moderating variables, but this reasoning is not supported by the present data.

An important thing to note is that participants seem to show a mood convergence towards the standards when primed to rely on comparative information processing. Also in the literature this convergence is often seen as the default outcome of the social induction of affect (Hatfield et al. 1994). However the opposite effect has also been found in previous studies (McIntosh et al., 1994). The question remains under which condition affective convergence or divergence occur and whether social comparison processes might help to clarify this issue.

Altogether the results of Experiment 1 provide a promising starting point for the investigation of the influence of comparisons on the social induction of affect. It has been demonstrated that people's mood seems not just to be influenced by the mere perception of others but by the extent to which people compare to these persons.

## ***Experiment 2***

The influence of comparisons on the social induction of affect has been established in Experiment 1. Here the general tendency seemed to be an assimilation of participants' mood toward the given standards. This is also in line with previous research. An affective shift in the direction of the target has often been found (e.g. Hatfield et al., 1994). The same pattern would be predicted by the selective accessibility account. As in social judgments (Mussweiler, 2003) assimilation should also be the

default outcome in mood judgments. However, as outlined by McIntosh and colleagues (1994), the opposite result has been found a number of times. From a selective accessibility point of view this is not surprising, because the judgmental outcome of a comparison depends on the judgmental standards and the hypotheses being tested. Therefore a next step in examining whether a selective accessibility mechanism influences the social induction of affect is to find determinants for either affective assimilation or affective contrast.

For the domain of social judgment it has been shown that the direction of the judgmental outcome is influenced by the kind of information activated by participants. Whenever information indicating similarity between the target person and the standard is activated, assimilation is likely to result. Contrast is likely to result from the activation of information indicating dissimilarity between standard and target. Searching for similarity or dissimilarity information can be seen as a cognitive procedure (Smith, 1994). Mussweiler (2001) established a priming method by which one or the other process is being triggered and consequently judgmental assimilation or contrast result. Participants were asked to compare two sketches to each other. In one condition they had to write down all the similarities between the two pictures and in the other condition they wrote down the differences. The practice of the searching procedure in that task carried over to an ostensibly unrelated subsequent comparison task. Participants who were procedurally primed to search for

similarities assimilated to a standard, while participants primed to search for differences contrasted away from a standard.

This method will be used here to show that the likelihood of affective assimilation and affective contrast can be influenced by the same mechanisms as judgmental assimilation and contrast. It is hypothesized, that participants primed to search for similarities show an affective shift in the direction of the targets, while participants primed to search for differences show an affective shift in the opposite direction.

## **Hypotheses**

As in Experiment 1 the participants' self-reported current mood state is the dependent variable. Two measures have been applied: an item measuring participants' general current mood state and a scale measuring specific dimensions of positive and negative affect. The following hypothesis will be tested:

H1: Participants' self-reported mood depends on whether participants were set in a similarity or dissimilarity focus and on whether they were being exposed to pictures depicting positive or negative facial expressions.

H1.1: In the positive mood condition, participants primed to search for similarities report a better mood than those primed to search for differences.

H1.2: In the negative mood condition, participants primed to search for similarities report a worse mood than those primed to search for differences.

## **Design**

A 2 (priming: similarities vs. differences) x 2 (type of displayed affect: positive vs. negative) design was realized. Both factors were varied between participants.

## **Method**

### *Participants*

Fifty-four students from the University of Würzburg took part in the experiment. Up to three persons participated at a time. They were approached in the cafeteria and asked whether they would like to take part in a short experiment. They received a chocolate bar as compensation for participation.

### *Materials and Procedure*

Upon agreement to take part in the experiment participants were led to a separate room. They were seated in front of a portable notebook. They were unable to see each other. The experimenter explained to them that they were going to take part in a series of smaller unrelated studies on perception. The first part of the experiment consisted of the priming procedure developed by Mussweiler (2001), but with the copperplate

prints already used in Experiment 1 as stimulus material. The instructions fully resembled the ones given by Mussweiler (2001). Participants received two sheets of paper. On one sheet of paper there were the two prints and on the other sheet there were the instructions and enough space to complete the task. Participants in the similarity condition were asked to compare the two prints in order to write down all the similarities between them. In the difference condition participants had to write down all the differences between the two pictures.

After having completed the priming procedure the next part of the experiment, the "perception task" already used in Experiment 1 was run at the notebook computer. Participants received the same pictures with the same instructions as in Experiment 1. After this, the main dependent variable, their current state of mood, was measured. This time a paper-pencil version of the Positive Affect Negative Affect Scale (PANAS; Watson, Clark, & Tellegen, 1988) was used to obtain this measure. This measure was used to test whether more distinct affective responses can be found when separating positive and negative affect from one another. The PANAS consists of 20 adjectives that form two sub-scales: one for positive affect and one for negative affect. Each of the scales contains ten items. Participants have to indicate for each item how well relates to their current mood state. Responses are given on a 5-point scale from 1 (*not at all*) to 5 (*very much*). In addition to these items another item was included in the measure, namely the general mood measure item, already

used in Experiment 1. Participants had to indicate their answer on a 10-point scale ranging from 1 (*very good*) to 10 (*very bad*). At the end of the experiment participants were thanked, fully debriefed and received their chocolate bar as compensation for participation.

## Results

It was hypothesized that participants' current mood state will depend on whether they have been put in a similarity or a dissimilarity focus and on whether they have been exposed to pictures showing positive or negative facial expressions of others. The main dependent variable was participants self-reported general mood state.

As is apparent from the inspection of Figure 2 participants with an induced similarity focus reported a better mood after being exposed to positive facial expressions ( $M = 2.62$ ) than after being exposed to negative facial expressions ( $M = 3.72$ ),  $t(50) = 5.47$ ,  $p < .05$ . For participants with an induced dissimilarity focus the opposite pattern emerged. Here participants who have been exposed to positive facial expressions reported a worse mood ( $M = 3.62$ ) than those who have been exposed to negative facial expressions ( $M = 2.58$ ). However, this difference only reached marginal significance,  $t(50) = 4.93$ ,  $p < .05$ . This pattern of means produces a significant interaction effect in a 2 (focus: similarity vs. dissimilarity) X 2 (mood: positive vs. negative) ANOVA using the general mood measurement as dependent variable,  $F(1, 50) = 10.39$ ,

$p < .01$ ,  $\eta_p^2 = .17$ . None of main effect proves to be significant in this analysis, all  $F_s < 1$ . Therefore, the analyses of the main dependent variable in this experiment strongly supports the Hypotheses 1, 1.1, and 1.2.

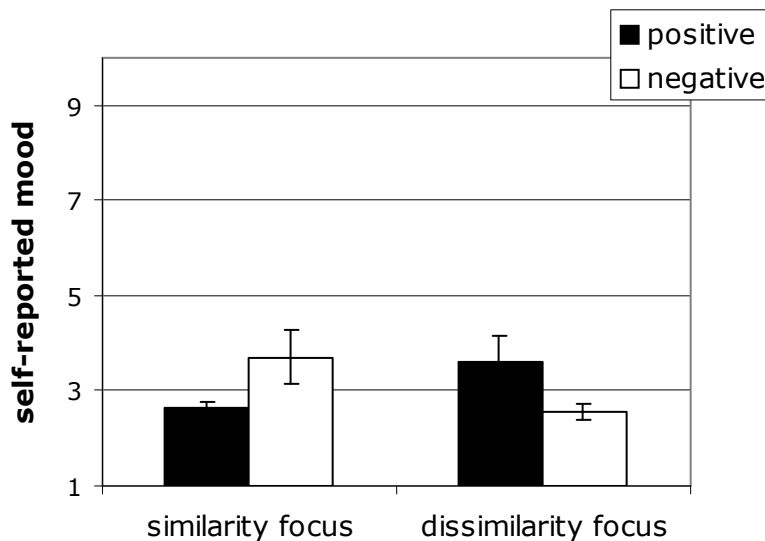


Figure 2: Participants self-reported mood on a scale from 1 (very good) to 10 (very bad)

In a next step the second dependent measure was explored. To analyze the items of the PANAS scale the means for the two sub-scales (positive and negative affect) had to be computed. Hence, two new variables were calculated, one indicating the amount of positive affect experienced by the participant and one indicating the amount of negative affect currently experienced by the participant.



The inspection of the pattern of means for the positive affect subscale of the PANAS revealed no significant differences between the conditions, all  $F_s < 1$ . The same was true for the negative affect subscale of the PANAS, all  $F_s < 1$ .

## Discussion

The main result of Experiment 1 is consistent with the hypothesis that the direction of affect induction crucially depends on the type of social comparison process that is taking place. As expected, participants who were procedurally primed to search for similarities between a standard and a target reported a better mood after being exposed to positive facial expressions than after being exposed to negative facial expressions. Participants who were procedurally primed to search for dissimilarities between standard and target tend to report a better mood after being exposed to more negative facial expressions of others than after being exposed to more positive facial expressions. No effects have been found on more specific measures of positive and negative affect. However, the item to measure the general mood state might be a rather good indicator for a person's current mood, because it is easy to understand and easy to complete. The PANAS scale takes more time to be completed and might therefore not be able to detect present changes in the general mood state. In addition, in previous research has also found an effect for the general but not for the specific mood items (Neumann & Strack, 2000).

The main finding of the experiment is important in several ways. First, it demonstrates that socially induced affect does not necessarily mean an affective convergence between a target person and a standard. Both affective convergence and affective divergence can be experimentally found and relatively easily manipulated. Second, Experiment 2 points to commonalities between social judgment research and research on mood and affect. Here a method that has been previously used in research on social judgments is transferred to research on mood. Furthermore effects similar to those in the social judgment literature (i.e. judgmental assimilation and judgmental contrast) can be found when participants are asked to indicate their own mood (i.e. affective convergence and affective divergence). A third point of importance is the fact that the findings from Experiment 2 might help to find a general mechanism based on social comparison processes to explain why people are affected by other people's mood state.

To summarize, Experiment 2 demonstrated that similarity and dissimilarity testing can influence judgments of a person's present mood state. Thereby it is demonstrated that comparisons influence social affect induction. Furthermore a focus on similarities seems to lead to a tendency to affectively converge with others, while searching for dissimilarities seems to lead to a tendency to affectively diverge from possible standards.

### ***Experiment 3***

The induction of similarity and dissimilarity focus in Experiment 2 had the expected effect. Participants tended to show an affective convergence when a similarity testing strategy was induced, and affective divergence in the case of dissimilarity testing. However, the way these foci were induced may still appear somewhat artificial. The question remains, whether there are cues in the daily environment leading to similarity or dissimilarity testing. One commonly found cue for behavioral or judgmental contrast is the category membership of a person. Ever since the classic findings of discrimination in the context of minimal groups (Tajfel, Turner, Billig, Bundy, & Flament, 1971), the effects of mere categorization into ingroup and outgroup have been studied extensively (for recent overviews see Mackie & Smith, 1998; Mummendey & Otten, 1998)). In a recent experiment, Schubert and Häfner (2003) have shown that young participants do not necessarily assimilate their behavior to elderly exemplars (i.e. slowing down their responses). Instead they contrast away from them when these exemplars are classified as outgroup members. Similar results have been found on the judgmental as well as the behavioral level (e.g. Mussweiler & Bodenhausen, 2002; Spears, Gordijn, Dijksterhuis, & Stapel, 2004; Wilder & Shapiro, 1984).

In light of these results one could argue that group membership might also determine the likelihood of the social induction of affect. Indirect evidence for this idea comes from a recent experiment by Platow

and colleagues (in press). They tested the influence of group membership on the extent to which people are affected by laughter from others. They can show that their participants were only affected by canned laughter when they believed that it comes from fellow ingroup members. For example, participants then laughed and smiled more. The canned laughter had no effect when participants thought that it comes from members of the outgroup.

When perceiving an ingroup member in a salient intergroup context, people might show a general tendency to assimilate (Brewer & Weber, 1994, Mussweiler & Bodenhausen, 2002). This should not only be true for behavioral and judgmental outcomes but also for affective measures. Contrary to that, the perception of outgroup members might lead to a general contrastive tendency (e.g. Schubert & Häfner, 2003), also on an affective level (Platow et al., in press). The assumed processes leading to this affective assimilation or contrast are similar to the ones outlined before. Perceiving outgroup exemplars in a salient intergroup context should lead the perceiver to search for dissimilarities between the self and the targets. Therefore self-knowledge indicating differences, also at an affective level, should be activated. This knowledge is then taken as the basis for the participants' own mood judgment. In the case of encounters with ingroup exemplars the alternative process of dissimilarity testing is likely to operate. Similarities between the perceiver and the ingroup

exemplars are searched for and congruent self-knowledge is being activated. The following experiment is designed to test this idea.

## **Hypotheses**

The dependent variables were participants' judgment of their own current mood state.

H1: Participants' self-reported mood depends on whether participants were being exposed to pictures of ingroup or outgroup members and on whether the persons on these pictures had a positive or negative facial expression

H1.1: Those participants who were being exposed to ingroup member displaying an affectively positive facial expression are likely to report a better mood than those who were being exposed to ingroup member displaying an affectively negative facial expression.

H1.2: Those participants who were being exposed to an outgroup member displaying an affectively positive facial expression are likely to report a worse mood than those being exposed outgroup member displaying an affectively negative facial expression.

## **Design**

The experiment was realized as a 2 (target stimuli: ingroup vs. outgroup exemplars) x 2 (type of displayed affect: positive vs. negative) design. Both factors were varied between participants.

In order to obtain suitable material for affect induction based on group membership a pilot experiment was conducted. Participants had to rate thirteen pictures of human faces in terms of their affective quality.

## **Method**

### *Pretest*

In order to find suitable material, a small pretest was conducted. Forty-eight students from the University of Würzburg were asked to rate a number of photographs depicting human faces in terms of the affective quality of the facial expression on a scale from 1 (negative) to 9 (positive). Based on the results of this pretest, the stimulus material for the present experiment was chosen.

### *Main Experiment*

#### *Participants*

Forty-one students of the University of Würzburg participated in the main experiment. The experiment was the first part of a one-hour experimental session. Participants received 6 € as compensation.

### *Materials and procedure*

The experiment was part of a one-hour experimental session. It was the first experiment in that session. Upon arrival participants were picked up by the experimenter and lead to the lab room. They were seated in front of a computer. A maximum of 3 persons at a time participated in the experiment. The intergroup context that was introduced to participants was the gender context. This was done by giving participants the task to proofread a short paragraph in terms of its comprehensiveness. The paragraph was part of an article from the German newspaper *die tageszeitung*. It was about growing rivalry between men and women in the German media world and at the labor market. Participants' task was to rate the comprehensiveness of the paragraph on a scale from 1 (*very*) to 9 (*not at all*).

These stimulus pictures were embedded in what was introduced as an experiment on perception. The basic paradigm for this task was similar to Experiment 2 with the exception that the pictures differed. The pictures for this experiment were chosen on the basis of the pretest. In every condition there were the same six pictures, depicting persons with a neutral facial expression. Three of them depicted females and three depicted males. Furthermore there were seven pictures with an affectively unequivocal facial expression. These pictures differed depending on the experimental condition. In the ingroup/positive condition ingroup

members with an affectively positive facial expression were depicted. In the ingroup/negative condition ingroup members with an affectively negative facial expression were presented. Analogously, in the outgroup/positive condition outgroup members with a positive facial expression were presented and in the outgroup/negative condition outgroup members with a negative facial expression were portrayed. As in the previous studies each picture was presented for 15 seconds. Participants were asked to rate the brightness and sharpness of each picture. Subsequent to the presentation of the pictures, participants were asked to indicate their current general mood state and specific emotional states as described in Experiment 1. After having completed this questionnaire participants were thanked and continued with the rest of the 1-hour experimental session. At the end of the session participants were debriefed, thanked and received the 6 € as compensation.

## **Results**

The main dependent variable was participants' general judgment of their own mood. It was hypothesized that depending on the experimental condition participants mood should differ. Participants in the ingroup/positive condition are expected to indicate a better mood than those in the ingroup/negative condition. Participants in the outgroup/positive condition are expected to indicate a worse mood than those in the outgroup/negative condition. In more general terms, mood is



expected to be congruent when being exposed to ingroup members, but incongruent when being exposed to outgroup members.

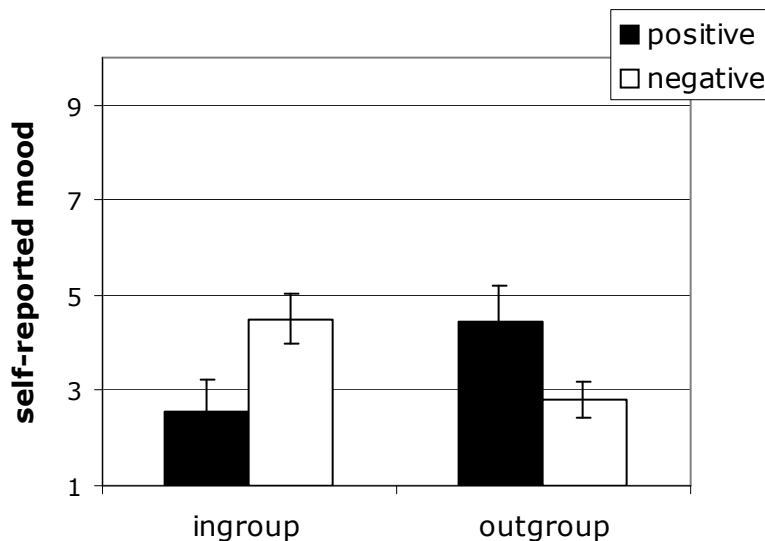


Figure 3: Participants self-reported mood on a scale from 1 (very good) to 10 (very bad)

As is apparent from Figure 3, the participants who were exposed to ingroup members with a positive facial expression indicated a better mood ( $M = 2.55$ ) than those who have been exposed to ingroup members with a negative facial expression ( $M = 4.50$ ). This difference reaches significance,  $t(37) = 2.51, p < .05$ . Participants who have been exposed to outgroup members with a positive facial expression indicated a worse mood ( $M = 4.43$ ) than those who have been presented with outgroup members with a negative facial expression ( $M = 2.82$ ). This difference reaches marginal significance,  $t(37) = 1.78, p < .08$ . This pattern of means produces a significant interaction effect in a 2 (stimuli: ingroup vs. outgroup members) X 2 (mood: positive vs. negative) ANOVA using the general

mood measurement as dependent variable,  $F(1,37) = 8.83, p < .01, \eta_p^2 = .19$ . None of the main effects in this analysis proved to be significant, all  $F_s < 1$ . Thus far the pattern of results supports the Hypothesis 1, 1.1 and 1.2.

Next the six items measuring specific affective dimensions were analyzed. Only for the item "frightened" a significant main effect emerged. Here participants, who were exposed to ingroup members generally indicated to be less frightened ( $M = 8.35$ ) than those who were exposed to the outgroup members ( $M = 6.44$ ),  $F(37) = 5.05, p < .05$ . All other effects did not reach significance, all  $F_s < 2.5$ .

## **Discussion**

This experiment was conducted to find out whether the effects of the experimentally induced similarity and dissimilarity focus can be replicated by using more natural cues that indicate similarity or dissimilarity to the perceiver. Group membership was chosen as the most promising way to induce the respective foci. Perceiving the facial expressions of fellow ingroup members was expected to produce a congruent mood state in the perceiver. On the other hand perceiving the facial expressions of outgroup members was expected to induce an incongruent mood state in the perceiver.

The results of Experiment 3 support this assumption. Participants who were presented with ingroup members showing a positive facial expression reported a better mood than those who perceived ingroup members with a negative facial expression. Contrary to that, participants who were exposed to outgroup exemplars with positive facial expressions reported a more negative mood than participants who were exposed to outgroup exemplars with negative facial expressions. This finding shows that the assumption that similarity and dissimilarity focus are related to the social induction of affect is not only a theoretical one. Whereas in Experiments 2 the foci had been established through a procedural priming technique in the present experiment it was done by merely manipulating the type of target the participant is exposed to (and can therefore compare with).

This result is partly in line with recent studies on the affective consequences of laughter by ingroup or outgroup members. As it was described above, laughter by ingroup members was more contagious to the participants than laughter by members of the outgroup (Platow et al., in press). However, the findings of the present experiment go even one step further: Being exposed to outgroup members can produce an almost significant affective contrast effect. In the literature on the relation of the personal self and group membership a similar effect for self-evaluation has only rarely been found (Cadinu & Rothbart, 1996; Mussweiler & Bodenhausen, 2002). The more common finding is, that there are no such

contrast effects produced by outgroups (Otten & Epstude, 2005; Smith & Henry, 1996). The tendency to affectively diverge from an outgroup member's expressed affect has not received much attention in research on intergroup relations (for an exception see Platow et al., in press). The result of the present experiment might be taken as another indicator for the need to explore the affective components of intergroup relations more deeply (see also Smith, 1993).

### ***Experiment 4***

So far it has been established that comparisons have a very systematic influence on the social induction of affect. In Experiment 1 it has been demonstrated that only under the condition of enhanced use of comparative information processing participants seemed to adapt their mood to the target persons. Drawing from research on social judgment it has been shown in Experiments 2 and 3 that the direction of mood transfer can be manipulated in a simple manner. An induced similarity focus led to affective convergence in the participants, while an induced dissimilarity focus produced affective divergence. So far, the results are in line with the selective accessibility approach that has been outlined before. A crucial point in that model is the activation of self-knowledge. It has been shown that assimilation and contrast in social judgments depend on the systematic activation of knowledge about the self (Mussweiler & Strack, 2000). In the case of judgmental assimilation it is likely that knowledge indicating similarity between the self and the comparison

standard has been rendered accessible before. Contrary, judgmental contrast seems to be produced by the activation of knowledge indicating differences between the self and the comparison standard (Mussweiler, 2003). The question remains, whether this assumption can be directly transferred to the field of social affect.

In research on affect and emotion such an approach does not exist. Hatfield et al. (1994) hypothesize that the type of self-construal might influence emotional contagion effects. They assume that an interdependent self-construal might make people more susceptible to affective expressions of others. Therefore these persons might show a larger contagion effect. Independent self-construal, on the other hand, might immunize people against contagion effects. Although theoretically plausible and in line with previously demonstrated effects of different types of self-construal (Markus, Kitayama, & Heiman, 1996), this assumption has never been tested.

In recent literature on automatic behavior effects one can also find the assumption that activation of the self plays a crucial role (S.C. Wheeler, DeMarree, & Petty, in press) in the generation of these effects. As outlined above a similar point has been made by Hull and colleagues (2002) who proposed that mainly people with a high level of private self-consciousness show the by now well known automatic behaviors after being primed (e.g. walking slower after being primed with the stereotype

of the elderly; Bargh, Chen, & Burrows, 1996). This is explained by the assumption that that people with a high level of private self-consciousness have chronically activated a larger amount of self-knowledge than people with a low level of self-consciousness. This argumentation is in line with the selective accessibility account of socially induced affect. The affective change is assumed to result from the activation of (specific) self-knowledge. However, if there is only a limited amount of self-knowledge activated in general, an affective change should be unlikely to occur. When there is large number of information about the self frequently activated, then the selective activation of self-knowledge might be much easier for people with a high level of private self-consciousness. Therefore, to explore how the activation of self-knowledge influences the social induction of affect self-activation will has to be manipulated. Activating the self should then lead to a higher susceptibility to another person's displayed affect.

## **Hypotheses**

Again, the dependent variables are participants' judgments of their own mood state. In addition an implicit mood measure is applied as a pre-post measure to investigate actual mood change in participants. The hypotheses refer to both types of measures (i.e. explicit self-reported mood and implicit measures).

H1: Participants mood depends on the activation of the self and on whether they were being exposed to pictures showing positive or negative facial expressions.

H1.1: When the self is activated, participants who saw pictures displaying positive facial expressions of others are expected to be in a better mood than participants who saw pictures with negative facial expressions.

H1.2: When the self is not activated no effect of the type of pictures is expected.

## **Design**

This experiment is based on a 2 (self-activation: yes vs. no) X 2 (type of displayed affect: positive vs. negative) design. Both variables were varied between participants.

## **Method**

### *Participants*

Forty-eight students of the University of Würzburg were recruited to participate in this experiment as part of a 1-hour experimental session. All participants received € 6.00 for taking part in the experiment.

*Materials and Procedure.*

The 1-hour experimental session began with this experiment. In the first part of the experiment the implicit mood measure was conducted. This was taken from an experiment by Higgins, Bond, Klein and Strauman (1986). Participants received written instructions. It was explained to them, that their writing speed would be tested. The task was to write down as many numbers as possible starting from 100 and counting backwards. The time limit was one minute. When participants had read the instructions and indicated that they were ready to start, the experimenter started to take the time. After one minute participants were asked to stop and the experimenter collected the sheets of paper.

The self-activation manipulation followed next. Participants received written instructions. It was explained to them that this task is a pre-test for another experiment to be carried out in the future. They had to read a small paragraph about the travel preparations of a person. The task was to circle all words that are related to persons. For half of the participants this small paragraph was written from a first-person narrator's perspective and therefore contained many words that are related to the self (e.g. I or me). Based on previous applications of this task, it was expected that the completion of this task would activate the personal self (Brewer & Gardner, 1996). For the other half of the participants the paragraph was written from a third person's perspective. Two subversions existed to control for effects of participant's gender. Males received a questionnaire



where the written paragraph contained only words that relate to male persons (e.g. him or he). In the female version these words were replaced by the analogous female word (e.g. her or she). The third person version of the task was used as the control condition. The basic content was the same for the first and the third person versions of the paragraph. Brewer and Gardner (1996) were the first to introduce this type of manipulation. The present German version of task is based on an experiment by Kühnen, Schubert and Hannover (2001).

Subsequent to that task, the presentation of the pictures of human faces followed. The task and the stimulus material were identical to the ones used in Studies 1 and 2 and will therefore not be described in detail again. After the completion of this task participants received the PANAS scale as an explicit mood measure. The scale has already been described in Experiment 2. They also completed the number writing task a second time. The implicit measure of participant's mood state was taken as an indicator of mood change during the course of the experiment. After having completed the task participants proceeded with the other experiments in the 1-hour session. At the end of the session they were thanked for their participation, fully debriefed, paid, and dismissed.

## **Results**

Two types of dependent variables were used in this experiment: participants' explicit self-reported mood and the implicit mood measure

(i.e. the number writing task). The implicit mood measure was used as a pre-post measure. It was hypothesized that participants whose self had been activated will be in a better mood after being exposed to positive facial expressions than after being exposed to negative facial expressions. Participants who were in the control condition and whose self had therefore not been activated will not show this difference. The hypotheses are expected to be true for explicit as well as implicit mood measures.

*Explicit mood measures.* Two means scores for the different subscales of the PANAS were calculated resulting in one score for negative affect and one score for positive affect. Higher values in the positive mood condition indicate a more positive mood at the end of the experiment. Higher values in the negative mood condition indicate a more negative mood during the course of the experiment.

As can be seen from Figure 4, participants whose self has been activated before report more positive mood after being exposed to positive facial expressions of others ( $M = 3.27$ ) compared to those who have been exposed to more negative facial expressions of others ( $M = 2.55$ ),  $t(44) = 3.15$ ,  $p < .01$ . Such a difference does not occur for participants whose self has not been activated before (positive:  $M = 2.85$ , negative:  $M = 2.81$ ,  $t(44) = .14$ , *n.s.*). This pattern of means produces a significant interaction in a 2 (self activation: yes vs. no) X 2 (mood: positive vs. negative) ANOVA with the positive mood subscale of the PANAS at the dependent measure,  $F(1,44) = 4.12$ ,  $p = .05$ ,  $\eta_p^2 = .09$ .

The main effect of the mood manipulation also reached significance,  $F(1,44) = 5.05$ ,  $p = .05$ ,  $\eta_p^2 = .10$ , indicating that overall participants who were exposed to more positive facial expressions reported a better mood ( $M = 3.07$ ) than those who were exposed to more negative facial expressions ( $M = 2.67$ ). The main effect of self-activation did not reach significance,  $F < 1$ .

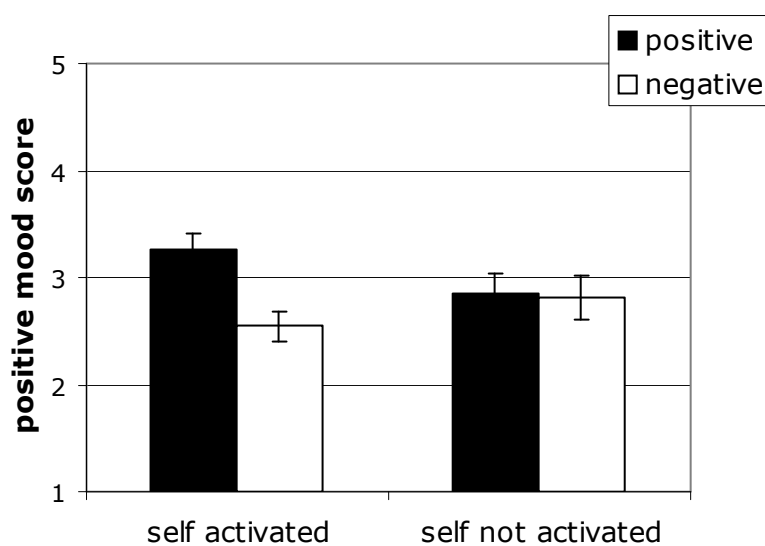


Figure 4: Positive mood score after being exposed to positive vs. negative facial expressions depending on the activation of the self

Next the PANAS subscale for negative affect was analyzed in a 2 (self activation: yes vs. no) X 2 (mood: positive vs. negative) ANOVA with the negative affect subscale as dependent measure. The analysis of the did not reveal any significant effects, all  $F_s < 1$

*Implicit mood measure.* Higgins and colleagues (1986) found that the more positive participant's mood is, the more numbers they write. Thus explicit mood measures and this type of measure are positively correlated. The written numbers were therefore counted at  $t1$  and at  $t2$ . A difference score was calculated as it was done for the explicit mood measures (i.e. the number of written items at  $t1$  was subtracted from the number of written items at  $t2$ ). Therefore higher values of that difference score indicate that participants' mood improved during the course of the experiment. Smaller values indicate that participant's mood deteriorated during the course of the experiment.

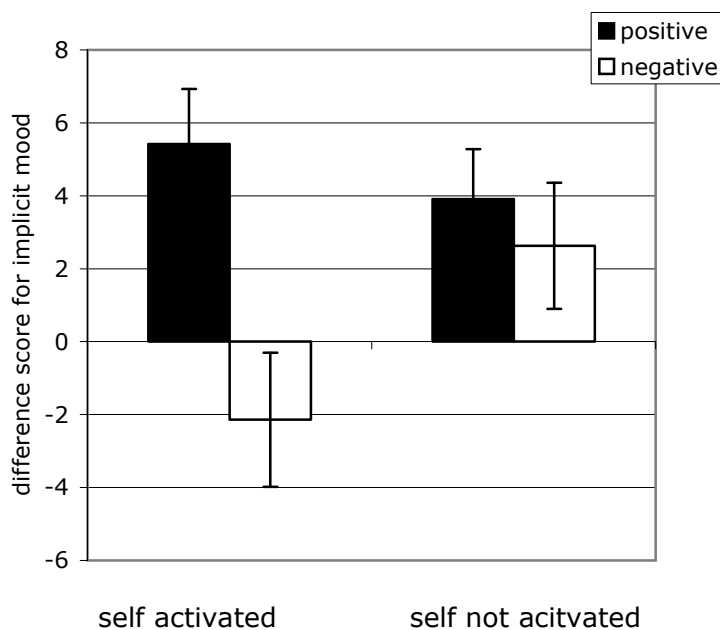


Figure 5: Difference score for the implicit mood measure. Higher values indicate a positive mood change from  $t1$  to  $t2$

From the inspection of Figure 5 it is apparent that participants whose self has been activated show seem to have improved in their mood

when they have been exposed to more positive facial expressions of others ( $M = 5.41$ ) compared to those who have been exposed to more negative facial expressions of others ( $M = -.21$ ),  $t(24) = 2.49$ ,  $p < .05$ . Participants whose self has not been activated before do not show such a pattern (positive:  $M = 3.91$ , negative  $M = 2.63$ ,  $t(20) = .52$ , *n.s.*). However, this pattern of means did not produce a significant interaction effect in a 2 (self activation: yes vs. no)  $\times$  2 (mood: positive vs. negative) analysis of variance,  $F(1,44) = 1.71$ ,  $p = .20$ ,  $\eta_p^2 = .04$ . The main effect of the mood manipulation was significant,  $F(1,44) = 4.28$ ,  $p < .05$ ,  $\eta_p^2 = .09$ . Participants who have been exposed to more positive facial expressions of others reported a better mood during the course of the experiment ( $M = 4.70$ ) compared to those who have been exposed to more negative facial expressions of others ( $M = 1.00$ ). The main effect of the self-manipulation did not reach significance,  $F < 1$ . Taken together the results for the implicit mood measure only partly confirm the Hypotheses 1, 1.1 and 1.2.

## Discussion

The goal of this experiment was to show that self-activation is a necessary precondition for the social induction of affect. To investigate this issue participants' amount of self-activation was experimentally varied. It was expected that participants whose self has been activated are affected by affectively unequivocal facial expressions of others.

Participants whose self was not activated were not expected to show such an effect.

Overall the results of the experiment are promising. The expected effect of self-activation has been found for participants' self-reported positive mood. Here it was shown that only participants whose self was activated felt better after viewing photographs containing positive facial expressions compared to those who had viewed photographs depicting negative facial expressions of others. This effect was not found for participants whose self has not been activated.

This mood pattern was not evident for the negative affect subscale of the PANAS. Here no difference at all emerged between the experimental conditions. This might be a result of the way the PANAS scale is conducted. The two separate subscales might not be an optimal way to assess mood differences like the ones expected in this experiment. The empirical evidence of the previous studies suggests, that the general mood item seems to be a more sensitive indicator of participants' mood than more differentiated measures (see also Neumann & Strack, 2000)

Another important feature of the present experiment was the implicit mood measure. As there are methodological difficulties when one wants to assess mood changes with explicit measures, it seemed worthwhile to find a more indirect measure that can show that

participants' mood really changes from the beginning to the end of the experiment. The method applied here was a task measuring writing speed. It has been found that writing speed is positively correlated to people's affect (Higgins et al. 1986). So in this experiment it was expected that participants whose self had been activated do show an actual change in their mood compared to those who's self had not been activated. This assumption was partly confirmed. When the self had been activated participants who were exposed to positive facial expressions showed an increased writing speed compared to participants who had been exposed to negative facial expressions. Such an effect did not occur for participants whose self had not been activated. A potential problem of the task is that practice effects cannot be ruled out. It is not unlikely that participants managed to increase their speed at  $t_2$  just because they perform the task a second time. Although the results for implicit mood measures do not completely support the assumptions, they suggest that it might be a promising enterprise to find suitable implicit pre-post measures of mood.

Finally it has to be mentioned that the manipulation of self-activation might allow have primed other features of the self. In the control condition another component of the self might have been activated: the relational self (e.g. Tice and Baumeister, 2001). This part of the self-concept includes self-definitions that have been developed in the context of dyadic relationships (Brewer & Gardner, 1996). According to Sedikides and Brewer (2001) it is "achieved by assimilating with

significant others (p.1)”. It might be a fruitful approach to replicate the results of Experiment 4 using a different self-activation manipulation.

To summarize, Experiment 4 provided partial support for the assumption that self-activation is a necessary precondition for the social induction of affect. However, there are some potential problems with the way the self has been manipulated. Furthermore it seems advisable to assess participants’ mood with a more general measure than the PANAS.

### ***Experiment 5***

Initial support for the crucial role of the self for the social induction of affect has been gained through Experiment 4. However, the paradigm used there was only one way to manipulate self-activation. As has been outlined before, there is a potential alternative explanation for the effect that has been found in Experiment 4, namely that other components of the self than the personal one have been activated. To control for these possible unwanted effects of the self-activation procedure in Experiment 4, it seems necessary to replicate the findings from that experiment with a different procedure. Because of the mixed findings in Experiment 4 by using only the PANAS scale to measure mood, a more general item to assess mood was included in the dependent variables.

In the following experiment it will be shown that a different self-activation procedure leads to a mood pattern similar to the one in



Experiment 4. The method to be applied is modeled after that described by Stapel and Tesser (2001, Experiment 2b) and seems to avoid the activation of other sub-aspects of the self.

## **Hypotheses**

The main dependent variable is the item measuring participants' general mood and 6 items measuring more specific emotional states (as in Experiment 1). No implicit mood measure is being used in this experiment. As in Experiment 4, the following hypotheses will be tested:

H1: Participants mood depends on the activation of the self and on whether they were being exposed to pictures showing positive or negative facial expressions.

H1.1: When the self is activated participants who saw pictures displaying positive facial expressions of others are expected to be in a better mood than participants who saw pictures with negative facial expressions.

H1.2: When the self is not activated no effect of the type of pictures is expected.

## Design

A 2 (self-activation: yes vs. no) X 2 (type of displayed affect: positive vs. negative) design was realized. Both independent variables were varied between participants.

## Method

### *Participants*

Fifty students of the University of Würzburg took part in the experiment. Up to three persons participated at a time. They were approached in the cafeteria and asked whether they would like to take part in a short experiment. They received a chocolate bar as compensation for participation.

### *Materials and Procedure.*

After having arrived in the lab room participants were seated in front of portable notebook computers. They were told that they were going to take part in a series of smaller, unrelated studies.

The first part of the experiment was the manipulation of self-activation. As mentioned before, a technique used by Stapel and Tesser (2001, Experiment 2b) was applied. Half of the participants received a questionnaire where they were asked to explain another person how they really are and what they really like. They had to write down four statements. That was the self-activation condition. For the other half of

the participants the task was to imagine somebody who had never seen TV or watched a movie during the last 50 years. Participants had to write down four movies this person has to see. This was the control condition.

Subsequently participants were told that the next part of the experiment is taking place at the notebook computer. What followed was the "perception task" using the pictures of human faces that had been used in Studies 1, 2 and 4. After that, participants had to indicate their present mood state on one general mood item and 6 specific emotional dimensions. At the end of the experiment participants were thanked, debriefed, paid, and then dismissed.

## **Results**

As in Experiment 4 it was expected that self-activation is a precondition for participants to be affected by the facial expressions of others. Those whose self was activated and who were being exposed to more positive facial expressions of others were expected to be in a better mood than those who were exposed to negative facial expressions. No such difference has been expected for participants in the control condition.

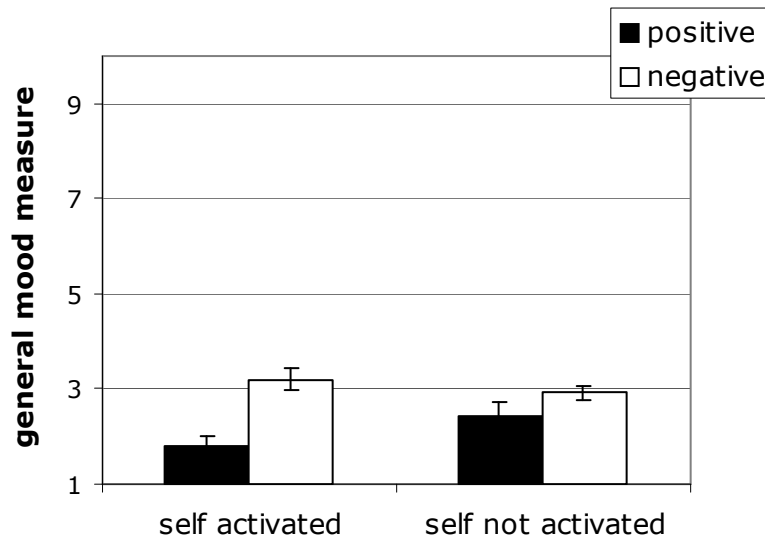


Figure 6: Participants' self-reported mood depending on the activation or non-activation of the self and on the exposure to positive vs. negative facial expressions (Experiment 5)

First the general mood measure is analyzed. From the inspection of Figure 6 it is apparent that participants whose self has been activated and who were exposed to positive facial expressions of others appeared to be in a better mood ( $M = 1.82$ ) than those who have been exposed to negative facial expressions of others ( $M = 3.20$ ),  $t(24) = 4.66$ ,  $p < .001$ . For participants in the control condition no such difference is found (positive:  $M = 2.45$ , negative:  $M = 2.92$ ,  $t(22) = 1.53$ , *n.s.*). This pattern of means produces a significant interaction effect in a 2 (self-activation: yes vs. no)  $\times$  2 (mood: positive vs. negative) ANOVA with the general mood item as the dependent variable,  $F(1, 46) = 4.59$ ,  $p < .05$ ,  $\eta_p^2 = .09$ . In addition the main effect of mood condition became significant. Participants who were exposed to positive facial expressions reported to

be in a better mood ( $M = 2.14$ ) than those who were being exposed to negative facial expressions ( $M = 3.07$ ),  $F(1,46) = 18.84$ ,  $p < .001$ ,  $\eta_p^2 = .29$ . There was no main effect of the self-activation manipulation,  $F < 1$ . Taken together, the results of this analysis support the Hypothesis 1, 1.1 and 1.2.

Next the six items measuring specific dimensions of participant's current affective state were analyzed. Here only one significant main effect occurred. Participants who were being exposed to more positive facial expressions of others reported to be more joyful ( $M = 3.59$ ) than those who were exposed to negative facial expressions of others ( $M = 4.64$ ),  $F(1, 46) = 5.24$ ,  $p < .05$ ,  $\eta_p^2 = .10$ . All other effects did not reach significance, all  $F_s < 3.4$ .

## **Discussion**

The aim of the present experiment was to replicate the findings from Experiment 4 by using a different way to manipulate self-activation. In addition a different dependent measure was used. Instead of separate subscales for positive and negative affect, a general mood measurement in the form of the question "How do you feel right now?" was used as the main dependent variable. Moreover, six separate items measuring specific emotional states were used as additional dependent measures.

The previous findings from Experiment 4 were replicated. The mood of those participants whose self had been activated was better after being exposed to more positive facial expressions than the mood of those participants who were exposed to more negative facial expressions. This difference was not found in the control condition, where the self had not been activated before. However, this effect was only apparent in the analysis of the general mood measure, but not in the analysis of the six other items. But this is consistent with the previous studies (1-3) in which the same measures were applied.

Overall it can well be concluded that self-activation seems to be a necessary pre-condition for the transfer of another person's displayed affect onto the self.

## ***Experiment 6***

The results of Studies 4 and 5 suggest that self-activation seems to be a necessary pre-condition for an automatic transfer of mood between persons. Only when the self had been activated, the affective expression of another person seems to have an effect on the perceiver. What aspects of the self trigger the affect transfer can up to now only be hypothesized. Referring to selective accessibility approach outlined above, one could assume that the type of knowledge that is activated can determine the outcome of the mood judgment. When people report positive affect, also

positive self-knowledge is activated. Conversely, when negative affect is reported negative self-knowledge is likely to be activated (Blanley, 1986).

Studies 2 and 3 point to the fact that the way a perceiver is reacting to affective expressions of other persons can be manipulated. Experimentally putting participants in a similarity or dissimilarity focus (Experiment 2) or making natural cues for either of these foci salient (Experiment 3) can lead to specific mood patterns. These results all seem to support a selective accessibility account for the social induction of affect. However, at the heart of that account stands the assumption that standard congruent self-knowledge is activated. This specific knowledge activation is supposed to lead to judgmental assimilation and contrast (Mussweiler, 2003; Mussweiler & Strack, 2000). Extrapolating this reasoning to the domain of socially induced affect, one could argue that assimilating one's own mood state to a target is also caused by the activation of self-knowledge that indicates affective similarity between the self and the target person. Conversely, contrasting one's own mood state away from a target should be caused by the activation of self-knowledge indicating affective difference between a standard and a target person. To convincingly argue that the social induction of affect is a product of specific self-knowledge activation these activation patterns have to be demonstrated empirically.

A suitable method for the investigation of the accessibility of self-related knowledge is lexical decision task (see Neely, 1991 for a review). A modified form of this technique was used here. After indicating their mood on the explicit measures, participants were asked to make a series of lexical decisions. This task included words that were related to experiencing positive affect (e.g. happy, funny) and words that are associated with experiencing negative affect (e.g. sad, aggrieved). In addition to that, neutral words and non-words were included in the task. The general expected effect here would be that participants react faster to mood-consistent words than to mood-inconsistent words. For example, positive affect words should be recognized faster after having been exposed to positive rather than negative facial expressions. However, a mood congruent recognition mechanism (Blaney, 1986; Förster & Strack, 1996) can also explain this type of result. Being exposed to positive affective stimuli might just act as a simple affective priming. Therefore the specific activation of certain self-knowledge cannot be shown with a simple lexical decision task. This type of specific activation has to be separated from a more general affective priming effect. Dijksterhuis, Van Knippenberg, Spears, Postmes, Stapel, & Scheepers (1998) introduced a method that is based on the logic of a lexical decision task, but adds an interesting twist to the paradigm. Preceding every lexical decision a subliminal prime is presented on the screen. Half of the words are preceded by a word closely related to the self (I, my, me). Preceding the other half are words that are unrelated to the self (and, or, when).



Through this additional feature it becomes possible to distinguish between a general accessibility of a concept and the activation of specific self-knowledge. This method has also been applied by Mussweiler and Strack (2000) and Schubert and Häfner (2003) to investigate the activation of self-knowledge during social comparisons. In combining the method with the paradigm used in Experiment 2, one should be able to show how the similarity and dissimilarity focus and the exposure to the different facial expressions renders specific self-knowledge accessible and thereby produces different mood states.

## **Hypotheses**

The dependent variables are participants' self-reported mood and the response times of the primed lexical decision task. Therefore several hypotheses can be tested. At first the results from Experiment 2 concerning participants own mood judgments have to be replicated:

H1: Participants' self-reported mood depends on whether participants were set in a similarity or dissimilarity focus and on whether they were being exposed to pictures depicting positive or negative facial expressions.

H1.1: In the positive mood condition, participants primed to search for similarities report a better mood than those primed to search for differences.

H1.2: In the negative mood condition, participants primed to search for similarities report a worse mood than those primed to search for differences.

If these findings from Experiment 2 can be replicated, then the hypotheses concerning the activation of selective self-knowledge can be tested.

H2: Lexical decisions for words that are congruent to participants current mood state are expected to be made faster than for words incongruent to their current mood state.

H2.1. Specifically, this effect is expected to occur for mood-congruent words that have been preceded by self-primes.

## **Method**

### *Participants.*

Thirty-five students from the University of Würzburg were recruited to participate in a 1-hour experimental session. They received € 6 as compensation for their participation.

*Materials.*

The first part of the experiment was identical to the procedure in Experiment 2 and will therefore not be outlined in detail again: participants received the similarity/dissimilarity focus manipulation and then proceeded with the “perception” task at the computer during which the pictures of human faces were presented.

For the lexical decision task 4 different sets of stimulus word were used. 6 words that are associated with being in a positive mood state (*lustig* [funny], *fröhlich* [cheerful], *gut* [good], *freudig* [happy], *heiter* [cheerful], *glücklich* [lucky]), 6 words that are associated with being in a negative mood state (*traurig* [sad], *betrübt* [miserable], *schlecht* [bad], *verärgert* [angry], *nervös* [nervous], *bekümmert* [worried]) 6 neutral words (*fest* [hard], *klar* [clear], *groß* [tall], *breit* [wide], *schlicht* [simple], *urban* [urban]), and 6 non-words. In addition two sets of primes were used: one set of primes was associated with the self (*ich* [I], *mein* [my], *mir* [me]), the other set of primes was not associated with the self (*und* [and], *ein* [a], *das* [the]). From these primes and targets a list of 36 prime-target combinations were constructed. Each prime was once succeeded by a positive word, a negative word and a neutral word. Each prime was three times succeeded by a non-word. So there were 9 trials where a self-prime was succeeded by a word, 9 trials where a neutral prime was preceded by a word, 9 trials where a self-prime was preceded by a non-word, and 9 trials where a neutral prime was preceded by a non-

word. The order of presentation for the 36 prime-target combinations was randomized. Before the presentation of these combinations there were 5 practice trials without a prime during which participants were able to get used to the task.

### **Procedure.**

Upon arrival in the lab participants were greeted by the experimenter, lead to separate booths and were seated in front of a 70-Hz computer screen at a predetermined distance. The present experiment was the first in that experimental session. The experimenter explained to the participants that they were going to take part in several unrelated small studies, starting with a pre-test for a experiment to be run sometime in the future. Only the similarity/dissimilarity focus manipulation was a paper-pencil-task, the remaining parts of the experiment were computer-based, so that participants didn't need to be interrupted by the experimenter. After the completion of that "perception task", participants were asked to indicate their present mood state on the general mood item and the six specific emotional items used in Experiment 2.

The next part of the experiment was a primed lexical decision task. It was closely modeled after the task used by Dijksterhuis et al. (1998). For the participants it was introduced as an experiment on word comprehension, where they have to decide whether a letter string

presented on the screen is a German word or not. Responses were made via two keys at the computer keyboard. Whenever participants thought that the letter string presented at the screen is a word, they had to press the right "ctrl" key. When they thought the letter string is a non-word, they had to press the left "ctrl" key. To reduce variance in response latencies, participants were told to position their forefingers on the respective keys. It was pointed out to the participants that it is important to solve the task as quickly and as accurately as possible. Furthermore participants were instructed to concentrate on the fixation point in the middle of the screen.

The lexical decision task contained 41 trials. The first 5 trials were practice trials, whereas the remaining 36 trials were the critical trials that were included in the analysis. At the beginning of each individual trial, a fixation stimulus (XXX) was presented at the center of the screen for 1000 ms. The prime was then presented at the same location for 15 ms and was immediately masked by a letter string (XXX) for 500 ms. Then the target word was presented. It remained on the screen until participants had made their response. Then the screen cleared and the next trial began.

After the lexical decision task participants received a short questionnaire to test for awareness of the priming. Participants were asked whether they had noticed anything unusual during the experiment.

They were then informed that other words were presented for a short interval before the target words. When participants had noticed these words, they were asked to write them down. At the end of the experimental session participants were fully debriefed, thanked, paid and then dismissed.

## Results

### *Explicit mood measure*

It was hypothesized that participants' current mood state will depend on they have been put in a similarity or a dissimilarity focus and on whether they have been exposed to pictures showing positive or negative facial expressions of others.

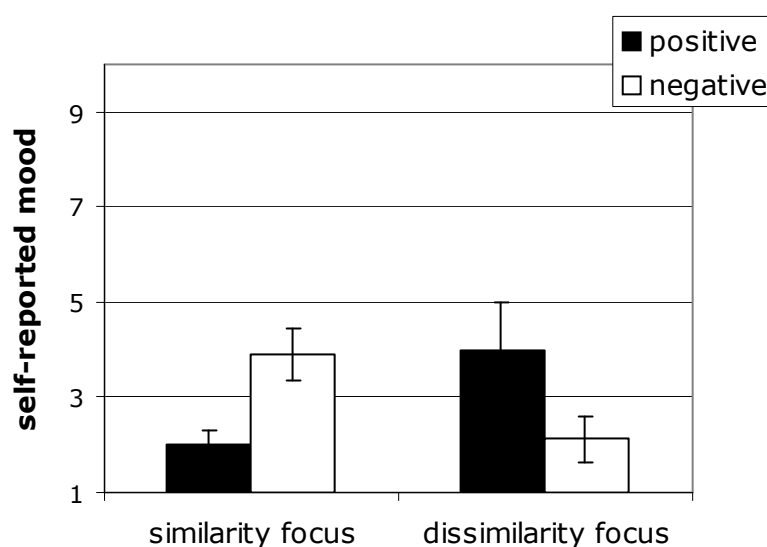


Figure 7: Participants self reported mood on a scale from 1 (good) to 10 (bad)

As it is apparent from the inspection of Figure 7 participants with an induced similarity focus reported a better mood after being exposed to positive facial expressions ( $M = 2.00$ ) than after being exposed to negative facial expressions ( $M = 3.89$ ),  $t(31) = 2.11$ ,  $p < .05$ . For participants with an induced dissimilarity focus the opposite pattern emerged. Here participants who have been exposed to positive facial expressions reported a worse mood ( $M = 4.00$ ) than those who have been exposed to negative facial expressions ( $M = 2.13$ ),  $t(31) = 2.03$ ,  $p = .05$ . This pattern of means produced a significant interaction effect in a 2 (focus: similarity vs. dissimilarity)  $\times$  2 (mood: positive vs. negative) ANOVA using the general mood measurement as dependent variable,  $F(1, 31) = 8.57$ ,  $p < .01$ ,  $\eta_p^2 = .22$ .

The inspection of the pattern of means for the six more differentiated affect measurement items revealed no significant effects, all  $F_s < 1$ .

#### *Lexical decision task*

*Awareness check.* None of the participants realized that prime words had been presented. In addition none of the participants were able to list any of the prime words.

*Lexical decisions.* The response times of the lexical decision task were logarithmically (*ln*) transformed to reduce the skewness of the response distribution (Fazio, 1990). The analysis is based on this logarithmic transformation. However, for ease of interpretation, the non-transformed means are reported.

Since the explicit mood measures were in line with the predictions, the two within-participant factors were summarized. A new factor as an indicator for the experience of positive or negative affect was calculated. Participants who primed to search for similarities and saw positive facial expressions of others and participants primed to search for dissimilarities and saw negative facial expressions of others were summarized as one step of that factor. Therefore in this group all participants that indicated a more positive affect were summarized. The other step consisted of cases where participants were primed to search for dissimilarities and saw pictures of positive facial expressions and of participants who were primed to search for similarities and saw negative facial expressions. Therefore, the second step of the factor consisted of all people that indicated a more negative affect on the explicit measures.

In the main analysis response times for words congruent with the affect indicated by the participants (i.e. positive words after being presented with positive facial expressions and negative words after the negative facial expressions) were compared to words incongruent to the



affect experienced by the participants (i.e. negative words after being presented with positive facial expressions and positive words after being presented with negative facial expressions). In addition to that the influence of the type of prime (self vs. control) was analyzed. This was done in a 2 (mood: positive vs. negative) x 2 (self vs. control) x 2 (target: positive words vs. negative words) mixed ANOVA with repeated measures on the last two factors. The analysis revealed a mood x target interaction,  $F(1, 32) = 10.97, p < .01, \eta_p^2 = .26$ . This is in line with the predictions. As can be seen from the inspection of Table 1 participants in positive mood recognized positive words much faster than negative words. Conversely, participants who were in negative mood recognized negative words much faster than positive words. This effect was especially pronounced for those words which were preceded by a self-prime resulting in a mood x self x prime interaction,  $F(1, 32) = 9.05, p < .01, \eta_p^2 = .22$ . Not additional effects became significant in this analysis.

Table 1. Mean response latencies (in Milliseconds) for the lexical decision task

Mood	Priming	Target	
		positive words	negative words
positive	Self	626	651
	Control	681	696
negative	Self	684	639
	Control	665	657

## Discussion

The goal of the present experiment was to explore the underlying mechanisms for the social induction of affect. Based on the results of Experiment 2 it was hypothesized that participants who are in a similarity focus indicate a more positive affect after being exposed to positive facial expressions of others than after being exposed to negative facial expressions of others. Conversely, participants in a dissimilarity focus were expected to indicate a better affect after being exposed to more negative facial expressions of others than after being exposed to more positive facial expressions of others. Results fully confirmed this prediction and thereby also replicated the findings of Experiment 2.

To investigate the assumption, that the selective accessibility of self-knowledge after a comparison is the reason for this mood pattern a primed lexical decision task was conducted. If the selective accessibility mechanism indeed influenced the social induction of affect, then the accessibility of self-related knowledge indicating a congruent affect between the self and the affective reactions displayed in the pictures was expected to be increased. Specifically, after comparing to persons displaying positive affect participants should have been faster in recognizing positive words than in recognizing negative words. After the comparison with persons displaying negative affect negative words should have been recognized faster than positive words. In addition, it was expected that to the extent that self-related knowledge rather than a

mood congruency effect was responsible for the affective reaction, it should have primarily occurred if the lexical decisions are preceded by self-primers.

The results were in line with the predictions. A general mood congruency effect (Blaney, 1986) occurred, indicating that information that is congruent with one's own mood state is more accessible than knowledge that is incongruent with one's own mood state. But in addition evidence for a selective self-accessibility was found. Knowledge that was congruent to the participants' affect and related to the self was highly accessible. Thus, the claim that a comparison between the self and the perceived affect of others took place and specific self-knowledge was rendered accessible is supported by the data. The current experiment demonstrates that selective knowledge activation after the comparison with another person can lead to an affective change. Moreover, the findings for the explicit mood measures reflect the fact that focusing on similarities and dissimilarities is a strong predictor for the occurrence of concordant and discordant affect.

## General Discussion

The goal of the present research was to provide support for the assumption that social comparison processes are one of the underlying mechanisms behind the social induction of affect. Prior research has typically focused on the occurrence of affective convergence, i.e. a shift of the perceiver's affect into the direction of the affect displayed by a target person. Thus, theoretical explanations almost exclusively focused on affective convergence. However, a number of studies show that affective divergence is also a common result (McIntosh et al., 1994). The conditions for the occurrence of either affective divergence or affective convergence have only been vaguely specified. The approach outlined here tries to find an integrative mechanism that can explain both affective convergence and divergence. The core assumption is that socially induced affect depends on comparison processes. Based on the selective accessibility model (Mussweiler, 2003; Mussweiler & Strack, 2000) affective convergence and divergence are assumed to result from testing different hypotheses. Affective convergence is expected to result from testing a similarity hypothesis. Thereby self-knowledge indicating similarity between a given standard (e.g. a facial expression of another person) and the self is being activated. Affective divergence results from testing a dissimilarity hypothesis. In this case, self-knowledge indicating dissimilarity between the standard and the self is rendered accessible.

In Experiment 1 the assumption that comparisons are a key mechanism behind the social induction of affect is tested. Based on previous research from the domain of social judgments (Keil et al. 2004, Mussweiler & Epstude, 2005) a comparative information processing mode was induced. The induction of a comparative processing strategy was expected to increase the extent to which participants are influenced by another person's displayed affect. Results clearly confirmed the predictions. Evidence for socially induced effect was only found, when participants were in a comparative information processing mode. Those participants indicated an affective state that was congruent to the one displayed by the targets. Participants who were in an absolute information processing mode did not show that effect. This result was taken as first evidence for the assumption that comparison processes contribute to the social induction of affect.

In line with prior research an affective state congruent with the target persons seems to be the default finding (Chartrand et al., 2005; Hatfield et. al, 1994; McIntosh et al., 1994). The results from Experiment 1 provide support for this claim. The aim of Studies 2 and 3 was to explore conditions for the occurrence of either affective convergence or affective divergence. Based on the selective accessibility mechanism it was expected that affective convergence results when a similarity hypothesis is tested, while affective divergence results when a dissimilarity hypothesis is tested. More generally, it was suggested that

when individuals assume that they are similar to a target person, they might show a similar affective reaction. When they assume that are different from another person they are likely to show an opposite affective reaction. The results of Experiment 2 and 3 support this line of argumentation. In Experiment 2 a priming procedure was applied to induce a focus on either similarities or dissimilarities. Results clearly indicate that a similarity focus leads to a concordant affective state, while a dissimilarity focus produces a discordant affective state. Priming the procedure to search for similarities or dissimilarities between given standards and the self seems to determine the direction of affect induction. Analogously to findings from the social judgment literature (e.g. Mussweiler et al. 2004; Mussweiler & Strack, 2000) it can be argued that participants in a similarity focus assimilate their mood to that of a given standard. Conversely, participants in a dissimilarity focus seem to contrast their mood away from a standard. As a consequence one may suggest that determinants of assimilation and contrast that have been identified in the domain of social judgments might also be relevant in the area of socially induced affect.

A cue that has often been found to determine assimilative or contrastive judgments is different category or group membership (e.g. Brewer & Weber, 1994; Cadinu & Rothbart, 1996; Mussweiler & Bodenhausen, 2002). Participants that are asked to compare themselves to an outgroup member are likely to contrast their self-evaluation away

from that standard (Schubert & Häfner, 2003). Conversely, comparisons to ingroup members are likely to have assimilative consequences for self-evaluation (Brewer & Weber, 1994). Based on these prior findings it was assumed that the group membership of target persons might also elicit either a similarity or a dissimilarity focus. This idea was tested in Experiment 3. The results were in line with the predictions. Exposure to the affective expressions of ingroup members led participants to indicate a congruent mood state. The opposite was true for participants who were exposed to affective expressions of outgroup members. They tended to indicate an incongruent (or discordant) mood state.

To summarize, in Studies 1-3 it was shown that comparison processes influence the social induction of affect. Not only is there evidence for a general influence of comparisons on affect induction, but also for a more specific effect. The direction of affect induction seems to crucially depend on the type of comparison process the perceiver engages in. If the focus is on similarities between the self and another person, a congruent affective state is likely to occur in the perceiver. If the focus is on dissimilarities, the opposite result is found, namely an incongruent or discordant affective state of the perceiver.

Having established *that* comparisons influence social affect induction, the question remained *how* this is achieved. A common assumption in the social comparison literature is that the self is involved

in the comparison process (e.g. Festinger, 1954; Mussweiler, 2003; Stapel & Tesser, 2001; Tesser, 1988). It has been shown that the activation of specific self-knowledge is the basis of the effects of social comparisons (Mussweiler & Strack, 2000). Therefore, the goal of Studies 4-6 was to explore the role of the self in the process of social affect induction. Analogously to social judgment research it was assumed that specific self-knowledge activation might be a mechanism behind social affect induction. In Studies 4 and 5 it was tested, whether self-activation in general is necessary precondition of social affect induction. In Experiment 6 it was explored, what kind of self-knowledge is activated when an individual's affective state is influenced by another person's displayed affect.

Both in Experiment 4 and in Experiment 5 a priming procedure was applied to increase self-activation. The findings from these two studies indicate that indeed self-activation is a necessary pre-condition for affect induction. Evidence for socially induced affect was found only for participants whose self had been activated before. The studies used different methods for activating the self ruling out the possibility that specific aspects of the methodologies can solely account for the effects.

In addition, in Experiment 4 an indirect pre-post measure of mood was applied. Unfortunately the results of this measure are not very strong, which might be due to methodological reasons to be discussed below.



However, there is tentative evidence from Experiment 4 that an actual mood *change* occurs during the presentation of the pictures.

In Experiment 6 the question of what type of self-knowledge is activated during the presentation of the pictures is approached more directly. Before being exposed to the affective stimuli, participants were put either in a similarity or in a dissimilarity focus. The accessibility of specific self-knowledge was measured by using a primed lexical-decision task (Dijksterhuis et al., 1998; Mussweiler & Strack, 2000). Results showed that participants in a similarity focus had activated knowledge that was congruent to the affective state of the stimuli. Moreover, this knowledge was specifically connected to the self, which was indicated by facilitated responses for the respective words when they were preceded by a self-related prime. The results of Experiment 6 provide clear support for the assumed role of self-knowledge activation in the process of social affect induction. In addition the present research contributes to the theoretical debate in the field of social comparison research, which will be outlined in more detail below.

### ***Implications for social comparison research***

People seem to be automatically influenced by perceiving another person's displayed affect. However, the direction of the perceiver's affective reaction depends on comparison processes. On the one hand these conclusions drawn from the studies reported above can enrich the

current debate on the automaticity of social comparisons. On the other hand the findings also shed light on the processes behind the common outcomes of social comparisons: assimilation and contrast. The stimulus pictures of the present research did not depict extreme emotional states (e.g. crying or fear) but only light affective expressions. They can therefore be seen as moderate comparison standards. Analogously to research on social judgments (e.g. Mussweiler & Strack, 2000) one could argue that the affective stimuli served as a comparison standard. The affective change occurs as the result of a comparison to these standards.

The fact that affective convergence or divergence can be elicited by a similarity or dissimilarity focus (Experiment 2) leads to the conclusion that a comparison might have occurred. In contrast to the traditional perspective on social comparison processes (e.g. Goethals & Darley, 1977; L. Wheeler, 1966) where social comparisons are seen as rather conscious, reflective, and motivated processes, the results from the present studies support the assumption that comparisons can also be automatic processes that work outside of conscious awareness. Recent results from social comparison research lead to a similar conclusion. To illustrate it has been shown that the mere perception of a comparison standard can elicit a comparison, which then leads to an assimilative or a contrastive judgment (Mussweiler et al., 2004; Stapel & Blanton, 2004). For example, participants who had the task to judge how athletic they are were influenced by a comparison standard, even when it was presented

outside of their conscious awareness (Mussweiler et al., 2004a; Experiment 2). Similar to more reflective comparisons (Mussweiler & Strack, 2000) participants assimilated their self-evaluations to moderate standards and contrasted their self-evaluations away from extreme standards. Together with these findings the present results support the notion of comparisons as ubiquitous processes that occur spontaneously. An additional conclusion for social comparison research concerns the outcome of a comparison. Some researchers argue that contrast is the default outcome of a comparison and assimilation is the exception (e.g. Stapel & Suls, 2004). Yet, the present findings support the assumption that, at least in the case of moderately extreme comparison standards, assimilation is the default outcome (Mussweiler, 2003; Mussweiler, Rüter, & Epstude, 2004b). The findings from the present studies indicate that a convergent (or assimilative) affective response is likely to be the default outcome. This is especially apparent in Experiment 1. Participants who were primed to engage in comparative information processing were likely to be in a mood that was concordant with the stimulus material. The implications of this research for the theoretical concept of socially induced affect will be outlined in more detail in the next section.

### ***Implications for research on automatic behavior***

Considering classic approaches that favored facial or postural mimicry to be the key mechanism behind affect induction (Hatfield et al., 1992) the findings of the present studies are surprising. In the traditional

work on emotional contagion a direct link between imitation and an affective change has been proposed. The term "primitive emotional contagion" was introduced for this very immediate and automatic type of contagion (Hatfield et al., 1992). This label signals the assumed basic nature of this process. The perception-behavior link account of "mood contagion" also favors a very basic form of affect transfer between two persons (Neumann & Strack, 2000). Similarly to theories on automatic behavior (see Dijksterhuis & Bargh, 2000 for a review) a direct link between the perception of an affective reaction in another person and the affective response of the perceiver is proposed. Yet, the present social comparison approach does not stand in opposition to the perception-behavior link explanation. It rather attempts to further explain what actually happens between the perception of a certain stimulus and the execution of a behavior, in this case the affective reaction. The findings of the present experiment imply that a comparison takes place. People compare the stimulus to themselves and activate specific self-knowledge. This can result in either an assimilative or a contrastive reaction. In the light of a great variety of findings from automatic behavior research indicating a general tendency to assimilate to a given standard (or stereotype) this might seem surprising. Nevertheless, there is also research on contrast in automatic behavior. Previous findings showed that participants primed with concepts related to the elderly stereotype (e.g., Florida, old, lonely) walked more slowly down a hallway compared to those primed with words unrelated to age (e.g., thirsty, clean, private)

(Bargh, Chen, & Burrows, 1996). However, priming participants with an old exemplar (e.g. the Dutch princess Juliana, who was 89 years old at the time of the experiment) resulted in a contrast effect. Participants walked faster than a control group and they were not consciously aware of that (Dijksterhuis et al., 1998). These findings mirror effects on assimilation and contrast in judgment tasks, in that distinct exemplars can lead to automatic contrast rather than assimilation. For example, Dijksterhuis and colleagues (1998) argued that extreme and distinct exemplars, as opposed to mild and less distinct exemplars, give rise to a process in which one compares oneself to the target, a process that naturally produces a contrast (see also Stapel, Koomen, & Van der Pligt, 1996; 1997). However, this outcome might be limited to extreme exemplars. As it was outlined above, in the case of more moderate comparison standards, assimilation seems to be the default outcome of a comparison process (e.g. Mussweiler, 2003; Mussweiler et al., 2004a,b).

More recently there has been evidence for contrastive automatic behavior (e.g. Schubert & Häfner, 2003; Spears et al., 2004) and boundary conditions for the occurrence of mimicry behavior (see Chartrand et al., 2005 for a review) and comparison processes have been proposed as an explanation for these effects (Schubert & Häfner, 2003). This suggests that the concept of a perception-behavior link might be enriched by considering comparison processes as mechanisms behind the variety of different effects.

An additional point to be discussed concerns the role of the self in social affect induction and in automatic behavior. In the latter context, the self has only recently been given a very prominent role (S.C. Wheeler et al., 2005). It is proposed that that a given stimuli temporarily modifies the active self-concept resulting in a behavioral change. This model is compatible with the approach presented here. The activation of specific self-knowledge also elicits a change in the active self-concept and thereby influences the behavior or the affective state of an individual.

### ***Implications for research on affect and embodied cognition***

The results of the present experiment raise the question of how affect is represented in the organism and how cognition and affect are connected to each other. One of the most influential approaches regarding this question is the hard-interface model (Zajonc & Markus, 1984). Pursuing a computer metaphor, the model distinguished between hard and soft representations of affect. Hard representations of affect are all representations provided by the motor system (e.g. arm movements). Soft representations are cognitive processes (e.g. the experience of having an emotion). The aim of the model is to analyze "subjective (soft) representations of emotion" (Zajonc & Markus, 1984, p.80). The present approach clearly puts forward a cognitive view of affect induction. In the hard-interface model the main emphasis is on establishing that motor processes possess a representational function themselves, instead of

being secondary to cognitive processes. This view is well established by now (see Barsalou, 1999; Niedenthal et al., in press; Strack & Deutsch, 2004). Thus far, in the present research on the influence of comparisons on social affect induction, the main focus was on cognitive variables. The classic mimicry explanation of socially induced affect has not been empirically investigated here. However, it is certainly of great theoretical importance to explore how the comparison focus and knowledge activation interact with facial and postural responses of an individual. The relevance of such an approach becomes even clearer when considering the common assumption that affective contrast is an exception when investigating phenomena like emotional contagion (Hatfield et al., 1994; Chartrand et al., 2005). Disentangling motor and cognitive components of socially induced affect can deepen the understanding about the nature of the present findings. Does affective contrast (or affective divergence) only occur, when higher cognitive processes are involved? The answer to this question has to be found in future research. A related question is whether the present findings are limited to self-reports or can be generalized to other measures of affect. This will be outlined in the next section.

### ***Methodological considerations***

All studies reported in this research were based on self-reported mood as the dependent variable. Many studies in the field of emotion research use self-reports as the main dependent measure (e.g. Crutcher, 1994; Feldman-Barrett, Quigley, Bliss-Moreau, & Aronson, 2004).

Evidence for concordant and discordant affective reactions after being exposed to the affective expressions of a target person has been found on different types for measurement (McIntosh et al., 1994). There is evidence for the occurrence of concordant affect using facial expressions as dependent variables (e.g. McNeil, Arkowitz, & Pritchard, 1987) as well as when self reports (e.g. Hammen & Peters, 1978) or physiological measures are used (e.g. Krebs, 1975). Discordant effect has also been shown to occur on various types of measures like self-reports (e.g. Bramel, Taub, & Blum, 1978) and physiological measures (e.g. Englis et al., 1982). Therefore it is unlikely that the results found in these studies can be simply interpreted as an effect of the methodology that has been applied.

However, the stable finding that the expected results only occurred on general mood items, but not on specific measures of affect has to be explained. First it is possible that the mood effects are rather short lived and might be interrupted by answering a questionnaire which is a cognitive task for a participant that in itself can influence mood. Second it is possible that in the present experiments more diffuse and unspecific mood was induced rather than specific emotions. It might be more difficult to detect specific emotions in the other person than to perceive the general bad vs. good mood. When considering the effects to be of a very short duration the initial general mood item might just measure these first



diffuse affective reactions, while the effects are gone when it comes to the more specific mood items.

Nevertheless, it is worthwhile to combine different measures of affect. In order to explore the relation between the cognitive processes proposed in the present studies and facial or postural mimicry both types of measures should be applied. In Experiment 4 an indirect measure of mood (writing speed; Higgins et al. 1975) was used as a pre-post measure. However, no significant effects were observed. This might be due to learning effects that were specific to the task that was used. Developing an on-line measure of affect would be a very useful strategy to disentangle the effects of facial mimicry and cognitive aspects of mood transfer between persons.

### ***Similarity and dissimilarity focus as integrative principles?***

As it has been outlined before, several potential moderators of socially induced affect have been discussed in the literature. However, little research has been done to empirically support for the suggested processes. Therefore, in this section some potentially moderating variables will be discussed. It will be outlined how they might fit into the framework suggested in here.

*Type of self-construal*

There are individual differences of how much individuals relate their self-concept to others (Markus & Kitayama, 1991). People who construe their self in relation to others (interdependent type of self-construal) have been shown to value harmony, the importance of the family, and value conformity. These individuals are expected to be highly susceptible to the affective reactions of other persons (Hatfield et al., 1994) and to the experience of other-focused affective reactions (Markus & Kitayama, 1991). People who construe their self independently of others (independent type of self-construal) have been shown to value uniqueness and independence. They have been shown to be less susceptible to other people's affective reactions. The type of self-construal can be seen as a variable measuring individual or even cultural differences. People in Western cultures are expected to have a more independent type of self-construal while people in Eastern cultures are supposed to construe their self in a more interdependent way (Markus & Kitayama, 1991). However, there is also evidence for the assumption of situational differences in the type of self-construal (Brewer & Gardner, 1996; Kühnen, Schubert, & Hannover, 2001).

As can be seen from the definitions of independent and interdependent self-construals they are also likely differ in the extent to which the focus is on similarities or differences. It can be speculated that an independent type of self-construal involves generally focusing on how

the self differs from others. An interdependent type of self-construal might involve a general focus on similarities between self and others. As it has been outlined before, there is only little research that directly investigates cases of divergent or contrasting affective experiences. However, independent self-construals might have the same effects as the experimentally induced dissimilarity focus. Thus one might speculate that contrast would naturally occur in people with a chronic independent self. The current data, which were run with students from Western Europe which typically have chronic independent selves yet show that this is not the case: In Experiment 1 automatic assimilation was the default effect. However, although independent self-construers might not show a contrastive affective experience, they might be *relatively* more likely to show contrast effects due to a focus on dissimilarities. Furthermore it is also likely that interdependent self-construer's lack of susceptibility to other people's emotions might be triggered by a chronic focus on dissimilarities. Thus, the current data might shed light to research showing that independent selves do not share emotions to such an extent (Markus & Kitayama, 1991). The reason might lie in their chronic focus on dissimilarities. For the same reasons, assimilation effects would be more likely in interdependent selves. Future research has to examine these interesting assumptions.

*Power and status differences between individuals*

The type of relationship between two individuals can be seen as an important determinant of the extent to which they will converge affectively (Hatfield et al., 1994). One crucial variable in this context is the power-relation between individuals. It has been proposed that powerless persons should attend more to affective reactions of powerful persons than vice versa (Hsee et al., 1990). At the same time, powerful persons express their own affective reactions more intensively than powerless persons (Snodgrass, 1985). The latter finding can be explained by the fact that powerful persons have to care less about their impression on subordinates than vice versa. Subordinates therefore have a bigger chance to "read" the affective state. Another interpretation of the different effects of power on social affect induction is that subordinates try to be similar to a superordinate other. Therefore a general focus on similarities might exist which then also leads affective assimilation. Yet for the superordinate it might be the case that he or she wants and has to distinguish him or herself from the subordinates. Here, contrast effects would be expected.

An interesting aspect of assimilation and contrast in the context of power relations was provided in a recent study (Tiedens & Fragale, 2003). In interactions between participants the occurrence of dominant and submissive behavior was manipulated. Results showed that complementary behavior led to increased liking for the partner compared

to mimicry behavior. This study provided clear evidence that mimicry is not adaptive in every case. From the present social comparison framework the results of the study by Tiedens and Fragale (2003) can be seen as evidence for the fact that both assimilative and contrastive reactions have an adaptive value. The context of power it might therefore be interesting to disentangle mimicry explanations of socially induced affect from the framework presented in the research described above. Including measures of affective convergence and divergence might provide support for the present social comparison framework of socially induced affect.

### *Liking between individuals*

The effects of liking between individuals on the social induction of affect are very strong. It has been found that viewing a disliked other (e.g. a politician from an opposing political party) clearly inhibits the process of affect induction (McHugo, Lanzetta, Sullivan, Masters, & Englis, 1985). While watching Ronald Reagan on TV Democratic Party voters did not adopt his mood, whereas Republicans showed a tendency to assimilate to him. Research from developmental psychology indicates that gender similarity between 1<sup>st</sup> grade children increases the tendency to share an affective reaction (Feshbach & Roe, 1968). It has also been demonstrated that liking and perceived similarities influence the reaction to another person's suffering. Participants who believed a similar other lost in a game against themselves and therefore will receive light electric shocks adapted to the other person's mood. The effects were much lower for participants

who interacted with a dissimilar other whom they did not like (Krebs, 1975). An opposite affective reaction towards the one observed was found in a study by Bramel et al. (1968). Here participants were observed to be infected with another person's affective state when they liked that person. However, when they disliked the person, they showed signs of a contrastive affective experience.

It has been outlined before that there is very little research on the moderating conditions of socially induced affect. However, the effects of the three variables that have been discussed (type of self-construal, power differences, and liking) might be summarized in arguing that in all cases either a focus on similarities or a focus on dissimilarities is elicited. The underlying mechanism behind the three very different variables might therefore be the same: searching for similarities or dissimilarities and activating the respective self-knowledge.

### ***Contributions of the findings to other areas of research***

Responding to other's affective reactions by expressing congruent or incongruent affective reactions has important consequences. The interaction can take very different routes when people express similar or different feelings to each other. Indirect evidence for that mechanism comes from classic work on impression formation (Snyder & Swann, 1978; Snyder, Tanke, & Berscheid, 1977). When male participants assumed to interact with an attractive female via telephone they seemed to adapt to the female's mood and the interaction went very smoothly. However, assuming to interact with a less attractive female led to less friendly

interactions and divergent affective reactions might have occurred (Snyder et al., 1977). One might interpret these findings as goal driven: People who feel attracted to other people do everything to be friendly and this can be achieved by mimicking their behavior. Reconsidering these findings in the light of the results presented above, one could also argue that participants who thought to interact with an attractive female focused on similarities compared to those that interacted with a less attractive female. They expected the person to be similar to themselves and therefore automatically adapted their affective state. Participants who expected to talk to an unattractive female focused on dissimilarities. They expected the female to be different from themselves and thereby showed a divergent affective reaction. Future research should examine this possibility.

Other research areas for which the findings of these studies are relevant are the resolution of intergroup conflicts and the reduction of prejudice. A classic assumption in social psychology is that prejudice and conflict between social groups can be reduced by bringing the groups into contact with each other (Allport, 1954). Different conditions for successful intergroup contact have been specified (see also Brewer & Brown, 1998; Gaertner & Dovidio, 2000; Mummendey & Wenzel, 1999). However, recent theorizing (Pettigrew, 1998) and meta-analytical findings (Pettigrew & Tropp, 2001) suggest that one variable seems to be of utmost importance for the success of every intergroup contact situation,

namely the affective side of the interaction. When participants develop a positive affective relation (or even friendship) to each other, prejudices towards the group as a whole are reduced. As it was shown in Experiment 3 the likelihood of the occurrence of congruent affective states between individuals decreases, when they do not share the same group membership. Therefore the findings of Experiment 3 fully support a contact strategy suggested by Pettigrew (1998): A contact situation might be most successful when the initial contact takes place in decategorized manner (i.e. group membership is not salient; see also Brewer & Miller, 1986). When the different group memberships are introduced people already know (and probably like) each other and affective ties have already been woven. The perceived similarities between each other might already be larger than the differences that are connected to the non-shared group memberships. Therefore a rather strong focus on similarities exists and congruent affective states are likely to be experienced. The focus on similarities also helps to establish the final step in Pettigrew's model: a common group membership of all participants can be made salient (Gaertner, Dovidio, Bachmann, & Rust, 1996). The affective reaction to a common ingroup is generally positive (Beaupré & Hess, 2003). Of course, these proposed mechanisms have not yet been explored in the context of an intergroup contact situation, but it might be a fruitful enterprise to explore this issue. The practical relevance can be seen immediately, because it would help to improve the effectiveness of intergroup contact situations and might also help to explain why contact



situations sometimes fail to result in the expected improvement of intergroup relations. If a general similarity focus leads to a greater likelihood of affective congruence with members of the other group, it might be easier to recategorize the two groups into one inclusive group. Especially in the light of the recent increase of interest in affective variables in intergroup relations (e.g. Mackie, Devos, & Smith, 2000; Smith & Mackie, 2002), the results of the present research suggest to consider the role of comparison processes in that context more precisely.

## **Conclusions**

The aim of this research was to explore when and why people tend to affectively converge to or diverge from others. Research in the area of socially induced affect has shown that both types of affective change after exposure to another person can be found (McIntosh et al., 1994). However, most attention in theory and research was paid to affective convergence. The phenomenon of emotional contagion has been investigated extensively (Hatfield et al., 1992, 1994). In the research presented here it is shown that either an affective state congruent with a target person or incongruent with that person can be elicited fairly easy. The theoretical framework is based on the idea that social comparisons are a key mechanism behind the social induction of affect. Based on the selective accessibility model (Mussweiler, 2003) it is assumed that the selective activation of self-knowledge influences the likelihood and the direction of affect induction. Furthermore it has been shown that

comparisons themselves seem to have an important influence in that context. With regards to the classic theory of social comparison (Festinger, 1954) the results seem to provide support for what has been proposed theoretically: people's own affective state tends to be influenced by their social environment. However, the type of self-knowledge that is accessible largely determines the effect of this environment. The influence of knowledge activation on one's own affective state does not seem to fit easily into recent conceptions of embodied cognition (Niedenthal et al., in press). Nevertheless, the results of the present research can be taken as evidence, that facial or postural mimicry are not the only determinants of affect induction. Rather it should be acknowledged that the activation of specific information about the self and mimicry might work together. This becomes even more evident when reconsidering the perception-behavior link approach to mood contagion (Neumann & Strack, 2000). Knowledge activation can easily be implemented as another component in this approach. This has important implications for the literature on socially induced affect as well as for behavioral priming research, because the processes behind the two phenomena might be quite similar.

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## Appendix

Stimulus Pictures used in Experiments 1, 2, 4-6 _____	A
Stimulus Pictures used in Experiment 3 _____	B
Instructions for perception task (Experiments 1-6) _____	C
Experiment 1	
Priming manipulation _____	D1
Materials _____	D2
Experiment 2	
Priming manipulation _____	E1
Materials _____	E2
Experiment 3	
Priming manipulation _____	F1
Materials _____	F2
Experiment 4	
Priming manipulation _____	G1
Materials _____	G2
Experiment 5	
Priming manipulation _____	H1
Materials _____	H2
Experiment 6	
Priming manipulation _____	I1
Materials _____	I2

***Neutral Stimuli***



**Positive Stimuli**



**Negative Stimuli**



***Neutral Stimuli***





Appendix B: Stimulus pictures (Experiment 3)

Positive Stimuli (Males)





**Positive Stimuli (Females)**



**Negative Stimuli (Males)**



**Negative Stimuli (Females)**



### ***Instructions for perception task***

Bitte achten Sie auf die Hinweise durch die Versuchsleitung.

Der nun folgende Versuch beschäftigt sich mit dem Thema "visuelle Wahrnehmung". Es geht dabei also um die Verarbeitung bildlich dargebotener Informationen hinsichtlich verschiedener Aspekte. Bei der Beurteilung von Bildern kann zum einen der konkrete Inhalt eine Rolle spielen, aber auch scheinbar weniger wichtige Merkmale, wie Farbgebung und hauptsächlich vorherrschende Formen.

Um die beiden eben genannten Aspekte von bildlicher Information , auf den ersten Blick also nebensächlichen, Merkmale von Bildern soll es jetzt gehen. Ihnen werden Bilder am Computer gezeigt, bei denen sie die Helligkeit und die Qualität des Bildes einschätzen sollen.

Nach der Präsentation jedes Bildes ist es ihre Aufgabe jeweils zu beurteilen, ob das gezeigte Bild eher hell oder dunkel ist. Weiterhin sollen Sie einschätzen, ob das Bild er scharf oder eher unscharf ist. Ihre Antwort können sie über die Tastatur eingeben. Jedes Bild wird Ihnen für 20 Sekunden gezeigt. Während dieser Zeit sollten sie sich eine Meinung hinsichtlich der beiden genannten Aspekte des Bildes bilden. Im Anschluss haben Sie die Möglichkeit, Ihre Antwort einzugeben. Bitte beachten Sie, dass sie bei der Abgabe der Antwort keine Möglichkeit mehr haben, das Bild noch einmal zu sehen. Es ist also nötig, sich bereits während des Betrachtens des Bildes, eine Meinung zu bilden.

Wenn Sie bereit sind, dann drücken Sie bitte zum Beginnen der Aufgabe die Leertaste.

Bitte schätzen Sie dieses Bild ein:

Das Bild ist eher...

1	2	3	4	5	6	7
(hell)						(dunkel)

1	2	3	4	5	6	7
(scharf)						(unscharf)

## ***Priming Manipulation***

Comparison condition:

Bitte vergleichen Sie stichpunktartig die beiden Bilder miteinander. Vergleichen Sie die dargestellten Personen. Wo liegen die Gemeinsamkeiten, wo die Unterschiede? Vergleichen Sie auch die dargestellten Szenen miteinander. Wo liegen hier die Gemeinsamkeiten und wo die Unterschiede?

Control condition:

Bitte beschreiben Sie stichpunktartig das Bild. Was für Personen sind zu sehen? Was für eine Szene ist dargestellt?



### ***Mood measures***

Nach Beendigung der Aufgabe möchten wir Sie noch um eine kurze Einschätzung Ihres momentan Befindens bitten.

Wie fühlen Sie sich jetzt

1 2 3 4 5 6 7 8 9 10  
gut schlecht

Wie fröhlich fühlen Sie sich jetzt?

1 2 3 4 5 6 7 8 9 10  
sehr gar nicht

Wie ängstlich fühlen Sie sich jetzt?

1 2 3 4 5 6 7 8 9 10  
sehr gar nicht

Wie ärgerlich fühlen Sie sich jetzt?

1 2 3 4 5 6 7 8 9 10  
sehr gar nicht

Wie traurig fühlen Sie sich jetzt?

1 2 3 4 5 6 7 8 9 10  
sehr gar nicht

Wie gelangweilt fühlen Sie sich jetzt?

1 2 3 4 5 6 7 8 9 10  
sehr gar nicht

Wie glücklich fühlen Sie sich jetzt?

1 2 3 4 5 6 7 8 9 10  
sehr gar nicht

**German version of the Social Comparison Orientation Scale.**

Jeder von uns stellt von Zeit zu Zeit Vergleiche mit anderen Menschen an. Man vergleicht zum Beispiel wie man sich fühlt, und welche Meinungen oder Fähigkeiten man hat. Oder man vergleicht eine Situation, in der man sich befindet mit der Situation von anderen Menschen. Manche Menschen tun es öfter, andere tun es seltener. In diesem Fragebogen geht es darum, wie das bei Ihnen ist. Kreuzen Sie bitte an, in wie weit die folgenden Aussagen für Sie persönlich zutreffen.

1. Oft vergleiche ich die Situation von Menschen, die mir nahe stehen, mit der von anderen Menschen.

1	2	3	4	5	6
Stimmt gar nicht			Stimmt völlig		

2. Ich achte immer sehr darauf, wie ich Dinge im Vergleich zu anderen erledige.

1	2	3	4	5	6
Stimmt gar nicht			Stimmt völlig		

3. Wenn ich herausfinden möchte, wie gut ich etwas gemacht habe, dann vergleiche ich meine Leistung mit der von anderen Menschen.

1	2	3	4	5	6
Stimmt gar nicht			Stimmt völlig		

4. Ich vergleiche häufig meinen sozialen Status (z.B. soziale Fähigkeiten, Beliebtheit) mit dem von meinen Mitmenschen.

1	2	3	4	5	6
Stimmt gar nicht			Stimmt völlig		

**5. Ich bin nicht der Typ Mensch, der sich häufig mit anderen vergleicht.**

1	2	3	4	5	6
Stimmt gar nicht			Stimmt völlig		





## Appendix D2: Experiment 2 (Materials)

6. Wenn ich daran denke, was ich bis jetzt im Leben erreicht habe, vergleiche ich mich häufig mit anderen Menschen.

1	2	3	4	5	6
Stimmt gar nicht			Stimmt völlig		

7. Ich unterhalte mich gerne mit anderen Menschen über gemeinsame Erfahrungen und Meinungen.

1	2	3	4	5	6
Stimmt gar nicht			Stimmt völlig		

8. Oft versuche ich herauszufinden, was andere Leute denken, die ähnliche Probleme haben wie ich.

1	2	3	4	5	6
Stimmt gar nicht			Stimmt völlig		

**9. Es interessiert mich oft, was andere Leute in einer ähnlichen Situation wie meiner machen würden.**

1	2	3	4	5	6
Stimmt gar nicht			Stimmt völlig		

10. Wenn ich mehr über eine Sache erfahren möchte, dann versuche ich herauszufinden, was anderen darüber denken.

1	2	3	4	5	6
Stimmt gar nicht			Stimmt völlig		

11. Nie betrachte ich meine Lebenslage in Bezug auf andere.

1	2	3	4	5	6
Stimmt			Stimmt		

gar nicht völlig  
German Version of the Private Self-Consciousness Inventory.

Es ist mir wichtig, meine eigenen Bedürfnisse zu erkennen.

Ich erforsche gründlich meine Absichten.

Ich versuche, über mich selbst etwas herauszufinden.

Ich denke über mich nach.

Ich mache mir Gedanken über die Art, wie ich Dinge anpacke.

Ich spüre es, wenn sich meine Stimmung verändert.

Ich beobachte sorgfältig meine innersten Gefühle.

Ich merke, wie ich mich selbst beobachte.

Ich glaube, ich kenne mich selbst sehr genau.

Ich spüre richtig, wenn mein Kopf arbeitet, wenn ich ein Problem löse.

Ich ertappe mich dabei, wie meine Gedanken um mich selbst kreisen.

Ich bin mir über meine eigenen Pläne und Ziele sehr gut im klaren.

Ich denke über mich und mein Leben intensiver nach als andere Menschen.

Antwortformat:

- 1 sehr oft
- 2 oft
- 3 ab und zu
- 4 selten
- 5 sehr selten

Priming Manipulation (Instructions)

Vielen Dank für Ihre freundliche Bereitschaft, an dieser Untersuchung teilzunehmen!!

Es handelt sich um eine Voruntersuchung, in der Versuchsmaterial getestet werden soll. Bitte schauen Sie sich die beiden Bilder auf dem beigelegten Blatt genau an. Versuchen Sie bitte festzustellen, inwiefern sich beide Bilder *gleichen* und notieren Sie bitte möglichst viele Gemeinsamkeiten. Es ist dabei wichtig, dass sie die Bilder so genau wie möglich vergleichen und so viel wie möglich Gemeinsamkeiten nennen. Bitte lassen Sie sich für diesen Vergleich einige Minuten Zeit.

Welche *Gemeinsamkeiten* zwischen beiden Bildern konnten Sie finden?

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## Appendix E1: Experiment 2 (Priming manipulation)

Vielen Dank für Ihre freundliche Bereitschaft, an dieser Untersuchung teilzunehmen!!

Es handelt sich um eine Voruntersuchung, in der Versuchsmaterial getestet werden soll. Bitte schauen Sie sich die beiden Bilder auf dem beigelegten Blatt genau an. Versuchen Sie bitte festzustellen, inwiefern sich beide Bilder *voneinander unterscheiden* und notieren Sie bitte möglichst viele Unterschiede. Es ist dabei wichtig, dass sie die Bilder so genau wie möglich vergleichen und so viel wie möglich Unterschiede nennen. Bitte lassen Sie sich für diesen Vergleich einige Minuten Zeit.

Welche *Unterschiede* zwischen beiden Bildern konnten Sie finden?

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**Priming Manipulation (Stimuli)**



**Mood measures**

Nach Beendigung der Aufgabe möchten wir Sie noch um eine kurze Einschätzung Ihres momentan Befindens bitten.

Wie fühlen Sie sich jetzt

1 2 3 4 5 6 7 8 9 10  
 gut schlecht

Dieser Fragebogen enthält eine Reihe von Wörtern, die unterschiedliche Gefühle und Empfindungen beschreiben. Lesen Sie jedes Wort und tragen Sie dann in die Skala neben jedem Wort die Intensität ein. Sie haben die Möglichkeit zwischen fünf Abstufungen zu wählen. Geben Sie bitte an, wie Sie sich im Moment fühlen.

	ganz wenig oder gar nicht	ein bisschen	einigermaßen	erheblich	äußerst
aktiv	(1)-----	(2)-----	(3)-----	(4)-----	(5)
bekümmert	(1)-----	(2)-----	(3)-----	(4)-----	(5)
interessiert	(1)-----	(2)-----	(3)-----	(4)-----	(5)
freudig erregt	(1)-----	(2)-----	(3)-----	(4)-----	(5)
verärgert	(1)-----	(2)-----	(3)-----	(4)-----	(5)
stark	(1)-----	(2)-----	(3)-----	(4)-----	(5)
schuldig	(1)-----	(2)-----	(3)-----	(4)-----	(5)
erschrocken	(1)-----	(2)-----	(3)-----	(4)-----	(5)
feindselig	(1)-----	(2)-----	(3)-----	(4)-----	(5)
angeregt	(1)-----	(2)-----	(3)-----	(4)-----	(5)
stolz	(1)-----	(2)-----	(3)-----	(4)-----	(5)
gereizt	(1)-----	(2)-----	(3)-----	(4)-----	(5)
begeistert	(1)-----	(2)-----	(3)-----	(4)-----	(5)
beschämt	(1)-----	(2)-----	(3)-----	(4)-----	(5)
wach	(1)-----	(2)-----	(3)-----	(4)-----	(5)
nervös	(1)-----	(2)-----	(3)-----	(4)-----	(5)
entschlossen	(1)-----	(2)-----	(3)-----	(4)-----	(5)
aufmerksam	(1)-----	(2)-----	(3)-----	(4)-----	(5)
durcheinander	(1)-----	(2)-----	(3)-----	(4)-----	(5)
ängstlich	(1)-----	(2)-----	(3)-----	(4)-----	(5)

### **Activation of the gender category**

Liebe Versuchsteilnehmerin / lieber Versuchsteilnehmer,

vielen Dank für Ihre Bereitschaft, an diesem Versuch teilzunehmen. Bevor das eigentliche Experiment beginnt, möchten wir sie noch bitten, an einem Vortest für einen Versuch teilzunehmen, den wir demnächst durchführen wollen. Lesen Sie dafür bitte den folgenden Text und beurteilen Sie ihn im Hinblick auf seine Verständlichkeit.

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Männer machen sich Sorgen um ihr Geschlecht. Das sommerliche Feuilleton-Wehgeschrei über einflussreiche TV-Größen wie Sabine Christiansen konzentriert sich auf eine Arena des Ornamentalen, in der Blondinen schon immer gute Chancen hatten. Weibliche Fernsehpräsenz, garniert mit ein paar reichen Verlegerwitwen, als Beleg dafür, wie überflüssig die Männer geworden sind? So lässt sich prima ignorieren, wer in den Führungsetagen der Wirtschaft nach wie vor das Sagen hat. Frauenförderung, Quote? Nicht nötig, wir haben doch Elke Heidenreich statt Karasek und Reich-Ranicki! Die fortbestehende männliche Dominanz in den Spitzenpositionen von Wissenschaft, Technik und Industrie verdeckt, dass die ganz normalen Arbeitsmänner tatsächlich mit einer Zersetzung ihrer traditionellen Rolle konfrontiert sind. Der Stolz der Ernährer ist angeknackst, das Band der Treue zwischen paternalistischem Unternehmertum und fleißiger Belegschaft ist zerrissen. Vor allem die wilden Kerle der Schwerindustrie sind die Verlierer des Umbruchs. Die weibliche Arbeitslosenquote in Deutschland ist im letzten Jahrzehnt mit 10,3 Prozent nahezu konstant geblieben, die männliche von 7,1 auf 11,3 Prozent im Jahr 2002 gestiegen. Selbst in Ostdeutschland, einst eine Hochburg der Frauenerwerbslosigkeit, sind inzwischen ebenso viele Männer ohne einen Arbeitsplatz. In Mecklenburg-Vorpommern gibt es halb verlassene Dörfer, in denen fast nur noch Alte und männliche Alkoholiker leben - junge Frauen wandern deutlich häufiger ab und bauen sich in Westdeutschland eine neue Existenz auf.

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Wie verständlich finden Sie den Text (1 = sehr; 9 = gar nicht)?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1	2	3	4	5	6	7	8	9

Noch einige Angaben zu Ihrer Person:

Alter: \_\_\_\_\_

Geschlecht: ( ) weiblich      ( ) männlich

Studienfach: \_\_\_\_\_

**Mood measures**

Nach Beendigung der Aufgabe möchten wir Sie noch um eine kurze Einschätzung Ihres momentan Befindens bitten.

Wie fühlen Sie sich jetzt

1 2 3 4 5 6 7 8 9 10  
gut schlecht

Wie fröhlich fühlen Sie sich jetzt?

1 2 3 4 5 6 7 8 9 10  
sehr gar nicht

Wie ängstlich fühlen Sie sich jetzt?

1 2 3 4 5 6 7 8 9 10  
sehr gar nicht

Wie ärgerlich fühlen Sie sich jetzt?

1 2 3 4 5 6 7 8 9 10  
sehr gar nicht

Wie traurig fühlen Sie sich jetzt?

1 2 3 4 5 6 7 8 9 10  
sehr gar nicht

Wie gelangweilt fühlen Sie sich jetzt?

1 2 3 4 5 6 7 8 9 10  
sehr gar nicht

Wie glücklich fühlen Sie sich jetzt?

1 2 3 4 5 6 7 8 9 10  
sehr gar nicht



### ***Self-Activation Manipulation***

Self-Activation Condition

Zuerst möchten wir Sie bitten folgenden Text, der Versuchsmaterial für einen Versuch ist, den wir in nächster Zeit durchführen, durchzulesen. Bitte überprüfen Sie die Rechtschreibung und die Grammatik. Unterstreichen Sie bitte alle Worte, die personenbezogen sind (z.B. ich, mich, mir...).

**Eine Reise zu planen macht mir den größten Spaß. Wenn ich erst einmal von einem Land inspiriert bin, suche ich gezielt nach Reiseberichten und Bildbänden. Wenn ich Glück habe, gibt es zu dieser Zeit gerade einen Diavortrag über mein Wunschreiseland. Auf diese Art und Weise bekomme ich genauere Informationen, die mir bei meiner Planung sehr hilfreich sind. Als nächstes kaufe ich mir einen detaillierten Reiseführer, der mich auf meiner gesamten Reise mit allem Wissenswerten versorgen soll. Der mir Tipps gibt, wo ich günstig übernachte, wo ich das beste Essen bekomme und der mich über alle Attraktionen informiert. Schließlich mache ich mir eine Liste über alle Dinge, die ich beim Packen auf keinen Fall vergessen darf. Nun fehlen mir nur noch die Ferien – aber die kommen bestimmt.**

## Appendix G1: Experiment 4 (Priming manipulation)

### Control Condition (Males)

Zuerst möchten wir Sie bitten folgenden Text, der Versuchsmaterial für einen Versuch ist, den wir in nächster Zeit durchführen, durchzulesen. Bitte überprüfen Sie die Rechtschreibung und die Grammatik. Unterstreichen Sie bitte alle Worte, die personenbezogen sind (z.B. er, ihm, sein, sich....).

**Eine Reise zu planen macht ihm den größten Spaß. Wenn er erst einmal von einem Land inspiriert ist, sucht er gezielt nach Reiseberichten und Bildbänden. Wenn er Glück hat, gibt es zu dieser Zeit gerade einen Diavortrag über sein Wunschreiseland. Auf diese Art und Weise bekommt er genauere Informationen, die ihm bei seiner Planung sehr hilfreich sind. Als nächstes kauft er sich einen detaillierten Reiseführer, der ihn auf seiner gesamten Reise mit allem Wissenswerten versorgen soll. Der ihm Tipps gibt, wo er günstig übernachtet, wo er das beste Essen bekommt und der ihn über alle Attraktionen informiert. Schließlich macht er sich eine Liste über alle Dinge, die er beim Packen auf keinen Fall vergessen darf. Nun fehlen ihm nur noch die Ferien – aber die kommen bestimmt.**

### Control Condition (Females)

Zuerst möchten wir Sie bitten folgenden Text, der Versuchsmaterial für einen Versuch ist, den wir in nächster Zeit durchführen, durchzulesen. Bitte überprüfen Sie die Rechtschreibung und die Grammatik. Unterstreichen Sie bitte alle Worte, die personenbezogen sind (z.B. sie, ihr, ihre, sich....).

**Eine Reise zu planen macht ihr den größten Spaß. Wenn sie erst einmal von einem Land inspiriert ist, sucht sie gezielt nach Reiseberichten und Bildbänden. Wenn sie Glück hat, gibt es zu dieser Zeit gerade einen Diavortrag über ihr Wunschreiseland. Auf diese Art und Weise bekommt sie genauere Informationen, die ihr bei seiner Planung sehr hilfreich sind. Als nächstes kauft sie sich einen detaillierten Reiseführer, der sie auf seiner gesamten Reise mit allem Wissenswerten versorgen soll. Der ihr Tipps gibt, wo sie günstig übernachtet, wo sie das beste Essen bekommt und der sie über alle Attraktionen informiert. Schließlich macht sie sich eine Liste über alle Dinge, die sie beim Packen auf keinen Fall vergessen darf. Nun fehlen ihr nur noch die Ferien – aber die kommen bestimmt.**

## Appendix G1: Experiment 4 (Priming manipulation)

### ***Implicit mood measure***

#### Time 1

Zunächst möchten wir Ihre Schreibgeschwindigkeit testen. Sie haben im folgenden **1 Minute** Zeit, Zahlen von 100 an in absteigender Reihenfolge (also 100, 99, 98...) untereinander aufzuschreiben. Bitte beenden Sie diese Aufgabe nach genau einer Minute.

#### Time 2

Wir möchten Sie nun noch einmal bitten, die Zahlenschreibaufgabe vom Anfang durchzuführen. Sie haben im folgenden **1 Minute** Zeit, Zahlen von 100 an in absteigender Reihenfolge (also 100, 99, 98...) untereinander aufzuschreiben. Bitte beenden Sie diese Aufgabe nach genau einer Minute.

## Appendix G2: Experiment 4 (Materials)

### *Mood measure*

	ganz wenig oder gar nicht	ein bisschen	einigermaßen	erheblich	äußerst
aktiv	(1)-----	(2)-----	(3)-----	(4)-----	(5)
bekümmert	(1)-----	(2)-----	(3)-----	(4)-----	(5)
interessiert	(1)-----	(2)-----	(3)-----	(4)-----	(5)
freudig erregt	(1)-----	(2)-----	(3)-----	(4)-----	(5)
verärgert	(1)-----	(2)-----	(3)-----	(4)-----	(5)
stark	(1)-----	(2)-----	(3)-----	(4)-----	(5)
schuldig	(1)-----	(2)-----	(3)-----	(4)-----	(5)
erschrocken	(1)-----	(2)-----	(3)-----	(4)-----	(5)
feindselig	(1)-----	(2)-----	(3)-----	(4)-----	(5)
angeregt	(1)-----	(2)-----	(3)-----	(4)-----	(5)
stolz	(1)-----	(2)-----	(3)-----	(4)-----	(5)
gereizt	(1)-----	(2)-----	(3)-----	(4)-----	(5)
begeistert	(1)-----	(2)-----	(3)-----	(4)-----	(5)
beschämt	(1)-----	(2)-----	(3)-----	(4)-----	(5)
wach	(1)-----	(2)-----	(3)-----	(4)-----	(5)
nervös	(1)-----	(2)-----	(3)-----	(4)-----	(5)
entschlossen	(1)-----	(2)-----	(3)-----	(4)-----	(5)
aufmerksam	(1)-----	(2)-----	(3)-----	(4)-----	(5)
durcheinander	(1)-----	(2)-----	(3)-----	(4)-----	(5)
ängstlich	(1)-----	(2)-----	(3)-----	(4)-----	(5)

*Self-Activation manipulation*

Stellen Sie sich bitte vor, Sie würden einer anderen Person erklären, wie Sie selbst wirklich sind? Hierfür könnten Sie der Person 4 Dinge nennen. Welche wären das?

1. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

2. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

3. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

4. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Control condition

Stellen Sie sich bitte vor, Sie treffen eine andere Person, die seit 50 Jahren nicht im Kino war und auch keinen Fernseher besitzt. Sie sollen dieser Person 4 Filme nennen, die Sie unbedingt gesehen haben muss. Welche wären das? Begründen Sie bitte jede Ihrer Antworten kurz!

1. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

2. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

3. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

4. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## Mood measures

Nach Beendigung der Aufgabe möchten wir Sie noch um eine kurze Einschätzung Ihres momentan Befindens bitten.

Wie fühlen Sie sich jetzt

1 2 3 4 5 6 7 8 9 10  
gut schlecht

Wie fröhlich fühlen Sie sich jetzt?

1 2 3 4 5 6 7 8 9 10  
sehr gar nicht

Wie ängstlich fühlen Sie sich jetzt?

1 2 3 4 5 6 7 8 9 10  
sehr gar nicht

Wie ärgerlich fühlen Sie sich jetzt?

1 2 3 4 5 6 7 8 9 10  
sehr gar nicht

Wie traurig fühlen Sie sich jetzt?

1 2 3 4 5 6 7 8 9 10  
sehr gar nicht

Wie gelangweilt fühlen Sie sich jetzt?

1 2 3 4 5 6 7 8 9 10  
sehr gar nicht

Wie glücklich fühlen Sie sich jetzt?

1 2 3 4 5 6 7 8 9 10  
sehr gar nicht



Priming Manipulation (Instructions)

Vielen Dank für Ihre freundliche Bereitschaft, an dieser Untersuchung teilzunehmen!!

Es handelt sich um eine Voruntersuchung, in der Versuchsmaterial getestet werden soll. Bitte schauen Sie sich die beiden Bilder auf dem beigelegten Blatt genau an. Versuchen Sie bitte festzustellen, inwiefern sich beide Bilder *gleichen* und notieren Sie bitte möglichst viele Gemeinsamkeiten. Es ist dabei wichtig, dass sie die Bilder so genau wie möglich vergleichen und so viel wie möglich Gemeinsamkeiten nennen. Bitte lassen Sie sich für diesen Vergleich einige Minuten Zeit.

Welche *Gemeinsamkeiten* zwischen beiden Bildern konnten Sie finden?

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## Appendix I1: Experiment 6 (Priming manipulation)

Vielen Dank für Ihre freundliche Bereitschaft, an dieser Untersuchung teilzunehmen!!

Es handelt sich um eine Voruntersuchung, in der Versuchsmaterial getestet werden soll. Bitte schauen Sie sich die beiden Bilder auf dem beigelegten Blatt genau an. Versuchen Sie bitte festzustellen, inwiefern sich beide Bilder *voneinander unterscheiden* und notieren Sie bitte möglichst viele Unterschiede. Es ist dabei wichtig, dass sie die Bilder so genau wie möglich vergleichen und so viel wie möglich Unterschiede nennen. Bitte lassen Sie sich für diesen Vergleich einige Minuten Zeit.

Welche *Unterschiede* zwischen beiden Bildern konnten Sie finden?

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**Priming Manipulation (Stimuli)**



**Stimuli Lexical Decision Task:**

Prime	Target
XXXX	glatt
XXXX	westlich
XXXX	sageb
XXXX	refen
XXXX	lang
ich	lustig
ich	traurig
ich	fest
ich	ertufem
ich	lanpen
ich	geruf
mir	fröhlich
mir	betrübt
mir	klar
mir	schpank
mir	lardig
mir	silfer
mein	gut
mein	schlecht
mein	groß
mein	blomor
mein	kalkir
mein	webec
und	freudig
und	verärgert
und	breit
und	bereig
und	moelf
und	sepro
ein	heiter
ein	nervös
ein	schlicht
ein	supor
ein	gewee
ein	rotef
das	glücklich
das	bekümmert
das	urban
das	mulig
das	gepund
das	schun

## Mood measures

Nach Beendigung der Aufgabe möchten wir Sie noch um eine kurze Einschätzung Ihres momentan Befindens bitten.

Wie fühlen Sie sich jetzt

1 2 3 4 5 6 7 8 9 10  
gut schlecht

Wie fröhlich fühlen Sie sich jetzt?

1 2 3 4 5 6 7 8 9 10  
sehr gar nicht

Wie ängstlich fühlen Sie sich jetzt?

1 2 3 4 5 6 7 8 9 10  
sehr gar nicht

Wie ärgerlich fühlen Sie sich jetzt?

1 2 3 4 5 6 7 8 9 10  
sehr gar nicht

Wie traurig fühlen Sie sich jetzt?

1 2 3 4 5 6 7 8 9 10  
sehr gar nicht

Wie gelangweilt fühlen Sie sich jetzt?

1 2 3 4 5 6 7 8 9 10  
sehr gar nicht

Wie glücklich fühlen Sie sich jetzt?

1 2 3 4 5 6 7 8 9 10  
sehr gar nicht

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Erklärung gemäß § 4, Abs. 4, Nr.3 der PromO vom 14.06.2001

Hiermit versichere ich an Eides statt, dass ich die Dissertation selbständig angefertigt und keine anderen als die angegebenen Quellen und Hilfsmittel eingesetzt habe.

Würzburg, den 15.03.2005

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Kai Epstude