How the mind moods

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WAARSCHUWING

Deze publicatie is door de commissie Levelt ter onderzoek van de publicaties van de heer D.A. Stapel in 2012 aangemerkt als frauduleus en voldoet daarmee niet aan de gangbare eisen van wetenschappelijke kwaliteit zoals ook Tilburg University die hanteert. De publicatie wordt getoond om maatschappelijk en wetenschappelijk meta-onderzoek mogelijk te maken.

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In 2012, the Levelt Committee, formed to investigate the publications by mr. D.A. Stapel, has decided to label this publication as fraudulent as it does not meet the accepted requirements for scholarly quality which are also adhered to by Tilburg University. The publication is shown to enable social and scholarly meta-research.

Y.R. Avramova (2010), How the mind moods (dissertation)

Conclusion from the Levelt Committee:

Chapter 2, see article:

Avramova, Y.R., Stapel, D.A. (2008). Moods as spotlights: The influence of moods on accessibility effects. *Journal of Personality and Social Psychology, 95*, 542-554.

- According to Mr. Stapel: fraudulent
- Fake data collection (school data), data supplied by Mr. Stapel
- Results highly implausible, e.g., effect size measures are unreasonably high, all F's smaller than 1 when no effect is expected, main effects on separate elements of the composite score are exactly identical

Chapter 3

- Fake data collection (school data), data supplied by Mr. Stapel
- Results highly implausible, e.g., suspiciously high effect of weak manipulation on single item, suspiciously high reliabilities, absence of correlation between two identical items

Chapter 4, see article:

Avramova, Y.R., Stapel, D.A. & Lerouge, D. (2010). Mood and context-dependence: Positive mood increases and negative mood decreases the effect of context and perception. *Journal of personality and Social Psychology, 99*, 203-214.

- According to Mr. Stapel: fraudulent
- Fake data collection (school data), data supplied by Mr. Stapel
- Highly unlikely design of experiments, that is, unlikely next to impossible to realize experimental set up in the described circumstances
- Highly implausible results regarding effect sizes, lack of missing data

Chapter 5, see article:

Avramova, Y.R., Stapel, D.A. & Lerouge, D. (2010). The influence of mood on attribution. *Personality and Social Psychology Bulletin, 36,* 1360-1371.

- According to Mr. Stapel: fraudulent
- Fake data collection (school data), data supplied by Mr. Stapel
- Very doubtful results, e.g., too strong effect sizes in particular given the reliabilities of the scales, all F's smaller than 1 for non-significant results

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to my family

and

to Diederik

Contents

Chapter 1
General Introduction

"How are you today." One of the first things that inevitably strike a European traveling to the US is the staggering rate at which one hears this statement. A statement, rather than a question, as one quickly learns that nobody really cares for an answer. People at the airport, at the supermarket, at the bank, at a high-end jewelry shop, or at a flea-market, are equally likely to greet you with these words. Though realizing it is just a "cultural thing", and scolding yourself for being overly-sensitive, you just can't help but feel confused, or even a bit offended. Indeed, it takes some time before you get rid of the discomfort you feel every time you have to inhibit your urge to reply in a meaningful (albeit often dishonest) way. Of course, you eventually get used to this abracadabra; you conform to the norm and, imperceptibly, start replying in the same rhetorical manner.

And yet, the *answer* to the *question* "How are you today**?**" is actually quite important. Maybe not for the cashier at the supermarket, or the bank teller, or your neighbor. But, how you feel does have a large impact on *your own* perceptions and judgments of objects, people, situations, and of yourself. The nature and direction of this impact is the focus of this dissertation.

Adding to the extant literature on mood effects on perception and judgment seemed to be a daunting and ambitious endeavor: Massive empirical evidence has accumulated, and many theoretical models have been developed to account for, and predict, a myriad of different mood effects. And yet, a thorough review of the literature reveals that there are still gaps to be filled, contradictory findings to be reconciled, and new questions to be raised. Most strikingly, and contrary to a deeply-rooted tradition in social psychology, past mood research has ignored a basic aspect of the judgment situation, namely the notion of *context*: Given that people are hardly ever looking at the world as "moody blank slates" (i.e., with nothing but their mood on their mind), and given that people always encounter stimuli within a particular context (rather than in a vacuum), it is surprising that virtually no research to date has looked at how moods interact with contextual information to affect judgment. So we went for it.

The present dissertation introduces a new theoretical framework of mood effects on perception and judgment. Specifically, we propose a model that integrates previous work on the influence of mood on attention, on the one hand, and work on context effects, broadly defined, on the other. Our basic idea is that by altering the breadth of attentional scope, positive and negative moods render different aspects of available information accessible or salient. We argue that, since different pieces of information, or

even different representations of the same information, may have different implications, mood-elicited attentional differences may produce divergent patterns in target perception and judgment. The research reported in this dissertation represents the first empirical test of this hypothesis.

The rest of the Introduction is organized as follows. First, I briefly review the basic features (or tenets) of several prominent mood theories (i.e., the associative network model, the affect-as-information model, and the affect-infusion model) and their respective predictions regarding the influence of mood on perception, information-processing, and judgment. Then, I go over some important empirical findings and theoretical developments (e.g., the hedonic contingency hypothesis, the mood-as-input model) that qualified or challenged the early models. This literature review aims to demonstrate that although we know a lot about mood effects by now, what we know may sometimes be vague or confusing, due to the contradictory nature of many of the extant findings. What is more, I argue that – despite the richness of the field – we still do not know enough, since none of the existing models can efficiently predict how mood affects judgments of a target in context. Next, I introduce our own perspective, and discuss evidence from research on the influence of mood on basic attention, on which we base our hypothesis regarding the impact of mood on perception and judgment. Finally, I summarize the research we report in each of the empirical chapters.

Setting the stage: Major theories of mood effects on perception, information-processing, and judgment

It is not surprising that the affect-cognition interface has intrigued researchers for quite a while now. People are in a certain – positive or neutral or negative – mood most of the time, and they may even be unaware of what caused them to be in high or low spirits. What distinguishes moods from other affective states, such as emotions, is moods' more generalized, moderate, and diffuse nature. Whereas being angry, or afraid, or proud, or jealous, typically requires a specific object – something or somebody to be angry with, afraid from, proud with, or jealous of – entailing specific emotion-related cognitions and action tendencies (see e.g., Frijda, 1986; Scherer, 1984; Smith & Ellsworth, 1985; Zeelenberg & Pieters, 2006), being in a positive or negative mood may be more object-

free. Thus, lingering moods, which are mainly characterized in terms of valence, can easily get a life of their own, affecting perceptions and judgments of (unrelated) objects, people, and situations.

A great deal of research has investigated the influence of mood on perception, information-processing, and judgment. For a long time, the effect of mood that seemed most basic, and the one that dominated the literature, was what is known as *mood-congruence*. It refers to what seems to be an almost trivial observation, namely that mood colors, or distorts, our perceptions of reality, present or past (e.g., Bower, 1981; Erber, 1991; Forgas & Bower, 1987; Forgas & Moylan, 1987; Isen, Shalker, Clark, & Karp, 1987; Mayer, Gaschke, Braverman, & Evans, 1992). Thus, when we are happy, the world seems beautiful, the future promising, and our existence worthwhile. On the contrary, when we are sad, we tend to see everything in a more negative light. A related, and similarly strong, "default" that has been well-established in the literature is the influence of mood on information-processing style. Numerous studies consistently found support for dual-process accounts of mood effects, namely that positive mood induces more superficial, effortless, heuristic processing, whereas negative mood induces more careful, effortful, systematic processing (e.g., Bless, Bohner, Schwarz, & Strack, 1990; Forgas, 1995; Isen, 1987; Mackie & Worth, 1989).

Although later findings largely discredited the notion that there are such strong "defaults" in mood effects on cognition, some of the basic tenets of earlier models, which I now turn to describe, remained quite influential and triggered further theorizing and experimentation in the field. Rather than offering a detailed treatment of each of these models and their extensions (which is beyond the scope of this dissertation), I specifically focus on their predictions as to how moods influence perception, information-processing, and judgment.

The associative network model

Some thirty years ago, scholars proposed that moods *prime* same-valenced concepts in memory that then serve as filters in interpreting and evaluating external stimuli (e.g., Bower, 1981; Forgas & Bower, 1987; Forgas, 1992, 1995). Within this framework, affective states are seen as nodes in an associative (i.e., semantic) network, where activation spreads to interconnected nodes representing perceptual categories, themes, or mental sets (see Bower, 1981, 1983), thus biasing evaluation and judgment in a mood-congruent direction. Some researchers have further argued that moods affect the

amount and quality of information processing. That is, because positive moods are generally more prevalent than negative moods, they prime a greater amount of information in memory, which drains some of the available cognitive resources, and hence results in more superficial or heuristic processing in positive than in negative moods (see e.g., Forgas, 1992; Mackie & Worth, 1989; Worth & Mackie, 1987).

The affect-as-information model

In contrast to the associative network model, the affect-as-information model (Schwarz & Clore, 1983, 1988) and the cognitive tuning model (Schwarz, 1990; see Clore, Gasper, & Garvin, 2001, and Schwarz & Clore, 1996, 2003, for overviews) took a functional approach, positing that mood is informative about the current state of the environment and how one is faring in it. A positive mood signals a benign and safe environment, and good progress towards one's goals, whereas a negative mood alarms one for a potentially problematic situation and insufficient progress towards one's goals. As a consequence, people tend to misattribute evaluative aspects of their mood to aspects of a target object or person, inferring their evaluations using the "How do I feel about it?" heuristic (Schwarz & Clore, 1983), and thus arriving at mood-congruent judgments. Furthermore, the affect-as-information approach posits that mood can also confer value to one's own cognitions and inclinations, such that these are taken to be more relevant or reliable when one is in a positive than in a negative mood. Consistent with this, it has been found that positive mood enhances, and negative mood inhibits, the use of accessible cognitions and dominant responses (e.g., Clore & Huntsinger, 2007; Clore & Storbeck, 2006; Huntsinger, Sinclair, Dunn, & Clore, 2010). Finally, in line with the proposed misattribution mechanism, it was found that when people become aware of the potentially biasing role of their mood, they tend to correct for it, and mood effects are thus dampened (see Schwarz & Clore, 1996, Clore et al., 2001).

The affect infusion model

The affect infusion model developed by Forgas (AIM, see Forgas, 1995, 2001, 2006, for overviews) aimed to integrate the semantic network (affect-priming) and affect-as-information perspectives by specifying a set of conditions under which the predictions of each of these models would hold. According to the AIM, people form a judgment based on one of four different processing strategies: direct access, motivated processing, heuristic processing, and substantive processing. The model predicts no affect infusion (i.e., mood effects) under the direct access or the motivated processing strategy, since in these cases

one relies on a routine response, or has the goal to arrive at a specific judgment, respectively. However, mood is predicted to affect judgments under the other two processing strategies. Specifically, under heuristic processing (low motivation or cognitive resources), judgments follow an affect-as-information pattern, and under systematic processing (high motivation or cognitive resources) responses follow an affect-priming pattern. Thus, positive mood supposedly leads to shallower processing of accessible positive information, whereas negative mood leads to more systematic processing of accessible negative information. In both cases, mood-congruent judgments should ensue. Furthermore, mood-induced effort and depth-of-processing differences (which are presumably produced by capacity and motivation differences) have been proposed to affect judgment in yet another way, namely positive, relative to negative, mood increasing reliance on mental shortcuts or easy, time- and effort-saving "devices", such as heuristics, stereotypes, and peripheral cues in persuasive communication (see Forgas, 2001, 2006).

Although the associative network, the affect-as-information, and the affect infusion models could account for many mood-congruent findings, they could not efficiently explain the accumulating *mood-incongruent* patterns. Evidence grew showing that positive, as compared to negative, moods do not always lead to more *positive* judgments (ruling out mood-congruence), and neither do they necessarily lead to *shallower* or *careless* processing (ruling out capacity and motivation accounts; see Bless & Fiedler, 2006; Isen, 2008; Martin, 2001, for overviews). In what follows, I review some of these findings that challenged earlier models and thus led to their refinement, as well as to some new theoretical developments.

Further refinements and developments

As already noted above, evidence accumulated that the link between mood, depth of information-processing, and task performance is not as straightforward as had been previously assumed. In a comprehensive research program, Isen and colleagues, for instance, demonstrated that positive mood may actually promote an open, flexible, and creative processing style. Specifically, happy people were shown to have enhanced semantic access, form broader and more inclusive categories, better integrate numerous pieces of information, make better (more-informed, less rigid) decisions, see more and more diverse alternatives, and come up with more creative solutions on a variety of

cognitive tasks (see Isen, 2000, 2008, for overviews). Further, contrary to what mood-priming accounts would predict, Bodenhausen and colleagues found that positive mood leads to more stereotypic, rather than more favorable, evaluations, thus demonstrating that mood valence does not always predict target evaluations (Bodenhausen, Kramer, & Süsser, 1994; see also Abele, 2000).

Work by Bless and colleagues (Bless et al., 1996) further showed that the use of general knowledge structures (such as stereotypes, schemas, and scripts) by people in a positive mood is not necessarily indicative of a decreased capacity or motivation to process information, since they outperformed their negative mood counterparts on a secondary task. In other words, rather than impairing motivation or cognitive processing ability, a positive mood supposedly signals that deeper or more effortful processing is simply unwarranted, thus promoting a more efficient, top-down processing style and greater reliance on routine and dominant responses (Bless et al., 1996; Bless & Fiedler, 2006; see also Krauth-Gruber & Ric, 2000). Consistent with this, extending the affect-as-information approach, Clore and colleagues argued that positive mood confers value on whatever information or processing strategy is currently accessible (see Storbeck & Clore, 2008, and Clore & Huntsinger, 2007, for recent overviews). For instance, relative to negative mood, positive mood has been found to increase affective and semantic priming effects (Storbeck & Clore, 2006), enhance the false memory effect (Storbeck & Clore, 2005), and actually decrease stereotyping in cases where counter-stereotypical or egalitarian cognitions are more accessible (Huntsinger, Sinclair, Dunn, & Clore, 2010; see also Fishbach & Labroo, 2007, for related findings).

A similar challenge to earlier findings and theoretical explanations came from emerging motivational (e.g., mood-management) perspectives and, more specifically, empirical evidence from the persuasion domain. Most prominently, Wegener and Petty (1994; see also Wegener, Petty, & Smith, 1995) demonstrated that mood valence is not the sole determinant of the type of processing style that will be adopted. Rather, in line with their *hedonic contingency hypothesis*, Wegener and colleagues proposed that mood-regulation goals play an important role, such that one's processing strategy critically depends on the specific implications of the persuasive message: Since people in a positive mood are strongly motivated to maintain this state, they can (and do) process information systematically and effortfully, as long as it is not self-threatening. Thus, capacity explanations for earlier evidence showing that happy, as compared to sad,

people were less affected by argument quality and more affected by peripheral cues (e.g., Bless et al. 1990; Mackie & Worth, 1989) were largely discredited.

On the other hand, work by Trope and colleagues (see Trope, Ferguson, & Raghunathan, 2001; Trope, Igou, & Burke, 2006, for overviews) showed that people in a positive mood are not always avoiding negative information. According to their *mood-as-resource hypothesis*, positive mood may serve as a buffer against the immediate emotional costs of self-threatening information if this information is diagnostic and thus potentially helpful for improving one's future performance. Thus, people in a positive, as compared to those in a negative, mood may sometimes more actively search for and (systematically) process constructive negative feedback or self-threatening information, if that grants them long-term benefits.

One way to reconcile these contradictory findings was recently offered by Fishbach and Labroo (2007) in their work in the domain of self-control. In line with the affect-as-information approach, these researchers proposed that in a positive mood one is more likely to adopt an accessible goal than in a negative mood. Therefore, they argued, the influence of mood on performance on self-control tasks should depend on the specific goal that is currently accessible. The findings supported the predicted pattern: When a self-improvement goal was more accessible, participants in a positive mood performed better on self-control tasks than those in a negative mood, in line with the predictions of the mood-as-resource hypothesis. When a mood-management goal was more accessible, however, positive mood hindered performance on self-control tasks, in line with the hedonic contingency hypothesis.

Finally, Martin and colleagues (see e.g., Martin, 2001; Martin & Davies, 1998; Martin & Stoner, 1996, for overviews) developed the *mood-as-input model*, which posits that moods serve as input, just as any other piece of information. In light of the large bulk of contradictory findings that the field had produced, Martin and colleagues argued for a configural view of mood effects, where the context (task, situation, goals) of experiencing a particular mood, as well as the implications of the information provided by one's mood – rather than mood valence *per se* – are crucial in determining its influence on evaluation, judgment, and task performance. As Martin and Davies (1998) beautifully summarized it: *"Most existing models assume that negative moods are more likely than positive moods to (a) induce recall of negatively toned information, (b) lead to less favorable evaluations, (c) induce more*

systematic but less flexible processing, and (d) arouse a desire to change the mood. A series of studies is discussed in which each of these effects and its opposite are obtained."

The road behind and the road ahead

The review of the literature thus suggests that the answer to the question of how mood affects information-processing, evaluation, and judgment is best captured by the truism "It depends". That is, different mood effects are observed under different circumstances, and different models have posited different mechanisms via which moods exert their influence. Unsurprisingly, some have even reached the conclusion that "*there is no such thing as mood effects*" (Martin & Stoner, 1996). The present dissertation aims to challenge this state-of-affairs by demonstrating that there *is* a stable and reliable effect of mood on perception and judgment after all; that there is something that moods systematically "do" to people to affect their judgment in predictable ways.

The cornerstone of our approach is that, unlike most existing theories, we argue that mood *alone* does not determine the direction of people's evaluations and judgments. Rather, we propose and test the novel hypothesis that moods affect judgment by determining what information is attended to in the first place – either in terms of internal mental representations or external percepts – and how that information is construed and used. Thus, we argue that instead of priming mood-congruent content in memory, altering the amount or depth of processing, informing judgments directly, or triggering mood-management goals, moods may exert their influence at a much earlier stage, namely by guiding attention to different aspects of (internally) accessible or (externally) available information.

Our perspective was inspired by a curious observation: Previous research has mainly investigated how a positive or a negative mood influences people's evaluations of a target person or object. In most real life situations, however, our mood is seldom the only thing we have on our mind. Rather, *while* being in a good or bad mood, we engage in our daily activities (i.e., work, talk to people, walk around, shop, have dinner) and our mind is busy with all sorts of other things. Similarly, we rarely encounter objects or people in isolation. Rather, these are virtually always embedded in a specific physical and/or social context. Thus, one's mind is hardly a "blank slate" and a target is hardly ever perceived in a vacuum. Since both common sense and decades of research in social

psychology suggest that (both internal and external) context matters for how a target is perceived and judged, it is surprising that to date the question of how mood interacts with the information at hand to affect target judgment has not been explored. The work reported in the present dissertation aims to fill this void. That is, instead of asking the traditional question of "How does mood affect one's judgment of X?", we ask "How does mood affect what aspects of available information are picked up and how they are used in judging X?".

In taking this approach, we build on evidence for the influence of mood on lower-level attentional processes. Specifically, it has been demonstrated that positive moods expand, whereas negative moods narrow attentional scope. Notably, unlike research on the (direct) effects of mood on information-processing, retrieval, or judgment *per se* (i.e., higher-order processes that other mood models have focused on), research in the attention domain has produced strikingly robust and consistent evidence. Moods' influence on attention thus seems to be a more solid and reliable basis for developing our own perspective. Next, I review some relevant findings, and then I turn to describe how they have inspired our own view.

Mood effects on attention

By now, converging evidence has accumulated showing that positive mood broadens and negative mood narrows attention. Taking on a functional approach, most researchers in this domain have argued that affective states provide us with crucial (bodily) feedback about our environment, thus preparing us for appropriate action (see e.g., Clore, Gasper & Garvin, 2001; Fredrickson, 1998; Frijda, 1988; Schwarz, 1990). Specifically, since negative affect typically signals the presence of a problem or danger, it is more likely to constrict attentional scope, inducing a narrow focus on whatever is most salient or deemed most important in the situation, with the goal of solving the problem or avoiding the danger. On the contrary, since positive affect typically signals a positive state-of-affairs, it is more likely to broaden attentional scope and promote open exploration.

Evidence for this influence of affect on attentional breadth comes from research using a wide variety of paradigms and measures (e.g., Basso, Schefft, Ris, & Dember, 1996; Derryberry, 1993; Derryberry & Reed, 1998; Derryberry & Tucker, 1994; Fredrickson, 1998; Fredrickson & Branigan, 2005; Gasper & Clore, 2002; Rowe, Hirsch, & Anderson, 2007;

Schmitz et al., 2009). For example, the work of Gasper and Clore (2002) and Fredrickson and Branigan (2005) showed that people in a positive mood are more likely to attend to the global shape of a visual stimulus, whereas negative mood participants are more likely to attend to its local building elements. Rowe and colleagues (2007) further demonstrated that positive affect broadens visual selective attention: In their studies, positive, as compared to negative, mood participants were more distracted by flankers appearing in their peripheral visual field.

Importantly, evidence from the conceptual domain is in line with findings from the perceptual domain. For instance, it has been demonstrated that positive mood enhances access to more remote semantic associates (Rowe et al., 2007) and broadens thought-action repertoires (Fredrickson & Branigan, 2005). In line with this, research by Isen and colleagues has provided evidence that positive affect leads to more inclusive and integrative categorization, consideration of more perspectives and choice alternatives, and more flexible and creative problem-solving, or thinking out-of-the-box (e.g., see Isen, 2000, 2008, for overviews). Furthermore, research on the influence of mood on language use has demonstrated that people in a positive mood use more global, abstract words (e.g., adjectives), whereas people in a negative mood use more concrete words (e.g., verbs; Beukeboom & Semin, 2006).

To sum up, a large body of empirical findings supports the notion that mood systematically affects attention, both on the perceptual and the conceptual level: Positive mood broadens, and negative mood narrows, attentional scope. Critically, unlike past research on mood effects on information-processing and judgment, research on mood and attention has produced impressively consistent evidence. That is, whereas various factors have been shown to determine whether mood elicits a heuristic versus systematic processing strategy, mood-congruent versus incongruent judgments, and mood-repair/maintenance versus alternative goals (see e.g., Martin & Davies, 1998), mood seems to have an impact on attentional breadth that is robust and reliable. And yet, to date no research has investigated the consequences of mood-elicited effects on attention for target perception and judgment. This is surprising, given that the information one attends to (or not) is often the information one uses (or ignores) in forming a judgment. Put differently, knowing what (piece of) information people focus on, and its specific implications, should help us more accurately predict people's judgments. We took this

logic as a starting point in developing our own theoretical framework, which I describe in more detail next.

The spotlight model of mood effects on perception and judgment

Based on the above analysis, the work presented in this dissertation set out to test the hypothesis that positive and negative moods produce differences in evaluation and judgment by differentially affecting the kind of information that is picked up (both in the external environment and in our mind's eye), the way it is mentally represented, and the manner it is used in subsequent judgment. More specifically, based on the evidence showing that positive mood broadens attentional scope and promotes a more global perceptual focus, whereas negative mood narrows attentional scope and induces a more local focus, we posit that positive and negative moods "illuminate" different features of the available (accessible) information. Thus, we suggest that moods work like *spotlights*: Positive mood broadens the attentional beam, whereas negative mood narrows it, and one attends to whatever information comes "under the spotlight". For instance, happy people should be more likely to activate global and abstract representations of accessible (e.g., primed) information, whereas sad people should be more likely to activate specific and distinct representations. As a result, their subsequent judgments of an unrelated target should be affected by the prime in a different manner. Also, in judging a target stimulus that is embedded in a particular context, positive mood should promote attention to contextual information, whereas negative mood should elicit a narrower focus on the target. As a result, the implications of the contextual information will have a larger impact on happy people's judgments than on sad people's judgments.

Thus, we propose that one's judgment of a target stimulus will be determined by one's mood state, insofar as mood directs the beam of attention to different aspects of the available information. Compared to other mood theories, our approach has several important benefits. First, it can be used to generate testable predictions regarding the influence of mood in a wide variety of judgment domains. That is, since the mechanism we propose is of *attentional*, rather than of motivational, informational, or priming nature, we argue that the effects of mood should not be limited to the evaluative domain (positive – negative), but they should rather hold for *any* sort of judgment (e.g., evaluations of oneself, judgments of other people's personality, estimates of objects' physical magnitude, inferences about physical and social contexts). Second, our

framework can parsimoniously account for both mood-congruent and mood-incongruent judgments, since it posits that how one perceives and judges a target is a function of both mood and the implications of the information one attends to. Thus, it specifies a simple, yet reliable, mechanism that is inherently (and predictably) "context-dependent", rather than introducing additional factors (e.g., availability of cognitive resources, awareness of mood's biasing impact, or the activation of mood-management goals) to explain how a "default" effect (e.g., mood-congruence) is "overridden" (see Martin & Davies, 1998, for a discussion of "default" feature of the majority of mood models).

Besides putting forward what we believe is a novel, inspiring, and "user-friendly" perspective on mood effects on perception and judgment, the next four chapters of this dissertation provide the first empirical evidence for the impact of mood on several exciting, yet ubiquitous, phenomena in the broader field of context effects. I next briefly summarize the issues that we address in each of these chapters.

Summary of the empirical chapters

Chapter 2. The influence of mood on accessibility effects

Chapter 2 investigates how mood guides accessibility effects. Specifically, we test the hypothesis that over and above their direct influence, moods can have a strong *indirect* influence on judgment by affecting whether accessible information leads to assimilation or contrast. Our approach was inspired on the one hand by research on the impact of mood on the *globality* of one's perceptual focus (e.g., Gasper & Clore, 2002) and, on the other hand, by work on the importance of the *globality* and *distinctness* of accessible knowledge for the direction of priming effects (e.g., Stapel, 2007). In Chapter 2, we thus test the hypothesis that by altering perceptual focus, such that positive moods lead to a more global focus and negative moods lead to a more local focus, moods may determine what features of accessible information (global versus specific) come "under the spotlight". We further argue that this may affect the impact of this information on subsequent judgments (whether assimilation or contrast occurs).

We explore the manner in which mood may affect the use and impact of accessible information on judgments in three studies. First, we study the influence of positive versus negative mood on the judgmental impact of trait-implying behaviors. Specifically, we predict that happy (sad) people will assimilate (contrast) their judgments of an

ambiguous target person towards a primed trait. Next, we go on to replicate this effect using a subliminal (face) priming paradigm. Finally, and most critically, we use a lexical decision task to test our core hypothesis that the type of information activated by trait-implying behaviors is indeed mood-dependent, such that abstract trait information is activated in a positive mood, whereas specific actor-trait links are activated in a negative mood.

Chapter 3. Rumination and reflection effects on social perception

In Chapter 3, we go beyond valence, and investigate whether negative mood will always lead to contrast effects in judgment. A review of the literature on self-focused attention suggested an interesting route to answering this question. Specifically, it has been shown that people may focus on and experience a negative mood in at least two different manners, namely *ruminating* and *reflecting* (Nolen-Hoeksema, 1991; Trapnell & Campbell, 1999; see Nolen-Hoeksema, 2008, for a review). Previous research suggests that these two modes elicit different processing styles and corresponding cognitions, such that the former is characterized by more global mental representations, diffuse feelings, and repetitive thought, and the latter by clear and distinct feelings and more concrete thought. Inspired by these findings, we set out to investigate how the manner in which one focuses on one's negative feelings may influence perception and judgment. More specifically, based on the Interpretation Comparison Model of accessibility effects (ICM, see Stapel, 2007), we predict that rumination will activate global and diffuse thoughts and feelings, leading to assimilation, whereas reflection will activate specific and distinct thoughts and feelings, leading to contrast.

We test our hypotheses regarding the divergent effects of rumination and reflection in four experimental studies. In an initial study, we explore how ruminating, as compared to reflecting, in a negative mood influences global-local processing style. Next, we use a social comparison paradigm to explore the manner in which adopting a ruminative versus a reflective focus affects self-perceptions, while also measuring the mediating role of global versus local processing. In a subsequent study, we test our core hypothesis that rumination and reflection also influence judgments of an ambiguous target person. Finally, in our last study we aim to show that perceptual differences, rather than mood-repair goals, are driving differences in judgment, thus further ruling out motivational accounts.

In sum, Chapters 2 and 3 investigate the effects of mood on how accessible information (such as internal mental representations) is construed and used in subsequent social judgments. And yet, if the relationship between mood and attention (positive – broad, negative – narrow) is as stable and reliable as it seems to be, one would expect that moods will not only exert an impact on evaluative social judgments (where target information is often complex and ambiguous), but that they will also affect *any* sort of judgment. In other words, even simple judgments of properties that are not inherently positive or negative, such as whether an object is heavy or light, big or small, cheap or expensive, could be affected by mood. Of course, research in psychophysics and social psychology has long confirmed the intuition that everything is relative: A kilo is perceived to be heavier when compared to a hundred grams, but lighter when compared to ten kilos. Generally, there is no target without a context, and perceptions of the context influence perceptions of the target. Surprisingly, however, to date there has been no research that has systematically addressed the intriguing question of how moods influence the basic, lower-order processes that elicit context effects in target perception and judgment. What is more, none of the existing mood theories can generate coherent and straightforward predictions regarding the effects of mood on how we perceive and judge a target in context. We investigate this question in Chapter 4.

Chapter 4. Mood and context-dependence

The work we report in Chapter 4 was inspired by decades of research showing that how one perceives, evaluates, and judges a target stimulus is not only driven by the target itself, but also by the context in which it is embedded. Based on evidence that the degree to which one *attends to* contextual information determines the magnitude of context effects, and evidence for the influence of mood on attentional scope, we hypothesize that the magnitude of context effects will be moderated by mood. Specifically, we predict that in a negative mood one's attention will be mainly focused on a salient target, whereas in a positive mood one will attend to both the target *and* the context, since positive mood broadens the attentional beam and the context comes "under the spotlight". Therefore, context effects should be larger in a positive than in a negative mood. Put differently, although everything is relative, it should be more so when one is happy.

We test this hypothesis in five studies employing different paradigms and tasks. More specifically, we use judgments of temperature, weight, and size to explore whether people are more strongly affected by the context in a positive than in a negative mood. Further, we test whether these effects extend to the social domain by exploring the influence of mood on the degree to which context affects perceptions of a target person's emotions.

Chapter 5. The influence of mood on attribution

Whereas Chapter 4 deals with the effects of mood on basic perception, Chapter 5 goes further to test our logic in yet another domain, namely how moods affect our tendency to attribute observed behavior to dispositional or situational causes. Research on the *correspondence bias* and the *fundamental attribution error* has revealed that observers typically focus on the person and somehow "forget" about the context. One approach to explaining attribution biases is in terms of *perceptual salience*: An actor's behavior is typically more perceptually salient than the situation in which it unfolds or any external forces that may be constraining or facilitating it. Being unaware of the role of subtle contextual factors, observers tend to explain the actor's behavior in dispositional rather than in situational terms. On the other hand, previous research has shown that when the context is extra salient or relevant, people tend to draw situational attributions, thus reducing the fundamental attribution error. In other words, what one attends to is what one attributes to.

Once again building on evidence from two different fields, namely evidence that attention is critical for the type of attribution one makes, and evidence that mood affects attention to target and context, we hypothesized that positive and negative moods should differentially affect attributions. Since the actor is typically more salient than the context, we predict that negative mood will make people focus on the actor performing the behavior, thus leading to more dispositional attributions. In contrast, since positive mood broadens attention, it should make people attend to otherwise less salient contextual information and lead to more situational attributions. We further argue, however, that this pattern will reverse when the context is (made) extra salient or relevant. In these cases, negative mood will elicit more situational attributions than positive mood (i.e., people in a positive mood, who have a broader focus, will also consider the less salient actor's dispositions).

We test these hypotheses in four studies. Specifically, we explore how mood affects perceptions of an actor's personality, as well as preferences for dispositional versus situational explanations of the actor's behavior. In addition, we manipulate actor versus context salience in order to study whether a narrow focus (in a negative mood) always entails a focus on the actor, or instead, as we suggest, a focus on whatever is most salient (actor *or* context).

A final note about the individual chapters that follow: The chapters were written as journal articles and, as such, they can be read independently and in any order. As a result, however, there may be some overlap between the different chapters of the dissertation.

Enjoy!

Chapter 2

The influence of mood on accessibility effects*

* This Chapter is based on Avramova, Y. R., & Stapel, D. A. (2008).

The interplay of affect and cognition has intrigued social psychologists for a long time. They have shown that moods have profound effects on perception, memory, judgment, and behavior. For example, previous research has shown that moods may directly spill over to evaluation and judgment. These are the so-called mood-congruency effects: when you are happy, everybody looks beautiful; when you are sad, the whole world looks gloomy. Moods may also influence the depth of processing of incoming information: when you are happy, you process more superficially; when you are sad, you process more analytically (see Bless & Fiedler, 2006; Bless & Schwarz, 1999; Fiedler, 2001; Forgas, 1995; Martin, 2001; Schwarz & Clore, 1996; Wegener & Petty, 1994).

In the present research, we focus on another aspect of mood effects on information-processing, that is on how moods may influence priming effects. In real life, moods are seldom the only things people have "on their mind". People are not only and exclusively in a good or bad mood; rather, they live their normal lives (go to work, talk to people, go shopping, have dinner, watch television) *while* being in a good or bad mood. Thus, it is important and interesting to investigate how mood may indirectly affect judgments, namely via the *interaction* with normal, everyday experiences that by themselves have effects on judgment. In other words, the question is how mood may influence the direction of accessibility effects. Interestingly, there have been no systematic, empirical studies that have attempted to address this question to date. Thus, whereas previous research has focused mainly on "How do moods affect what is on people's mind?", we focus on "How do moods affect what people do with what is on their mind?" Specifically, we argue that over and above their direct influence on judgment, moods can have a strong indirect influence by affecting whether what is on one's mind leads to assimilation or contrast. The hypothesis is that moods alter people's perceptual focus such that positive moods lead to a more global focus and negative moods lead to a more local focus. In this way, moods may determine what features of accessible information (global versus specific) come "under the spotlight". This, in turn, may affect the impact of this information on subsequent judgments (whether assimilation or contrast occurs). Our approach is inspired on the one hand by research on the impact of mood on the *globality* of one's perceptual focus (e.g., Gasper & Clore, 2002) and, on the other hand, by work on the importance of the *globality/ distinctness* of accessible knowledge for the direction of priming effects (e.g., Stapel, 2007).

Focus level

The distinction between global and local processing in cognitive psychology can be traced back to the classic study by Navon (1977) in which participants were shown large letters that were made of smaller letters and had to judge whether or not a target letter was presented (see also Kimchi, 1992). Navon's main finding was that responses to global structures were faster – the so-called global advantage – a notion which was later challenged and boundary conditions were specified (see Kimchi, 1992, for a review). Subsequent research within cognitive, clinical, and social psychology has shown that this distinction between global and local processing is related to a large variety of important psychological phenomena (e.g., Delis, Robertson, & Efron, 1986; Fink, Halligan, Marshall, Frith, Frackowiak, & Dolan, 1996; Förster & Higgins, 2005; Gasper & Clore, 2002; Kühnen & Oyserman, 2002; Lamb & Robertson, 1990). An especially intriguing finding has been that the level of perceptual focus (or scope) is related to the level of conceptual focus (see e.g., Anderson & Neely, 1996; Derryberry & Tucker, 1994; Förster, Friedman, Özelsel, & Denzler, 2006; Friedman, Fishbein, Förster, & Werth, 2003; Stapel & Semin, 2007). As Derryberry and Tucker (1994) proposed, motivational states not only influence the scope of perceptual attention (i.e., the extent to which attention is focused upon central as opposed to peripheral environmental cues) but analogously influence the scope of conceptual attention - one's internal attention to mental representations as opposed to external percepts (see also Anderson & Neely, 1996; Förster et al., 2006). In support of this idea, they found that anxiety causes one to adopt a local attentional focus, while joy broadens one's focus, both on a perceptual level (increased responsiveness to peripheral cues) and on a conceptual level (increased activation of relatively inaccessible mental representations).

The link between perceptual and conceptual focus can be also illustrated by several different lines of research. For example, in a study by Friedman and colleagues (2003), participants who were engaged in a global task (looking at state maps in a global manner) did better in a subsequent creativity task (calling for broader conceptual attention) than participants who were asked to focus on (map) details. In addition, Friedman et al. (2003) demonstrated that local versus global processing affects breadth of categorization: Participants who underwent a global, as compared to a local, processing manipulation were better at generating unusual exemplars for a number of categories (e.g., birds, colors, fruits). Previous research has suggested that the inclusion of an

exemplar into a category (e.g., "Is a camel a vehicle?") requires a broader conceptual scope and more abstract representations (Isen & Daubman, 1984; see also, Stapel & Semin, 2007; Bless & Fiedler, 2006).

In sum, a variety of research findings corroborate the notion of a close relationship between perceptual and conceptual focus with regard to the global/local, or abstract/concrete, distinction. Nevertheless, it should be noted that in the existing literature, the term "focus" has been used alternatively to denote *scope* (narrow/broad), *focus* (global/local) and *processing style* (abstract/concrete, global/local), thus sometimes pertaining to attention and perception, and sometimes to other, less basic cognitive processes. Although the terms "global/local" have their roots in research on visual perception and the terms "abstract/concrete" usually refer to higher-order, conceptual processes (e.g., language use, categorization, concept clustering in memory), the research reviewed above testifies and also calls for a broader, more flexible approach. Thus, on the one hand, perceptual (global/local) and conceptual (abstract/concrete) processing have been shown to be closely related, and on the other, we would like to argue that for the purposes of the present chapter, the distinction between perceptual and conceptual focus is not essential. Hence, to avoid ambiguity, but also superfluity, from this point on we will be using the term "focus" to refer to one's current *perceptual focus* in the broadest sense of the term "perceptual" (i.e., not limited to visual perception, but also including social/person perception). That is, we will not discriminate between perceptual and conceptual focus, since by "focus" we mean *mindset,* or *processing style,* which may vary along the global/local (or, abstract/concrete) dimension and may thus have an impact on how both external (social) information is picked up and attended to, and how the mental representation of this information is dealt with, elaborated on and further used in person perception and judgment.

Focus level and mood

Evidence suggests that mood is one of the factors that may influence one's focus, and thus the level of abstractness of mental representations (see Bless & Fiedler, 2006; Derryberrry & Tucker, 1994; Gasper & Clore, 2002; Förster et al., 2006). One of the main principles or central assumptions of Schwarz and Clore's affect-as-information approach is the *Level of Focus principle* (see Clore et al., 2001). This principle suggests that affective feedback should influence the focus of processing, such that positive moods promote attention to the global aspects of stimuli (the forest), whereas negative moods promote

attention to the local aspects of stimuli (the trees). In two experimental studies, Gasper and Clore (2002) showed this mood effect on the globality of focus on a rather basic perceptual level. In their first experiment, they found that happy participants more readily assimilated the details of an ambiguous drawing to a global face schema than sad participants. In their second study, they demonstrated that happy people categorized geometric figures more by their global shape, whereas sad people categorized these figures more by their local shapes. Moreover, they found no evidence for differences in the depth of processing, which rendered such an account of the observed effects implausible.

We argue that the impact of mood on focus level should hold beyond the domain of visual (purely perceptual) processing. As we mentioned above, Derryberry and Tucker (1994) have already shown that affective states can have a parallel effect on perceptual and conceptual attention. In addition, Gasper and Clore's results (2002) are conceptually consistent with the notion that people who are in a positive mood are more likely to use global stereotypes and broad, abstract categories, whereas those in a negative mood focus more on specific behaviors and lower-level categories (e.g., Edwards & Weary, 1993; Isen, 1984; Park & Banaji, 2000; Sinclair, 1988). Notably, positive moods are associated with an increased reliance on general knowledge structures such as general expectancies, stereotypes, schemas, and scripts (Bless & Schwarz, 1999; Fiedler, 2001). For instance, happy (but not sad) participants have been found to rely on a global rather than on a specific representation of persuasive messages (see Bless et al., 1992; Bless & Schwarz, 1999) and to use more abstract language (e.g., adjectives rather than verbs) when describing social events (Beukeboom & Semin, 2006).

Focus level and accessibility effects

It seems then that mood influences one's focus level: Positive moods induce a global focus and negative moods induce a local focus (see Gasper & Clore, 2002; Bless & Fiedler, 2006). In the present research, we aimed to use this logic to predict the effects of mood on knowledge accessibility (priming) effects. Specifically, we argue that by inducing different levels of focus, positive and negative moods affect the encoding and use of accessible knowledge and thus the direction of accessibility effects. We base this hypothesis concerning the relation between focus level and the direction of accessibility effects on studies by Stapel and his colleagues investigating the *Interpretation Comparison Model* (ICM, e.g., Stapel, 2007; Stapel & Koomen, 2001; Stapel, Koomen, & Van der Pligt,

1996). The ICM, like other assimilation and contrast models, posits that the way accessible information is used is an important determinant of the impact of such information on subsequent judgments. When accessible information is used as an interpretation frame to disambiguate and encode target information, *assimilation* is likely to occur. However, when accessible information serves as an extreme comparison standard (anchor), *contrast* effects are more likely (see also Martin, 1986; Schwarz & Bless, 1992; Trope, 1986; Wyer & Srull, 1989).

One important factor determining whether accessible information is used as an interpretation frame or as a comparison standard is the degree of abstractness of this information. In numerous studies, Stapel and his colleagues have shown that, *ceteris paribus*, abstract, diffuse trait primes (e.g., "hostile" versus "friendly; "smart" versus "stupid") usually lead to assimilation, whereas distinct, specific exemplar primes (e.g., Hitler versus Gandhi; "Einstein" versus "Clown") usually lead to contrast (see Stapel, 2007, for a review of abstractness/ distinctness effects, as well as other factors affecting the direction of knowledge accessibility effects). The distinctness notion refers to the idea that such person exemplars constitute distinct and separate entities with relatively clear object boundaries and are therefore more likely to be used as comparison standards. Abstract trait concepts or attributes lack the distinctness to be used as a comparison standard and are more likely to be used as an interpretation frame rather than an anchor: As Murphy and Zajonc (1993) put it, diffuse information is more likely than distinct information to "spill over" and "fill in" the gaps in vague target information (see also Schwarz & Clore, 1996). The notion that abstract trait priming yields assimilation and distinct exemplar priming yields contrast is well-established and has now been shown in various domains (e.g., politics, advertising, health) using a variety of judgments (self-evaluations, other-judgments, preferences, choices) and unobtrusive behavioral measures (reaction times, walking speed, coloring tasks, puzzle tasks, scores on an IQ test; for a review, see Stapel, 2007).

Mood, focus level, and accessibility effects

Given the effects of mood on focus level on the one hand and research on the impact of information distinctness on knowledge accessibility effects, on the other, one could argue the following: If positive moods induce a more global focus, then global, abstract features of a stimulus will be more likely to be picked up in a positive mood. Hence, stimuli should be more likely to lead to assimilation when people are happy.

Similarly, if negative moods induce a more local focus, then specific, distinct features of a stimulus will be more likely to be picked up in a negative mood. Hence, stimuli should be more likely to lead to contrast when people are sad. Thus, we argue, transient mood states may have a profound effect on how people encode and use accessible information during impression formation and whether assimilation or information-incongruent contrast judgments occur.

In the current studies, we test this hypothesis by examining the impact of *trait-implying social information* (like behaviors or faces) on subsequent judgments (see also Stapel et al., 1996). Previous research suggests that categorizing behavioral information or facial information in trait terms is something people do both frequently and spontaneously (see e.g., Uleman, Newman & Moskowitz, 1996). It is less clear, however, what type of representations are activated when people categorize behavior in trait terms. Previous research has shown that the goals, motivation, and mindset of the individual perceiver may all affect the likelihood that a sentence such as "*John knew he was the best and didn't hesitate to tell people about it"* would activate actor-trait links ("John is arrogant") instead of abstract trait concepts ("arrogant"; see Stapel et al., 1996; Uleman et al., 1996).

Our analysis of the relation between focus level, mood, and accessibility effects suggests that mood may also be an important determinant of what features of social information come under the spotlight. More specifically, we posit that when perceivers are in a positive mood, abstract labels will be primed (e.g., "hostile", "attractive"), whereas more specific actor-trait links (i.e., a trait *and* an exemplar) will be primed when they are in a negative mood (e.g., "Peter is aggressive", "Mary is attractive"). Furthermore, since the work of Stapel and colleagues (see Stapel, 2007) suggests that primed trait concepts are likely to lead to assimilation, whereas primed actor-trait links usually lead to contrast (see also Martin, 1986; Schwarz & Bless, 1992; Trope, 1986; Wyer & Srull, 1989), it follows that mood is also likely to be an important determinant of the *impact* of perceived behavior on subsequent judgments, that is whether assimilation or contrast ensues.

We test this logic in three experimental studies, employing divergent mood induction methods (scenarios, music), research paradigms (supraliminal, subliminal priming, lexical decision tasks, judgments tasks), and dependent measures (response latencies, person perception). With these studies, we aim to demonstrate that moods may

influence the direction of knowledge accessibility effects (assimilation vs. contrast) by guiding the referents of trait inferences (traits vs. actor-trait links).

Study 2.1

In our first study, we investigated the impact of positive versus negative mood on the influence of trait-implying behaviors on subsequent target evaluations. After a mood induction task (reading a happy or sad story; see Erber, 1991), participants read several trait-implying behavior descriptions and were then asked to read a description of a target person and rate this person on a number of personality dimensions (see Stapel et al., 1996). The prediction was that in a positive mood, participants would assimilate the target judgments towards the trait-implying behaviors, whereas in a negative mood, these judgments would be contrasted away from these behaviors.

Method

Participants and Design

One hundred thirty-five university students took part in the study in exchange for partial academic credit. They were randomly distributed across the conditions of a 3 (Mood: positive, negative, neutral) X 3 (Prime type: positive, negative, irrelevant) factorial between-subjects design.

Procedure

Upon arrival in the laboratory, participants were welcomed by the experimenter who explained that they will participate in an experiment consisting of several paper-pencil tasks. The first task was presented as a study on print media content (this was actually the mood induction procedure). Participants were asked to read one of the three stories, depending on mood condition, and answer the media question. After the mood induction procedure, and following Stapel et al.'s (1996) procedure, participants were asked to read the 5 trait-implying sentences (2 of which differed across prime type conditions). One group of participants read two experimental sentences that implied the traits *confident* and *persistent* along with three filler sentences. One group of participants read two sentences that implied the traits *conceited* and *stubborn* along with the three filler sentences. One group of participants had two sentences that did not imply traits on these dimensions along with the three filler sentences. The experimental sentences always appeared in the second and the fourth position. After participants read the trait-implying sentences, they were instructed to read the paragraph and try to form an impression about the person described. Next, respondents had to indicate their

impressions of the target on trait rating scales. Participants were then asked to answer a mood question as a manipulation check. Finally, on completion of these tasks and questions, participants were carefully debriefed about the goal and purpose of the experiment, following the funneled debriefing procedure for priming experiments, as advocated by Bargh and Chartrand (2000). None of the participants spontaneously indicated suspicion of the actual goal of the study. After debriefing, participants were thanked and dismissed.

Materials

Mood induction. Mood was induced, following the procedure that was designed by Erber (1991). In this procedure, participants received, depending on condition, one of three stories describing events that happened to a young, female artist (the text of the stories we used was similar in content, but not identical, to the ones used by Erber, 1991). The story for participants in the positive mood condition described a number of fortunate events culminating in her receiving a scholarship to study art. The story designed to induce a negative mood described how the same person was overcome by a rare, disabling illness (rheumatoid arthritis) at the end of her freshman year in college. The neutral mood story simply described how the person decides which college to attend. All three stories were approximately the same length.

We tested the effectiveness of this mood induction procedure in a pilot study. Participants (n = 45) read one of three stories (happy, sad, or neutral) as part of a so-called media classification study ("*In which newspaper or magazine do you think this story might have been published?")* and then answered the following question: *"Indicate how positive or negative you feel."* Participants indicated their ratings on a 9-point scale with endpoints "*negative*" (1) and "*positive*" (9). Results showed that the stories effectively influenced pilot participants' mood: $F(2, 42) = 9.94$, $p < .01$, $\eta_p^2 = .32$, with the positive mood story resulting in more positive mood self-ratings (M = 6.93, SD = 1.10) than the negative mood story (M = 5.33, SD = .82) and the neutral story lying halfway between these two extremes (M = 6.02, SD = 1.01) (all single comparisons, $ps < .05$).

In the main study, the mood induction story was (as in the pilot study) presented as part of a media classification study. Respondents were asked in what magazine/newspaper they thought the story they read might have been published. This was done to ensure that participants perceived the different tasks (mood induction, trait-implying sentences, and paragraph) as unrelated.

Trait-implying sentences. Each participant was shown 5 trait-implying sentences and all participants read the same three neutral filler sentences. On the basis of experimental sentences type, three groups were created. One third of the participants read two experimental sentences that implied relevant *positive* traits. One third of the participants read two experimental sentences that implied relevant *negative* traits. One third of the participants read sentences that implied *irrelevant* traits. These sentences were pretested (see Stapel et al., 1996) to be both strong in their ability to imply (and thus prime) traits and relevant to two trait dimensions that characterized the target stimuli to be judged later on (persistent-stubborn and confident-conceited; see below). The positive sentences were: "Peter paddled even harder as he fell further behind in the race" (*persistent*); "John knew he could handle most problems that would come up" (*confident*). The negative sentences read: "Peter refused to listen to them even though all the evidence was in their favor" (*stubborn*); "John knew he was the best and didn't hesitate to tell people about it" (*conceited*). The irrelevant sentences were: "Peter decorated the office with antiques from the Far East" (*cultured*); "John invited them to call if they needed any help getting settled" (*helpful*). Order of sentence presentation was counterbalanced across conditions.

Paragraph. Participants read a paragraph that described the activities of a character named Ralph. This paragraph consisted of a series of behavioral descriptions that had been pretested and determined to be ambiguous along the following trait dimensions: adventurous-reckless, confident-conceited, and persistent-stubborn. Although participants read no trait-implying sentences that implied either adventurousness or recklessness, the behavioral description of this dimension was retained in the paragraph to maintain coherence.

Rating scales. After reading the paragraph, participants were asked to rate the target along four (two applicable and two inapplicable) bipolar trait dimensions. Participants indicated their impressions of the target by circling a number on 7-point scales that measured along the applicable confident-conceited and persistent-stubborn dimensions and the inapplicable friendly-irritating and intelligent-stupid dimensions. A rating of 1 indicated a positive evaluation (confident, persistent) and a rating of 7 indicated a negative evaluation (conceited, stubborn).

Mood manipulation check. Participants were asked to indicate how they felt on a 9-point scale with the endpoints "*negative*" and "*positive*". This last question served as a manipulation check for the mood induction procedure.

Results and Discussion

Mood manipulation check. An analysis of variance (ANOVA) on the mood measure showed the predicted main effect of mood induction, $F(2, 132) = 34.09$, $p < .01$, $\eta_p^2 = .34$ (Other $Fs < 1$). Participants who had read the positive mood story reported to be in a more positive mood ($M = 6.91$, $SD = .85$) than participants who had read the neutral mood story ($M = 5.93$, $SD = 1.10$), and those who read the negative mood story reported to be in a more negative mood ($M = 5.38$, $SD = .69$) as compared to both other groups (all $ps < .05$).

Main analysis. We tested our predictions in 3 (Mood) X 3 (Prime type) ANOVAs. As predicted, the ANOVAs did not reveal any main or interaction effects for the inapplicable rating scales ($Fs < 1$). To keep the presentation of results simple, we only report ANOVAs on the composite scores of the applicable scales (persistent-stubborn and confident-conceited, $r(133) = .50$, $p < .01$.).[1] For this measure, an ANOVA revealed the expected two-way interaction between mood and prime type, $F(4, 126) = 16.14$, $p < .01$, $\eta_p^2 = .34$ (Other $Fs < 1$).

Table 1: Mean (SD) trait ratings as a function of Mood and Prime Type (Study 2.1)

	Mood		
	Positive	Negative	Neutral
Prime type			
Positive	3.17	4.80	3.77
	(.77)	(.65)	(.88)
Negative	4.73	3.03	3.93
	(.82)	(.58)	(.86)
Irrelevant	3.93	3.97	3.97
	(.59)	(.77)	(1.17)

Note: Means reported here are composite scores that were computed over the applicable rating scales (persistent-stubborn, confident-conceited). Lower ratings indicate more positive ratings.

[1] Separate analyses for each of the items showed the same pattern of results as analyses for the composite measure.

Comparison of the relevant means (see Table 1) showed that among positive mood participants those who were shown positive trait-implying sentences (traits with a positive connotation) rated the target more positively (i.e., more towards the confident/persistent scale anchor) (M = 3.17, SD = .77) than did those who were shown negative trait-implying sentences (M = 4.73, SD = .82), $t(28) = -5.39$, $p<.01$, $d = 1.96$. In contrast, among negative mood participants, those who were shown positive trait-implying sentences rated the ambiguous target more negatively (i.e., more towards the conceited/stubborn scale anchor) (M = 4.8, SD = .65) than those who were shown negative sentences (M = 3.03, SD = .58), $t(28) = 7.85$, $p<.01$, $d = 2.78$. This pattern indicates *assimilation* effects in the positive mood conditions and *contrast* effects in the negative mood conditions. As can be seen in Table 1, neutral mood participants' ratings fell halfway between the ratings of respondents in the two experimental conditions.

The results of Study 2.1 provide strong support for our hypothesis that people's mood affects the way primed information is used in subsequent judgments. Positive moods elicit assimilation and negative moods elicit contrast effects.

There is one particular issue, however, that needs to be addressed here in greater detail. Whereas we argue that the reported contrast effects result from comparisons away from a reference point (see also Ruys, Spears, Gordijn, & de Vries, 2006), a number of authors have suggested that in some contexts contrast effects may result from "prime-awareness" and the ensuing desire to correct for the prime's potential contaminating influence (e.g., Martin, 1986; Uleman et al., 1996; Wilson & Brekke, 1994; for a review see Stapel, 2007). Thus, one may argue that negative moods lead to contrast effects because, when in a negative mood, people are much more likely to process information systematically and, thus, to correct for unwanted biasing influences more readily (see Forgas, 1995; Schwarz & Clore, 1996). This would then mean that the result is *correction contrast* and not *comparison contrast* (as we have argued). There are several arguments against such an account. First, most studies that have instructed people to think accurately and carefully do not find contrast effects, but rather find no priming effects at all (see Stapel, Koomen, & Zeelenberg, 1998). Second, there is no evidence in the present studies that our participants were more aware or suspicious in the negative mood conditions or that they tried to correct for unwanted contamination of their judgments. In fact, our funneled debriefing procedure provided evidence for just the opposite, thus rejecting the prime-awareness explanation of contrast effects, which postulates active

and effortful correction processes operating in an attempt to subtract contextual contamination from target judgments. In addition, there is no reason to believe that contrast can only occur when people are aware of the primes, since both contrast and assimilation effects have been found after both subliminal and supraliminal priming (see e.g., Stapel, Koomen, & Ruys, 2002) and as a result of no-correction or correction strategies (see e.g., Petty & Wegener, 1993). Lastly, if people corrected for bias in their inferences, one would expect pervasive contrast effects on all measures, whereas in the present studies contrast was found only on relevant, target-related measures and not on target-unrelated measures.

Thus, it seems unlikely that correction is the underlying mechanism for the observed contrast effects in target judgment. We instead interpret the contrast effects found in the present study as a result of "unaware" *comparison processes* between the person information implied by the trait-implying sentences and the target person. In order to fully rule out a correction account for the obtained contrast effects, however, we conducted another study, in which we tested the impact of mood on accessibity effects in a subliminal priming paradigm.

Study 2.2

In Study 2.2, we had two major goals. First, we intended to show that correction processes are unlikely to drive the contrast effects we found under negative mood in our first study. Second, we aimed to demonstrate that the effects of mood on the direction of accessibility effects do not only hold for verbal stimuli (i.e., behavior descriptions), but that they can be just as strong for exposure to visual target information (e.g., human faces).

Our rationale here is that human faces - just like verbal behavioral descriptions or actual behavior - can imply a variety of traits (such as attractiveness, friendliness, intelligence, competence, etc.) that people often can infer quickly and spontaneously from as little as a glance to a person's face (Ambady, Bernieri, & Richeson, 2000; Todorov, Mandisodza, Goren, & Hall, 2005; Zebrowitz, 2006; Zebrowitz, Hall, Murphy, & Rhodes, 2002). Support for this view also comes from emotion research which has demonstrated that people (correctly) pick up others' emotional states, and that these can affect subsequent evaluation and judgment, even when emotional face primes are presented subliminally (Dimberg, Thunberg, & Elmehed, K., 2000; Ruys & Stapel, 2008a, 2008b; Stapel, Koomen, & Ruys, 2002). For example, recent studies by Stapel and Ruys and

colleagues (Ruys & Stapel, 2008a; Stapel, et al., 2002) show that super quick subliminal exposures to a smiling female face results in global, valence-based reactions (i.e., happy), whereas quick subliminal exposures result in specific, descriptive reactions (i.e., happy woman). If it is possible to decouple the trait from the actor in paradigms using supraliminal exposure to trait-implying sentences and in paradigms using subliminal exposure to emotional faces (evidenced by the differential effects of the prime on subsequent target evaluations), it seems logical that the trait and the actor can be also activated separately (or together) by exposure to non-emotional faces that vary on an evaluative dimension. Thus, we reasoned, although people are exposed to the same face prime (just as they are exposed to the same trait-implying sentence), their moods may lead them to focus on different features of this face.

A real-world example might be useful here. Imagine that you are cycling to work and you quickly pass by a billboard depicting a beautiful girl advertising facial cosmetics. For your own (and others') safety, you are not taking too long to look at the girl's shining clear skin and seductive smiling eyes, but you are rather cycling on. What are the chances that the abstract trait "attractive" or "beautiful" will be activated by glancing at the billboard (even if you are unaware of your wandering eyes) and what are the chances that you would make more specific inferences about this very girl? Well, we would argue, it depends on your mood: If you are happy this morning on your way to work, you might have a more global focus and the vague feeling or thought of "something attractive" may occupy the back of your mind. Conversely, if you just cycled through a dirty puddle on the rainy road, you might become more vigilant, so glancing at the billboard might make you infer "beautiful girl" or "attractive model". Our idea is that your mood this morning would then determine whether your new colleague, whom you meet when you get off your bike in front of your office, would strike you as attractive.

In order to test our hypothesis, in the present study we subliminally primed attractive versus unattractive faces and then asked respondents to judge the attractiveness of a neutral (supraliminally presented) target face. Following our analysis of the relations between mood, focus, and accessibility, and encouraged by the findings of our first study, we predicted that positive and negative moods should impact how respondents use subliminally primed visual information. Thus, the logic here is the same as in our previous study: Exposure to a human face can prime a more or less abstract concept, namely the trait label "attractive", "attractiveness" or the specific actor-trait

link “attractive person”, “unattractive woman.” Moreover, we argue that this very difference in what is activated is mood-dependent and that it should have a differential impact on the use of this information in subsequent judgments. Thus, we derived the following predictions: Positive mood participants should be more likely to assimilate their judgments of the neutral target face to the prime, if the latter, as we argue, activates broad, diffuse information (e.g., “attractiveness”). Negative mood participants, on the other hand, should contrast their judgments away from the prime, as a result of the activation of more distinct exemplar information (e.g., “attractive woman”). Thus, negative mood participants should be more likely to rate a neutral target face as more attractive when they are primed with an unattractive face, and as more unattractive after being exposed to an attractive face.

In this study, we induced positive and negative mood using the continuous music technique (Eich & Metcalfe, 1989) which has proven successful in previous studies. Employing this mood induction procedure allows us to fortify and generalize our results from the first study.

Method

Participants and design

Ninety-three university students took part in the study in exchange for partial academic credit. They were randomly assigned to the conditions of a 2 (Mood: positive, negative) X 2 (Prime type: positive, negative) between-subjects design or to a control condition in which participants received no mood manipulation and were primed with neutral stimuli (picture of trees).

Materials

Mood induction. To induce positive or negative mood, participants were listening to happy classical music (e.g., allegros from Mozart’s *Eine kleine Nachtmusik*) or sad classical music (e.g., Barber’s *Adagio for Strings*) over headphones during the priming episode of the experiment. Music was stopped before the judgment phase (for a similar method, see Innes-Ker & Niedenthal, 2002)

Priming stimuli. The priming stimuli were a (black-and-white) photograph of an unattractive female face (pretested on a 7-point unattractive–attractive rating dimension, $M = 2.23$) and a photograph of an attractive female face (pretested, $M = 5.72$). Both faces had a neutral expression.

Dependent measure. Participants were asked to rate a moderately attractive face with a neutral expression (pretested on a 7-point unattractive–attractive rating dimension, $M = 4.12$).

Mood manipulation check. After participants provided their target face ratings, they received a 7-point rating scale on which they had to indicate how they felt (anchored by negative – positive).

Procedure

On arrival, participants were shown into one of eight cubicles in the experimental room and seated in front of a computer equipped with stereo headphones for the music induction. They were told that they would participate in a series of unrelated studies. First, participants performed a parafoveal vigilance task (modeled after Stapel et al., 2002) in which the priming stimuli were presented outside of awareness. Participants were told that very short flashes would appear on the screen at unpredictable places and at unpredictable times and that their task was to decide as quickly and accurately as possible whether the flash appeared on the left or right side of the screen. After having completed the vigilance task, participants completed the target rating task.

Priming task. The priming task was modeled after Stapel et al.'s (2002) parafoveal priming task. Once participants were seated in front of their computer, the experimenter explained the vigilance task, first verbally and then with instructions on the computer screen. Participants were seated so that the distance between their eyes and the computer screen was 100 cm when they sat erect on the chair as they were instructed to do. This ensured that the priming stimuli were presented outside of participants' perceptual field (for details, see Stapel et al., 2002). The experimenter instructed participants to place their index fingers on the two labeled keys of the keyboard and to press the left key, labeled "L," if a flash appeared on the left side of the screen and the right key, labeled "R," if a flash appeared on the right side of the screen. A fixation point consisting of one X was presented continually in the center of the screen. The experimenter emphasized that because of the unpredictable timing and location of the flashes, the best way to detect all of them quickly would be to keep their eyes on the fixation point at all times.

Participants were given 10 (neutral priming) practice trials to become familiar with the procedure and to ensure that they understood it. After answering any questions, the experimenter began the 60 experimental trials of the vigilance task, which took

participants approximately 5 min to complete. All pictures presented on the computer screen were 20 mm in size. The pictures that were flashed in the 10 practice trials and in 40 of the experimental trials were pictures of trees. In the remaining 20 experimental trials, an attractive face, an unattractive face or a picture of a tree was flashed. The order in which pictures were flashed was random. All pictures were flashed for 110 ms. In all conditions, these pictures were immediately followed by a 120-ms mask (for details see Stapel et al., 2002).

Awareness and suspicion. Previous suboptimal priming studies have shown that the paradigm used here provides sufficient safeguards to prevent participants from becoming aware of the priming stimuli (see Stapel et al., 2002; Stapel & Blanton, 2004). However, to ensure that participants were not aware of the priming stimuli, we used an extensive funneled debriefing procedure in which participants were asked increasingly specific questions about the study (see Stapel et al., 2002). This procedure revealed that all participants reported that they had seen flashes. Although some reported to have seen "pictures," no participant could report on the general or specific contents of the primes. Furthermore, participants' guesses of which of the two pictures they had seen did not exceed chance, nor did they differ between conditions (see Stapel et al., 2002). Finally, there were no participants who thought the vigilance and judgment tasks were related. Thus, we could safely conclude that we were successful in presenting our priming stimuli outside of awareness and in not alerting participants to the actual relation between the vigilance and rating task.

Results and Discussion

Mood manipulation check. An ANOVA on the mood measure showed the predicted main effect of mood induction, $F(2, 90) = 19.66$, $p < .01$, $\eta_p^2 = .30$. (Other $Fs < 1$). Participants who had listened to happy music reported to be in a more positive mood ($M = 6.81$, $SD = .88$) than participants who had listened to no music ($M = 6.06$, $SD = .90$) and those who had listened to negative music, reported to be in a more negative mood ($M = 5.36$, $SD = 1.16$) as compared to both other groups (all $ps < .05$).

Main analyses. As predicted, a 2 (Mood) X 2 (Prime type) ANOVA on the attractiveness ratings revealed the expected two-way interaction between mood and prime type, $F(1, 72) = 31.65$, $p < .01$, $\eta_p^2 = .31$ (Other $Fs < 1$). Comparison of the relevant means (see Table 2) showed that positive mood participants who were primed with an attractive face rated the target face more positively ($M = 4.67$, $SD = .84$) than did those who

were shown an unattractive face (M = 3.47, SD = 1.02), $F(1, 74) = 10.24$, $p < .01$, $\eta_p^2 = .12$. In contrast, negative mood participants who were primed with an attractive face rated the target face more negatively (M = 3.26, SD = 1.33) than did those who were shown an unattractive face (M = 4.70, SD = .80), $F(1, 74) = 16.90$, $p < .01$, $\eta_p^2 = .19$. This pattern indicates *assimilation* effects in the positive mood conditions and *contrast* effects in the negative mood conditions. As can be seen in Table 2, neutral mood participants' ratings who were only primed with pictures of trees fell halfway between the ratings of respondents in the two experimental conditions, (M = 4.00, SD = .79).

Table 2: Mean (SD) attractiveness ratings as a function of Mood and Face prime (Study 2.2)

	Mood	
	Positive	Negative
Face prime		
Attractive	4.67	3.26
	(.84)	(1.33)
Unattractive	3.47	4.70
	(1.02)	(.80)

Note: Neutral mood participants' ratings who were only primed with pictures of trees fell halfway between the ratings of respondents in the two experimental conditions, M = 4.00, SD = .79.

The results from this study extend our findings from Study 2.1 by demonstrating that the impact of mood on the direction of accessibility effects generalizes over different mood induction procedures, different priming stimuli, and different target judgments. Furthermore, these results show that the predicted impact of mood on priming effects can also be quite strong when information is presented outside of awareness and/or when mood is primed rather unobtrusively. The effects of subliminal face priming we found in this study parallel the effects of supraliminal behavior priming we found in Study 1: Positive moods lead to assimilation, negative moods lead to contrast.

Thus, we provided further support against a correction account of our contrast effects: it is highly unlikely that participants tried to correct for the influence of a prime they were not aware of. In addition, it should be noted that, similar to our first study, and as predicted, we found both assimilation and contrast effects. If it were the case that

human faces always activate actor-trait links, contrast effects should have dominated the results. Instead, we showed that positive moods can override this intuitive "bond" between the actor and the trait in face perception: participants who were in a positive mood only picked up the abstract trait, namely attractiveness, but they did not store this trait along with the specific person whose face implied it. In sum, these results confirm our conjecture that accessibility effects in person perception can be elicited by verbal, as well as by visual stimuli, and that these are mood-dependent.

As we argued above, we based our predictions and thus also explain these results using the framework of the referent hypothesis, namely that the different levels of focus that positive and negative moods elicit lead to corresponding differences in what features of the primed information come under the spotlight. Positive moods prime more abstract representations ("attractive"), whereas negative moods prime more specific, entity-linked representations ("attractive woman"). In the next study, we test this hypothesis more directly.

Study 2.3

In our view, the differential effects of positive and negative mood on participants' processing of the trait-implying behavior primes (Study 2.1) and of the subliminally presented trait-implying face primes (Study 2.2) can be accounted for by the different levels of focus that moods evoke. Specifically, we posit that when people are in a positive mood, trait-implying social information (be it faces or behaviors) is more likely to activate global trait information (e.g., "*persistent*" or *"attractive"*), whereas in a negative mood, it is more likely to activate specific actor-trait links (e.g., "*persistent Peter*" or "*attractive woman"*). Whereas the results of our first two studies provide evidence for the idea that mood may influence the direction of knowledge accessibility effects (positive moods - assimilation, negative moods - contrast), in our third study we embarked to provide more direct empirical support for our spotlight hypothesis, namely that moods indeed determine whether trait-implying information primes global traits or distinct actor-trait links. To this end, we gave participants a lexical decision task after our mood induction procedure that was designed to measure the relative accessibility of the trait vs. actor-trait links activated by the primes (see e.g., Stapel & Suls, 2004, for a similar method).

To test the hypothesis that trait-implying behavior increases the accessibility of abstract traits when people are in a positive mood versus distinct actor-trait links in a

negative mood, we used a lexical decision task that was developed by Dijksterhuis, Spears, and colleagues (1998; see also Stapel & Suls, 2004). We put people in a positive or negative mood with the music technique we used before and then simply asked participants to quickly read a short paragraph about "Paul" that either implied specific positive traits (confident, persistent) or negative traits (conceited, stubborn, see Study 1). Participants then received a lexical decision task that included words associated with the positive traits (e.g., *certain, determined*), words associated with the negative traits (e.g., *arrogant, inflexible*), and irrelevant words and nonwords. These words were always preceded by a subliminal presentation of either the actor's name (*Paul*) or irrelevant words (*pear*), so that lexical decision trials that were preceded by the *Paul* prime should increase the accessibility of knowledge about the actor (see Dijksterhuis, Spears et al., 1998).

If positive moods solely increase the accessibility of abstract traits, whereas negative moods also increase the accessibility of specific actor-trait links ("Paul is ..."), then our lexical decision task should reveal such a pattern. Both positive and negative mood participants who are exposed to positive information should be faster in responding to positive words than to negative words. The opposite should be true for positive and negative mood participants exposed to negative information: Faster responses to negative words than to positive words. More important, because we predict that for negative mood participants (and not for positive mood participants) these trait words will be linked to the actor (*Paul*), these accessibility effects should primarily occur (i.e., word recognition should be facilitated) for lexical decision trials that are preceded by *Paul*.

Method

Participants and design

Sixty-one students participated in the study in exchange for partial course credit. They were randomly assigned to the conditions of a 2 (Mood: positive, negative) X 2 (Prime type: positive, negative) between-subjects design.

Procedure and materials

On arrival in the laboratory, participants were placed in individual cubicles and told that they would be serving in several unrelated pilot studies and that they would receive all instructions by means of a computer program. The experimenter started the computer program and left. As in Study 2.2, participants were listening to happy or sad music throughout the experimental session. First, participants were asked to quickly read

a paragraph about a person named Paul. In the positive priming condition, this description included sentences implying persistence and confidence. In the negative priming conditions, these were replaced by sentences implying stubbornness and conceitedness (see Study 2.1).

After reading the paragraph, participants worked on the lexical decision task. Participants were told that the task concerned a word recognition experiment, the goal of which was to find out how quickly people could discriminate between words and non-words. Participants were asked to focus on the screen every time a string of *Xs* appeared. They were told this string would be followed by a word or a non-word and were asked to decide as quickly as possible whether a letter string was an existing word or not. A total of 46 trials were presented. The first 10 trials were practice trials, whereas Trials 11–46 were the critical ones. Of the critical trials, in 18 cases the target was an existing word, whereas in the remaining 18 cases, the words were random letter strings. Of the 18 words, 6 were persistent- or confident-related (e.g., persevering, secure), 6 were stubborn- or conceited-related (e.g., obstinate, arrogant) and 6 were neutral words that were unrelated to the primed dimensions. For each group of 6 target words there was an accompanying subliminal prime, such that 3 of the targets were presented with the word *Paul*, whereas the remaining 3 were primed with the word *pear*. Following Stapel and Suls (2004), there were two versions of this task, so that 3 specific words that were primed with *Paul* in one version were primed with *pear* in the other and vice versa. The 36 trials were presented in random order.

The trials involved the following sequence of events. First, we presented a fixation stimulus (XXXX) at the center of the screen for 1,000 ms. Then the prime was presented at the same location for 15 ms and was immediately masked by the fixation stimulus again for 500 ms. Then, the target word was presented, overwriting the masking stimulus, and it remained on the screen until participants had made the lexical decision. After 2s, the same sequence was repeated with the next trial.

Upon completion of the lexical decision task, participants answered a final questionnaire that tested for awareness (see Stapel & Suls, 2004). This awareness check showed that none of the participants realized that prime words had been presented prior to the target words, and none of the participants were able to list any of the prime words. This demonstrates, as was expected, that the priming occurred outside of conscious

awareness (see Stapel & Suls, 2004). After they had completed the questionnaire, participants were thanked and debriefed.

Manipulation check. The manipulation check question was the same as the one used in Study 2. Participants had to indicate how they felt (from *negative* (1) to *positive* (7).

Results and Discussion

Mood manipulation check. An ANOVA on the mood measure showed the predicted main effect of mood induction, $F(1,59) = 22.05$, $p < .01$, $\eta_p^2 = .27$ (Other $Fs < 1$). Participants who had listened to happy music reported that they felt significantly more positively ($M = 5.83$, $SD = .87$) as compared to participants who had listened to sad music ($M = 4.84$, $SD = .78$).

Main analysis. We conducted logarithmic transformations on the response latencies in order to reduce the skewness of the response distribution. Our analyses were computed on these transformed values. For ease of interpretation, however, we report the non-transformed means (see Dijksterhuis, Spears et al., 1998; Stapel & Suls, 2004). Since we did not find any effects of our manipulations on neutral words (Fs < 1), and following Stapel & Suls (2004), in our main analysis we compared response latencies for prime-congruent target words (i.e., positive words for positive primes and negative words for negative primes) and prime-incongruent target words (i.e., negative words for positive primes and positive words for negative primes).

Table 3 shows that when the target words were preceded by a neutral prime, prime-congruent words were recognized faster ($M = 511.37$ ms, $SD = 128.97$ ms) than prime-incongruent words ($M = 563.48$ ms, $SD = 133.30$ ms), $F(1, 59) = 5.83$, $p < .05$ $\eta_p^2 = .09$, independent of mood. This effect indicates that for both positive and negative mood participants reading the article about Paul activated abstract trait information, which facilitated the recognition of this type of information in the lexical decision task.
More important, however, as Table 3 also shows, is that mood had a significant effect on how participants responded to words that were preceded by "*Paul.*" Specifically, negative, but not positive, mood participants recognized prime-congruent words faster when target words were preceded by the name prime ($M = 448.23$ ms, $SD = 112.97$ ms) than when they were preceded by the control prime ($M = 512.10$ ms, $SD = 113.61$ ms), $F(1, 59) = 6.68$, $p < .05$, $\eta_p^2 = .18$. Positive mood participants did not exhibit such an effect of *Paul* priming ($F < 1$). On prime-incongruent trials (i.e., when the target word was a trait that was incongruent with the trait implied by the paragraph participants had read), this effect

was reversed: negative mood participants were slower at recognizing prime-incongruent words that were preceded by *Paul* (M = 673.07 ms, SD = 87.35 ms) than when they were preceded by *pear* (M = 566.90 ms, SD = 117.49 ms), $F(1, 59) = 22.08$ $p < .01$, $\eta_p^2 = .42$. Again, no such differences were found for positive mood participants ($F < 1$). This pattern comes to show that those in a negative mood (as compared to those in a positive mood) activated a more specific referent of the implied traits, i.e., Paul. These activated actor-trait links then inhibited these participants' recognition of trait-inconsistent words.

Table 3: Mean (SD) response latencies (in Milliseconds) as a function of Target Word (Trait-Congruent vs. Incongruent), Mood (Positive vs. Negative), and Prime (Paul vs. pear) (Study 2.3)

		Target word	
		Target congruent	Target Incongruent
		Positive mood	
Prime			
	Paul	513.53 (53.57)	562.13 (67.16)
	Pear	510.63 (145.12)	559.93 (149.86)
		Negative mood	
	Paul	448.23 (112.97)	673.07 (87.35)
	Pear	512.10 (113.61)	566.90 (117.49)

A 2 (Mood: positive, negative) x 2 (Congruency: congruent target, incongruent target) x 2 (Subliminal prime: Paul, pear) mixed ANOVA with repeated measures on the last two factors yielded the predicted three-way interaction, $F(1, 59) = 11.43$, $p < .01$, $\eta_p^2 = .09$, a Subliminal prime x Congruency interaction, $F(1, 59) = 11.24$, $p < .01$, $\eta_p^2 = .09$, a Mood

x Congruency interaction, $F(1, 59) = 8{,}37$, $p < .01$, $\eta_p^2 = .07$, and a main effect of Congruency, $F(1, 59) = 36.10$, $p < .01$, $\eta_p^2 = .23$ (Other effects $Fs < 1$).

These findings clearly support our referent-based explanation for the impact of mood on accessibility effects. Whereas for negative mood participants exposure to trait-implying behavior evoked a strong actor-trait link, positive mood participants seem to have mainly activated actor-free, abstract behavioral information. Thus, as predicted, the findings of this study show that negative moods elicit a more local, and positive moods a more global focus which then determines what features of the primed behavioral information will be picked up: whereas our positive mood participants only activated abstract trait information, those in a negative mood were more likely to activate specific actor-trait links.

General Discussion

The studies reported in this chapter present strong evidence that mood may affect the direction of priming effects by influencing what features of primed information come under the spotlight. We showed that when people are in a positive mood, behavior information is more likely to activate abstract traits, whereas when people are in a negative mood, behavior is more likely to activate distinct actor-trait links. We also showed that when people are in a positive mood, accessible knowledge is more likely to lead to assimilation, whereas when they are in a negative mood, accessible knowledge is more likely to lead to contrast. Together then, these studies support the hypothesis that assimilation is more likely to occur in positive moods because these states induce a global focus and thus activate more abstract representations of primed information ("attractive", "persistent"), whereas contrast is more likely to occur in negative moods because the latter induce a local focus and thus activate more distinct representations of primed information ("Kate is attractive", "Peter is persistent").

This mood-to-focus-to-impact logic was tested using a variety of mood induction and priming techniques and dependent measures. We used scenarios and music to induce positive and negative moods; we used supraliminal and subliminal priming methodologies to activate trait-implying information; we tested the impact of exposure to such information by presenting participants with verbal behavioral descriptions as well as with pictures of faces; and we tapped the impact of these mood and priming manipulations by using judgmental as well as lexical decision measures. Thus, the present studies suggest that the proposed logic is quite robust and quite general. Furthermore, we

think the present findings can be integrated in a general conceptual framework which specifies the mechanisms underlying the influence of mood on priming effects in terms of its impact on perceptual focus. More specifically, we contend that Gasper and Clore's (2002) level-of-focus hypothesis can be extended to mood effects on person perception, judgment, and social interactions, such that exposure to social information in positive moods elicits more global processing (and thus, assimilation), whereas negative moods elicit more local processing (and thus, contrast). In testing these ideas, we employed a well-known (but rather specific) person perception paradigm and demonstrated the impact of moods on accessibility effects by showing that moods determine the referents of what is activated: positive moods activate abstract behavior labels and negative moods activate specific actor-trait links. This should not be taken to mean, however, that we think the proposed logic only applies to this paradigm. Mood-induced focus level should similarly influence other kinds of (person) perception processes and behaviors. For example, mood can affect whether you see a number of different individuals or a group of people; a series of discrete behaviors or one overarching person characteristic; tomatoes, peppers, and cabbage or a crate of vegetables. An avenue for future research may be to test this more explicitly in other contexts, using other methodological paradigms.

Interestingly, one may argue that a competing explanation of our results may be provided by models employing a depth-of-processing approach to mood effects (e.g., Fiedler, 2001; Forgas, 1995; Mackie & Worth, 1989; see Bless & Schwarz, 1999 for an extensive review). These models typically posit that positive moods lead to more heuristic, peripheral, effortless processing, whereas negative moods elicit more systematic, effortful, resource-dependent processing. While these classic dual-process models usually explain the disparate effects of mood with information-processing differences in terms of *depth* of processing and *strategy* (processing style) employed, the current levels-of-focus approach attributes the observed effects of mood on the direction of accessibility effects to the differences in *perceptual focus* that moods elicit (and not necessarily to differences in quality or depth of processing). These two perspectives may seem more or less divergent in their predictions, depending on how the processes in question are conceptualized. If the heuristic vs. systematic distinction is conceptualized such that "systematic" pertains to more detailed, differentiated, and specific processing, then it converges with our own view. It would then just be a terminological, rather than a

conceptual controversy, since it is exactly the detail-oriented, specific processing style that we refer to when we are talking about local (as opposed to global) focus.

Alternatively, if the heuristic vs. systematic distinction is conceptualized in terms of processing *effort*, awareness, and cognitive resources, we would actually argue that both people with a more global and a more local focus should be able to process information in a more systematic or a more heuristic manner. That is, we would prefer to look at these dimensions separately and we believe they may vary orthogonally (see Kimchi, 1992, for a similar argument). There is no reason to believe that global processing is by itself less effortful or shallower, a more simplistic, partial, or inadequate form of processing (Kimchi, 1992; Reyna & Brainerd, 1995). Neither is there any reason to believe that local processing is by default more taxing, more conscious, or more effortful. Even in the domain of basic visual processing, the global precedence hypothesis (Navon, 1977) has been later modified and boundary conditions have been specified (see Kimchi, 1992). Thus, it seems that although global features sometimes have a processing advantage over local features, it is sometimes the other way around and global features of the stimuli are not always processed *first* or *faster*; rather, both global and local features are processed parallely, but contextual or affective factors can play a role in the *relative ease* with which each type of features is encoded and retrieved. And this is exactly the point we wish to make: We argue that what aspects of primed social information come into the spotlight may be dependent on mood, such that positive moods make it more likely for one to see "the forest" and negative moods – to see "the trees"(see Gasper & Clore, 2002). We do not claim, however, that seeing the forest means *not* seeing the trees; we just think the trees are more hazy when one is in a positive mood, and more "in focus" when one is in a negative mood.

Another reason for our preference of the focus logic over the depth-of-processing one is that the latter seems to describe a less reliable relationship between mood and processing. For example, research guided by the affect-as-information approach (see Schwarz & Clore, 1996) has provided evidence that instead of limiting cognitive resources, positive mood may actually act as a signal (feedback) that more detailed or analytic processing is not necessary (see also Clore, Gasper, & Garvin, 2001; Fiedler, 2001). Thus, it has been shown that, when motivated or when the task requires it, people in positive moods can process as systematically as those in negative moods. Furthermore, evidence from a myriad of studies supports the contention that moods can exert their effects on

processing and judgment for reasons and in ways other than capacity and depth of processing. For example, current goals, task instructions, mood repair motivations, and the nature of the task at hand have all been shown to moderate or override mood effects on depth-of-processing (see Bless & Fiedler, 2006; Martin & Davies, 1998; Schwarz & Clore, 1996).

One specific alternative account of our results that deserves further attention may be derived from the idea that people in a negative mood may exert more effort than those in a positive mood. In line with this account, sad participants may have allocated this extra effort to drawing dispositional inferences on the basis of the priming stimuli, thus generating exemplars, which in turn leads to contrast effects in target evaluation. There are several reasons why such an explanation fits our findings less elegantly. First, there is no reason to believe that people in a negative mood exert more effort as a rule (as already discussed above). Then, reading simple trait-implying sentences is not a particularly taxing task (and perceiving faces subliminally obviously does not rely on effort). Further, dispositional inferences do not necessarily require more effort either: Evidence from research on correspondent inferences shows that drawing dispositional (or situational) inferences can be just as effortless as the first stage of behavior categorization (Krull & Dill, 1996).

Moreover, the idea that negative mood (as compared to positive mood) participants exerted more effort and thus were able to draw a dispositional inference which would then drive the comparison process and result in a contrast effect is not easily reconciled with some previous findings in the field (see Forgas, 1998). Forgas has demonstrated that people in a negative mood exert more effort, and thus process information more carefully, so they can correct for their (premature) dispositional inferences and take into account situational constraints. In other words, an effort account may (apparently) also predict that people in a negative mood should take the extra step and correct for their dispositional inferences. Thus, effort does not necessarily predict contrast effects for negative moods, and yet, contrast effects is what we found.

Most important, it is now well-established that the spontaneous activation of an actor-trait link is enough to elicit contrast and that this does not require any more effort than assimilation. So, although this is a popular idea, it is empirically unsubstantiated. Experimental evidence supporting the Interpretation Comparison Model is abundant and there are a large number of subliminal priming studies employing unobtrusive, implicit

measures that attest to the idea that *both* assimilation and contrast can occur without effort and rather automatically (see Stapel, 2007). The present research provided further support for this notion by showing that both assimilation and contrast may be observed when participants are exposed to face primes subliminally (Study 2.2). Thus, the contrast effects we observed for participants in a negative mood are difficult to explain drawing on the increased effort logic: Since our participants were unaware of the primes, it is highly unlikely that they exerted more effort in encoding the information, and even less likely that they allocated this effort to drawing dispositional inferences. A correction-based explanation was also refuted on these grounds: It is difficult to correct for things one is not aware of (see Glaser, 2007). In light of all the arguments above, we are confident that a depth-of-processing or effort account cannot offer a compelling and parsimonious explanation of all our findings.

Thus, although the present studies were not designed to explicitly test a depth-of-processing explanation *against* a levels-of-focus explanation, we interpret the current results in terms of the latter perspective. First, we find the local/global distinction a more appropriate, elegant, and notably, more parsimonious account of moods' impact on priming effects. In addition, our findings are conceptually in line with Gasper and Clore's (2002; see also Gasper, 2004) results on the effects of mood on perceptual processing. These researchers provided clear evidence that depth of processing cannot account for their findings. Similarly, Beukeboom and Semin (2006) recently extended Gasper and Clore's level-of-focus hypothesis (and related affect-as-information approaches) to the effects of mood on language use. In several studies, they demonstrated that linguistic expression varies as a function of the focus elicited by one's current mood. Happy participants consistently described social events in more global and abstract terms (e.g., using more adjectives and fewer verbs) than sad participants. It is important to note that these effects, like Gasper and Clore's, could not be accounted for by differences in depth of processing. Beukeboom and Semin included a word count and a writing time measure, which would have tapped processing differences, but such were not found between positive and negative mood conditions. This fact provides additional support for a level-of-focus explanation of these findings, as well as for our contention that global/local processing differences need not necessarily correspond to heuristic/systematic processing differences.

Future research may try to put these two explanations to a more direct test and find out how focus level and depth of processing are interrelated in guiding the impact of mood on priming and other effects. In the meantime, what the present results *do* show is that mood affects (a) the information that is primed when people are exposed to target information (which may be in verbal or non-verbal form; supraliminally or subliminally presented); (b) the way such information influences subsequent person judgments (we found both assimilation and contrast and showed that these effects are indeed mood-dependent); and (c) the referents activated by the implied traits (we showed that negative mood is more likely to lead to actor-trait link activation, whereas positive mood is more likely to lead to abstract trait label activation). The present studies clearly demonstrate that the impact of mood on knowledge accessibility effects is quite dramatic and can be rather consequential (i.e., it determines the extent to which you tend to positively or negatively evaluate a person). Moreover, they show that the effects of moods on judgments need not always be mood-congruent. When moods interact with accessible knowledge (as is likely to happen quite often in daily life where people typically have more on their mind than a positive or negative mood), positive, as well as negative, moods may have positive, as well as negative, effects. Moods then seem to determine how accessible knowledge is represented (global or distinct) and used (to categorize and assimilate or to compare and contrast).

In sum, the studies reported here imply that current moods directly influence and guide accessibility effects. It was demonstrated that this influence can be striking in that moods tend to change the way one perceives and evaluates other people, their behavior as well as their personalities. Bearing in mind that over the course of a day, we all interpret and evaluate the behavior of others rather spontaneously and effortlessly, we could safely acknowledge that moods affect all aspects of our lives quite readily and even imperceptibly. One of the most emblematic pop-phenomena of our time, Puff Daddy, has summed this up quite well: *"I just want to put positive energy out there. I'm not saying a curse word is putting out negative energy, but it depends what mood you're in."*

Chapter 3
Rumination and reflection effects on social perception*

* This Chapter is based on Avramova, Y. R., & Stapel, D. A. (2010).

The mind of a "sad" person is in many ways different from that of a "happy" person. An ever growing body of research shows that negative and positive moods have divergent effects on attention, perception, information-processing, judgment, and decision-making (see Forgas, 2006; Isen, 2000; Martin & Clore, 2001 for overviews). Interestingly, whereas *emotion* researchers have explored the effects of same-valence emotions (e.g., anger, fear, and sadness) which differ along other dimensions (such as certainty, control, and responsibility; see e.g., Lerner & Keltner, 2000; 2001, Lerner & Tiedens, 2006; Smith & Ellsworth, 1985; Tiedens & Linton, 2001), most *mood* investigators typically employ a valence-based approach, studying negative versus positive affect. However, not all negative (or positive) moods are created equal.

The way we experience a negative mood, for example, may vary with the way we think about the mood-eliciting events. We sometimes have a strong urge to go back to what happened, and keep on thinking and analyzing the causes and consequences of events, as well as our own reactions to them. In such cases, we may be overwhelmed by feelings of confusion and uncertainty, and by a strong desire to understand the past, our feelings, and ourselves. At other times, we do not fall prey to such broodings; although we are aware of our negative feelings, we see them as clear and distinct, so we can reflect on them, or leave them behind, and move on.

Distinguishing between these two ways of experiencing negative affect is not only intuitively appealing. In the literature, these are identified as different cognitive styles, or modes of thinking, and are usually referred to as *rumination* and *reflection* (Nolen-Hoeksema, 1991; Trapnell & Campbell, 1999). In the present chapter, we investigate how the manner in which one focuses on one's negative feelings has important consequences for perception and judgment. More specifically, inspired by prior research on priming and accessibility effects (e.g., Higgins, 1996; Schwarz & Bless, 1992; Stapel, 2007; Wyer & Srull, 1989), we argue that rumination will activate global and diffuse thoughts and feelings, leading to assimilation, whereas reflection will activate specific and distinct thoughts and feelings, leading to contrast. Thus, we posit that negative mood effects are not as straightforward as is often thought. Negative mood can produce diametrically opposite effects because how it affects subsequent judgment depends not only on *whether* one is sad, but also on *how* one is sad.

Rumination, reflection, and cognitive processing

Research on self-focused attention distinguishes between two general ways in which people may focus on and experience negative moods: rumination and reflection (e.g., McFarland & Buehler, 1998; McFarland, Buehler, von Ruti, Nguyen, & Alvaro, 2007; Nolen-Hoeksema, 1991; Trapnell & Campbell, 1999; see Nolen-Hoeksema et al., 2008, and Watkins, 2008 for recent overviews). A *ruminative focus* is characterized by a sense of confusion; a need to focus on one's thoughts and feelings, which are perceived as unclear and diffuse; and a cyclical mode of rethinking, re-evaluating, and brooding over the causes and consequences of events and one's own reactions to them. In contrast, a *reflective focus* is characterized by a sense that one's feelings are clear and distinct; an awareness of oneself and one's feelings, and no urge to analyze and further ponder on the causes or implications of the negative events. Being a more maladaptive and self-perpetuating form of repetitive thought, chronic rumination has thus been related to depression, while reflection has been shown to be a more constructive and healthy mode of thinking (e.g. Nolen-Hoeksema, 1991; Trapnell & Cambell, 1999; Watkins, 2008).

Interestingly, whether one adopts a ruminative or a reflective focus in a negative mood also affects other aspects of cognitive processing. For example, ruminators have been found to have difficulty switching to novel strategies or inhibiting previously useful strategies when working on cognitive tasks (Whitmer & Banich, 2007). Furthermore, ruminators, as compared to reflectors, have been shown to retrieve more negative than positive information from memory, generate more pessimistic predictions for the future, and fail to inhibit negative information even when it is irrelevant (see Nolen-Hoeksema et al., 2008). Thus, rumination puts a global "lens" on perception that makes one more likely to pick up negative cues and interpret ambiguous information in negative terms.

Consistent with this, rumination has been shown to activate more abstract mental representations than reflection. For instance, Borkovec and colleagues (Borkovec et al., 1998; Stöber & Borkovec, 2002) found that descriptions of problems about which participants worried and kept reanalyzing were rated by independent raters as more abstract (i.e., more diffuse, cross-situational, ambiguous, unclear, and aggregated) and less concrete (i.e., more distinct, situationally specific, unequivocal, clear, and singular) than descriptions of problems about which participants did not worry (see also Cribb, Moulds, & Carter, 2006; McLaughlin et al., 2007; Watkins & Moulds, 2005, 2007). Further evidence for the rumination-abstractness connection comes from work by Watkins and

colleagues (e.g., Moberly & Watkins, 2006; Watkins, 2004; Watkins, 2008; Watkins & Teasdale, 2001), who found that the adoption of a ruminative focus led to more general and categorical autobiographical memory, as well as more global negative self-judgments than a reflective focus, and who showed that ruminators tend to explain single failures in terms of a global personal inadequacy (e.g., "I am worthless") rather than in terms of situation-specific difficulties, which is more typical for reflectors.

In sum, relevant evidence suggests that rumination and reflection elicit different processing styles and corresponding cognitions. Rumination is characterized by more global mental representations, diffuse feelings, and repetitive thought. Reflection is characterized by clear and distinct feelings and more concrete thought. Interestingly, although the effects of these two styles have been widely studied within the domains of cognitive performance, self-perception, and affect regulation, no research so far investigated the consequences of ruminative versus reflective focus for social perception and judgment.

In the present chapter, we hence propose and test a new theoretical framework for the impact of ruminative versus reflective negative moods on perception and judgment. Specifically, we hypothesize that *sad ruminators* will assimilate their judgments to the global negativity of their diffuse feelings, thus reporting *mood-congruent* judgments. On the contrary, *sad reflectors* will be more likely to contrast their judgments away from their clear and distinct negative feelings, thus reporting *mood-incongruent* judgments. These predictions are based on the insights of prior research on accessibility effects showing that the way accessible information is mentally represented (i.e., diffuse and abstract versus distinct and specific) determines how this information is used in subsequent (unrelated) judgments (i.e., diffuse – assimilation; distinct – contrast).

Rumination, reflection, and accessibility effects

Decades of research on accessibility effects have shown that judgments of a target stimulus – be it an inanimate object, another person, or oneself – are easily affected by accessible information (see Stapel, 2007, for an overview). In other words, we never perceive and judge a target in isolation. Rather, we always have something on our mind that serves as a context for the judgment at hand. Importantly, the way contextually primed information is construed is an important determinant of how it is used in evaluating the target (see e.g., Herr, 1986; Mussweiler, 2003; Stapel, 2007). For example, Stapel's (2007) Interpretation Comparison Model of accessibility effects (ICM) posits that

whether assimilation or contrast ensues depends on the degree of abstractness/distinctness of accessible information. According to this model, information that is diffuse and abstract is more likely to be used as an interpretation frame, leading to assimilation of the features of the target to the evaluative implications of the context. For example, priming the abstract trait "sad" is likely to make people perceive an ambiguous target (e.g., Cathy) as sadder, and priming the trait "happy" is likely to make people see the target as happier, as compared to when these constructs are not as accessible. On the other hand, the ICM suggests that specific and distinct information is more likely to be used as a comparison standard in evaluating the target. For instance, priming a specific actor-trait link, such as "sad Susan", will make people see the target (e.g., Cathy) as happier, and priming "happy Susan" will make people see the target as sadder, as compared to when these specific exemplars are not primed. The reasoning is that a prime that is specific and distinct is represented as a separate entity with clear object boundaries, which can thus only be used as an anchor in evaluating the target (see Stapel, 2007, for a detailed discussion of the theory and relevant empirical evidence). Consistent with this logic, the Inclusion-Exclusion Model (IEM, Schwarz & Bless, 1992) suggests that perceivers are more likely to "include" the representation of an ambiguous target in the representation of the prime if the prime is broad and global, whereas they are more likely to "exclude" the target from the prime, if the prime is narrow and specific. As a consequence, this model also predicts that more global primes lead to assimilation, and more specific primes lead to contrast.

It thus seems that the nature of primed information (global and diffuse versus specific and distinct) may be crucial for whether target evaluation is swayed in a prime-congruent or prime-incongruent direction. Interestingly, the manner in which rumination and reflection may affect this process has not yet been investigated. Recent models of accessibility effects provide useful frameworks for exploring this question. The ICM seems to be especially useful because it proposes that one important determinant of whether assimilation or contrast occurs is whether primed information is diffuse-global or distinct-clear and this is precisely what distinguishes rumination from reflection, respectively. Specifically, the ICM implies that ruminators will use their diffuse negative feelings and global negative self-thoughts as an interpretation frame. In contrast, reflectors, whose negative thoughts and feelings are clear and distinct, will use these as a

comparison standard in making judgments. As a consequence, rumination will elicit assimilation, and reflection will elicit contrast.

Recent evidence that the direction of accessibility effects depends on the completeness of the priming episode provides (albeit indirect) empirical support for the ICM-inspired logic that rumination should lead to assimilation, whereas reflection is more likely to result in contrast. That is, Maringer and Stapel (2007) demonstrated that an interrupted emotion priming episode led to assimilation, whereas a complete priming episode let to contrast in target judgment. These researchers argued that when the priming task is interrupted, task-related thoughts are more likely to persevere, thus making the boundaries between the priming episode and the target evaluation episode unclear and diffuse. The mental overlap between the two tasks then causes target information to be incorporated in the representation of the prime. On the other hand, when the priming episode is completed, task-related thoughts are less likely to persevere. As a result, the priming task and the evaluation task are construed as two separate and distinct entities, and primed information is then more likely to serve as a comparison standard in evaluating the target, hence eliciting contrast (see also Martin & Seta, 1983; Martin, 1986; Zeigarnik, 1927).

When applied to the present analysis, these findings suggest that a ruminative processing style, which is characterized by repetitive thought and a continuous analysis of negative events, is likely to "spill over" to unrelated tasks, such as judging another person. As a consequence, thoughts that pertain to the negative event will merge with evaluations of the target stimulus. On the contrary, a reflective processing style may act as a "stop rule" (see Lewin, 1951; Martin, 1986; Maringer & Stapel, 2007) that renders negative self-thoughts as a separate and distinct entity, which could be used as a comparison standard in subsequent target judgment, producing mood-incongruent evaluations.

In sum, a review of relevant research on accessibility effects provides theoretical as well as empirical support for our hypothesis that a ruminative focus will lead to assimilation and a reflective focus will lead to contrast in perception and judgment. Interestingly, McFarland and colleagues (McFarland, et al., 2007) have recently presented a series of *self-perception* studies that are also quite relevant to the present analysis. That is, McFarland and colleagues demonstrated that adopting a reflective, as compared to a ruminative, focus in a negative mood increases self-enhancing cognitions and judgments.

They found that reflectors provided more mood-incongruent, self-enhancing responses on a variety of measures (e.g., social comparison, attributions, relationship evaluations) and subsequently reported more positive mood than ruminators. Importantly, McFarland and colleagues interpreted these findings in terms of mood regulation, namely they argued that reflectors were more likely than ruminators to activate and actively pursue mood-repair goals, and thus strategically exploit self-enhancement opportunities. Furthermore, the motivational framework advanced by these researchers (see also McFarland & Buehler, 1998) poses that a perceived ability and willingness to repair one's negative mood is inherent to reflection and a perceived inability to achieve this goal is inherent to rumination, and that this difference drives subsequent (self-) evaluation responses.

In contrast to McFarland et al. (2007), we propose that the judgmental effects of rumination and reflection are perceptual, rather than motivational. That is, we suggest that by inducing a global processing style (activating more diffuse mental representations, and promoting repetitive thought), a ruminative focus makes mood-congruent evaluations more likely. In the same vein, by inducing a more specific processing style (activating more concrete and distinct representations and promoting a clear view of oneself and one's feelings), a reflective focus makes mood-incongruent evaluations more likely. Critically, we thus contend that a mood-repair goal is not necessary for these effects to occur. In other words, we suggest that even in the absence of potential mood-repair benefits reflection will elicit mood-incongruent responses.

The present work thus puts forward a new theoretical framework for the interactive effects of mood and rumination/reflection focus. Our approach is novel in several important respects. First, we argue that to understand mood effects it is essential to go beyond mood valence and look at how people experience their moods. The way one focuses on a negative event guides the effects of mood on judgment. Second, we suggest that the impact of ruminative versus reflective processing styles is broader than previously suggested: Rumination and reflection should not only affect self-evaluation, but also perceptions of others (and potentially, perceptions of virtually anything). Thus, we claim that the judgmental effects of rumination versus reflection are the result of processing style differences rather than of differences in mood-repair goals.

Overview of the studies

We test our hypotheses regarding the effects of rumination and reflection in four experimental studies. In all these studies, we orthogonally cross a negative or neutral mood (control condition) with a ruminative and a reflective focus. In Study 3.1, we employ a basic visual task to show that ruminating, as compared to reflecting, in a negative mood induces a more global processing style. In Study 3.2, we use a social comparison paradigm to explore the manner in which adopting a ruminative versus a reflective focus affects self-perceptions. In Study 3.3, we test the hypothesis that rumination and reflection not only influence self-judgments but also judgments of an ambiguous target person. Finally, in Study 3.4, we compare the rumination/reflection focus manipulation we use in our studies to the one used by McFarland et al. (2007) to demonstrate that while both manipulations induce specific processing styles, the McFarland et al. manipulation also induces mood-repair goals.

Study 3.1

In our first study, we set out to provide direct evidence for our hypothesis that rumination and reflection induce different perceptual styles. As described above, the literature suggests that ruminators, as compared to reflectors, are more likely to activate global (negative) self-thoughts and to construe negative events in more abstract and general terms (see Watkins, 2008). However, it is unclear if these differences only emerge on a higher-order, conceptual level or if they are paralleled or even caused by similar differences on a more basic, perceptual level. Based on our analysis, we argue for the latter: Adopting a ruminative versus a reflective focus should not only affect one's inner thoughts and feelings, but it will also produce differences in one's perceptions of external stimuli. More specifically, we suggest that ruminating in a negative mood will promote a more global perceptual focus, whereas reflecting will promote a more local, or specific, perceptual focus (see Avramova & Stapel, 2008; Gasper & Clore, 2002).

We tested this hypothesis using a task developed by Kimchi and Palmer (1982) and Gasper and Clore (2002) to measure differences in global-local visual processing. On each trial of this task, participants are asked to indicate which of two geometric figures was more similar to a target figure. Each target figure can be viewed from either a global or a specific, local perspective. Our prediction was that *sad ruminators* will match the figures more on the basis of their global shape, whereas *sad reflectors* will be more likely to match the figures on the basis of their local building elements. We did not predict any

differences between ruminators and reflectors in the neutral mood condition; rather, we expected that only the combination of a negative mood (a negative event) and a specific type of processing (ruminative versus reflective) will affect basic perception (see also McFarland et al., 2007).

Method

Participants and design. Fifty-two students were randomly assigned to the conditions of a 2(Mood: negative, neutral) X 2(Focus: rumination, reflection) between-subjects design.

Procedure. Participants were told that they will participate in several unrelated studies. First, they completed a selective recall task, designed to induce negative or neutral mood, followed by a mood manipulation check. Next, they engaged in a task that induced either a ruminative, or a reflective focus. Then, they completed the perceptual global-local focus task, followed by a second mood manipulation check and a focus manipulation check. On completion of these tasks, participants were carefully debriefed about the purpose of the experiment, following the funneled debriefing procedure advocated by Bargh and Chartrand (2000). None of the participants in this or the subsequent studies indicated suspicion of the actual goals of the study and the hypotheses tested. After debriefing, participants were thanked and dismissed.

Mood manipulation. The mood manipulation task was presented as a study on visual imagery. Participants were asked to recall and describe as vividly as possible an event from their personal life. Those in the *negative mood* condition were asked to visualize and describe a recent event that created strong unpleasant feelings, whereas those in the *neutral mood* (control) condition were asked to describe a recent mundane event that did not create strong positive or negative feelings. Participants were additionally asked to visualize themselves in the situation as though it were happening in the present; to visualize the event in the first person and not as though they were watching themselves; and to clearly imagine how the event made them feel and experience the feelings as though it were happening in the present (see McFarland et al., 2007; Strack, Schwarz, & Gschneidinger, 1985). Following this task, participants answered several short questions, among which the mood manipulation check (i.e., *How negative/positive do you feel right now?,* on a 9-point scale).

Focus manipulation. To induce ruminative and reflective focus, we adapted the manipulation used by McFarland and colleagues (McFarland et al., 2007; McFarland &

Buehler, 1988). Specifically, right after the mood manipulation task, participants were asked to read a list of eight short statements and choose the two that best described their feelings and thoughts at the moment. These two lists differed across focus conditions, such that half of the participants read statements designed to induce a ruminative focus, and the other half read statements designed to induce a reflective focus. Importantly, we modified the lists used by McFarland and colleagues by removing items that were related to mood-repair motivations (e.g., *My feelings can be controlled; I feel like distracting myself from these feelings; I feel like I want to do something to make myself better; It isn't easy to change or improve my mood*), while keeping original items – and adding a couple of new items – that seemed to tap into the other components of a ruminative versus reflective focus (e.g., *I find my feelings clear and easy to label; I find my feelings distinct and unambiguous; I find my feelings diffuse and unclear; I find myself wondering why I feel the way I do*). Notably, these lists were designed in such a way as to manipulate focus without affecting the intensity or general negativity of induced mood.

Global-local focus task. Directly following the focus manipulation task, participants started working on the "visual perception task". Specifically, participants were given the 24-trial perceptual global-specific focus task, modeled after Gasper and Clore (2002) and Kimchi and Palmer (1982). On each trial of this task, they had to indicate which of two geometric comparisons was more similar to a target figure. Each object was either a square, or a triangle (global form) made up of smaller squares or triangles (specific forms). Participants indicated whether a target figure was more similar to a group of objects that matched its global shape or a group of objects that matched its local components.

Dependent measures and manipulation checks. Our main dependent measure was the number of global matches participants made on the global-local focus task. In addition, upon finishing this task participants completed a second mood manipulation check measure (same question; to make sure that mood was not affected by the perceptual task), as well as a focus manipulation check measure. For the latter, participants were given a short description of what rumination and reflection entail, and were asked to rate the degree to which they were ruminating or reflecting on a 9-point bipolar scale (see McFarland et al., 2007).

Results and Discussion

Manipulation checks. A 2(Mood) X 2(Focus) ANOVA on the first mood measure revealed only the predicted main effect of mood, $F(1,48) = 7.44$, $p < .01$, $\eta_p^2 = .13$, other Fs < 1, *ns*. This confirmed that our mood manipulation was successful, namely negative mood participants felt more negative ($M = 4.08$, $SD = 1.23$) than neutral mood participants ($M = 5.05$, $SD = 1.28$), independent of induced focus. An identical pattern emerged from the analysis of the second mood measure: Only the main effect of mood was significant, $F(1,48) = 9.37$, $p < .01$, $\eta_p^2 = .16$, negative mood participants still feeling more negative ($M = 4.07$, $SD = 1.2$) than neutral mood participants ($M = 5.23$, $SD = 1.45$), independent of focus. Finally, a 2(Mood) X 2(Focus) ANOVA on the focus manipulation check measure revealed the predicted main effect of focus, $F(1,48) = 29.88$, $p < .001$, $\eta_p^2 = .38$, other Fs < 1, *ns.* In both mood conditions, participants who were induced with a reflective focus rated their current feelings as more reflective ($M = 4.85$, $SD = 1.62$) than participants induced with a ruminative focus ($M = 2.65$, $SD = 1.16$).

Main analysis. After confirming that our manipulations were successful, we proceeded with the analysis of our main dependent measure. A 2(Mood) X 2(Focus) ANOVA on the number of global matches on the perceptual task revealed a main effect of focus, $F(1,48) = 9.01$, $p < .01$, $\eta_p^2 = .16$, which was qualified by a mood x focus interaction, $F(1,48) = 10.33$, $p < .01$, $\eta_p^2 = .18$, other Fs < 1, *ns*. Examination of the means showed that ruminators made more global matches ($M = 11.33$, $SD = 3.4$) than reflectors ($M = 8.98$, $SD = 2.66$). Importantly, and as predicted, this difference was larger in the negative mood condition ($M = 12.67$ vs. $M = 7.79$, $t(24) = 3.68$, $p < .01$, $d = 1.68$), whereas it was absent in the neutral mood condition ($M = 10.00$ vs. $M = 10.17$, $p > .8$). Additional analyses further demonstrated that the correlation between reported rumination/reflection and the number of global matches was significant, $r = -.65$, $p < .001$, showing that higher levels of rumination were associated with a stronger tendency to match the figures based on their global shapes.

These results support our hypothesis that mood and focus interact to influence basic perception. Specifically, sad ruminators were more likely to process visual stimuli in a global manner, whereas sad reflectors were more likely to process these in a local manner. To our knowledge, this is the first empirical evidence for the notion that the way one focuses on one's negative mood may divergently affect processing of visual stimuli. Thus, not only are our results consistent with previous work showing that rumination

promotes more abstract thought, but they also extend this previous work by demonstrating that the same pattern emerges on a much more basic perceptual level.

Interestingly, mood did not have an *independent* effect on perceptual focus: Negative mood participants did not make more local matches than neutral mood participants, as would be predicted by the level-of-focus hypothesis advanced by Gasper and Clore (2002, see also Clore et al., 2001). That is, although sad reflectors in our study indeed made more local matches than neutral reflectors (replicating Gasper and Clore's finding for negative versus neutral mood), the difference between ruminators in our two mood conditions did not mirror this pattern. This could be explained by the fact that rumination itself seems to promote global processing (as our results show), which could be overriding any differences induced by mood *per se*. It is important to note, however, that since we did not have a "pure mood" condition (where only mood, and no focus, was manipulated, as in the study of Gasper and Clore), making this comparison is less pertinent.

Study 3.2

In study 3.2, we apply our logic to the domain of self-perception. Specifically, we propose that adopting a ruminative focus in a negative mood will produce more mood-congruent, and thus more negative, self-evaluations than adopting a reflective focus. Critically, we predict that perceptual differences will mediate these effects. We tested these hypotheses by manipulating mood and focus, as we did in our first experiment, and then measuring perceptual focus and self-perceptions. We employed a widely used social comparison paradigm, used to tap into the *illusion of superiority* or *better-than-average effect* (e.g., Alicke & Govorun, 2005; Alicke, Klotz, Breitenbecher, Yurak, & Vredenburg, 1995; Suls, Lemos, & Stewart, 2002). In this task, participants are asked to rate themselves in comparison to "the average other student" on a set of personality traits. Previous research has shown that people typically exhibit a self-serving bias when responding to this measure. We predicted that this pattern will be moderated by mood and focus, such that sad ruminators will evaluate themselves more negatively than sad reflectors. In other words, we expected that ruminating in a negative mood will elicit assimilation, whereas reflecting in a negative mood will elicit contrast in self-evaluations, relative to neutral mood.

Method

Participants and design. Sixty students were randomly assigned to the conditions of a 2(Mood: negative, neutral) X 2(Focus: rumination, reflection) between-subjects design.

Procedure. The general structure of the procedure was similar to that of Study 3.1. Participants completed a series of tasks in the following order: mood manipulation task, mood manipulation check, focus manipulation task, global-local focus task, self-evaluation task, second mood manipulation check, and a focus manipulation check. After debriefing, participants were thanked and dismissed.

Mood and focus manipulations. The mood and focus manipulations, as well as the respective manipulation checks, were identical to the ones used in Study 3.1.

Global-local focus task. As in Study 3.1, participants completed 24 trials of the perceptual task, and we measured the number of global matches as an indicator of global versus local processing style.

Self-evaluation. We measured self-evaluation by asking participants to rate themselves "in comparison to the average other student" along four personality traits, namely *intelligent*, *lazy*, *friendly*, and *vain* (Cronbach's α = .88). Participants provided their ratings on 9-point scales, ranging from *much less* (1) to *much more* (9). Averaging these ratings resulted in a mean self-evaluation score, which served as our main dependent measure, with higher ratings indicating more positive self-perceptions.

Results and discussion

Manipulation checks. A 2(Mood) X 2(Focus) ANOVA on the focus manipulation check measure revealed the predicted main effect of focus, $F(1,56) = 4.62$, $p < .05$, $\eta_p^2 = .08$, other Fs < 1, *ns.* In both mood conditions, participants who were induced with a reflective focus rated their current feelings as more reflective ($M = 4.83$, $SD = 1.21$) than participants induced with a ruminative focus ($M = 4.23$, $SD = .90$).

Further, a 2(Mood) X 2(Focus) ANOVA on the first mood measure revealed the predicted main effect of mood, $F(1,56) = 67.87$, $p < .001$, $\eta_p^2 = .55$, other Fs < 1, *ns*. Inspection of the means confirmed that negative mood participants felt more negative ($M = 4.77$, $SD = .97$) than neutral mood participants ($M = 6.6$, $SD = .72$), independent of induced focus. A different pattern emerged from the analysis of the second mood measure: It revealed a main effect of mood, $F(1,56) = 26.88$, $p < .001$, $\eta_p^2 = .32$, and a mood x focus interaction, $F(1,56) = 4.56$, $p < .05$, $\eta_p^2 = .08$. Whereas focus did not affect mood ratings in the control condition ($M = 6.47$ vs. $M = 6.33$), it did have an effect in the negative mood condition.

Specifically, sad ruminators felt more negative (M = 4.87, SD = .74) than sad reflectors (M = 5.67, SD = .72). Furthermore, a 2(Mood) X 2(Focus) X 2(Measure) mixed-ANOVA with mood and focus as between-subject factors and measure (mood measured at time 1 vs. time 2) as a within-subject factor also yielded a marginal mood x focus interaction, $F(1,56) = 3.47$, $p < .07$, $\eta_p^2 = .06$, and a mood x measure interaction, $F(1,56) = 9.22$, $p < .01$, $\eta_p^2 = .14$. Inspection of the means showed that whereas participants in the neutral mood condition reported the same level of mood on both mood measures, negative mood participants significantly improved their mood over the course of the experiment. Moreover, this difference tended to be stronger for reflectors (M = 4.93 vs. M = 5.67) than for ruminators (M = 4.6 vs. M = 4.87).

Self-evaluation. In order to test the hypothesis that mood and focus have interactive effects on self-perceptions, we conducted a 2(Mood) X 2(Focus) ANOVA on the mean self-evaluation scores. This revealed a main effect of focus, $F(1,56) = 6.46$, $p < .05$, $\eta_p^2 = .10$, which was qualified by a mood x focus interaction, $F(1,56) = 7.63$, $p < .01$, $\eta_p^2 = .12$, other Fs < 1, *ns*. As predicted, sad ruminators provided more negative self-evaluations (M = 5.25, SD = 1.6) than sad reflectors (M = 6.85, SD = 1.46), $t(28) = -2.86$, $p < .01$, $d = -1.66$, whereas focus did not affect self-evaluations in the neutral mood condition (M = 6.03 vs. M = 5.97, $p > .7$), which fell in-between. Thus, in a negative mood rumination elicited assimilation, and reflection elicited contrast.

Table 1: Mean (SD) self-ratings as a function of Mood and Focus condition (Study 3.2)

	Mood	
Focus	Negative	Neutral
Rumination	5.25[a]	6.03[b]
	(1.6)	(.54)
Reflection	6.85[c]	5.97[d,b]
	(1.46)	(.69)

Note: Means with different superscripts within the same rows and columns are significantly different at least at the p < .05 level, with the exception of the contrast comparing negative and neutral mood ruminators, which was only marginally significant, p = .072. Higher ratings indicate more positive self-evaluations.

Perceptual focus. Just before the self-evaluation task, participants completed the perceptual task we used in Study 3.1. We expected that, as in our first experiment, rumination will elicit more global processing than reflection. A 2(Mood) X 2(Focus) ANOVA on the number of global matches revealed a main effect of focus, $F(1,56) = 16.02$, $p < .001$, $\eta_p^2 = .22$, which was qualified by a mood x focus interaction, $F(1,56) = 20.27$, $p < .001$, $\eta_p^2 = .27$, other Fs < 1, *ns*. Inspection of the relevant means showed that ruminators made more global matches ($M = 15.12$, $SD = 2.53$) than reflectors ($M = 13.03$, $SD = 2.19$). Importantly, and as predicted, this difference was larger in the negative mood condition ($M = 16.4$ vs. $M = 11.87$, $t(28) = 5.2$, $p < .001$, $d = 1.98$), whereas it was not present in the neutral mood condition ($M = 13.93$ vs. $M = 14.2$, $p > .6$). Thus, in a negative mood adopting a ruminative focus increased global processing, and adopting a reflective focus increased local processing, relative to neutral mood.

Mediation. Next, we explored whether perceptual style (global versus local) mediated the effects focus (rumination versus reflection) on self-evaluation in a negative mood. We tested this mediation sequence by following the procedure advocated by Baron & Kenny (1986). Evidence for the first step was already provided above, namely ruminators rated themselves more negatively than reflectors ($\beta = 1.6$, $t(28) = 4.13$, $p < .001$). Furthermore, focus affected perceptual style, indicated by ruminators' stronger tendency to match visual stimuli based on their global rather than their local shape ($\beta = -4.53$, $t(28) = -5.2$, $p < .001$). Critically, when perceptual style was statistically controlled for (by using it as a covariate in a focus x perceptual style ANCOVA), we found that the independent effect of focus on self-evaluation was no longer significant, $\beta = -.68$, $t(28) = -1.36$, $p > .18$, whereas perceptual style significantly affected self-evaluations, $\beta = -.50$, $t(28) = -6.54$, $p < .001$. A Sobel test further showed that the decrease in the effect of focus on self-ratings was a significant, $Z = 5.19$, $p < .001$, thus confirming our hypothesis that perceptual differences mediate the effects of focus on self-evaluations.

In sum, the results of study 3.2 demonstrate that adopting a ruminative versus a reflective focus in a negative mood has divergent consequences for the way one perceives oneself. Importantly, these differences in self-evaluation were mediated by perceptual differences. Specifically, rumination elicited a more global perceptual style, and reflection elicited a more local, specific perceptual style. As a result, ruminators assimilated their self-ratings to the global and diffuse negativity of their thoughts and

feelings, whereas reflectors contrasted their self-ratings away from their specific and distinct thoughts and feelings.

As strong as these results are, confirming our hypothesis on all counts, they are still in line with a motivational account. That is, although we showed that perceptual differences mediate the effects of focus on judgments, one could argue that reflectors' more positive self-evaluations may *also* reflect the operation of mood-repair goals. The results of our mood manipulation checks indeed show that reflectors felt better than ruminators at time 2 (i.e., after they completed the self-evaluation task), and they also improved their mood (i.e., from time 1 to time 2). Their mood-incongruent responses could thus be taken to indicate that they used this self-enhancement opportunity strategically (see MacFarland et al., 2007).

Although we agree that rating oneself as better than the average other student may elicit positive affect and thus improve one's mood, we believe that mood-repair goals need not drive the effects of reflection (versus rumination) on self-evaluation in the first place. That is, we argue that perceptual differences are driving self-evaluation, confirmed by our mediation data, and the resulting differences in judgment then produce differences in subsequently reported affect. In order to put our perceptual account to a yet more stringent test, in our next study we explore the effects of mood and focus on judgments of another person – in which motivational, self-defensive concerns should play no role.

Study 3.3

In order to test our perceptual account of rumination-reflection effects against the alternative motivational account, in Study 3.3 we investigate how adopting a ruminative versus a reflective focus in a negative mood affects evaluations of an ambiguous target. To this end, we employed the classic "Donald paradigm", which has been widely used in research on accessibility effects (see e.g., Herr, 1986; Higgins, Rholes, & Jones, 1977; Srull & Wyer, 1979; Stapel, Koomen, & Van der Pligt, 1996). In this paradigm, participants are asked to engage in a reading comprehension task and to familiarize themselves with an ambiguously described character named Donald (or in our case, Arnold). Participants are then asked to judge the target along several personality traits. Previous research has shown that priming concepts that could be used to disambiguate the target affects the direction in which the target is evaluated. For example, priming the abstract trait "happy" makes one more likely to perceive the target as happier than when this trait has

not been primed (i.e., assimilation). On the other hand, priming a distinct exemplar, such as "happy Peter" makes perceivers more likely to use this information as a comparison standard and thus contrast their target judgments away from the prime (i.e., contrast; see Stapel, 2007).

We hypothesized that the different processing styles, elicited by rumination and reflection in a negative mood, will guide people's judgments of ambiguous Arnold. Specifically, we predicted that sad ruminators will assimilate, whereas reflectors will contrast, their target trait ratings to the evaluative implications of their mood. Our logic is the same as in Study 3.2, namely that the repetitive mode of thinking and the global perceptual style induced by rumination, as opposed to the more local perceptual style induced by reflection, will lead people to perceive the target more negatively when ruminating than when reflecting. These predictions are further supported by previous research showing that incomplete, diffuse priming episodes lead to assimilation, whereas complete, distinct priming episodes lead to contrast (Maringer & Stapel, 2007).

Critically, such a pattern in other-evaluations would provide strong support for our perceptual account, while rendering an explanation in terms of mood-regulation less likely. That is, even if evaluating *oneself* in a positive light (i.e., self-enhancement) repairs one's mood, judging *another person* more positively is unlikely to have such added value. Thus, if mood-repair goals are driving the effects of reflection on self-perception (as argued by McFarland et al., 2007), this pattern should not emerge when one is evaluating others. Furthermore, if judging another person more positively serves a mood-repair goal, we should find that reflectors indeed feel better than ruminators after evaluating the target. We predict that neither of these will be true: Reflectors will still evaluate the target more positively than ruminators (similar to their mood-incongruent responses observed in Study 3.2), but this will not affect their mood. In other words, we suggest that since perceptual, rather than motivational, differences underlie the effects of focus on (any) judgment, reflectors will "sincerely" and "selflessly" evaluate the target more positively than ruminators, uncorrupted by vested interest.

Method

Participants and design. Forty-nine students were randomly assigned to the conditions of a 2(Mood: negative, neutral) X 2(Focus: rumination, reflection) between-subjects design.

Procedure. The procedure was similar to that of Study 3.2. Participants completed a series of tasks in the following order: mood manipulation task, focus manipulation task, target evaluation task, mood manipulation check, and a focus manipulation check. After debriefing, participants were thanked and dismissed.

Mood and focus manipulations. The mood and focus manipulations, as well as the respective manipulation checks, were identical to the ones used in Studies 3.1 and 3.2.

Target evaluation. Participants were asked to read a short description of a fictional character named Arnold and to try to form an impression of this person. Arnold's behavior was ambiguous on the witty/sarcastic, thrifty/stingy, and cultivated/artificial dimensions (see Stapel & Koomen, 2000, 2005). Participants were then asked to judge Arnold along three 9-point scales, anchored by these trait labels. Averaging target ratings (Cronbach's α = .84) resulted in a mean target evaluation score, which served as our main dependent measure, with higher ratings indicating more positive evaluations.

Results and discussion

Manipulation checks. A 2(Mood) X 2(Focus) ANOVA on the mood measure revealed the predicted main effect of mood, $F(1,45) = 39.63$, $p < .001$, $\eta_p^2 = .47$, other Fs < 1, *ns*. Inspection of the means confirmed that negative mood participants felt more negative (M = 4.52, SD = .90) than neutral mood participants (M = 6.27, SD = 1.00), independent of induced focus. That is, sad reflectors felt as negative (M = 4.45, SD = 1.04) as sad ruminators (M = 4.58, SD = .79, $p > .7$). Further, a 2(Mood) X 2(Focus) ANOVA on the focus manipulation check measure showed a main effect of focus, $F(1,45) = 17.25$, $p < .001$, $\eta_p^2 = .28$, other Fs < 1, *ns.* Participants who were induced with a ruminative focus rated their current feelings as less reflective (M = 3.96, SD = .79) than participants induced with a reflective focus (M = 5.00, SD = .93).

Target evaluation. We conducted a 2(Mood) X 2(Focus) ANOVA on the mean target evaluation scores, which revealed a main effect of focus, $F(1,45) = 15.23$, $p < .001$, $\eta_p^2 = .25$, which was qualified by the predicted mood x focus interaction, $F(1,45) = 13.46$, $p < .01$, $\eta_p^2 = .23$, other Fs < 1, *ns*. As predicted, sad ruminators rated Arnold more negatively (M = 4.28, SD = .65) than sad reflectors (M = 5.94, SD = .92), $t(21) = -5.05$, $p < .001$, $d = -3.2$, whereas focus did not affect target evaluations in the neutral mood condition (M = 5.05 vs. M = 5.10, $p > .8$), which fell in-between. Notably, the same strong pattern emerged for each of the individual trait ratings.

Table 2: Mean (SD) target ratings as a function of Mood and Focus condition (Study 3.3)

	Mood	
Focus	Negative	Neutral
Rumination	4.28[a]	5.05[b]
	(.65)	(.92)
Reflection	5.94[c]	5.10[d,b]
	(.92)	(.52)

Note: Means with different superscripts within the same rows and columns are significantly different at least at the $p < .05$ level. Higher ratings indicate more positive target evaluations.

In sum, Study 3.3 provides further evidence that rumination in a negative mood elicits assimilation, whereas reflection elicits contrast. Notably, these results are not only consistent with those of Study 3.2, but they also extend those findings, as well as previous research, to the domain of other evaluations, demonstrating that the impact of reflection and rumination is broader than previously suggested. Even more important, though, the findings of the current study are inconsistent with a motivational account. Specifically, it is unlikely that mood-repair goals were driving the effects of ruminative versus reflective focus on judgment for two reasons: First, although mood-incongruent (i.e., more positive) target evaluations should not provide mood-repair benefits, reflectors still reported higher evaluations; and second, reflectors did not feel better than ruminators, as indicated by our mood measure. At the same time, these results are fully consistent with our perceptual account, according to which reflection, relative to rumination, induces a more local processing style that leads to contrast (i.e., mood-incongruent judgments).

While we argue that a motivational perspective cannot explain our effects, we do not suggest that mood-repair goals cannot produce similar effects, albeit through a different mechanism. In fact, as already mentioned above, McFarland and colleagues (2007) found that rumination in a negative mood led to more mood-congruent self-evaluations than reflection. In addition, these researchers consistently found that reflectors felt better than ruminators after being given an opportunity to self-enhance. We would like to suggest that this apparent discrepancy between their findings and ours can be easily explained in terms of the different manipulations used. That is, whereas McFarland and colleagues induced different levels of motivation and perceived capacity

to repair one's mood as part of their rumination and reflection manipulations, we excluded items pertaining to mood-regulation from our focus manipulation. Our rationale is that although mood-repair goals may sometimes *also* operate, thus enhancing mood-incongruent judgments, they are not a *necessary* precondition for contrast to occur. Rather, the different perceptual styles, promoted by a ruminative versus a reflective focus, should be sufficient to produce such effects in (self and other) judgment. We test this claim directly in our final study.

Study 3.4

In Study 3.4, we test the effects of the focus manipulation we used in the previous three studies and the focus manipulation used by McFarland and colleagues (McFarland et al., 2007; see also McFarland & Buehler, 1998). Specifically, we hypothesize that although both manipulations tap into the diffuse/clear feelings and repetitive thoughts components distinguishing rumination from reflection, the stimuli used by McFarland et al. to manipulate focus *additionally* induce thoughts and feelings related to one's perceived ability and willingness to repair one's current mood (as is also acknowledged by these researchers). To test this claim directly, our experimental design crossed the negative mood manipulation (which was also used by McFarland et al.) with a ruminative or a reflective focus, induced by either ours or McFarland et al.'s manipulation. In addition, we included a control condition, where neither mood, nor focus was manipulated. We measured global-local perceptual style (as we did in the previous studies) and participants' mood-repair motivations. We predicted that while both focus manipulations will produce the perceptual style differences we observed in Studies 3.1-3, only McFarland's et al.'s focus manipulation will affect participants' responses on the mood-regulation measures.

Method

Participants and design. Seventy-one students were randomly assigned to the conditions of a 5-group design (negative ruminative + our manipulation; negative reflective + our manipulation; negative ruminative + McFarland et al.'s manipulation; negative reflective + McFarland et al.'s manipulation; control).

Procedure. After the mood and focus manipulation tasks, participants completed a mood manipulation check. Next, they worked on the global-local perceptual task, followed by a focus manipulation check. Finally, they completed several mood-regulation measures. After debriefing, participants were thanked and dismissed.

Mood and focus manipulations. The mood manipulation was identical to the one used in the previous three studies and the one used in McFarland et al.'s (2007) research. Depending on condition, participants then received one of the two set of statements designed to induce focus. Participants in the control condition did not undergo a focus manipulation.

Dependent measures. In this study, we had two main dependent measures. First, we measured perceptual style using the global-local task we used in Studies 3.1-3. Second, based on McFarland et al.'s (2007) definition of rumination and reflection and the stimuli they used to measure mood-repair motivations, we designed a measure of *mood-regulation*. Specifically, we asked participants to respond to the following three questions: *Do you think moods can be changed easily?, Do you think that you can change your mood right now?,* and *Do you think you have control over your feelings?* (Cronbach's α = .81). Participants provided their responses on 9-point scales, anchored by *not at all* (1) and *very much* (9).

Results

Manipulation checks. An ANOVA on the mood measure revealed the predicted effect of condition, $F(4,66) = 11.68$, $p < .001$, $\eta_p^2 = .41$. For participants who received *our* focus manipulation, inspection of the relevant means confirmed that both ruminating ($M = 4.86$, $SD = .86$) and reflecting ($M = 5.00$, $SD = 1.08$) participants in the negative mood condition felt more negative than participants in the control condition ($M = 6.64$, $SD = .63$), all *p*s < .001, and that focus did not affect this measure. Similarly, for participants who received *McFarland et al.'s* focus manipulation, inspection of the means showed that both ruminating ($M = 5.50$, $SD = .86$) and reflecting ($M = 4.50$, $SD = 1.08$) participants in the negative mood condition felt more negative than participants in the control condition ($M = 6.64$, $SD = .63$), all *p*s < .01. Unexpectedly, ruminators in these conditions felt better than reflectors, $t(66) = 2.96$, $p < .01$.

Further, an ANOVA on the focus manipulation check measure showed the predicted effect of condition, $F(4,66) = 11.8$, $p < .001$, $\eta_p^2 = .42$. For participants who received *our* focus manipulation, reflectors reported higher levels of reflection ($M = 5.54$, $SD = .88$) than ruminators ($M = 4.21$, $SD = .80$). The same pattern emerged for participants who received *McFarland et al.'s* focus manipulation ($M = 4.14$, $SD = .86$ vs. $M = 5.75$, $SD = .78$, respectively, all *p*s < .001).

Perceptual focus. An ANOVA on the number of global matches yielded an effect of condition, $F(4,66) = 8.46$, $p < .001$, $\eta_p^2 = .34$. Separate contrasts showed that processing style

was similarly affected by the two focus manipulations. Specifically, among participants who received *our* focus manipulation, ruminators made more global matches (M = 16.21, SD = 2.86) than reflectors (M = 12.38, SD = 1.26). Similarly, among participants who received *McFarland et al.'s* focus manipulation, ruminators made more global matches (M = 16.64, SD = 3.52) than reflectors (M = 13.19, SD = 1.91), all ps < .001). Neutral mood participants' scores on the global-local task were in the middle (M = 14.71, SD = 1.54). Thus, both focus manipulations affected perceptual style, such that rumination elicited more global processing, and reflection – more local processing, relative to a base-line.

Table 3: Mean (SD) number of global matches and mood-regulation scores as a function of condition (Study 3.4)

	Condition				
Measures	1	2	3	4	5
Number of global matches	16.21[a] (2.86)	12.38[b] (1.26)	14.71[c,a] (1.54)	16.64[d,a] (3.52)	13.19[e,b] (1.91)
Mood regulation	4.62[a] (.79)	4.85[a] (.52)	4.45[a] (.75)	4.79[a] (.78)	6.21[b] (.86)

Note: Conditions 1 to 5 correspond to negative ruminative + our manipulation; negative reflective + our manipulation; control; negative ruminative + McFarland et al.'s manipulation; negative reflective + McFarland et al.'s manipulation, respectively.
Means with different superscripts within the same rows are significantly different at least at the p < .05 level, with the exception of the contrast comparing conditions 3 and 5, which were only marginally significant, p = .083. Higher number of global matches indicates more global perceptual style. Higher ratings on the mood regulation measure indicate stronger motivation to repair one's mood.

Mood-regulation. An ANOVA on our mood-regulation measure revealed an effect of condition, $F(4,66) = 13.36$, $p < .001$, $\eta_p^2 = .45$. Individual contrasts demonstrated that whereas *McFarland et al.'s* focus manipulation affected participants' mood-repair motivations, *our* focus manipulation did not exert such an effect. Specifically, among participants who received *McFarland et al.'s* manipulation, sad reflectors (M = 6.21, SD = .86) scored higher on this measure than sad ruminators (M = 4.79, SD = .78), $t(28) = -4.72$, $p <$

.001, d = -2.87. In contrast, ruminators and reflectors who received *our* focus manipulation did not differ in the degree to which they adopted mood-repair goals (M = 4.62, SD = .79 vs. M = 4.85, SD = .52, p > .3), nor did they differ from control participants (M = 4.45, SD = 75, ps > .12).

In sum, the results of Study 3.4 support our claim that the operation of mood-repair goals is not inherent to reflection. Instead, the focus manipulation used in previous research seems to induce a belief that one could change one's mood and regain control over one's feelings. When that focus manipulation was employed, the responses of ruminators and reflectors on the mood-regulation measure differed and the pattern was indeed in line with the motivational account. In addition, it seems that reflectors repaired their moods, whereas ruminators did not. We attribute these mood differences to the reflective focus manipulation itself, which explicitly primes a motivation, an intention, and an ability, to change one's mood. In contrast, when our focus manipulation was used, ruminators and reflectors did not differ along the mood-regulation measure and their mood was equally negative. Critically, both focus manipulations produced differences in perceptual styles (rumination – global, reflection – local). Therefore, our perceptual account seems to be a relatively parsimonious way of conceptualizing rumination and reflection and their influence on perception and judgment.

General discussion

The present work shows that the manner in which one focuses on and experiences negative affect has consequences for perception and judgment. In four studies, we demonstrated that adopting a ruminative, as compared to a reflective, focus in a negative mood leads to more global processing and more mood-congruent judgments. Furthermore, we provided evidence that differences in perceptual style (global versus local) are driving the effects of focus on judgment. Importantly, we also showed that mood-repair goals are not essential for reflection to produce contrast, rendering a motivational account of these effects less parsimonious.

We believe that our findings are newsworthy for several reasons. First, they show that *how* one experiences one's mood makes a difference and is thus a better predictor of self- and other-judgments than mood valence alone. The judgmental effects of negative mood critically depend on how one experiences this mood. Second, we propose a novel theoretical framework which conceptualizes the interactive effects of (negative) mood and focus in terms of basic, lower-level processes. Specifically, to our knowledge we are

the first to provide empirical evidence that rumination and reflection lead to basic perceptual differences: Ruminators were more likely to adopt a global perceptual focus, whereas reflectors adopted a more local focus when categorizing simple visual stimuli. Furthermore, we demonstrated that the different perceptual styles that rumination and reflection elicit mediate the effects of focus on judgment.

We predicted – and also interpret – these findings in terms of the Interpretation Comparison Model of accessibility effects (see Stapel, 2007), which posits that global and diffuse information is typically used as an interpretation frame, whereas specific and distinct information is typically used as a comparison standard, in subsequent judgment. In the context of the present research, we argued that ruminating in a negative mood is likely to activate more global, abstract, unclear, and diffuse negative thoughts and feelings, to which evaluations of oneself or other people can be readily assimilated. In contrast, reflecting in a negative mood is more likely to elicit thoughts and feelings that are specific, clear, and distinct, and which could thus serve as an anchor in judgment, thus producing contrast. Importantly, although the ICM seems to best fit out data, our results are also consistent with other accessibility models (e.g., the Inclusion-Exclusion model of Schwarz & Bless, 1992).

Paradoxically, previous work on the influence of *positive* versus *negative* moods on the direction of priming effects has shown that positive mood leads to assimilation and negative mood leads to contrast (Avramova & Stapel, 2008). It has been argued that this pattern is due to the more global focus induced by a positive mood, and the more local focus induced by a negative mood (see also Gasper & Clore, 2002). Our present findings, however, suggest that this is not the whole story: Depending on whether one adopts a ruminative or a reflective focus, negative mood may influence judgment in ways that diverge from the "general" mood effects documented in the literature. That is, a ruminative focus elicits a global processing style, which is usually associated with positive mood, whereas a reflective focus elicits a local processing style typically associated with negative mood. Thus, rather than framing differences between mood states in terms of valence, it may indeed be more useful to look at the type of the particular processing style they elicit and – based on that – predict their influence on cognition.

Related to this, we would like to suggest that our perceptual account of the impact of focus on judgment is a more parsimonious explanation of the divergent effects of these two thinking styles than the alternative motivational account. As we argued, and as our

final study demonstrates, mood-repair goals may accompany, or even enhance, perceptual and other differences that are inadvertently triggered by a reflective focus. In other words, whereas a mood-incongruent judgment may reflect *both* a motivation to repair one's mood and a more global processing style, the latter is a *necessary and sufficient* condition for contrast to occur, whereas a specific mood-regulation intention is a "bonus". Thus, although the past few decades of research have shown that motivation does play a role in social cognition and not everything can be explained in terms of cold cognitive processes (see e.g., Kunda, 1990), our research suggests that – like Miller and Ross (1976) warned – we sometimes seem to be too quick to employ hot motivational explanations and forego simpler albeit colder ones. Importantly, subscribing to a broader definition of rumination and reflection – one that assumes these only differ in terms of clarity, diffuseness, and repetitiveness of thought (rather than in the desire to change one's mood, the intention to use particular strategies, and the belief in the attainability of this goal, as well) – allows for a broader and more creative approach to investigating the impact of processing style in various contexts. Our findings suggest that this impact may be powerful and wide-ranging.

Finally, inspired by the research of Maringer and Stapel (2007) on the role of incomplete versus complete priming (leading to assimilation and contrast, respectively), we would like to suggest that conceptualizing rumination as an "incomplete priming episode", an "open Gestalt", or "unfinished business" (see) may be particularly useful. All these terms seem to beautifully capture the diffuse, cyclical, self-perpetuating nature of ruminative thought. That is, repeatedly going back to reconstruct, reanalyze, and reevaluate the causes and consequences of negative events, trying to understand what has happened and what it all means, may be an obstacle to *closing the Gestalt* and "moving on" (i.e., one cannot "escape" the vicious circle of global negative thoughts that lead to generalizations, which lead to more negative mood, etc.). As a result of being trapped in this "*unfinished business*" that lacks clear boundaries may thus prolong the *priming* effects of negative mood on unrelated perceptions and judgments. In contrast, the perceptual processing style, triggered by a reflective focus, seems to act as a powerful "stop rule": Seeing things (e.g., events, circumstances, one's feelings, oneself, and others) as separate, distinct entities may help one "draw the line", close the Gestalt, and get on to *other business*.

Chapter 4

Mood and context-dependence*

* This Chapter is based on Avramova, Y. R., Stapel, D. A., & Lerouge, D. (2010a).

Looking up a word in a dictionary or a thesaurus is supposed to be informative, but sometimes it is also especially intriguing. Searching for a word as trivial as "context" generates a long list of synonyms: ambiance, aura, backdrop, background, circumstances, climate, conditions, domain, environment, framework, habitat, location, milieu, scene, scenery, set, setting, situation, surroundings... It seems that context is almost everything. On second thought, context is even more fundamental than that: It *qualifies* everything. It is the where, when, how, and how much of an otherwise meaningless, measureless, and generic everything. Less poetically, context is what we refer to when we say that "it (all) depends". One kilo is a lot when compared to one gram, but less when compared to ten kilos. The same remark may be perceived as good-humored if it comes from a friend, and as aggressive if it comes from a stranger. And a job candidate may be evaluated as mediocre, or excellent, depending on the quality of the other candidates in the pool. Decades of research in psychophysics and social psychology have confirmed the intuition that "everything is relative." How one perceives, evaluates, and judges a target stimulus is not only driven by the target itself, but also by the (perceptual or psychological) context in which it is embedded (Biernat, 2005; Brown, 1953; Bruner & Postman, 1948; Eiser, 1990; Coren & Enns, 1993; Herr, 1986). As pervasive and robust as context effects are, however, we will argue and show that their magnitude is dependent on mood: Positive mood increases and negative mood reduces the effects of context on perception.

Context effects on perception

One of the most striking and basic illustrations of the influence of context on target perception is the Ebbinghaus illusion, which shows that perception of the size of a target stimulus is strongly affected by the size of the context stimuli. The same target circle is seen as smaller when surrounded by big circles, and bigger when surrounded by small circles – a perceptual contrast effect. Similarly, lukewarm water is experienced as "hot" following immersion in cold water, and as "cold" after immersion in hot water. The same grey square looks darker against a white background, and lighter against a black background. Furthermore, this phenomenon is just as pervasive in the social domain: As research on accessibility effects has shown, subtly activated contextual information (e.g., the construct "aggressiveness" or the exemplar "Hitler") can influence perception and judgment of an ambiguous target person, leading to assimilation or contrast effects (for

reviews see Eiser, 1990; Parducci, 1995; Stapel, 2007; Wedell, Hinklin, & Smarandescu, 2007).

In sum, there is ample evidence that context matters. But what determines *when* and *how much* it matters? Is the context always affecting target judgments with the same strength? Most probably not. We know, for instance, that constructs that are less accessible, or features of the environment that are less salient, are less likely to impact target judgment. In line with this, research shows that the magnitude of the Ebbinghaus illusion and other perceptual biases is moderated by the degree to which one attends to contextual information. Specifically, when people are instructed to focus exclusively on the target stimulus and ignore the context stimuli, the illusion is substantially reduced (Shulman, 1992).

It thus seems that the degree to which one attends to the context should be a major determinant of how strong its impact is. The construct of *context-dependence* (also known as *field-dependence*) seems to capture this idea most elegantly. It was first introduced by Witkin (1949; Witkin & Goodenough, 1977) to assess the relative propensity to differentiate (focal) perceptual input from its background or context. When perception is more context-dependent, as opposed to context-independent, one tends to process information coming from both the target and the background, treating the perceptual field as a whole that resists analysis or decomposition. As a result, perception of the context influences perception of the target within it. Interestingly, this distinction has proven useful in differentiating between learning styles (i.e., context-dependent vs. independent learners), as well as chronic (social-) cognitive cultural differences. For example, it has been found that whereas Westerners typically focus on salient focal objects (i.e., context-independent), East Asians are more likely to attend to contexts or objects-in-context, both in the non-social and social domains (i.e., context-dependent, see Kitayama et al, 2003; Masuda et al., 2008; Nisbett, 2003).

We argue that the construct of context-dependence can be readily applied beyond the domain of chronic personal traits to describe situationally determined differences in the degree to which one attends to contextual information. In other words, we argue that context-dependence is itself context-dependent: It varies across situations and in response to (external and internal) contextual factors. Such a claim begs the question of what then influences state (as opposed to trait) context-dependence? Our answer is: mood.

Mood and context-dependence

Surprisingly, to date there has been no research that has systematically addressed the intriguing question of how moods may impact the basic, lower-order processes that elicit context effects in target perception and judgment. What makes this gap surprising is the fact that affective influences on cognition have received a great deal of attention over the last years. And indeed, it has proven to be a fruitful area. That moods affect perception, information-processing, evaluation, and judgment in various ways is by now well-documented (see Forgas, 2006; Martin & Clore, 2001, for overviews). And yet, none of the existing mood theories can generate coherent and straightforward predictions regarding the effects of mood on how we perceive and judge a target in context. In this article, we embark to do exactly that by testing mood's influence on the magnitude of context effects.

Our reasoning is as follows: If these effects depend on the degree to which one attends to the context, then factors influencing attention *per se* should be critical. Previous research suggests that mood is one such factor: Negative mood narrows and positive mood broadens attentional scope (e.g., Derryberry & Tucker, 1994; Fredrickson & Branigan, 2005; Rowe, Hirsh, & Anderson, 2007). For instance, it has been shown that happy people typically have a broader visual scope, focus on more global features of stimuli, and boast a more open and generative mindset, whereas sad people typically have a more narrow visual scope, focus on local features of stimuli, and have a more detail-oriented, analytic mindset (Fredrickson & Branigan, 2005; Gasper & Clore, 2002; Isen & Daubman, 1984; Rowe, Hirsh & Anderson, 2007). Furthermore, the notion that moods affect attentional focus is consistent with theorizing on the functional value of mood states suggesting that affect feeds us information about the environment (Schwarz & Clore, 1983; Frijda, 1988): Negative moods supposedly alert us to potentially problematic situations, making us more selective and vigilant to relevant cues, whereas positive moods usually signal a benign and safe environment, thus licensing broader attention.

Building on these findings, we test the novel hypothesis that moods influence the strength of context effects - and thus perception and judgment of the target itself - by affecting one's propensity to attend to contextual information: In a negative mood, one's attention will be mainly focused on the target, whereas in a positive mood one will attend to both the target *and* the context. Therefore, context effects will be larger in a positive

than in a negative mood. Importantly, we explore how moods influence *the magnitude*, rather than the *direction*, of context effects. That is, we argue that positive mood may sometimes enhance assimilation, and sometimes contrast, depending on the specific task and stimuli. For example, work on accessibility effects has shown that broad and diffuse primes typically lead to assimilation, whereas specific and distinct primes typically serve as a standard of comparison and thus lead to contrast (for a detailed discussion of the factors predicting assimilation versus contrast, see e.g., Stapel, 2007). We thus suggest that mood may exert an assimilative, or a contrastive, effect on judgment. Critically, however, we argue that regardless of its direction, the effect will always be stronger in a positive than in a negative mood. In sum, we test the overarching idea that mood affects context-dependence *per se*.

Overview of the studies

We conducted five experimental studies to investigate the effects of mood on perception and judgment. In all studies, participants have to judge a target (object or person) that is embedded in a certain context. Context and target are operationalized in different ways across the five experiments to increase the robustness and generalizability of our results.

In the first two studies, we use subjective judgments of temperature (Study 4.1) and weight (Study 4.2) to provide a basic demonstration of our mood-context-dependence logic. We predict that, due to differences in attention to target and context, positive mood will increase, and negative mood will reduce, the magnitude of these classic perceptual contrast effects.

In the next two studies, we use performance on two visual tasks - the Ebbinghaus Illusion and the Framed Line Test (FLT) - as indicators of one's propensity to incorporate contextual information when judging a target object. If people in a positive mood are more sensitive to the context than people in a negative mood, as we argue, their judgments will be more biased on the Ebbinghaus illusion task (Study 4.3), but more accurate on the FLT (Study 4.4). Such a divergent pattern in performance will not only provide support for the predicted effect of mood on context-dependence, but it will also refute an alternative account in terms of effort or depth of processing differences (i.e., systematic, careful processing in negative mood, and heuristic, shallow processing in positive mood, see Forgas, 2006; Martin & Clore, 2001, for overviews).

Finally, in Study 4.5 we test our logic in the social domain: We predict that people in a positive, as compared to negative, mood will more often incorporate information from the (social) context when judging a target person's emotional state. Critically, in this study we also employ memory measures in order to provide more direct support for our claim that differences in attention to target and context are driving the observed effects of mood on judgment.

Study 4.1: Water

In our first study, we adapted a paradigm that has been often used to illustrate the power of context. We asked our participants to put each hand in a bucket of water. One of the buckets always contained lukewarm water and the other one contained either cold or (again) lukewarm water. The classic finding is that people who have one hand in cold water perceive the lukewarm water to be warmer than people who have both their hands in lukewarm water. We argue, however, that this effect of context on target perception will be moderated by mood: Negative mood will make people focus on the target, whereas positive mood will boost attention to the (target plus) context. In other words, we predicted that context effects – the *difference* in target ratings across different contexts – will be smallest in negative mood and largest in positive mood.

Method

Participants and design. Seventy-nine students took part in the study and were randomly assigned to one of the conditions of a 3(Mood: positive, negative, neutral) X 2(Context: cold, lukewarm) between-subjects design.

Procedure and dependent measures. Participants first completed the *mood induction* task, which was presented as a study on print media content. They were asked to read a story about a young female artist that was happy, sad, or neutral in tone (for more details, see Avramova & Stapel, 2008; Erber, 1991). Next, participants engaged in the judgment task. They simultaneously kept each hand in a different bucket of water for 7 seconds. The target bucket always contained lukewarm water (26C°). Depending on the context condition, the other bucket was either filled with cold water (4C°), or with water of the same temperature as the target bucket (26C°) . Thus, half of the participants had one hand in cold water and their other hand in lukewarm water (i.e., context and target different), whereas the other half had both their hands in lukewarm water (i.e., context and target identical). With their hands still in the water, they judged the temperature of the lukewarm water (target) on a 9-point scale anchored by *cold* (1) and *hot* (9) by saying a

number out loud. The position of the buckets was counterbalanced across participants, such that half of them judged the target with their right hand, and the other half with their left hand ($F < 1$, *ns*). After the judgment task, participants completed the mood manipulation check (i.e., *"How do you feel right now?"* on a 9-point scale ranging from *negative* (1) to *positive* (9). Finally, they were thanked, debriefed, and dismissed. None of the participants in the current or subsequent studies indicated any suspicion regarding the separate tasks or the hypotheses under investigation.

Results and Discussion

Mood manipulation check. Our mood induction was successful, $F(2,76) = 40.98$, $p < .01$, $\eta_p^2 = .52$. Participants who read the happy story felt more positive ($M = 7.19$, $SD = 1.11$) than participants who read the neutral story ($M = 5.63$, $SD = .97$) and those who read the sad story felt more negative ($M = 4.72$, $SD = .89$) as compared to both other groups (all ps ≤ .01).

Main analysis. A 3(Mood: positive, negative, neutral) x 2(Context: cold, lukewarm) ANOVA on temperature judgments revealed a main effect of context, $F(1,73) = 28.18$, $p < .001$, $\eta_p^2 = .28$, replicating the classic perceptual contrast effect. Participants' judgments of the target (lukewarm) water were significantly higher when the context was cold water ($M = 5.79$, $SD = 1.17$) than when the context was lukewarm water ($M = 4.32$, $SD = 1.37$). Importantly, and in line with our expectation, the analyses also yielded a significant mood x context interaction, $F(2,73) = 3.63$, $p < .05$, $\eta_p^2 = .09$. As predicted, context effects were strongest in the positive mood condition, $F(1,73) = 26.03$, $p < .001$, $\eta_p^2 = .26$, moderate in the neutral mood condition, $F(1,73) = 8.93$, $p < .01$, $\eta_p^2 = .11$, and weakest in the negative mood condition, $F(1,73) = 1.39$, $p = .24$.

A direct comparison of the magnitude of context effects across mood conditions confirmed this further: The effect of context was significantly stronger for positive mood participants ($M = 2.21$) than for negative mood participants ($M = .18$), $F(1,73) = 7.22$, $p < .01$, $\eta_p^2 = .09$. Inspection of the relevant means (see Table 1) verified that the observed pattern is always in the predicted direction: Within the positive mood conditions, participants' judgments of the target (lukewarm water) were much higher when the context was cold water ($M = 6.62$), than when it was also lukewarm water ($M = 4.21$). In contrast, for negative mood participants the context seemed to make little difference ($M = 5.08$ *vs.* $M = 4.50$), so their target judgment was more stable across different contexts. Neutral mood participants' ratings fell in-between.

Table 1: Mean (SD) judgments of target water temperature (1= cold, 9 = hot) as a function of Mood and Context (Study 4.1)

		Mood		
		Positive	Neutral	Negative
Context				
	Cold	6.62[a]	5.69[b]	5.08[c]
		(.77)	(1.18)	(1.04)
	Lukewarm	4.21[d]	4.29[d]	4.50[c,d]
		(1.81)	(1.27)	(.91)

Note: Means with different superscripts within rows and columns are significantly different at least at the p < .05 level, with the exception of the difference between ratings of neutral mood participants across context conditions (p = .06). Higher ratings indicate that the target water was perceived to be warmer.

Finally, our analysis also showed that mood affected temperature judgments only when context and target were different, $F(2, 73) = 5.22$, $p < .01$, $\eta_p^2 = .13$, and not when context and target were identical, $F(2, 73) = .19$, $p = .83$, $\eta_p^2 < .01$ (see Table 1). This pattern thus rules out an alternative judgment polarization account, according to which positive mood simply led to judgments that were closer to the "warmer" end of the scale, perhaps because warmth has a positive connotation.

Taken together, these results nicely support our hypothesis. Negative mood participants were more likely to focus on the target and ignore sensory information they received from the context. In contrast, positive mood participants were more likely to attend to the context, which resulted in stronger contrast in their target judgments. In our next study, we set out to replicate these findings in a different sensory domain.

Study 4.2: Weight

In Study 4.2, we test our mood-context-dependence logic using weight perception. The idea is basically the same as in our water experiment: Participants lift a target weight with one hand, while lifting another weight with their other hand that is either the same as, or heavier than, the target. Once again, we expect that mood will moderate the size of the classic context effect: People in a negative mood will focus more on the target, whereas those in a positive mood will be more inclined to also attend to the context. As a

result, contrast effects in weight judgments (i.e., the difference in target ratings across different contexts) should be smallest in negative mood and largest in positive mood.

Method

Participants and design. Eighty-one students took part in the study and were randomly assigned to one of the conditions of a 3(Mood: positive, negative, neutral) X 2(Context: heavy, light) between-subjects design.

Procedure and dependent measures. The procedure was the same as in Study 4.1, except that participants had to provide weight instead of temperature judgments. Participants first completed the mood induction task and then engaged in the judgment task. Specifically, they were asked to simultaneously lift two non-transparent boxes containing various amounts of weights and hold them for 8 seconds. The target box always weighed 1000 grams. The context box weighed either 2150 grams, or also 1000 grams. Thus, half of the participants lifted a light and a heavy weight (i.e., context and target different), whereas the other half lifted two light weights (i.e., context and target identical). Still holding the weights, participants were asked to judge how heavy the target (light weight) is on a 9-point scale anchored by *light* (1) and *heavy* (9) by saying a number out loud. The hand with which participants lifted the target weight was counterbalanced ($F < 1$, *ns*). Finally, after completing the one-item mood manipulation check (see Study 1), participants were thanked, debriefed, and dismissed.

Results and Discussion

Mood manipulation check. Our mood induction was successful, $F(2,78) = 15.90$, $p < .01$, $\eta_p^2 = .29$. Participants who read the happy story felt more positive ($M = 6.57$, $SD = 1.07$) than participants who read the neutral story ($M = 5.89$, $SD = .75$), and those who read the sad story felt more negative ($M = 5.31$, $SD = .55$) as compared to both other groups (all ps ≤ .05).

Main analysis. A 3(Mood: positive, negative, neutral) x 2(Context: heavy, light) ANOVA on the weight judgments revealed a main effect of context, $F(1,75) = 8.50$, $p < .01$, $\eta_p^2 = .10$, and a main effect of mood, $F(2,75) = 3.18$, $p < .05$, $\eta_p^2 = .08$. Judgments of the target weight were lower when the context weight was heavy ($M = 4.45$, $SD = 1.03$) as opposed to light ($M = 5.09$, $SD = 1.00$), which again illustrates the classic perceptual contrast effect. Most important, the analyses also revealed the predicted mood x context interaction, $F(2,75) = 3.89$, $p < .05$, $\eta_p^2 = .09$. Consistent with our previous findings, context effects were largest in the positive mood condition, $F(1,75) = 12.74$, $p < .01$, $\eta_p^2 = .15$; moderate in the

neutral mood condition, $F(1,75) = 3.85$, $p = .05$, $\eta_p^2 = .04$, and smallest in the negative mood condition, $F<1$, *ns*.

A direct comparison of the magnitude of the contrast effect across mood conditions again confirmed that the context effect was significantly stronger in the positive than in the negative mood condition, $F(1,75) = 7.69$, $p < .01$, $\eta_p^2 = .09$. Inspection of the relevant means (see Table 2) showed that the observed pattern was as predicted: Within the positive mood condition, participants judged the target to be much lighter when the context was heavy ($M = 3.79$), than when it was light ($M = 5.07$). In contrast, for negative mood participants the context did not seem to matter ($M = 5.15$ vs. $M = 5.00$). Neutral mood participants' ratings fell in-between. Finally, in line with our previous findings, mood only affected target judgments when target and context were different, $F(2,75) = 6.94$, $p < .01$, $\eta_p^2 = .16$, but not when they were the same, $F(2,75) = .14$, $p = .87$, $\eta_p^2 < .01$ (see Table 2).

Table 2: *Mean (SD) judgments of target weight (1= light, 9 = heavy) as a function of Mood and Context (Study 4.2)*

		Mood		
		Positive	Neutral	Negative
Context				
	Heavy	3.79[a]	4.46[b]	5.15[c]
		(.80)	(.69)	(1.07)
	Light	5.07[c]	5.19[c]	5.00[c]
		(1.21)	(.98)	(.82)

Note: Means with different superscripts within rows and columns are significantly different at least at the $p < .01$ level, with the exception of the difference between ratings of neutral mood participants across context conditions ($p = .05$). Within the Heavy Context condition, the differences between neutral and positive, and between neutral and negative, mood participants were marginally significant ($p = .09$ and $p = .08$ respectively). Higher ratings indicate that the target weight was perceived to be heavier.

These results are consistent with the findings from our first experiment and further confirm our hypothesis that positive and negative moods differentially affect basic attention to target and context. Specifically, negative mood induced a stronger

target focus, whereas positive mood elicited a target plus context focus, as indicated by the difference in the magnitude of context effects in target judgment.

And yet, although our findings are robust and support our claims on all counts, the question remains whether we are indeed measuring differences in actual perceptual experience, or (only) differences in judgment. That is, one could argue that instead of truly perceiving the target water or weight differently, positive and negative mood participants may be interpreting and using the rating scales and/or their anchors in a different manner (see e.g., Eiser, 1990, for a discussion of context effects in perception and judgment). In our view, although this may be possible, it is certainly not the most parsimonious account of our findings. Specifically, we consistently observed that positive mood led to more polarized target ratings (i.e., stronger contrast) when target and context were different, but not when they were the same – a pattern that cannot be compellingly explained in terms of semantic contrast or response selection. Nevertheless, we embarked to provide more support for our mood-context-dependence logic. To this end, we turned to the visual domain.

Study 4.3: Circles

In Study 4.3, we employ the Ebbinghaus illusion task to test the effects of mood on context-dependence in a different way. In the Ebbinghaus illusion, perceptual differences between target and context stimuli are exaggerated, such that perception of the size of the target is contrasted with perception of the size of the context stimuli. Critically, size *judgments* on this task can be safely taken to indicate corresponding differences in *perception*, due to the high overlap between what is seen and what needs to be judged: Judgments can be directly "read off" from immediate perceptual experiences (Coren & Girgus, 1978; see also Stapel & Koomen, 1997). Moreover, unlike the measures we used in the previous two studies, this task does not entail translating one's perception of the target into a numerical value on a subjective rating scale, nor does it contain any semantic component (e.g., scale anchors such as "cold" and "hot"). This allows us to more directly rule out an alternative semantic contrast account of our effects.

In sum, in Study 4.3 we once again test the hypothesis that positive mood broadens the perceptual field and hence facilitates incorporation of contextual information in target judgment, whereas negative mood narrows the perceptual field and hence elicits a stronger focus on the target. We predict that, as a result of these

attentional differences, positive mood will increase, and negative mood will decrease, bias on the Ebbinghaus illusion task.

Method

Participants and design. Sixty-one students were randomly assigned to one of three mood conditions (positive, negative, neutral).

Procedure. After completing the mood induction task, participants received a booklet titled "Size perception and estimation" that contained the Ebbinghaus illusion stimuli. Upon finishing this task, they filled in the mood manipulation check measure and were then thanked, debriefed, and dismissed.

Materials and dependent measures

Mood induction. In order to induce mood, we employed a selective recall task. Participants were asked to describe an event from their recent past that created strong pleasant/unpleasant feelings. Participants in the neutral mood (control) condition had to recount a recent mundane event that did not create any strong positive or negative feelings. At the end of the experimental session, participants completed the one-item mood manipulation check we used in the previous studies.

Ebbinghaus illusion task. The judgment task was modeled after Coren and Enns's (1993) size estimation task (see also Stapel & Koomen, 1997). Across 10 (2 practice and 8 experimental) trials, participants had to estimate the size of a target stimulus. We used four different target figures, presented in random order: a light circle, a dark circle, a female face, and a male face. Practice trials contained only target stimuli. In the experimental trials, target stimuli (22 mm) were embedded in either smaller (10 mm) or larger (40 mm) context stimuli of identical shape (see also Stapel & Koomen, 1997, p.1181). Participants' task was to estimate the width of each target stimulus by placing a tick mark on a measurement line provided at the bottom of each page. All responses were measured (to the nearest millimeter) by an individual who was blind to the hypothesis under investigation. The magnitude of the bias was obtained by calculating the average difference between participants' size estimations and the actual target sizes.

Results and Discussion

Mood manipulation check. It was first confirmed that our mood induction was successful, $F(2,58) = 10.47$, $p < .01$, $\eta_p^2 = .26$. Participants who recalled positive events felt more positive ($M = 6.70$, $SD = 1.49$) than participants who recalled neutral events ($M = 5.76$,

SD = .89), and those who wrote about negative events felt more negative (*M* = 4.95, *SD* = 1.19) as compared to both other groups (all *p*s < .05).

Main analysis. Since the bias was always in the expected direction (i.e., the target's size was always over-estimated when surrounded by smaller context stimuli, and under-estimated when it was surrounded by bigger stimuli), we averaged the absolute error across all 8 experimental trials to obtain a *mean error score* (in mm), which served as our measure of context-dependence and as the main unit of analysis (see also Stapel & Koomen, 1997). In testing whether size estimations were influenced by mood, we ran an ANOVA on the error scores. The analysis revealed an effect of mood, $F(2,58) = 7.69$, $p < .01$, $\eta_p^2 = .21$. As expected, the error scores of positive mood participants were significantly *higher* (*M* = .93, *SD* = .48), $t(58) = 2.2$, $p < .05$, $d = .63$, and those of negative mood participants marginally *lower* (*M* = .44, *SD* = .31), $t(58) = -1.77$, $p = .08$, $d = -.64$ than those of neutral mood participants (*M* = .66, *SD* = .37).[1] Thus, happy participants were more susceptible, and sad participants were less susceptible, to the Ebbinghaus illusion than neutral mood participants.

We argue that these effects emerged as a result of happy people's stronger tendency to incorporate contextual information in their judgments, as opposed to sad people's stronger focus on the target. However, one may also argue that positive mood elicits more shallow or effortless processing, thus increasing bias, whereas negative mood elicits more careful, analytic processing, thus producing more accurate judgments (see e.g., Bless, Bohner, Schwarz & Strack, 1990; Forgas, 1995; Mackie & Worth, 1989). We believe that an effort/depth of processing account is not as parsimonious in explaining these results as our context-dependence perspective: The most prominent feature of the Ebbinghaus illusion task is that it offers a purely perceptual, effort-independent measure of context-dependence. Moreover, we observed the same pattern in our first two studies, where effort seems to be just as irrelevant. That is, judging how warm the water is, or how heavy the weight is – from 1 to 9 – is a rather simple matter. Nevertheless, we designed another study in order to further refute an alternative effort-based account.

[1] Separate analyses of the absolute scores (estimated target size, in mm) showed the same pattern. That is, the effect of mod was significant both for the small ($F(2,58) = 8.48$, $p < .01$, $\eta_p^2 = .23$) and the large ($F(2,58) = 3.61$, $p < .05$, $\eta_p^2 = .11$) context configurations. Moreover, a 3 (Mood: positive, negative, neutral) x 2 (Context: small, large) mixed-ANOVA confirmed that the effect of context (small vs. large) was not significant, $F(2,58) = 1.28$, $p > .29$, $\eta_p^2 = .04$.

Study 4.4: Lines

So far, we supplied converging evidence from three different sensory domains demonstrating that mood affects context-dependence. Although the first two studies were not designed to measure task performance (e.g., there was no objectively correct response), Study 4.3 showed that people in a positive mood were more biased in their target judgments than their negative mood counterparts. The question is thus raised as to whether context-dependence or processing differences are driving our effects. Put differently, is positive mood always detrimental?

Our theory suggests that positive moods should only lead to more bias when attention to the context distorts target perception. On the contrary, when a greater sensitivity to the context is beneficial, positive mood may, in fact, *improve* target judgments. Thus, we propose that there is a stable relationship between mood and attention to context, but not between mood and judgment accuracy/task performance. In Study 4.4, we test this hypothesis using the Framed Line Test (FLT, Kitayama, Duffy, Kawamura, & Larsen, 2003; see also Stapel & Semin, 2007). Similar to the Ebbinghaus illusion task, the FLT provides a way to measure performance against an objective standard: There is a correct response and systematic deviance away from it can be assessed. On each trial of the "relative" version of the FLT, participants are first shown a square frame, within which is printed a vertical line. Participants are then presented with another frame of larger or smaller size and are asked to draw a line in it while preserving the original line-to-frame proportion. Thus, unlike in our previous studies, where the context was always irrelevant to the judgment at hand, in the FLT attention to the context is essential. Since participants have to incorporate the height information of the surrounding frame (context) in both encoding and reproducing the line (target), contextual perceivers have an advantage over target-focused perceivers. Hence, if positive mood indeed enhances one's propensity to attend to contextual information, happy people should outperform sad people on this task. Importantly, this would show that mood can override the effects of explicit instructions (i.e., keep the line-frame proportion) and alter perception and judgment regardless of context relevance: One just "can't help" seeing more in a positive mood and seeing less in a negative mood.

Method

Participants and design. Forty-three students were randomly assigned to one of three mood conditions (positive, negative, neutral).

Procedure. After the mood induction task, participants completed the FLT. Upon finishing this task and answering the mood manipulation check question, participants were thanked, debriefed, and dismissed.

Materials and dependent measures

Mood induction. The mood induction procedure and the mood manipulation check measure were identical to the ones used in Study 4.3.

The Framed-Line Test. We modeled the size estimation task after Kitayama et al.'s (2003) *relative task* (see also Stapel & Van der Zee, 2006). Across six trials, participants were first shown a square frame containing a vertical line that extended downward from the center of the upper edge of the frame. They were then shown a second square frame that was either larger or smaller than the first frame.[2] Participants were instructed to draw a line whose proportion to the size of the second frame was the same as the proportion of the first line to the size of the first frame (see Kitayama et al., 2003, p. 202-203 for more details).

The lines drawn by each participant were measured and the absolute differences (in mm) between these lines and the correct lengths were calculated. Since the bias was always in the expected direction (i.e., overestimation when the second frame was bigger, and underestimation when the second frame was smaller), we averaged the absolute error across all 8 experimental trials to obtain a *mean error score* (in mm). This score served as our context-dependence measure and as the main unit of analysis (see Duffy, Toriyama, Itakura, & Kitayama, 2009; Kitayama et al., 2003; Stapel & Van der Zee, 2006). A better performance on the FLT (i.e., less error) thus indicates stronger context-dependence.

Results and Discussion

Mood manipulation check. Our mood manipulation proved to be successful, $F(2,40) = 7.04$, $p < .01$, $\eta_p^2 = .26$. Participants who recalled positive events felt more positive ($M = 6.29$, $SD = 1.07$) than participants who recalled neutral events ($M = 5.53$, $SD = 1.13$), and those who recalled negative events felt more negative ($M = 4.75$, $SD = .87$) as compared to both other groups (all $ps \leq .05$).

Main analysis. An ANOVA on the error scores showed an effect of mood, $F(2,40) = 13.56$, $p < .01$, $\eta_p^2 = .40$. As expected, the error scores of happy participants were

[2] The stimulus dimensions for the 6 trials were respectively (line - frame 1 - frame 2): 68-81-162; 22-108-162; 28-101-141; 90-141-102; 73-108-81; 30-162-81.

significantly *lower* (M = 4.29, SD = .83), $t(40) = -2.69$, $p < .01$, $d = -.85$, and those of sad participants significantly *higher* (M = 6.42, SD = .79), $t(40) = 2.86$, $p < .01$, $d = .90$, than those of neutral mood participants (M = 5.29, SD = .79). Thus, positive mood enhanced, and negative mood hindered, performance on the FLT, relative to neutral mood.

This pattern again confirms that positive mood participants were more sensitive to contextual information than both negative and neutral mood participants: Their target judgments (i.e., the length of the lines they drew) reflected greater attention to the context (i.e., the height of the original frame and the relationship between line and frame in both the original and target stimuli). Critically, happy people's superior performance on the FLT (as compared to negative and neutral mood participants') does not fit an effort or depth of processing account. Taken together, Studies 4.3 and 4.4 support our claim that moods systematically and reliably affect attention to target and context, but not accuracy and performance: Positive (and negative) mood can be both detrimental and beneficial, depending on the task. Finally, these results render a semantic account of (some of) our findings even less plausible: Like the Ebbinghaus illusion task, the FLT does not rely on subjective rating scales with semantic anchors. It is thus highly unlikely that participants' performance was influenced by a (secondary) subjective interpretation of their immediate perceptual experience.

In the four experiments reported above, we employed various measures to explore the influence of mood on perception and judgment of physical magnitude (i.e., size, temperature, and weight). We believe, however, that these effects should not only hold for inanimate objects: Moods should similarly affect social perception. In order to test this claim, we turned to the area of emotion perception.

Study 4.5: People

Although people are impressively accurate in recognizing others' emotions through reading facial expressions (for overviews see Ekman, 1999; Fridlund, 1994), there is growing evidence for contextual influences on emotion perception (see Fernandez - Dols & Carroll, 1997). For example, Carroll and Russell (1996) demonstrated that participants presented with emotional faces *and* (verbally presented) incongruent situational information were more likely to choose an emotional label that was in line with the context than one that was in line with the facial expressions in isolation. Similarly, Righart and de Gelder (2008) found that recognition of facial expressions was quicker when they were accompanied by (visually presented) congruent versus

incongruent emotional scenes (see also Aviezer et al., 2008; Barrett, Lindquist & Gendron, 2007; Russell, 1991; Tanaka-Matsumi, Attivissimo, Nelson, & D'urso, 1995 for related findings). Finally, Masuda and his colleagues (Masuda, Ellsworth, Mesquita, Leu, Tanida, & Van de Veerdonk, 2008) demonstrated that differences in attention to the context, associated with Eastern versus Western cultures, elicit differences in emotion perception: East Asians, who are more context-dependent, are more likely to attend to the social context when perceiving and judging a target's emotion, compared to their North American counterparts, who are more context-independent, and thus mainly focus on the target's face.

In sum, relevant evidence suggests that – if attended to – contextual information can have a strong impact on emotion perception. Based on our mood-context-dependence logic, we thus hypothesize that people in a positive mood will be more inclined to take the context into account when judging a target person's emotion than those in a negative mood, who will mostly rely on the target's facial expression. We tested this idea by adapting a paradigm developed by Masuda and colleagues (Masuda et al., 2008). In this paradigm, participants are presented with a picture of a target person surrounded by four other people who express an emotion that is the same as, or different from, the emotion expressed by the target. Participants are then asked to rate the target person's emotion. The relative impact of the context is measured by comparing target judgments across congruent and incongruent contexts. In the current study, we induced positive or negative mood and then asked participants to judge the target's emotion.

Similar to Masuda et al. (2008), we expected participants who are more sensitive to contextual information to assimilate their perception of the target person's emotion to the emotions of the background figures. This prediction is also in line with previous research by, for example, Dijksterhuis and colleagues (Dijksterhuis, Spears, & Lepinasse, 2001; see also Stapel, 2007): In their Experiment 1, participants primed with five elderly individuals showed behavioural assimilation, whereas people primed with one elderly person showed behavioural contrast. In explaining these findings, the authors argued that priming multiple exemplars activates an abstract stimulus representation, whereas priming a single exemplar activates a distinct representation. This account is consistent with the Interpretation Comparison Model of knowledge accessibility effects (Stapel, 2007), which posits that prime distinctness is an important determinant of the direction of priming effects: When a broad or diffuse concept (e.g., an abstract trait) is activated, it

is typically used as an interpretation frame in target judgment, thus eliciting assimilation. When a distinct exemplar (i.e., an actor-trait link) is activated, it typically serves as a comparison standard, thus eliciting contrast (see also Schwarz & Bless's, 1992, Inclusion–Exclusion Model for a similar line of reasoning).

Taken together, the empirical evidence and the theorizing outlined above suggest that the context in our study (the emotional expression of the background characters) is more likely to activate one broad construct (i.e., "happy", "sad") rather than one distinct representation (i.e., a happy-person). As a result, the activated construct will affect the interpretation of the target's emotional expression (i.e., what is this person feeling?), producing assimilation effects. Critically, we predict that mood will affect the *magnitude* of context effects, such that the tendency to incorporate contextual information in target judgment will be stronger for positive, as compared to negative, mood participants.

In addition to the emotion judgments, we also collected memory data. That is, after rating the emotion of the target, participants were prompted about several features of the cartoon. If positive, as compared to negative, mood enhances attention to the context, as we argue, happy people should be better at remembering context-related features. Memory for target-related features, however, should not vary with mood. That is, both positive and negative mood people will attend to the target, but those in a positive mood will *also* attend to the context. Besides providing support for our hypothesis, such a pattern will also provide further evidence against a depth-of-processing account of our mood effects.

We tested these hypotheses in the context of two different emotions. Specifically, in Study 4.5a participants rated a happy target and in Study 4.5b participants rated a sad target. We expected that context effects in emotion perception will be larger in a positive than in a negative mood, independent of the specific emotion that is to be judged. Thus, people in a negative mood should judge the target to be equally happy (sad) across different contexts, whereas people in a positive mood should judge a happy (sad) target to be more sad (happy) when surrounded by sad (happy) than by happy (sad) figures. In addition, we tested the hypothesis that our memory measure, as a proxy for attention, mediates the effects of mood on emotion judgments.

Study 4.5a: Happy target

Method

Participants and design. Sixty participants were randomly distributed over the conditions of a 2(Mood: positive, negative) x 2(Background figures emotion: happy, sad) between-subjects design.

Procedure. After the mood induction task, participants started working on the emotion perception task, followed by the memory task. Finally, they were thanked for their participation, debriefed, and dismissed.

Materials and dependent measures

Mood induction. As in Studies 4.1 and 4.2, participants first read a (happy or sad) story and then completed the same filler questions and mood manipulation check ("*How do you feel right now*?", ranging from *negative* (1) to *positive* (9)).

Emotion perception task. The emotion perception task was presented as a pilot study of cartoon stimuli that were to be later used in studying children. Each participant viewed one full-colour A4 size cartoon. Each cartoon depicted five (Caucasian) characters: one boy in the middle (target), surrounded by four background figures (two boys & two girls; context). Depending on context condition, these figures were either congruent (happy) or incongruent (sad) with the target (see Masuda et al., 2008, p. 369, for an example of the cartoon stimuli). To measure context-dependence in emotion perception, we asked participants to rate the target along a 9-point scale (i.e., *How happy is the central person?*, ranging from *not at all* to *very*).

Memory task. After rating the target's emotion, the cartoon was removed and participants answered several factual questions about it. Two questions pertained to features of the target (e.g., *What color were the eyes of the central person?*) and four questions to features of the context (e.g., *How many girls surrounded the central person?*, *What color were the eyes of the rightmost person*?; see also Masuda, et al., 2008). Participants responded by filling in a word or number or by checking the option "I don't know". This latter option was provided in order to minimize guessing. Since choosing the "I don't know" option was, for the present purposes, equivalent to giving an incorrect answer, we later recoded these responses as *incorrect*. Target and context memory scores were calculated for each participant by adding the number of correct responses on the respective questions. We expected that mood will not affect memory for target-related features (i.e., everybody will look at the target's face, thus also noticing his eye and hair color), but will

affect memory for contextual information, such that positive, as compared to negative, mood participants will have better memory for irrelevant context features (such as the background figures' clothes or eye color).

Results and Discussion

Mood manipulation check. An analysis of the mood measure confirmed that mood was successfully induced: People who read the happy story felt more positive (M = 6.43, SD = 1.19) than people who read the sad story (M = 5.20, SD = 1.32), $t(58) = 3.79$, $p < 001$, d = 1.00.

Emotion perception. The results of a 2(Mood) X 2(Context) ANOVA revealed a main effect of context, $F(1,56) = 8.14$, $p < .01$, $\eta_p^2 = .13$, and the expected mood x context interaction, $F(1,56) = 4.25$, $p < .05$, $\eta_p^2 = .07$. The pattern of the means (see Table 3) confirms our predictions: Whereas negative mood participants judged the target to be equally happy across different contexts (M = 7.00 vs. M = 7.21, $p > .58$), positive mood participants judged the target to be happier when he was surrounded by happy (M = 7.33, SD = .90) than by sad (M = 6.00, SD = 1.25) characters, $t(28) = 3.35$, $p < .01$, d = 1.27. Furthermore, in line with the results of Studies 1 and 2, mood only affected target judgment when target and context were different, $t(29) = -2.31$, $p < .05$, d = - .86, but not when they were the same, $p > .71$.

Table 3: *Mean (SD) judgments of the happy target's emotion as a function of Mood and Context (Study 4.5a)*

		Mood	
		Positive	Negative
Context			
	Happy	7.33[a]	7.21[a]
		(.90)	(.80)
	Sad	6.00[b]	7.00[a]
		(1.25)	(1.16)

Note: Means with different superscripts within rows and columns are significantly different at least at the $p < .01$ level. Higher ratings indicate that the target was perceived to be happier.

Memory. Analyses of the memory scores revealed that, as expected, mood systematically influenced memory for contextual information. Specifically, positive mood

participants answered more questions about the context correctly (M = 3.67, SD = .86) than negative mood participants (M = 3.00, SD = 1.44), $t(58) = 2.16$, $p < .05$, $d = .57$, whereas memory for target-related features did not differ as a function of mood (M = 1.40 vs. M = 1.50, $p > .63$).

We next tested the hypothesis that context memory scores mediate the effects of mood on judgment. More specifically, we predicted moderated mediation: Mood should affect context memory (as a proxy for attention) directly, but the effect of memory on emotion judgment should be moderated by context. To test this, we conducted a mediation analysis as advocated by Baron and Kenny (1986) and Muller, Judd, and Yzerbyt (2005). In the first step of the analysis, we regressed mood, context, and their interaction on emotion judgments. As expected, the focal mood x context interaction was significant, $t(56) = 2.06$, $p < .04$. In the second step, we regressed mood, context, and their interaction on the mediator (context memory scores), which only revealed a main effect of mood, $t(56) = 2.17$, $p < .05$. Finally, in the third step we regressed mood, context, memory, the mood x context interaction, and the memory x context interaction on emotion judgments. Unfortunately, this third step failed to provide evidence for moderated mediation: The memory x context interaction did not predict judgment, $t(54) = .09$, $p > .9$, and the mood x context interaction remained marginally significant, $t(54) = 1.92$, $p = .06$.

Study 4.5b: Sad target

The goal of Study 4.5b was to show that the effects of mood on emotion perception observed in Study 5a are not specific to positive emotions. Thus, in Study 4.5b participants were asked to judge the emotions of a sad target. Again, we predicted that people in a positive mood will be more sensitive to contextual information when judging the target person's emotions.

Method

Participants and design. One hundred and nineteen participants were randomly distributed over the conditions of a 2(Mood: positive, negative) x 2(Background figures emotion: happy, sad) between-subjects design.

Procedure, materials, and dependent measures. The procedure and materials were identical to those of Study 4.5a. The only difference was that participants in the current study were asked to judge the emotion of a *sad* target (again presented in a sad or happy context) on a 9-point scale (i.e., *How sad is the central person?*, ranging from *not at all* to *very*), which served as the main dependent measure.

Results and Discussion

Mood manipulation check. The mood manipulation was successful: People who read the happy story felt more positive (M = 6.67, SD = 1.04) than people who read the sad story (M = 5.15, SD = 1.06), $t(117) = 7.87$, $p < 001$, $d = 1.46$.

Emotion perception. The results of a 2(Mood) X 2(Context) ANOVA revealed a main effect of mood, $F(1,115) = 12.61$, $p < .01$, $\eta_p^2 = .10$, a main effect of context, $F(1,115) = 12.04$, $p < .01$, $\eta_p^2 = .10$, and most importantly, the expected mood x context interaction, $F(1,115) = 11.78$, $p < .01$, $\eta_p^2 = .09$. In order to get more insight into this interaction, we conducted a series of simple effects tests. The pattern of the means (see Table 4) confirmed our predictions: Whereas negative mood participants judged the target to be equally sad across different contexts (M = 7.25 vs. M = 7.26, $p > .98$), positive mood participants judged the target to be more sad when he was surrounded by sad (M = 7.23, SD = 1.28) than by happy (M = 5.8, SD = 1.24) characters, $t(58) = -4.4$, $p < .001$, $d = -1.16$. Again, mood only affected target judgment when target and context were different, $t(56) = -5.24$, $p < .001$, $d = -1.4$, but not when they were the same, $p > .93$.

Table 4: *Mean (SD) judgments of the sad target's emotion as a function of Mood and Context (Study 4.5b)*

	Mood	
	Positive	Negative
Context		
Happy	5.80^a	7.25^b
	(1.24)	(.80)
Sad	7.23^b	7.26^b
	(1.28)	(1.13)

Note: Means with different superscripts within rows and columns are significantly different at least at the p < .001 level. Higher ratings indicate that the target was perceived to be sadder.

Memory. As in Study 4.5a, the analysis of participants' memory scores confirmed that mood affected memory for contextual information. As expected, positive mood participants answered more questions about the context correctly (M = 3.42, SD = 1.08) than negative mood participants (M = 2.93, SD = 1.29), $t(117) = 2.23$, $p < .05$, $d = -.81$, while

memory for target-related features did not differ as a function of mood (M = 1.48 vs. M = 1.69, p > .10).

As in Study 4.5a, we again tested our moderated mediation hypothesis. In the first step of the analysis, we regressed mood, context, and their interaction on emotion judgments. As expected, and consistent with the analyses above, the focal mood x context interaction was significant, $t(115) = -3.43$, $p < .01$. In the second step, we regressed mood, context, and their interaction on the mediator, which again yielded a main effect of mood, $t(113) = 2.22$, $p < .05$. Finally, we regressed mood, context, memory, the mood x context interaction, and the memory x context interaction on emotion judgments. Although the mediating memory x context interaction was significant, $t(113) = -2.02$, $p < .05$, it did not significantly reduce the focal mood x context interaction effect, $t(113) = -3.05$, $p = .06$, Sobel's $Z = 1.43$, $p = .13$.

In sum, the findings of Study 4.5 provide support for our hypothesis that mood moderates one's reliance on contextual information when perceiving and judging others' emotions: People in a positive mood were more strongly affected by the emotion implied by the social context than their negative mood counterparts, such that they perceived a happy (sad) target as less happy (sad), when the target was surrounded by sad (happy) characters. Moreover, the results from our memory measures further support our claim that moods influenced attention to target and context: Apparently, happy, as compared to sad, people were more likely to look "beyond" the target and take notice of various contextual features (see Van Baaren, Fockenberg, Holland, Janssen, & Van Knippenberg, 2006, for related findings). In line with this, Study 4.5b showed that the effect of context memory on judgments depends on the type of context. The mediation analyses, however, failed to confirm the hypothesis that context memory mediates the effects of mood on judgment. One possible explanation for this finding is that our memory measure did not tap into attention *per se* (or attention only). For instance, although participants in a positive mood attended to the context more, they might have been affected by the emotions of the background figures in a more, or less, automatic manner, in both cases producing the observed effects on judgment. Thus, although the memory pattern was as we predicted, it seems that the effect of mood on memory is independent of the effect of mood on judgment (even though both of these seem to result from differences in attention to target and context). Future research may further investigate this hypothesis.

General Discussion

Mood affects context-dependence: Negative mood focuses attention on the target, whereas positive mood promotes broader attention to both the target and the context. As a result, judgment of a target stimulus is more strongly affected by contextual information when one is in a positive than in a negative mood. Five studies employing different mood inductions, experimental tasks, and dependent measures provided converging evidence for these effects across different sensory modalities, both in the non-social and social domains. Specifically, we showed that irrespective of whether one is judging the temperature of water, the weight of a solid object, the size of a circle, the length of a line, or the emotional state of another person, mood determines the magnitude of context effects: Positive mood increases, and negative mood reduces, the impact of context information on perception and judgment. Thus, although everything is relative, it is more so when one is happy.

We believe our work makes several important contributions. First, in the spirit of the New Look tradition (see Bruner & Goodman, 1947; Balcetis & Dunning, 2006; Dunning, 1999; Goldstone, 1995; Niedenthal & Kitayama, 1994; Proffitt, 2006) it demonstrates that mood may impact judgment by affecting basic attentional processes. That your mood can influence the type of music you play on your iPod, or your impression of a stranger, or even the way you feel about your life is interesting, but it is also relatively old news. We showed that moods may alter (lower-level) perception of (objective) physical magnitude, such as perceptions of size, temperature, and weight – object properties that we consider in many of our judgments and decisions on an everyday basis. That you can blame your mood for buying a couch that would not fit your living room, or for lifting a weight that could cause you back pain – that is both interesting and new. And that is not all: We showed that even perception of other people's emotions can be affected by one's own current mood through the same basic mechanism. That is, how sad or happy you think someone is depends on the degree to which you attend to the context, which in turn depends on how you feel yourself.

Notably, we did not only provide evidence for our claim that mood affects perceptual context-dependence, but we also repeatedly tested our logic against different alternative accounts, thus bringing new insight into the mechanisms underlying mood effects on cognition. Specifically, our findings indicate that the link between mood and task performance is not as straightforward as is typically assumed by processing

accounts: Negative mood does *not* always lead to more accurate judgments than positive mood. We showed that positive mood leads to greater bias in tasks that entail ignoring the context (e.g., the Ebbinghaus illusion), but it reduces bias in tasks that require incorporating the context (e.g., the FLT). In addition, the results of Studies 1 and 2 render an alternative processing style explanation for our findings even less plausible: It is hard to imagine that deep, effortful, analytic processing could significantly "improve" simple sensory judgments, such as those of temperature or weight (not least because there was no "correct" response). After all, whether you perceive your coffee as hot or your suitcase as heavy, should not depend on how hard you are trying to make an accurate judgment. Moreover, taking the context into account when perceiving and judging a target does not need to be a conscious or effortful process. In fact, experimental evidence from the social judgment literature is abundant showing that comparison contrast effects can occur rather automatically (e.g., as a result of subliminal priming episodes) and without effort (e.g., on ideomotoric behavioral measures, see Stapel & Suls, 2007). Finally, the results from our emotion perception study provide further support for the attentional mechanism we propose. That is, people in a positive mood were not only more likely to incorporate contextual information in their judgments of the target's emotions, but they also had a better memory for specific context features than those in a negative mood. Taken together, the findings of these five studies provide converging support for our perceptual context-dependence logic, while being incompatible with an explanation in terms of mood-induced depth-of-processing or effort differences.

Third, while certainly building on earlier findings, our work goes beyond past research on the influence of affect on attention. Whereas previous work has explored the effects of mood on attentional scope *per se* (e.g., ease of distraction by peripheral visual stimuli, generation of remote semantic associates; see e.g., Derryberry & Tucker, 1994; Rowe, Hirsh & Anderson, 2007), we went further to investigate how mood affects actual perception and judgment of a target within a (relevant) context. That is, our framework allows one to generate specific and testable predictions regarding the *consequences* of the divergent attentional styles that positive and negative moods elicit. Importantly, these consequences are far from limited to processing speed and accuracy, or performance on complex cognitive tasks; rather, they range from basic perception to evaluation to judgment and (we dare speculate) to decision-making and choice – both in social and non-social contexts. Finally, whereas other researchers (e.g., Rowe et al., 2007;

Fredrickson & Branigan, 2005) only found evidence for the broadening effect of positive affect on attention, we provided strong support for the divergent effects on perception and judgment of both positive and negative mood, relative to neutral mood.

We would further like to note that our work is related to, yet fundamentally different from, previous research on the influence of mood on global vs. local processing (e.g., Avramova & Stapel, 2008; Gasper & Clore, 2002). We believe that despite a certain similarity in the underlying rationale (i.e., positive mood broadens and negative mood narrows attention), the present work presents a novel approach and tackles a different challenge. In the classic global-local paradigm, there are no "target" and "context": there is a target stimulus that can itself be seen at either a global *or* a local level (e.g., see the large triangle, or the small squares that compose it, see Gasper & Clore, 2002; Fredrickson & Branigan, 2005). Rather than an "either/or" relation, capitalizing on different renditions of the same stimulus, the present research focuses on an additive relationship, in which target and context are perceptually, as well as physically, different entities. Thus, one sees "less" (mainly the target) in a negative mood, but "more" (target AND context) in a positive mood. Therefore, we believe that our framework can be more parsimoniously applied to context effects in target judgment, where the global-local perspective seems less relevant. For instance, it is not very clear what the latter perspective would predict regarding the effect of mood on water and weight judgments, since it would not be clear what "global" and "local" is in this case.

We believe that the effects of mood on context dependence may have ample implications beyond the domains we tested them in. For instance, our findings suggest that being happy can make us more susceptible to persuasive communication that relies on the power of context. That is, we would speculate that a sales assistant who is trying to trick us into buying a product by comparing it to a ridiculously overpriced alternative, or a presidential candidate's video clip featuring poignant music and heart-warming scenes will be more successful if we are in a good, than in a bad, mood. However, being happy can certainly be pretty useful, too. Noticing that the weather is pretty nasty today can help you swallow a biting remark from a colleague. Looking at the top and bottom (and left and right) shelves in the supermarket can save you money. And the realization that everything is relative can actually be very, very comforting.

Chapter 5

The influence of mood on attribution*

* This Chapter is based on Avramova, Y. R., Stapel, D. A., & Lerouge, D. (2010b).

You are sitting in a bar and you see a waiter dropping a tray full of drinks. Why? Is the waiter clumsy or... did he trip because the floor was wet? Perception and judgment of other people's behavior depend on what information one attends to: Looking at the waiter, at the wet floor, or at both, will lead to quite different conclusions. But what then determines what we focus on and to what we thus attribute the causes of a particular behavior?

In this chapter, we will argue and show that mood influences the type of attributions one makes. Specifically, we suggest that by altering attentional scope moods affect the way people explain observed behavior. Specifically, in cases where the actor of a behavior captures attention, a sad observer will draw more dispositional attributions than a happy observer. In cases where the situation is of greater interest, however, the opposite effects will ensue: Sad observers will draw more situational attributions than their happy counterparts.

Attribution

One could safely say that social interaction is largely guided by the inferences we make about other people. Whether we infer from someone's behavior that he or she is helpful or opportunistic, tired or lazy, worried or aggressive has a large impact on our decision to initiate contact and further invest in a relationship with that person. Thus, it is no wonder that attribution processes, and the biases they give rise to, are well-studied in social psychology. Notably, research on the tendency to draw correspondent inferences from behavior (the *correspondence bias*, see Gilbert & Malone, 1995; Jones & Harris, 1967) and the tendency to underestimate situational, and overestimate dispositional factors when inferring the causes for other people's actions (the *fundamental attribution error*, see Ross, 1977) has revealed that people typically focus on the person and somehow "forget" about the context.

Although this tendency has been explained in different ways (see e.g., Gilbert, 1998; Krull, 2001; Gawronski, 2004 for overviews), one of the most basic and parsimonious accounts explains attribution biases in terms of *perceptual salience*. As Heider's (1958, p. 54) proverbial statement that "behavior engulfs the field" suggests, an actor's behavior is typically more perceptually salient than the situation in which it unfolds or any external forces that may be constraining or facilitating it. Being unaware of the role of subtle contextual factors, observers tend to explain the actor's behavior in dispositional rather than in situational terms (see e.g., Gilbert & Malone, 1995; Ichheiser, 1949; Ross & Nisbett,

1991; Smith & Miller, 1979). That is, perceivers often stick to the information that captures their attention and strikes their senses most directly, rather than suspending their judgment until they fully inspect some more pallid, though potentially important, features (see Gilbert, 1998).

The perceptual salience perspective on attribution effects thus suggests that dispositional attributions are the default. However, subsequent work has extended these findings, showing that salience can similarly account for the reverse phenomenon. That is, when the situation is especially salient or relevant, or when people are explicitly instructed to form an impression of the situation (rather than the actor), situational attributions are more likely to occur than dispositional ones (see e.g., Ham & Vonk, 2003; Krull, 1993; Rholes & Pryor, 1982; Storms, 1973; Taylor & Fiske, 1975, 1978; Trope, 1986; Trope & Alfieri, 1997). Thus, attentional focus seems to determine the direction of attribution effects: When one focuses on the actor, one is more likely to draw dispositional attributions, and when one focuses on the situation, one is more likely to draw situational attributions. In Ross & Nisbett's (1991, p. 140) words, "what you attend to is what you attribute to." An interesting implication of this "rule" is that factors affecting attention must be consequential for the type of attributions one makes. In this chapter, we argue that mood is one such factor that will determine whether one draws dispositional or situational attributions.

Mood

Previous research has established a reliable relationship between affect and attention, such that negative affect narrows, whereas positive affect broadens, attentional scope (e.g., Derryberry, 1993; Derryberry & Tucker, 1994; Rowe, Hirsh, & Anderson, 2007). For example, Rowe and colleagues showed that positive, as compared to neutral, affective states broaden visual scope, as indicated by increased distraction by peripheral visual stimuli in an Eriksen flanker task. Similarly, using physiological measures, Schmitz and colleagues (Schmitz, De Rosa, & Anderson, 2009) found that affect alters visual cortical responses, such that negative affect decreases and positive affect increases the scope of early perceptual encoding in a visuospatial task. Furthermore, we recently found that mood affects the degree to which one attends to contextual information when perceiving and judging a salient target. Specifically, relative to neutral mood, negative mood reduced and positive mood increased the magnitude of context

effects in target judgment across various sensory modalities, suggesting that happy participants adopted a broader focus (Avramova, Stapel, & Lerouge, 2010a).

Interestingly, findings from the perceptual domain are corroborated by evidence for effects of mood on the conceptual level, namely on internal attention to mental representations. Thus, although perceptual and conceptual scope may vary independently, research suggests that they often co-vary (e.g., Rowe et al., 2007) and that broadening on one level may cause or facilitate broadening on the other level (Derryberry & Tucker, 1994; see Förster et al., 2006, for a detailed discussion). For example, relative to a neutral state, positive mood has been found to facilitate semantic access on a remote associates test, supposedly by expanding the range of activation to less accessible constructs (e.g., Estrad, Isen, & Joung, 1994; Isen, Daubman, & Nowicki, 1987; Rowe et al., 2007). Consistent with this idea, people in a positive mood have been shown to activate more diverse semantic material, come up with more creative uses of an object, use more inclusive categories, and see more alternative cognitive perspectives, as compared to their neutral mood counterparts (see Isen, 2000, for an overview of these findings). Further, Fredrickson and Braningan (2005) demonstrated that some positive emotions, such as joy, broaden thought-action repertoires. In addition, there is some evidence that negative mood has the opposite effect. For example, Gasper and Clore (2002) showed that negative mood induces a local visual focus, which makes people attend to the details, rather than to the global features of a stimulus. In another line of research, Storbeck and Clore (2005) showed that negative, compared to neutral and positive, mood reduced the false memory effect in the Deese-Roediger-McDermott (DRM) paradigm, presumably by enhancing verbatim (item-specific) processing and inhibiting gist (relational) processing. In sum, there is converging evidence that mood systematically affects both perceptual and conceptual attention: Positive mood broadens and negative mood narrows attentional scope.

Mood and attribution: The present research

One well-known account for the effects of mood on basic attention is the affect-as-information approach (Schwarz, 1990; Schwarz & Clore, 1983, 1996). It is rooted in the idea that affect is functional (see e.g., Frijda, 1986; Ruys & Stapel, 2008a, 2008b), since it informs us about the current state of the environment and provides us with valuable feedback on how we ourselves are faring. Within this framework, negative affect is seen to signal a problematic state, whereas positive affect is taken to signal a benign state. In

response to these signals, one is more likely to adopt a narrow focus (which is better suited for identifying and solving problems) in a negative mood, and a broader focus (which is better suited for relaxed and open exploration) in a positive mood. An interesting implication of this view is that people in a negative mood should be more likely to focus on whatever happens to be most salient or seems most important. This is not surprising, given that a narrow focus on irrelevant information would simply be dysfunctional. People in a positive mood, however, can "afford" to attend to less salient or peripheral information that may not be of immediate relevance. Put differently, information that may be left unattended in a negative mood may capture attention – and thus affect perception and judgment – in a positive mood. What does this entail for person perception and, specifically, for attribution?

As already argued above, when people are exposed to behavioral information, they typically focus on the actor rather than on the situation. That is because – unless the situation is especially salient or relevant – human beings are typically more distinct and attention-grabbing than contextual features, such as inanimate objects or "invisible" circumstances (Heider, 1958; Jones, 1990). Thus, we suggest that if negative mood narrows attention – with regard to both one's external environment and internal mental representations – it should make one focus on the actor performing the behavior, since the actor is typically more salient. In contrast, if positive mood broadens attention, both perceptually and cognitively, it should make one attend to otherwise less salient information, such as the physical background in which the behavior unfolds or the role of the (psychological) circumstances in bringing about the observed behavior. The result will thus be more dispositional attributions in a negative mood and more situational (or less dispositional) attributions in a positive mood. We further argue, however, that this pattern will reverse when the situation is of extra salience or relevance. That is, when contextual features are of interest (i.e., when the context captures the focus of attention), the narrow focus of negative mood people will elicit more situational attributions. In contrast, the broader focus of positive mood people will make them also consider the (less salient) actor's dispositions and they will draw more dispositional (less situational) attributions.

In sum, given that attention affects attributions (such that people attribute to whatever is salient) and that mood affects attention (narrow versus broad), we suggest that mood should correspondingly influence attributions. We test these predictions in

four experimental studies. In Study 5.1, we use trait-implying sentences to test the hypothesis that people in a negative mood are more likely to judge an actor in line with an implied trait and to attribute the causes for the actor's behavior to (generic) dispositional factors, as compared to people in a positive mood. In Study 5.2, we set out to replicate these effects with different stimuli, this time studying the influence of mood on participants' choice of concrete actor-related versus context-related explanations of the described behavior. In Study 5.3, we employ separate actor and context ratings, which allow us to rule out an extremity account of our findings (i.e., negative mood leads to more extreme, and positive mood leads to more moderate, judgments across the board). In our final Study 5.4, we test the hypothesis that the effect of mood on attribution (Studies 5.1-3) reverses when the situation is made more salient, such that people in a negative mood will make more situational attributions than people in a positive mood.

Study 5.1

In our first study, we tested the hypothesis that mood guides attribution judgments by presenting participants with trait-implying behavioral descriptions. We predicted that, as a consequence of their narrowed attention, people in a negative mood will tend to focus on the actor and thus perceive him or her in stronger trait terms. As a result, they will make stronger dispositional attributions. In contrast, positive mood people's actor+context focus should elicit less extreme actor trait ratings and more situational (less dispositional) attributions.

Method

Participants and design. Fifty-two students took part in the study in exchange for partial academic credit. They were randomly assigned to the conditions of a 2 (Mood: positive, negative) X 2 (Trait: positive, negative) between-subjects design.

Procedure. Participants received a booklet containing a series of ostensibly unrelated tasks. They first read the story serving as our mood induction and were then presented with the trait-implying sentences and the rating scales. After completing the rating task and the mood manipulation check, they were thanked for their participation, debriefed, and dismissed. In this and the next studies, a funneled debriefing procedure (modeled after Bargh & Chartrand, 2000) confirmed that none of the participants were aware of the relation between the different tasks or the actual goals of the studies.

Materials

Mood induction. To induce mood, we asked participants to read a story about a young female artist that was happy or sad in tone (see Avramova & Stapel, 2008; Erber, 1991). The task was presented as a study on print media content and the story was followed by several filler questions (e.g., *In which newspaper or magazine do you think this story might have been published?*).

Trait-implying sentences. After the mood induction, each participant was shown two trait-implying sentences that that were pretested to imply specific personality traits (see Moskowitz & Roman, 1992; Stapel, Koomen, & Van der Pligt, 1996). These sentences differed across trait condition such that half of the participants read two sentences implying positive traits: "Peter paddled even harder as he fell further behind in the race" (*persistent*); "John knew he could handle most problems that would come up" (*confident*), while the other half read two sentences implying negative traits: "Peter refused to listen to them even though all the evidence was in their favor" (*stubborn*); "John knew he was the best and didn't hesitate to tell people about it" (*conceited*). Order of sentence presentation was counterbalanced across conditions.

Dependent measures. Each trait-implying sentence was followed by two 7-point rating scales: a *trait* rating scale (i.e., "How [implied trait] do you think the actor is?") ranging from 1 (*not at all*) to 7 (*very*); and a *situation/personality attribution* scale (e.g., "Do you think the actor's behavior was influenced mostly by the situation or mostly by his personality?"), where a rating of 1 indicates a situational attribution (*mostly influenced by the situation*) and a rating of 7 – a dispositional attribution (*mostly influenced by personality*).[1]

Mood manipulation check. After the rating task, participants answered the question "How do you feel right now?" on a 9-point scale ranging from *negative* (1) to *positive* (9) (Stapel, Koomen, & Ruys, 2002).

[1] Note that the trait rating scales differed across all trait conditions. For example, participants in the positive trait condition were shown the sentence "Peter peddled even harder as he fell further behind in the race" followed by the question "How *persistent* do you think Peter is?", whereas participants in the negative trait condition read the sentence "Peter refused to listen to them even though all the evidence was in their favor" which was followed by the question "How *stubborn* do you think Peter is?". These semantic differences were deemed inconsequential, since participants were always asked to rate the actor along the trait dimension implied by the stimulus sentence.

Results and Discussion

Mood manipulation check. We first confirmed that our mood induction was successful, $F(1,50) = 29.02$, $p < .001$, $\eta_p^2 = .37$. Participants who read the positive mood story reported to feel more positive ($M = 6.88$, $SD = 1.07$) than participants who read the negative mood story ($M = 5.23$, $SD = 1.14$).

Trait ratings. We calculated an average trait score from participants' trait ratings of the two actors and treated it as the main unit of analysis. It is important to note, however, that for all separate sentences the general pattern of results was identical and similarly strong. As expected, a 2(Mood) X 2(Trait) ANOVA revealed a main effect of mood on actor trait ratings, $F(1,48) = 60.71$, $p < .001$, $\eta_p^2 = .56$, all other $F<1$, *ns*. Since there was no effect of trait valence, we collapsed across this factor and compared the trait rating scores across mood conditions. As can be seen in Table 1, actors were rated higher (that is, in stronger trait terms) by participants in a negative mood ($M = 5.53$, $SD = .57$) as compared to participants in a positive mood ($M = 4.53$, $SD = .58$).

Table 1: Mean (SD) actor trait ratings (i.e., from 1 = not at all [trait], to 9 = very [trait]) and attribution ratings (i.e., from 1 = mostly influenced by the situation, to 9 = mostly influenced by his personality) as a function of Mood (Study 5.1)

	Mood	
Judgment measure	Positive	Negative
Trait	4.53 (.58)	5.53 (.57)
Attribution	4.08 (.52)	5.29 (.59)

Note: Means within the same row are significantly different at p <.001. Higher ratings indicate more dispositional attributions and lower ratings indicate more situational attributions.

Attribution ratings. We also predicted that mood will systematically affect participants' attribution patterns. To keep the presentation of results simple, we again report our analyses on the composite scores (averaged across the two actors), noting that for all separate sentences, independent tests showed the same pattern of results.

A 2(Mood) X 2(Trait) ANOVA revealed the predicted main effect of mood on attribution: $F(1, 48) = 59.99$, $p < .001$, $\eta_p^2 = .56$, all other $F<1$, *ns*. A comparison of the mean scores after collapsing across Trait (see Table 1) shows that negative mood respondents indeed rated the actor's behavior as more dispositionally determined ($M = 5.29$, $SD = .59$) than positive mood participants ($M = 4.08$, $SD = .52$).

These results support our hypothesis: Negative mood participants were consistently more likely to ascribe the actor's behavior to dispositional factors than their positive mood counterparts. Moreover, this pattern was independent of the valence of the trait that was implied by the sentence. That is, sad participants rated actors performing negative behaviors (e.g., implying stubborn) more negatively, and actors performing positive behaviors (e.g., implying persistent) more positively, as compared to happy participants. Such a pattern is especially interesting, because it refutes a possible alternative explanation of our results in terms of mood-congruence: If the tendency to perceive stimuli more positively in a positive mood and more negatively in a negative mood was driving our effects, it would have affected actor ratings as a function of trait valence. This was not the case.

As nice as these results are, confirming our predictions on all counts, one could argue that the sentences we used as stimuli in this study imply traits too strongly, thus obscuring the role of potential situational factors (see Uleman, Newman, & Moskowitz, 1996). Thus, although positive, as compared to negative, mood participants were more likely to attribute the behavior to the "situation" rather than to the "actor's personality", as we had predicted, it is not entirely clear what situational factors they were considering. In addition, we did not have a control group against which to test the independent effects of positive and negative mood. We set to address these concerns in our next study.

Study 5.2

Study 5.1 provided initial support for our idea that positive and negative moods have divergent effects on person perception and attribution. In the current study, we aimed to replicate and extend these results. To this end, we presented participants with behavior descriptions that did not imply traits as strongly (as the trait-implying stimuli in Study 5.1), and thus left more "space" for inferences about the context to be activated. Furthermore, instead of answering an abstract question about whether "the situation" or "the actor's personality" was mainly responsible for the event, participants had to choose

between two *concrete* causes of the described behavior. One of these causes always pertained to the actor, whereas the other always pertained to the context. Finally, we included a control condition to test the independent effects of positive and negative mood relative to a baseline.

We again predicted that participants in a negative mood will favor dispositional explanations. That is, although the stimulus sentences did not imply traits very strongly, they still described the behavior of a concrete person X (e.g., Rob), making the actor relatively salient. Thus, we expected that those in a negative mood, having a more narrow focus, will attend to the actor. In contrast, those in a positive mood should be more likely to adopt a broader, actor+context focus and thus prefer situational (or at least less dispositional) explanations. Finally, since previous research has often explained attribution biases (e.g., the fundamental attribution error) with reduced effort or depth of processing (see e.g., Forgas, 1998; Gilbert, 1998; Trope, 1986), we also included two (self-report) depth-of-processing measures.

Method

Participants and design. Forty-six students were randomly assigned to one of three mood conditions (positive, negative, neutral).

Procedure. The procedure was similar to the one of Study 5.1: The mood induction was followed by the target judgment task, the mood manipulation check, and depth of processing measures (see below).

Materials

Mood induction. In this study, we induced mood by asking participants to describe an event from their recent past that created strong pleasant/unpleasant feelings. Participants in the neutral mood condition described a recent mundane event that did not create any strong feelings.

Target sentences. After the mood induction, participants proceeded to the target judgment task, presented as part of a study on sentence comprehension. They read four short sentences describing various behaviors. These sentences have been previously shown to activate both actor-related and context-related inferences (e.g., "Rob gets an A on the test", "Wim cannot start the machine" [2]; see Ham & Vonk, 2003). Order of sentence presentation was counterbalanced across conditions.

[2] For more information about the stimulus materials used in this and the other studies, one could contact the authors.

Dependent measures. Each target sentence was followed by a question that asked participants to indicate which of two possible causes was more likely to have triggered the behavior or event described. For example, the sentence "Rob got an A on the test" was followed by the question "To what extent did these two factors contribute to the described event?" Participants indicated their preference on a 9-point scale anchored by two relevant causes (e.g., *The test was easy* (1), *Rob is smart* (9)[2]. For two of the sentences, lower ratings indicated dispositional, and for the other two – situational attributions. Participants' scores were later recoded such that lower ratings always indicated situational attributions and higher ratings – dispositional attributions.

Mood manipulation check and depth of processing measures. Following the attribution task, participants rated their current mood on a 9-point scale ranging from *positive* (1) to *negative* (9). Then, they answered the following two questions on 9-point scales: "How easy/difficult did you find this task?" (from *very easy* to *very difficult*); and "How much effort did you put into this task?" (from *very little effort* to *a lot of effort*).

Results and Discussion

Mood manipulation check. An ANOVA on our mood measure showed that the mood induction was successful, $F(2, 43) = 17.76$, $p < .001$, $\eta_p^2 = .45$. Those who recalled positive events felt more positive ($M = 6.73$, $SD = .88$), and those who recalled negative events felt more negative ($M = 4.87$, $SD = .99$), than participants in the control condition ($M = 5.75$, $SD = .68$), all $ps < .01$.

Attribution ratings. Since independent analyses of all individual actor ratings rendered the same strong pattern of results, we collapsed across the four separate target sentences (Cronbach's $\alpha = .71$) and calculated a mean attribution score. An ANOVA confirmed that mood significantly affected this measure, $F(2, 43) = 44.19$, $p < .001$, $\eta_p^2 = .67$. Contrast tests further showed that the differences between mood conditions were in the predicted direction: Negative mood participants were much more likely to attribute the events described in the sentences to stable person characteristics ($M = 5.78$, $SD = .45$) than were neutral mood participants ($M = 5.00$, $SD = .45$), $t(43) = 4.99$, $d = 1.52$, and positive mood participants were much less likely to make dispositional attributions ($M = 4.28$, $SD = .41$) as compared to those in a neutral mood, $t(43) = -4.56$, $d = -1.39$, all p's $< .001$.

Depth of processing measures. We then tested whether mood affected perceived difficulty and effort, as most processing accounts of mood effects would assume.

Inspection of the data showed that this was not the case: Mood did not have an effect on any of these measures ($F(2, 43) = 1.06$, $p > .36$ for difficulty; and $F<1$, *ns*, for effort).

Consistent with our findings from Study 5.1, these results again demonstrate that mood has a strong impact on how people perceive and interpret others' behavior. Specifically, people in a negative mood had a stronger tendency to attribute an actor's behavior to dispositional causes than people in a neutral or positive mood, who favored more situational explanations. Moreover, since we did not find any differences in perceived task difficulty and effort across mood conditions, we believe that our results can be more efficiently accounted for by the different degree of attention to actor and context that positive and negative moods elicit.

As consistent and robust as the results of Studies 5.1 and 5.2 are, one could argue that a response bias in terms of extremity could account for our findings. Specifically, the claim would be that, rather than attending to the context more, happy people may have just been more reluctant to give extreme ratings of the actors, thus sticking more to the middle of the scale when reporting their judgment. We designed a third study to rule out such an explanation.

Study 5.3

In order to demonstrate that happy, as compared to sad, people's greater sensitivity to contextual information drives the effects of mood on attribution, in this study we added some new dependent measures. Specifically, whereas in the previous studies participants were presented with a tradeoff between actor and context explanations for the described behavior or event, in Study 5.3 these were tested separately. For example, after reading the sentence "Rob got an A on the test", participants had to indicate the degree to which both the test and Rob independently contributed to the outcome. This simple modification of the response format allowed us to test the extremity account against our explanation: If people in a positive mood are just more prone to use the middle of the scale, they should provide more moderate ratings on all these questions. The reverse should happen in the negative mood condition: Sad people should be more extreme in rating the role of both the actor and the context. On the other hand, if mood-induced attentional differences drive our effects, as we suggest, people in a positive mood should provide more moderate ratings on the actor question, but more extreme (i.e., higher) ratings on the context question, the opposite being the case for people in a negative mood.

In addition, by employing separate actor and context measures we also address a common concern within the attribution literature (see Krull, 2001), namely that participants are typically only asked to judge the actor but not the situation, the method itself biasing their responses in the direction of dispositional explanations. Moreover, by collecting independent ratings of the actor and the situation, we can study the effects of mood on attribution without necessarily imposing a "hydraulic assumption" on our participants, according to which person factors and situation factors are seen as opposing and mutually exclusive (see Bassili & Racine, 1990; Krull, 2001 for a discussion).

Method

Participants and design. Forty-five students took part in the study. They were randomly assigned to one of three mood conditions (positive, negative, neutral).

Procedure. As in Study 5.2, after the mood induction task participants completed the judgment task, the mood manipulation check, and the depth-of-processing measures.

Materials and dependent variables

Mood induction. The mood induction procedure and stimuli were identical to the ones used in Study 5.1.

Target sentences. As in Study 5.2, participants read several short sentences that described an action performed by, or an event that happened to, a target person. Order of sentence presentation was counterbalanced across conditions. Each target sentence (e.g., *Peter fell asleep in the middle of the movie*) was followed by two questions - one about the actor (e.g., *How tired was Peter?*) and one about the context (e.g., *How boring was the movie?*). Participants provided their actor and context ratings on 9-point scales (ranging from e.g., *not at all tired* to *very tired*; from *not at all boring* to *very boring*).

Mood manipulation check and depth of processing measures. Participants completed the same measures as in Study 5.2.

Results and Discussion

Mood manipulation check. An ANOVA on our manipulation check measure showed that the mood induction was successful, $F(2, 42) = 7.92$, $p < .01$, $\eta_p^2 = .27$. Participants who read the happy story reported to feel more positive ($M = 7.14$, $SD = 1.35$) than participants who read the neutral story ($M = 6.24$, $SD = .97$), and those who read the sad story felt more negative ($M = 5.21$, $SD = 1.53$) as compared to both other groups (all ps $\leq .05$).

Attribution ratings. Since there was no effect of sentence valence (Fs < 1), we collapsed across the five sentences and calculated two mean attribution scores: an *actor-*

score (e.g., "How strong is Eric?", "How tired is Peter?", Cronbach's α = .88) and a *context-score* (e.g., "How heavy is the box?", "How boring is the movie?", Cronbach's α = .87). Still, independent analyses of all individual actor and context ratings rendered the same strong pattern of results as the one we report for the composite scores.[3]

Table 2: Mean (SD) actor and context ratings as a function of Mood (Study 5.3)

	Mood		
Judgment measure	Positive	Negative	Neutral
Actor	4.14[a]	5.60[b]	4.84[c]
	(.47)	(1.09)	(.43)
Context	5.23[a]	3.96[b]	4.64[c]
	(.82)	(.97)	(.28)

Note: Means with different superscripts within the same row are significantly different at least at the p < .05 level. Actor and context ratings were provided on separate 9-point scales. Higher actor ratings indicate more dispositional attributions and higher context ratings indicate more situational attributions.

A mixed 3(Mood: positive, negative, neutral) X 2(Attribution score: actor, context) ANOVA with mood as the between-subject factor and attribution score as the within-subject factor revealed a significant mood by attribution interaction: $F(2,42) = 13.81$, $p < .001$, $\eta_p^2 = .40$ (other *p*s > .15). Thus, actor and context judgments followed a different (in fact, opposite) pattern across mood conditions. We conducted a series of simple effects tests to get more insight into this interaction. Looking at the differences in responses to the same question across mood conditions confirmed our predictions (see Table 2): When asked about the role of the actor (e.g., How smart is Rob?), negative mood participants provided higher ratings ($M = 5.60$, $SD = 1.09$) than positive mood participants ($M = 4.14$, $SD = .47$), $t(42) = -5.44$, $p < .001$. In contrast, when asked about the role of the context (e.g.,

[3] We also included *trade-off* questions as in Studies 1 and 2 (i.e., participants rated the relative importance of actor- and context-related causes for the described behaviors on the same scale). The pattern of the *trade-off scores* (Cronbach's α = .66) replicated our previous findings, namely happy people favoring context explanations ($M = 3.95$, $SD = .50$) and sad people favoring actor explanations ($M = 5.17$, $SD = .87$), $F(2, 42) = 15.2$, $p < .01$, $\eta_p^2 = .42$.

How easy was the test?), positive mood participants provided higher ratings (M = 5.23, SD = .82) than their negative mood counterparts (M = 3.96, SD = .97), $t(42) = 4.62$, $p < .001$. As expected, ratings of participants in the control condition always fell in-between (all ps < .05, see Table 2).

Next, we looked at how actor and context ratings varied within mood conditions. Within the positive mood condition, participants rated the role of the context (M = 5.23, SD = .82) higher than the role of the actor (M = 4.14, SD = .47).[4] Within the negative mood condition, the pattern was reversed: Participants rated the role of the actor (M = 5.60, SD = 1.09) higher than the role of the context (M = 3.96, SD = .97), all p's < .01. Neutral mood participants' ratings were in-between those of positive and negative mood participants and did not differ as a function of the question ($F < 1$), suggesting that actor and context-related causes were indeed equally accessible at the baseline.

Depth-of-processing measures. As in Study 5.2, we asked participants to rate their effort and task difficulty perceptions. Again, mood did not have any effect on these measures (Fs < 1).

In sum, Study 5.3 replicated and extended our previous findings: Negative mood increased dispositional attributions and reduced situational attributions, whereas positive mood increased situational attributions and reduced dispositional attributions. Importantly, happy people were just as likely to make strong (or more extreme) attributions when those referred to the context. Similarly, sad people were not always extreme. In fact, their ratings of the role of the context were lower than the respective ratings of neutral or happy participants. Thus, this pattern refutes an extremity (response bias) account of our results, while it fully supports our attentional account. In our last study, we put our logic to an even stricter test.

Study 5.4

Taken together, the results of the first three studies provide converging evidence for the proposed relationship between mood and attribution. All three studies, however, used stimuli which rendered the actor relatively more salient than the context. That is, participants read about the behavior of a concrete person X (e.g., Eric) and situational factors were of no particular interest. This begs the question of how mood would affect attributions in cases where the context, rather than the actor, captures the observer's

[4] Note that here we compare participants' ratings (within mood condition) across two separate measures – an actor scale and a context scale.

attention. For instance, if a fellow colleague cannot start the new printer that you also need to use, it is likely that the printer, and the fact that it does not work properly, is more relevant than your colleague's technical skills. Put differently, the printer becomes the "target" (because you want to print yourself), and your colleague – the "context" (someone else cannot print). Interestingly, previous research has shown that when people expect to be in the same situation as the actor, they tend to make more situational inferences (Lee & Hallahan, 2001). This is also in line with evidence that explicit instructions to take the perspective of the actor or to form an impression of the situation can produce such reversals, increasing the salience of the context and thus resulting in stronger situational attributions (see e.g., Krull, 1993; Krull & Dill, 1996; Regan & Totten, 1975; Storms, 1973; Taylor & Fiske, 1975, 1978).

Our reasoning regarding the influence of mood on attention suggests that if the context is made more salient, the effects of mood on attribution should reverse: People in a negative mood (i.e., more narrow focus) will attend to the context more than people in a positive mood (i.e., broader focus), who will also take the actor's dispositions into account. In our last study, we tested these predictions using stimuli similar to those of Study 5.3, but this time also directly manipulating the relative salience of the context. We accomplished this by presenting half of our participants ("context salient" condition) with additional information, which always preceded the target sentences describing an actor's behavior. For instance, the sentence "You sit in a cafe and you consider getting a piece of pie with your coffee" preceded the sentence "Another customer ate two big pieces of pie". Participants in the control ("actor salient") condition only read the second sentence. We predicted that the attributions of control participants will follow the pattern we observed in Studies 5.1-3, namely dispositional attributions in a negative mood and situational attributions in a positive mood. In contrast, attributions of participants who were exposed to the context-related information should follow the opposite pattern. Critically, demonstrating such a reversal within the same experiment will not only help us paint a fuller picture of the influence of mood on attribution, but it will also provide direct support for our attentional account of these effects.

Method

Participants and design. Seventy-seven students took part in the study. They were randomly assigned to the conditions of a 3 (Mood: positive, negative, neutral) X 2 (Salience: actor, context) between-subjects design.

Procedure. As in the previous studies, the mood induction task was followed by the judgment task, the mood manipulation check, and the depth-of-processing measures.

Materials and dependent variables

Mood induction. The mood induction procedure and stimuli were identical to the ones used in Studies 5.1 and 5.3.

Target sentences. Participants read three sentences describing an actor's behavior (one negative, one positive, one neutral). Participants in the context salient condition also read a sentence providing context-relevant information. As in Study 5.2, each (context+) target sentence was followed by a tradeoff question. Participants provided their ratings on 9-point scales anchored by an actor-related and a context-related cause.

Mood manipulation check and depth of processing measures. Participants completed the same measures as in Study 5.3.

Results and Discussion

Mood manipulation check. An ANOVA on the manipulation check measure confirmed that the mood induction was successful, $F(2, 74) = 24.07$, $p < .001$, $\eta_p^2 = .39$. Participants who read the happy story reported to feel more positive ($M = 6.96$, $SD = .84$) than participants who read the neutral story ($M = 5.96$, $SD = 1.02$), and those who read the sad story felt more negative ($M = 5.04$, $SD = 1.06$) as compared to both other groups (all $ps \leq .01$).

Attribution ratings. Since there was no effect of sentence valence ($Fs < 1$), we collapsed across the three sentences and calculated a mean *tradeoff score* (Cronbach's $\alpha = .70$). Still, independent analyses of all individual ratings rendered the same strong pattern of results as the one we report for the composite score.

A 3(Mood) X 2(Salience) ANOVA on the tradeoff scores revealed a significant interaction: $F(2,71) = 21.76$, $p < .001$, $\eta_p^2 = .38$ (other $ps > .19$). We conducted a series of simple effects tests to get more insight into this interaction. First, we looked at the effect of salience on attributions within mood conditions. As expected, positive mood participants made more situational attributions in the actor salient condition ($M = 4.94$, $SD = .55$) than in the context salient condition ($M = 6.41$, $SD = .80$), $t(23) = -5.32$, $p < .001$, $d = -2.22$, while negative mood participants showed the opposite pattern ($M = 6.22$, $SD = .43$ vs. $M = 5.33$, $SD = .75$, respectively), $t(23) = 3.6$, $p < .01$, $d = 1.5$. Neutral mood participants' ratings fell in-between and were not affected by the salience manipulation ($t < 1$, *ns*, see Table 3).

Table 3: Mean (SD) tradeoff ratings as a function of Mood and Salience condition (Study 5.4)

Salience	Mood		
	Positive	Negative	Neutral
Actor	4.94[a] (.55)	6.22[b] (.43)	5.51[c] (.56)
Context	6.41[d] (.80)	5.33[e] (.75)	5.69[e,c] (.62)

Note: Means with different superscripts within the same rows and columns are significantly different at least at the p < .01 level. Ratings were provided on a 9-point scale, with higher ratings indicating more dispositional attributions and lower ratings – more situational attributions.

Next, we looked at the effect of mood on attributions within salience conditions. An ANOVA on the judgments in the *actor salient* condition showed that mood had a significant effect on attributions, $F(2,34) = 18.46$, $p < .001$, $\eta_p^2 = .38$. Furthermore, the pattern of the means (see Table 3) mirrored the one we observed in Studies 5.2 and 5.3, where participants were exposed to similar stimuli: Negative mood participants made more dispositional attributions ($M = 6.22$, $SD = .43$) than positive mood participants ($M = 4.94$, $SD = .55$), $t(34) = 6.06$, $p < .001$, $d = 2.08$ As expected, neutral mood participants' ratings fell in-between ($M = 5.51$, $SD = .56$, all ps < .05, see Table 3). We then conducted the same analysis for the *context salient* condition, which showed that mood had a significant effect on attributions, $F(2,37) = 7.53$, $p < .01$, $\eta_p^2 = .29$. Critically, and as predicted, the pattern of the means (see Table 3) was exactly the opposite of the one in the actor salient condition (and of that observed in Studies 5.2 and 5.3): Negative mood participants made more situational attributions ($M = 5.33$, $SD = .75$) than positive mood participants ($M = 6.41$, $SD = .80$), $t(37) = -3.81$, $p < .01$, $d = -1.25$. As expected, neutral mood participants' ratings fell in-between ($M = 5.69$, $SD = .62$), although only the difference with positive mood participants' ratings reached significance ($t(37) = -2.59$, $p < .05$, $d = -.85$.

Depth of processing measures. A 3(Mood) X 2(Salience) ANOVA on these measures confirmed that none of the effects were significant (ps > .2).

In sum, the results of this study show that the effects of mood on attribution, as observed in cases where the actor is more salient, reverses when the situation or some

features of the context are made salient. In these cases, sad people are more likely to explain the actor's behavior in situational terms than happy people.

General Discussion

The results of four experimental studies demonstrate that mood systematically affects observers' attributions for an actor's behavior: Negative mood leads to more dispositional attributions and positive mood leads to more situational attributions, when the actor is more salient than the context. We also showed, however, that moods have the opposite effects when the context is in the focus of observers' attention.

We believe that these results are newsworthy and exciting for several reasons. First, we show that affective states can dramatically affect attributions by means of altering (perceptual and) conceptual scope: Negative mood narrows attention and thus focuses observers on a salient actor/context, whereas positive mood broadens attention and thus allows one to attend to the context/actor as well. To our knowledge, the present work is the first to show that whether one draws dispositional or situational attributions depends both on one's mood and on actor versus context salience.

Second, since drawing inferences from other people's behavior is something we do automatically and effortlessly on an everyday basis (see Bargh, 1997; Uleman, Newman, & Moskowitz, 1996), and since we often are in a certain (positive or negative) mood, our findings have broader implications for social perception and judgment. The impressions one forms while reading a job applicant's motivation letter, watching a heated political debate on TV, or chatting with a new colleague in the cafeteria could all be influenced by the context. Importantly, the degree to which one takes contextual information into account depends on one's current mood.

Further, the present work offers a novel perspective by demonstrating that causal attribution can be guided by lower-order processes, such as mood-elicited differences in basic attention. In contrast, classic attribution models (e.g., Gilbert, Pelham & Krull, 1988; Quattrone, 1982; Trope, 1986) typically emphasize amount or depth of processing as the major determinants of the kind of attributions people make. Specifically, most of these models postulate the operation of several discrete stages in the attribution process and predict its outcome (i.e., dispositional vs. situational attributions) based on the availability and allocation of cognitive resources. Within these frameworks, the correspondence bias and the fundamental attribution error are seen to result from

insufficient correction of one's initial dispositional inferences (due to low capacity, motivation, or effort).

Interestingly, adopting such a processing perspective on attribution, Forgas (1998) found that happy, as compared to sad, people were more likely to draw dispositional attributions. Forgas explained these results in terms of the processing consequences of affective states (e.g., Fiedler, 2001; Mackie & Worth, 1989). That is, his positive mood participants supposedly engaged in shallower processing and thus did not correct for their premature dispositional inferences, whereas negative mood participants engaged in more careful processing, thus more often taking situational factors into account.

The present studies tell a different story: Unless the context was made salient, positive mood people were more reluctant to rate the actor in extreme trait terms and to attribute single behaviors to stable dispositions than either negative or neutral mood people. Moreover, differences in attributions were not associated with differences in amount or depth of processing. Although we only used self-report processing measures, we believe that our attentional account can more parsimoniously explain the results of our full set of findings, especially those of Studies 3 and 4, which together test the interactive effects of mood and salience most directly. Furthermore, our results are in line with previous evidence (see e.g., Isen, 2000, for an overview).

A simple way to reconcile the discrepancies between our results and those of Forgas (1998) is to take a closer look at the paradigms used to study the effects of mood on attribution. Critically, Forgas employed the classic attitude attribution paradigm (Jones & Harris, 1967), in which participants have to read an essay (e.g., pro- or anti-Castro), while being additionally informed that the position the essay defends has been either freely chosen by, or instead has been assigned to, the writer. Participants' task – to form an impression of the writer's attitudes – can thus be quite cognitively taxing, since there are several different pieces of information (e.g., a pro-Castro essay, forced-choice) one needs to process and integrate before making a final judgment. Given that mood can potentially influence amount and depth of processing, as well as motivation and effort (see Forgas, 2006, for overviews), and that the attitude attribution task is designed in such a way as to capture these differences, it is not surprising that people in a negative mood make less dispositional inferences than people in a positive mood in this particular context.

In contrast, the tasks we used in our studies were much simpler: Participants had to read several short behavioral descriptions (e.g., *Eric lifted the box*) and judge the actor (and the context) right after each sentence. Therefore, the information they had to base their judgments on was very basic, easy to grasp, and presented "all at once", rather than complex, ambiguous, and presented sequentially. In a task as simple as ours, differences in relative attention to actor and context are much more likely to emerge and affect target judgment than are differences in depth of processing or effort. On the contrary, basic attention differences are likely to be "overridden", or rendered less relevant, by the processing requirements of the much more complex and demanding attitude attribution task. In other words, it seems that mood effects are context-dependent (see Martin 2001; Martin & Davies, 1998, for a similar argument): Different tasks pose different requirements and thus present different "outlets" (or mechanisms) for mood to exert its influence. And yet, to the extent that people often make snap judgments of others based on very limited information, we argue that the impact of mood on basic attention can be especially informative and relevant to our understanding of social perception and judgment outside the lab.

Interestingly, one could argue that mood-induced differences in amount or depth of processing may still affect attributions, albeit in a different way, producing a similar pattern of results as the one we observed. Specifically, according to a judgmental polarization account, a dominant (target or context) attribution may have been thought about more in a negative than in a positive mood, thus leading to more polarized judgments (see e.g., Tesser, 1978) in a negative mood. Although such an interpretation also fits our data, we believe that it is a less parsimonious way to explain our findings, since additional assumptions should be made to account for the more polarized judgments of positive mod participants (Studies 5.3 and 5.4). Moreover, the null results on the elaboration measures make such an explanation less likely. Future research may further investigate this question and directly test the attentional and the elaboration (polarization) accounts against each other.

In conclusion, the present work shows that diffuse affective states systematically influence attributions of observed behavior: When the actor is more salient than the context – as is most often the case in real life – negative mood promotes dispositional attributions, whereas positive mood promotes situational attributions. On the contrary, when the context captures attention, moods produce the opposite effects. Thus, knowing

both the mind and the heart of the observer, namely what one focuses on and how one feels, is essential for accurately predicting attributions.

Chapter 6
General Discussion

"*Life is a train of moods like a string of beads;*
and as we pass through them they prove to be many colored lenses,
which paint the world their own hue,
and each shows us only what lies in its own focus."
Ralph Waldo Emerson

Already in the 19th century, Ralph Waldo Emerson poetically summarized some of the mood theories that we are talking about in this dissertation. In the quote above, the first three lines beautifully formulate a perspective that has been shared by many mood researchers, namely that moods are like colored lenses through which we see reality in a mood-congruent manner. As appealing as this view is, and as pervasive as these effects of mood seem to be in our everyday lives, there is by now substantial empirical evidence that this is not the whole story. In fact, Emerson inadvertently suggests that there is another way in which moods may affect our perceptions and judgments: A happy or sad mood can indeed "show us only what lies in its own focus", but it is the focal *breadth*, rather than the hue, of the lens that determines what we see.

The research in the present dissertation provides converging support for such an interpretation. It shows that positive and negative moods do not always influence judgment directly. Rather, the impact of mood is *indirect*, in the sense that mood interacts with other (non-affective) information to influence perception and judgment. Sometimes, this information is "located" in our mind, as when certain cognitive constructs are (for some reason) more accessible, and are thus readily used in evaluating oneself or interpreting another person's ambiguous behavior. At other times, this information is located in the external environment, as when the size of an object is judged relative to the size of other objects in the same perceptual field, or when a target's behavior is judged in relation to its specific physical or social context. Our work demonstrates that in both cases moods determine what aspects of (internal) accessible or (external) contextual information will be attended to and used in target perception and judgment by altering basic attention, namely by broadening or narrowing the perceptual and conceptual lens through which one views the world.

This final chapter of the dissertation is organized as follows. First, I summarize our main empirical findings and their contribution to the mood literature. Next, I review our spotlight model of mood effects on perception and judgment and describe how it

integrates the evidence reported in the empirical chapters. Then, I turn to discuss how our perspective relates to other mood models, as well as how it can accommodate some previous findings in the literature. Finally, I review some specific extensions and some more general implications of our model for other fields and judgment domains (i.e., social perception and judgment, legal decision-making, marketing), followed by a discussion of some limitations and avenues for future research.

Summary of the main empirical findings

Chapter 2 reported our findings from three studies exploring the manner in which mood affects the impact of accessible information on judgments. Specifically, drawing on evidence for the effects of mood on perceptual focus (e.g., Gasper & Clore, 2002), and on work on the Interpretation Comparison Model of accessibility effects (see Stapel, 2007), we tested the hypothesis that positive (negative) moods activate more global (specific) representations of primed information, thus leading to assimilation (contrast) in subsequent target judgments. We found converging support for these predictions, employing both supraliminal and subliminal priming techniques. Critically, we showed that the type of information activated by a prime is indeed mood-dependent, such that abstract trait information (e.g., "persistent") is activated in a positive mood, whereas specific actor-trait links (e.g., "persistent Peter") are activated in a negative mood.

In our view, the work presented in Chapter 2 makes several important contributions. First, it is the first to investigate how one's current mood interacts with accessible information to influence social perception and judgment. Given that people are hardly ever looking at the world with an "empty" mind, and given evidence from decades of priming research showing that what's on one's mind may influence subsequent judgments in predictable ways, our findings fill an important gap in past mood research and provide a fuller, and more realistic, picture of how moods affect judgment. Furthermore, in line with our spotlight model, which posits that a target judgment is the product of one's mood and the implications of accessible information (rather than of mood alone), we demonstrated that both positive and negative moods can lead to both positive and negative judgments. Thus, unlike most other mood theories, our framework parsimoniously accounts for both mood-congruent and mood-incongruent effects.

In Chapter 3, we went beyond mood valence and investigated how the specific way in which one focuses on and experiences one's negative mood may affect social perception. More specifically, we demonstrated that adopting a ruminative, as compared to a reflective, focus in a negative mood leads to more global processing and more mood-congruent judgments, both of oneself and of another person. Furthermore, we provided evidence that differences in global versus local processing style, rather than mood-repair goals, are driving the observed effects on judgment, in line with our attentional account.

Our findings from Chapter 3 bring important new insight into our understanding of mood effects on judgment. First, we demonstrated that negative mood can produce two diametrically opposite effects, depending on what focus (ruminative versus reflective) one adopts. Thus, how mood affects judgment depends not only on *whether* one is sad (i.e., valence), but also on *how* one is sad (i.e., focus). Second, we showed that the impact of focus is broader than previously suggested (see e.g., McFarland, Buehler, von Ruti, Nguyen, & Alvaro, 2007): Rumination and reflection not only affected self-evaluations, which may or may not be driven by mood-management motives, but also perceptions of others, which are unlikely to secure mood-repair benefits. Specifically, reflection led to more mood-incongruent (i.e., more positive) judgments of an ambiguous target, as compared to rumination, and yet did not improve participants' mood – a finding that is inconsistent with a motivational account. Critically, these findings are in line with our perceptual account: Rumination induces a global processing style, thus leading to assimilation, whereas reflection induces a local processing style, thus leading to contrast in perceptions of both oneself and others. In sum, we showed that whether one ruminates or reflects on a negative event may have divergent consequences for what information is attended to, how it is mentally represented and processed, and how it is subsequently used in social judgment.

The finding that mood, and the way one focuses on one's mood, determines how cognitively accessible information will affect social perception raised new intriguing questions. Specifically, in Chapters 4 and 5 we set out to investigate how positive and negative moods guide attention to different aspects of the *environment*, and how "external context" may affect target judgment.

In Chapter 4, we reported the data of five studies showing that mood influences perceptual context-dependence, or the degree to which one attends to and incorporates contextual information when judging a target stimulus. We showed that in various

domains (temperature, weight, size, emotions), people are more strongly affected by the context in a positive than in a negative mood. Thus, positive mood enhanced, and negative mood reduced, the magnitude of perceptual context effects.

The work described in Chapter 4 contributes to the existing literature in several respects. First, we showed that moods systematically affect perception and judgment beyond the evaluative domain: Moods may alter even (lower-level) sensory judgments of size, temperature, and weight. Ironically, we tend to see our judgments of physical magnitude as inherently more objective and stable (or even "true") than, for instance, our judgments of another person, a social group, or a controversial issue. More often than not, we even call these latter judgments "opinions", the word itself implying something personal, malleable, subjective. Our findings suggest, however, that although perceptions of ambiguous social stimuli typically require more inferential work, judgments of even the most trivial of objects' properties – whether the plate is large, the coffee hot, and the laptop heavy – are not immune to mood effects either. Thus, the influence of our current affective state on how we view the world seems to be much more basic and pervasive than previously assumed.

Furthermore, our findings with regard to the influence of mood on emotion perception have an interesting implication. Specifically, we found that in judging a target's emotion, people in a positive mood were more strongly affected by the context in which the target was embedded (i.e., the emotion expressed by a group of people surrounding the target) than people in a negative mood. Importantly, this effect was independent of the valence of the target's emotion. That is, people in a negative mood focused on the target's face (and ignored the context), whereas people in a positive mood incorporated contextual information, both when the target was happy and when he was sad. This finding is intriguing, given evidence that affective stimuli may themselves modulate breadth of attention. For instance, Fenske and Eastwood (2003) demonstrated that faces expressing a negative emotion constrict attention, whereas those expressing a positive emotion broaden attention (as indicated by increased distraction by peripheral visual flankers). The findings from our study, however, seem to suggest that the effects of incidental mood on attention are independent of, and thus arguably stronger than, those of the affective stimuli (see also Chapter 2, where we find that the effects of mood on the direction of accessibility effects is independent of the valence of the prime).

Finally, Chapter 4 demonstrated that the link between mood and task performance is not as straightforward as is typically assumed by processing accounts (see e.g., Forgas, 1995, 2001). That is, we showed that both positive and negative moods can improve or impair task performance, depending on whether the task requires one to incorporate or ignore contextual information. The relationship that is stable and robust, however, is that differences in basic attention (positive mood – broad, negative mood – narrow) drive differences in judgment: The breadth of the colored lens determines what falls in its focus. As a result, the information that is attended to affects the target of judgment.

Although the last study of Chapter 4 suggests that our mood-context-dependence logic extends to the social domain (i.e., people in a positive mood were more affected by the social context when judging a target person's emotions), in Chapter 5 we set to test our account in the domain of a somewhat more complex social phenomenon, namely (causal) attribution. Our findings demonstrated that mood systematically affects observers' attributions of another person's behavior. Specifically, sad, as compared to happy, participants were more inclined to perceive an actor in stable trait terms and consistently favored dispositional over situational explanations of the actor's behavior, when the actor was more salient. However, when the context was made more relevant, this pattern reversed, such that positive mood resulted in more dispositional attributions than negative mood. Thus, these findings provided strong support for our hypothesis that moods influence attributions by altering attention to actor and context, rather than by differences in the availability and allocation of cognitive resources, as classic attribution models (e.g., Gilbert, Pelham & Krull, 1988; Quattrone, 1982; Trope, 1986) or other mood theories (see Forgas, 1998) would postulate.

In sum, each of the empirical chapters of this dissertation carves out an important facet of moods' influence on perception and judgment. And yet, we believe that the whole is more than the sum of its parts. In the next section, I thus take a more global perspective and discuss how our findings can be integrated by our spotlight model.

The mood-attention-judgment link: The spotlight model of mood effects on perception and judgment

The core hypothesis of the present dissertation is that moods affect judgment by altering attention, such that positive mood broadens and negative mood narrows

perceptual and conceptual scope. Thus, we argue that mood valence alone does not reliably predict judgment. Rather, moods determine what aspects of available information will come "under the spotlight" upon exposure to a target stimulus, as well as how accessible information will be represented and used in target judgment. In other words, we claim, and our findings consistently demonstrate, that how an object, person, or situation is perceived and judged depends on both one's mood and the implications of the information that one picks up (or ignores). For example, in the domain of priming effects, mood-induced attentional differences produce differences in terms of the globality/abstractness of the primed information. That is, positive mood activates more global, diffuse representations, thus enhancing assimilation, whereas negative mood activates more specific and distinct representations, thus enhancing contrast. In the domain of perceptual context effects, the mood-elicited broadening or narrowing of attentional scope affects one's sensitivity to contextual information, such that positive mood increases and negative mood decreases the impact of context on target judgment. Finally, in the domain of causal attribution, attentional differences translate into differences in the degree to which one is likely to consider actor-related and/or context-related causes in explaining an observed behavior: Whereas negative mood promotes a narrow focus on the most salient cause, positive mood makes people "look around" and also consider the role of other, less salient factors. In sum, our model can be used to investigate a wide variety of phenomena, simple or complex.

Importantly, our work describes how mood affects judgment on two different levels: On the one hand, we found that mood has an effect on the *direction* of context effects (i.e., positive mood – assimilation, negative mood – contrast; rumination – assimilation, reflection – contrast; Chapters 2 & 3). On the other hand, we found that mood affects the *magnitude* of context effects (i.e., positive mood increases and negative mood decreases the impact of contextual information; Chapters 4 & 5). However, if one were to directly compare the findings from the four empirical chapters, one could argue that there is an inconsistency: In the studies reported in Chapter 2, negative mood led to contrast effects in social perception, but in Chapter 4 it actually reduced the strength of context effects (both assimilation and contrast). Similarly, positive mood enhanced assimilation in the studies reported in Chapter 2, whereas it enhanced both assimilation and contrast in Chapter 4. This may seem odd, given that priming effects are in essence context effects: A prime typically provides irrelevant, and thus by definition contextual,

information that influences a subsequent target judgment. So how do we explain this ostensible discrepancy in our findings?

In fact, we believe that this pattern is contradictory only on the surface, and that it actually reveals the role of an important factor that may determine how the same general mechanism (attentional broadening or narrowing) may produce different effects. Specifically, our studies on the impact of mood on accessibility effects employed classic social perception paradigms in which participants are first exposed to a prime (e.g., trait-implying sentences, faces) and are *subsequently* given the target judgment task (e.g., rate an ambiguously described target person, or a neutral face). Thus, it is inherent to these paradigms (and to much of priming research in general) that the prime (the "context") and the target are presented *sequentially*. In contrast, in our studies on perceptual context effects, the target was always *embedded* in a certain context (e.g., the target stimuli in the Ebbinghaus illusion are surrounded by context stimuli; the "target" and "context" weights were lifted simultaneously). Thus, these paradigms entail a *simultaneous* presentation of target and context.

Why is this distinction important? We argue that whether information is presented sequentially or simultaneously will affect how mood-induced attentional differences influence judgment. Specifically, the idea that mood makes attention expand or constrict, thus making one incorporate more or less information from the perceptual field, helps us understand the effects of mood in situations where all information (target and context) is available to the perceiver at the same time. In these cases, as our findings demonstrate, the broad attention elicited by a positive mood makes one more sensitive to contextual (peripheral, less salient, irrelevant) information, whereas the narrow attention induced by a negative mood makes one more likely to ignore this information. As a result, positive mood increases, and negative mood decreases, the *magnitude* of *context effects* (be they contrastive, assimilative, or unclassifiable in these terms).

In contrast, in a priming setting participants cannot recognize that what they see *first* is the "context" and what they see *next* is the "target" – a distinction that reflects *the researcher's* conceptualization (and operationalization) of the task. In a sense, one could even argue that each stage of the priming sequence presents participants with a different target (and context), so moods could exert their effects at each of these stages. Hence, when we are interested in how moods affect the ways in which information that is relevant to one situation (now) is then used in another situation (later), we need a

different concept. The notion that positive and negative moods promote different *levels of focus* seems to better capture the mechanism driving the influence of mood on priming effects. More specifically, as a result of an overall attentional broadening, people in a positive mood adopt a more global focus, and thus encode incoming information (e.g., a prime) in more global, diffuse, and abstract terms; on the contrary, due to an overall narrowing of scope, people in a negative mood adopt a more local focus, and thus encode information in more detailed, specific, and distinct terms. As a consequence (see Stapel, 2007), positive mood leads to assimilation and negative mood leads to contrast in target judgment. Thus, although people use accessible information both when they are happy and when they are sad, they use different renditions of this information (more global *vs.* more specific), which results in disparate effects on judgment (assimilation *vs.* contrast).

To sum up the analysis above, our framework not only posits that mood-elicited differences in basic attention drive the effects of mood on target perception and judgment, but it also specifies the conditions under which different types of effects will ensue. That is, in judgment settings where target and context are (perceptually or conceptually) available all at once, positive mood will increase, and negative mood will decrease the impact of contextual information on judgment (irrespective of the effect's direction). However, in settings where information made accessible at one point can affect judgment at a later point, mood will influence the direction (rather than the magnitude) of context effects, such that positive mood will lead to assimilation and negative mood will lead to contrast.

In the next section, I turn to discuss how our spotlight model relates to other mood theories, namely the affect-as-information model, the associative network model, the affect-infusion model, and mood-management models, and pinpoint its unique predictions.

The link between the spotlight model and other mood theories

We contend that our model offers a novel and parsimonious way to account for a large set of findings regarding the effects of mood on perception and judgment. However, our own theorizing has been heavily influenced by earlier models in the field. Thus, it is important to specify how our perspective is similar to and different from these earlier theories, which I briefly described in the Introduction.

First, consistent with the affect-as-information model and other functional approaches to affect (see e.g., Clore, Gasper & Garvin, 2001; Frijda, 1986; Schwarz, 1990), we assume that moods (similar to specific emotions) serve to provide feedback about the state of our environment. In order to prepare one to effectively cope with, or benefit from, the current state of affairs, positive and negative moods modulate attentional scope. Thus, a negative state signals that the situation might be problematic or threatening, inducing a narrow focus that is better suited for problem-solving. In contrast, a positive state signals that the situation is safe and one is doing fine, eliciting a broader focus that allows for open exploration.

At this point, however, our model diverges from the (classic) affect-as-information approach (Schwarz & Clore, 1983; 1996) in several important respects. First, we posit that moods do not inform evaluations and judgments via a misattribution mechanism (i.e., through the "How do I feel about it?" heuristic), but that they rather determine what aspects of available information are attended to (come "under the spotlight") and how they are construed, which in turn affects judgment. Second, and related to this, we argue that there is no "default" effect of mood on judgment (e.g., mood-congruence), which is sometimes overridden or reversed by correction processes (as when one becomes aware of the biasing potential of one's mood). Rather, we claim that both mood-congruent and mood-incongruent evaluations may ensue, depending on the implications of the attended information.

In suggesting that mood-elicited attentional differences drive mood effects on perception and judgment, our view differs from other mood theories as well. For example, the associative network model and the affect-infusion model both posit that moods prime same-valenced content in memory, thus leading to mood-congruent evaluations (i.e., positive mood – positive evaluations, negative mood – negative evaluations; e.g., Bower, 1981; Forgas, 1995; Forgas & Bower, 1987). In contrast, we claim that moods interact with other accessible information, and depending on what that information is, it may lead to both mood-congruent and mood-incongruent judgments. Moreover, our model can generate predictions beyond the evaluative domain and can parsimoniously explain the effects of mood on many different kinds of judgments (rather than just those made along a positive-negative dimension).

Further, unlike the affect-infusion model, which posits that moods may exert their impact on judgment by altering effort or depth of processing (i.e., positive mood –

heuristic, shallow processing; negative mood – systematic, deep processing; e.g. Forgas, 1995, 2001), we propose that moods may affect judgment at a more basic, lower level, namely by making salient different aspects of available information in one's perceptual and/or conceptual field. Thus, although we admit that in some cases (e.g., in complex cognitive tasks that require analytical thinking, under high cognitive load) moods may affect processing style and thus drive, or at least contribute to, differences in judgment and task performance, we argue that these processing differences may be of a higher order. That is, since attentional processes typically precede further information-processing (i.e., one needs to first attend to and encode a particular piece of information before one can elaborate on it further), mood effects on attention still seem to be more basic, or primary. Therefore, effort or depth-of-processing differences should not be critical for positive and negative moods to produce divergent patterns in perception and judgment, and vice-versa – the presence of differences in target judgment need not necessarily correspond to differences in depth of processing (as a lot of evidence has demonstrated, see Bless & Fiedler, 2006; Martin & Clore, 2001, for overviews).

Related to this, and in line with the idea that moods (first and foremost) alter attentional scope, our model does not specify or emphasize a direct correspondence between mood valence and (cognitive) task performance, as many other models do. That is, some models posit that positive (negative) mood impairs (improves) performance, while others formulate the opposite predictions. For example, the affect-infusion model uses the heuristic/systematic processing dichotomy to explain findings showing that people in a positive mood stop working on a task earlier, are less accurate, have worse memory, are more likely to stereotype, and are more easily persuaded by peripheral cues, as compared to those in a negative mood (see e.g., Forgas, 2006). On the other hand, it has been shown, that people in a positive mood are more creative, flexible, and efficient in various domains (see e.g., Isen, 2008); that they can persevere and ultimately outperform sad people on tasks that are construed as enjoyable (see Martin, 2001); that they can process persuasive messages more systematically when these either help maintain one's positive mood (Wegener & Petty, 1994) or, alternatively, help one improve on an important dimension (Trope, Ferguson, & Raghunatan, 2002).

Thus, it seems that the link between mood and task performance is rather weak and unstable. Instead, we predict – and our work also shows – that if a task requires one to adopt a more global focus or to incorporate more contextual information in one's

judgment, happy people will do better than sad people. If, instead, a task needs one to adopt a narrow focus, attend to the details, or ignore the context, sad people will outperform their happy counterparts. In our view, such a relationship is not only logical and well-supported by our findings (and other evidence in the literature), but it also represents a more parsimonious way to test (and explain) the effects of mood on task performance.

Finally, our approach also diverges from that of mood-management theories (e.g., the hedonic contingency hypothesis, Wegener & Petty, 1994). An obvious difference is that these latter perspectives postulate a *motivational* mechanism for the influence of mood on information-processing and judgment, whereas we argue that the effects of mood are (essentially) *cognitive* in nature. Specifically, mood-management models assume that, because people are motivated to maintain a positive mood and repair a negative mood, they tend to process information strategically (i.e., more heuristically or more systematically, depending on which strategy is deemed more useful in regulating one's mood; cf. Trope, et al., 2001; see also Fishbach & Labroo, 2007). In contrast, our spotlight model is based on the notion that moods exert their impact on a very early stage of processing that seems to be relatively immune to the influence of mood-management concerns. Moreover, although we agree that mood-repair/maintenance goals may sometimes (also) elicit differences in information-processing and judgment, we contend that these motivations are not essential for such differences to ensue. For instance, in the research reported in Chapter 3, we demonstrate that the interactive effects of negative mood and (ruminative versus reflective) focus on perception and judgment are more parsimoniously explained in terms of the different perceptual styles that these foci elicit (i.e., rumination – global and disuse representations; reflection – specific and distinct representations), rather than in terms of mood-management motivations (cf. McFarland et al., 2007). Moreover, our model seems to have more wide-ranging implications than motivational models, since it can efficiently predict the effects of mood in various judgment domains, where mood-regulation goals are less relevant (see e.g., Chapters 2 & 4).

In sum, the spotlight model put forward in the present dissertation offers a novel perspective on how moods affect perception and judgment. Specifically, it posits that positive mood broadens, whereas negative mood narrows attentional scope, resulting in differences in what information is attended to, how it is mentally construed, and how it is

used in (subsequent) judgment. Importantly, we contend that this simple and reliable mechanism is anything but simplistic and rigid: In fact, it can parsimoniously account for a wide range of mood effects in various judgment domains, as our empirical findings demonstrate. Moreover, unlike most existing mood theories, our model can accommodate both mood-congruent and incongruent effects, drawing on the same attentional mechanism. Furthermore, our research is the first to investigate the fundamental question of how moods *interact* with other available information to affect judgment. Thus, our framework generates unique predictions as to how happy and sad people will perceive and judge a *target in context* – an issue that other mood models have been silent on.

In the next section, I discuss how our model can accommodate a diverse set of earlier findings.

Applying our spotlight model to explain some previous findings

The empirical chapters of this dissertation provide strong support for our framework. However, I would argue that the explanatory power of our model extends beyond the specific paradigms and settings we used to test it. Next, I give several examples of how our view can accommodate well-known findings from the literature.

First, Bless and colleagues (1996) showed that people in a positive mood were more likely to rely on general knowledge structures (such as scripts and stereotypes) than people in a negative mood. Although these researchers ruled out a capacity account for their findings, they proposed that, in line with the affect-as-information model, positive mood signals that deeper or more detailed processing is not necessary, thus promoting a top-down processing style, whereas negative mood signals that more processing may be warranted, thus promoting a bottom-up processing style. Based on our theory, I would instead argue that positive mood broadens attention and makes people adopt a more global focus, whereas negative mood narrows attention and makes people adopt a more local focus. As a result, happy people are more likely to form a global, abstract representation of a stimulus (e.g., a description of an event or target person), and negative mood people are more likely to form a specific representation of a stimulus.

This account can also accommodate other evidence from the literature. For instance, it has been shown that positive mood enhances the “false memory effect”,

which is associated with more global, or gist processing (Storbeck & Clore, 2005). It has also been found to decrease stereotyping in cases when counter-stereotypical or egalitarian cognitions are more accessible (Huntsinger, Sinclair, Dunn, & Clore, 2010). Although these findings have been interpreted in affect-as-information terms, such that positive mood confers *value* on whatever information is currently accessible, whereas negative mood "casts doubt" on accessible cognitions, in our view they can also be seen as support for a more basic influence of mood on attention. That is, since positive mood broadens and negative mood narrows attentional scope, people in a positive mood are more affected by information that enters their (broader) perceptual field (e.g., a primed trait, an accessible stereotype, semantic gist, etc.) and the notion of "value" thus seems redundant. Our view is further consistent with evidence showing that positive, as compared to negative, mood enhances access to remote semantic associates (Rowe et al., 2007); leads to broader, more inclusive categorization (see Isen, 2001); and increases the use of more global language categories (Beukeboom & Semin, 2006). Importantly, although these findings can also be explained in terms of other theories (e.g., affect-as-information, cognitive flexibility), our perspective offers a more efficient way of looking at all these pieces of evidence as reflecting the same underlying mechanism, namely mood-elicited differences in attentional scope.

A similar line of reasoning can be applied to findings from the judgment domain. Specifically, Bodenhausen and colleagues (Bodenhausen, Gabriel & Lineberger, 2000) showed that sad, as compared to neutral mood, participants were more likely to assimilate their target judgments to an arbitrary reference point – what is known as the anchoring-and-adjustment bias (Tversky & Kahneman, 1974). In explaining these results, the researchers suggested that negative mood increases sensitivity to judgment-relevant information and also makes people process that information more extensively. As a consequence, confirmatory hypothesis testing is more likely to yield information that is consistent with the implications of the anchor value (e.g., the question "Is the Mississippi River shorter or longer than 5,000 miles?" will mainly activate information that is consistent with the possibility of the river being about 5,000 miles long). Thus, sad people's final absolute estimates oscillate around the anchor more strongly than the estimates of neutral mood people.

We would suggest that these findings can be as readily explained in terms of our mood-context logic, namely, that differences in basic *attention* to target and context

(rather than *processing* differences) could account for this effect. That is, if negative mood narrows attention relative to neutral mood, sad people may have mainly focused on the anchor (e.g., length of abut 5,000 miles), ignoring information that lies "further away" in the background (e.g., rivers that are 3,000 miles long, knowledge about other American rivers, information about the state of Mississippi, etc.). In contrast, neutral mood participants' broader attentional scope should have made such contextual information more salient, thus enabling them to depart from the arbitrary reference point and arrive at a more accurate judgment. Such an account is not only consistent with our findings regarding the influence of mood on basic perceptual judgments, but it is also in line with the evidence on semantic activation and breadth of categorization reviewed earlier.

In sum, we believe that our spotlight model offers a compelling and efficient account of various findings from the mood literature, beyond those generated by our own research. In the next section, I turn to discuss some extensions and implications of our findings for other domains – some of which are hopefully relevant for what we, experimental social psychologists, often call "real life".

Extensions and implications

Social perception and judgment

Although we tested our logic in some areas of social perception (accessibility effects in person perception, attribution), our framework can be used to generate predictions regarding the effects of mood in other social domains as well. For example, our work on the influence of mood on attribution (see Chapter 5) focused on *observers'* attributions of another person's behavior, but it raises the intriguing question of how moods affect the way one explains the reasons for one's own behavior. Interestingly, research in social psychology has long shown that people interpret other people's behavior differently from their own. Specifically, the *actor-observer bias* describes people's tendency to attribute others' behavior to the actor's stable dispositions and their own behavior to unstable situational factors. One of the explanations for this asymmetry posits that people typically focus on whatever is most salient in the environment. Thus, when observing another person's behavior, the actor and the behavior form a perceptual unit, and the observer is more likely to notice (or infer) the role of the actor, rather than the role of temporary, often invisible circumstances. For example, when one sees a waiter

spilling a tray of drinks, one is likely to think that the waiter is clumsy, failing to notice that the wet floor caused the slip. When one explains the reasons for one's own behavior, however, situational forces that may be restraining or facilitating it are much more salient: The wet floor is obviously to blame for falling down.

Given that attention, or salience, is a crucial determinant of the type of attribution one makes, and based on our own research on mood effects on attributions for observed behavior, we would predict that mood will also affect the way one explains one's own behavior. That is, since the situation will be more salient for actors, we would predict that sad, as compared to happy, people will be more likely to attribute the causes of their own behavior to external circumstances (which are more salient) than to their stable dispositions. A question arises, however, as to whether this pattern would hold for both positive and negative behaviors and outcomes. From a self-regulation perspective, people are typically more likely to attribute self-relevant negative outcomes to external causes, while they take credit for positive outcomes. It would thus be interesting to test the attentional mood effect and the self-enhancing effect against each other.

There also seems to be an interesting implication of our model to the field of stereotyping. Evidence has accumulated that contextual information moderates whether, and what aspect of, a stereotype is activated (e.g., Barden, Maddux, Petty, & Brewer, 2004; Casper, Rothermund, & Wentura, 2009; Mitchell, Nosek, & Banaji, 2003; Wittenbrink, Judd, & Park, 2001). For example, it has been shown that encountering a Black person at a street corner versus in church may affect White people's target evaluations by activating different features of the associated stereotype (Wittenbrink et al., 2001). Moreover, encountering a member of a stereotyped group in a counter-stereotypical context or role may even thwart stereotype activation. Our spotlight model of mood effects suggests that people in a positive mood will be more likely to incorporate contextual information in their target judgment than people in a negative mood. In light of the evidence described above, this implies that happy and sad people may activate different features of the stereotype (depending on whether the cues are target- or context-related). Also, happy people may end up stereotyping to a lesser extent than sad people when the context is counter-stereotypical. In fact, although it was interpreted in slightly different terms, there is some recent evidence in support of this hypothesis (Huntsinger et al., 2010). Finally, since increased perspective-taking has been shown to drive the activation of metastereotypes in an intergroup setting (e.g., Lammers, Gordijn, & Otten, 2008), we

would predict that people in a positive mood, who have a broader attentional scope, will be more likely to adopt the outgroup's perspective and will thus be more affected by a relevant metastereotype.

Legal decision-making

The research reported in the present dissertation can certainly be relevant to more applied domains as well. For instance, a potential implication of the findings from our work on attribution is that people in positive and negative moods may differ in the way they assign blame in a legal setting. That is, differences in attention to actor and context may have important consequences for how jurors (or other decision-makers) use different pieces of evidence and how these affect their final verdict or decision. For example, our findings imply that positive, as compared to negative, mood will make people more sensitive to the implications of mitigating or aggravating circumstances, which may be seen as contextual information. Thus, happy, as compared to sad, jurors may assign less blame to the perpetrator and award a lower compensation to the victim in the presence of mitigating circumstances.

Interestingly, past research on legal decision-making has also shown that counterfactual thinking – the tendency to generate alternatives to reality – is related to causal reasoning and blame assignment. In particular, it has been found that the more mutable an outcome is (the more easily it can be mentally "undone"), the more likely it is that the actor's behavior is perceived as causal, and the actor as more responsible, for the final outcome (see e.g., Williams, Lees-Haley, & Price, 1996). Since people tend to activate counterfactuals about actions that are *salient* or abnormal (rather than pallid or habitual; see e.g., Kahneman & Miller, 1986), jurors' verdicts may critically depend on what features of the (factual and counterfactual) information are most salient or attention-grabbing. Given that moods determine what information one attends to by modulating attentional scope (negative mood – narrow, positive mood – broad), our model can be used to predict moods' impact on counterfactual thinking (which may in turn influence the final verdict). Specifically, people in a negative mood should be more likely to "stick" to salient information, whereas people in a positive mood should adopt a broader perspective and, as a result, activate more and more diverse counterfactuals. In other words, positive mood people may see more alternative ways in which things could have turned out differently, and this could in turn affect blame assignment.

A recent study in our lab provides some initial support for our hypothesis regarding the effects of mood on counterfactual thinking. Specifically, after a positive or negative mood induction, we asked participants to generate counterfactual thoughts in response to several scenarios (each describing a series of events leading to a negative outcome). We coded participants' responses in terms of whether they deleted some elements of the story (subtractive counterfactuals), or added new elements to it (additive counterfactuals). In line with our predictions, we found that participants in a positive, compared to those in a negative, mood listed a greater number of *additive* counterfactuals. Importantly, the number of subtractive counterfactuals (which are based on the salient information) did not differ across mood conditions.

Finally, a broader implication of our findings concerns the influence of mood on moral reasoning in general. Does mood have an impact on whether people stick to the rules, or instead make an exception, when they face a moral dilemma? Previous research on the effects of power on moral reasoning provides an interesting clue. Specifically, it has been shown that low power promotes outcome-based moral thinking, whereas high power promotes rule-based moral thinking (Lammers & Stapel, 2009). Thus, in judging whether an act is right or wrong, the powerless focus on the specific consequences, thus being more prone to make exceptions, whereas the powerful focus on whether general rules and principles are violated (but only when judging others', and not one's own, behavior, see Lammers, Stapel, & Galinsky, 2009). In addition, it has been demonstrated that high power is associated with a more global, abstract processing style, whereas low power is associated with a more local, concrete processing style (Smith & Trope, 2006). Based on these findings, we would speculate that positive mood, which broadens attention and elicits more global processing (similar to high power) will lead to more rule-based moral thinking, whereas negative mood, which narrows attention and elicits more specific processing (similar to low power) will lead to more outcome-based moral thinking. In other words, a happy person will be more likely to condemn an act of stealing, even if stealing were the only way for one to feed one's hungry family, as compared to a sad person. Interestingly, a competing hypothesis could also be formulated: If positive mood broadens attention and thus increases perspective-taking, one could expect that happy people will be better able to take the perspective of the other person, take into account the specific context or circumstances of the behavior, and

ultimately make a less strict (rule-based) judgment. Pitting these two predictions against each other seems to be a fruitful avenue for future research.

Consumer behavior

Obviously, in our everyday lives we are not only colleagues, friends, lovers, and parents, but we are also (or, some would say predominantly) *consumers*. Therefore, we recently extended our approach from the basic perceptual and social domains to the consumer domain, investigating how moods influence product evaluation and choice (Lerouge, Stapel, & Avramova, 2010). Specifically, based on our evidence for the effects of mood on perceptual context effects (see Chapter 4), we hypothesized that positive, as compared to negative, mood will make people more sensitive to contextual information when evaluating a target product. Our predictions were confirmed: We indeed found that happy, as compared to sad, people were more influenced by the size of adjacent products when judging the size of a target product (e.g., judging a jar of peanut butter or a can of Coke to be smaller when they are surrounded by bigger jars/cans than when they are surrounded by smaller jars/cans). Furthermore, happy people perceived the same amount of money (e.g., 40€) to be more valuable when it was presented in the context of higher than of lower amounts. These findings seem to imply that happy people are more likely to compare products and prices with available alternatives (and even when these are irrelevant to the judgment at hand).

In another couple of studies, we found that positive mood increased, and negative mood decreased the magnitude of the attraction and compromise effects. That is, the specific configuration of a choice set (the set of product alternatives) was found to have a stronger impact on target product evaluations of happy than sad participants. Specifically, happy people evaluated the same target option more positively when it was dominating than when it was dominated by another option (attraction). For instance, they evaluated a laptop more positively when it was presented along with an inferior, compared to a superior alternative. Similarly, they evaluated a target option more positively when it was presented as the middle, rather than as an extreme, option in a choice set (compromise). For example, the tendency to prefer a brand of toothpaste that scores moderately on both cavity and tartar protection over brands that score higher on either of these dimensions was stronger for happy than sad participants. Future research

may test whether these differences in evaluation translate into differences in consumers' willingness to pay for certain products and actual choice.

Another issue that has received a lot of attention in the marketing literature in recent years is *choice overload*. This term describes the phenomenon of consumer satisfaction decreasing, rather than increasing, when too much choice is offered (see Iyengar & Lepper, 2000; Schwartz, 2004). Researchers have suggested that when a choice set becomes too big, feelings of uncertainty and anticipated regret may lead the consumer to defer a difficult choice, or be less satisfied with the chosen product alternative. We believe that our framework may help identify an important moderator of choice overload effects. Specifically, we would argue that since choice overload occurs when people attend to (i.e., try to choose among) many options, positive mood will increase, and negative mood will decrease its occurrence or intensity. That is, because positive mood broadens attention, happy people should be more likely to form a larger consideration set, where making a choice requires more (or more difficult) tradeoffs, resulting in decreased satisfaction. In contrast, because negative mood narrows attention, sad people should be more likely to consider a smaller amount of product alternatives and thus be less affected by choice overload. We are currently testing these predictions and the evidence we have so far supports our hypotheses.

In sum, the implications of our findings are wide-ranging and our model can be used to generate specific and testable predictions regarding the effects of mood on perception and judgment in various domains. And yet, our model has some limitations, and I turn to discuss these next.

Limitations and avenues for future research

Although the framework proposed in the present dissertation parsimoniously explains how mood affects perception and judgment in a variety of settings, we admit that mood can also impact judgment (as well as cognition and behavior more generally) in other ways as well, and that these may be better captured by other mood theories. For example, when the task at hand is very complex and requires more elaboration or analytic reasoning, or for judgments made under high cognitive load, it is likely that mood will have an effect on performance that is more easily described in processing,

rather than in attentional, terms (positive mood – heuristic processing, benefits creative tasks; negative mood – systematic processing, benefits analytic tasks). Similarly, in judgment setting where mood- or self-regulation is of primary concern, mood-management models may better predict the effects of mood (e.g., positive mood – mood-maintenance; negative mood – mood-repair, resulting in differences in, for example, extent of elaboration, evaluation, and attitude change). Finally, (most) overt behavior is influenced by a myriad of factors that may enter at multiple stages down the chain, with mood-elicited perceptual differences sometimes only playing a limited, albeit important role.

In sum, there seem to be domains where other mood models may be more relevant or useful in predicting the impact of mood. And of course, we are far from claiming that our spotlight model can explain every piece of evidence in the mood field. Nevertheless, we are confident that our model is the one that best accounts for the full set of findings presented in this dissertation, and more. In fact, it could be argued that attentional processes are in the basis of, and thus consequential for, all kinds of other, higher-order cognitive processes and, ultimately, for overt behavior. In what follows, I thus briefly discuss how our mood-attention-judgment logic can even be applied to settings that typically "invite" predictions from other mood models (as I just described above). At present, these ideas are speculative in nature, but hopefully they will inspire future research.

First, although solving a complex problem may benefit from a specific information-processing strategy or thinking style, which are on their part affected by mood, mood is likely to influence what information one attends to in the first place. In other words, it all starts with attention; only then can information-processing differences kick in and produce effects. Thus, we contend that as long as there is a target (e.g., a salient object, person, task, memory, idea) and a context (e.g., physical background, psychological circumstances, social norms, accessible cognitions), mood may already exert its impact on an early (attentional) stage. As a result, different aspects of the (externally) available or (internally) accessible information will be registered and elaborated on further.

Similarly, even if we assume that mood repair/maintenance goals affect how one deals with self-threatening information, it seems wise to also consider the impact of mood on attentional breadth and level of processing. For instance, a negative persuasive

message (or even a piece of negative feedback) can be perceived and processed in different ways: One can focus on the implications of the message *per se*, or one can relate this information to a relevant context (e.g., the persuasion situation, the source of the information, pertinent comparison standards) and thus see it in more relative terms. Our findings suggest that the broader attentional scope elicited by a positive mood may render such peripheral information more salient and thus promote a more "relativistic" perspective. Importantly, if the context casts doubt on the informational value of the target message, a happy person may end up processing the message more elaborately – which runs contrary to what a classic mood-management analysis would predict.

Finally, it has been shown that mood affects actual behavior, for instance product choice, spending patterns, bargaining and negotiation, and helping behavior (see e.g., Forgas, 2006; Isen, 1987, 2001, for reviews). Although a variety of factors may influence behavior in these domains, and mood itself may exert an impact via several different mechanisms (e.g., affect-as-information, mood management, processing strategy), it is conceivable that the way one perceives a given situation (e.g., a particular product, a financial transaction, a social interaction) will affect one's evaluations, judgments, decisions, and behaviors in this setting. Thus, we believe that mood-elicited attention differences will still play an important role in guiding all these processes and determining the final outcome.

The analysis above pinpointed at some intriguing questions – yet to be explored – related to how mood-elicited attentional differences may interact with or guide other (higher-order) effects of mood on cognition and behavior. Yet another interesting avenue for future research lies in testing whether our findings can be generalized to the domain of specific emotions. The distinction between these different forms of affect is quite important: Unlike moods, which are diffuse and relatively long-lasting, emotions are acute and specific. Furthermore, discrete emotions are triggered by something or someone, they are associated with different cognitive appraisals and hedonic experiences, and they motivate the individual to take a particular course of action (see e.g., Frijda, 1986; Scherer, 1984; Zeelenberg, Nelissen, Breugelmans, & Pieters, 2008; Zeelenberg & Pieters, 2006). Because of these properties, it has been argued, specific emotions have specific effects on perception, judgment, and decision-making, which cannot be predicted by valence alone (e.g., Lerner & Keltner, 2000; Tiedens & Linton, 2001; Zeelenberg & Pieters, 2006). These findings raise the question of whether the effects

of mood on judgment that we obtained in our work would extend to the influence of specific positive and negative emotions: Would anger and fear (both being negative emotions, but each of them eliciting different appraisals and action tendencies) both lead to a narrowing of attentional scope and thus affect perceptions and judgments as negative mood does? Or would their different motivational components also trigger differences in basic attention that would override the pattern predicted on the basis of valence? We hope that future research will explore these intriguing questions.

Conclusion

Two monks were arguing about the temple flag waving in the wind.
One said, "The flag moves." The other said, "The wind moves."
They argued back and forth, but could not agree.
Hui-neng, the sixth patriarch, said:
"It is not the flag that moves. It is not the wind that moves.
It is your mind that moves."
Zen koan

There seems to be a whole wide world out there.

And yet, it is our mind that moves, incessantly constructing meaning from generic reality bites. More often than not, it is how we *perceive* the world, rather than what the world *is* like, that really counts.

But how does the mind move? And... where does it go?

In this dissertation I hopefully convinced you that one important answer to these questions is “It depends on one’s mood.” Happy minds and sad minds move in different ways and end up going different places. That is *how the mind moods*.

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Summary

The present dissertation introduces a new theoretical framework of mood effects on perception and judgment. Our *spotlight model* integrates previous work on the influence of mood on attention, on the one hand, and work on context effects, broadly defined, on the other. We propose that moods do not "act alone", but rather interact with contextual information to influence the way we perceive the world. That is, we suggest that positive and negative moods differentially affect the kind of information that is picked up (both in the external environment and in our mind's eye), the way it is mentally represented, and the manner it is used in subsequent judgment. More specifically, based on previous evidence showing that positive mood broadens attentional scope and promotes a more global perceptual focus, whereas negative mood narrows attentional scope and induces a more local focus, we posit that positive and negative moods "illuminate" different features of the available (accessible) information. Thus, we suggest that moods work like *spotlights*: Positive mood broadens the attentional beam, whereas negative mood narrows it, and one attends to whatever information comes "under the spotlight".

Compared to other mood theories, our approach has several important benefits. First, it can be used to generate testable predictions regarding the influence of mood in a wide variety of judgment domains. That is, since the mechanism we propose is of *attentional*, rather than of motivational, informational, or priming nature, we argue that the effects of mood should not be limited to the evaluative domain (positive – negative), but they should rather hold for *any* sort of judgment (e.g., evaluations of oneself, judgments of other people's personality, estimates of objects' physical magnitude, inferences about physical and social contexts). Second, our framework can parsimoniously account for both mood-congruent and mood-incongruent judgments, since it posits that how one perceives and judges a target is a function of both mood and the implications of the information one attends to. Thus, it specifies a simple, yet reliable, mechanism that is inherently (and predictably) "context-dependent", rather than introducing additional factors (e.g., availability of cognitive resources, awareness of mood's biasing impact, or the activation of mood-management goals) to explain how a "default" effect (e.g., mood-congruence) is "overridden".

The four empirical chapters of this dissertation provide the first experimental evidence of our hypotheses regarding the impact of mood on perception and judgment. A brief summary of our main findings, reported in each of these chapters, follows.

In *Chapter 2*, we explored the manner in which mood may affect the use and impact of accessible information on judgments. Specifically, we hypothesized that over and above their direct influence, moods can have a strong *indirect* influence on judgment by affecting whether accessible information leads to assimilation or contrast. Our approach was inspired on the one hand by research on the impact of mood on the *globality* of one's perceptual focus (e.g., Gasper & Clore, 2002) and, on the other hand, by work on the importance of the *globality* and *distinctness* of accessible knowledge for the direction of priming effects (e.g., Stapel, 2007). Thus, we tested the hypothesis that by altering perceptual focus, such that positive moods lead to a more global focus and negative moods lead to a more local focus, moods may determine what features of accessible information (global versus specific) come "under the spotlight". We further argued that this may affect the impact of this information on subsequent judgments (whether assimilation or contrast occurs).

Chapter 2 reports the findings of three studies testing these predictions. First, we showed that moods indeed influence the impact of trait-implying behaviors, such that happy people assimilate their judgments to, and sad people contrast their judgments away from, a trait prime when judging an ambiguous target person. Next, we replicated this effect using a subliminal (face) priming paradigm. Finally, and most critically, the results from a lexical decision task confirmed our core hypothesis that the type of information activated by trait-implying behaviors is indeed mood-dependent, such that abstract trait information is activated in a positive mood, whereas specific actor-trait links are activated in a negative mood.

In *Chapter 3*, we investigated whether negative mood always leads to contrast effects in judgment. The literature on self-focused attention suggests that people may focus on and experience a negative mood, for example, in at least two different manners, namely *ruminating* and *reflecting* (Nolen-Hoeksema, 1991; Trapnell & Campbell, 1999). Moreover, these two modes have been found to elicit different processing styles and corresponding cognitions, such that the former is characterized by more global mental representations, diffuse feelings, and repetitive thought, and the latter by clear and distinct feelings and more concrete thought. Inspired by these findings, we set out to

investigate how the manner in which one focuses on one's negative feelings may influence perception and judgment. More specifically, based on the Interpretation Comparison Model of accessibility effects (ICM, see Stapel, 2007) that we also employed in the studies in Chapter 2, we predicted that rumination will activate global and diffuse thoughts and feelings, leading to assimilation, whereas reflection will activate specific and distinct thoughts and feelings, leading to contrast.

We tested our hypotheses regarding the divergent effects of rumination and reflection in four experimental studies. First, we found support for our idea that ruminating, as compared to reflecting, in a negative mood induces a more global processing style. Next, we used a social comparison paradigm to show that adopting a ruminative versus a reflective focus leads to more mood-congruent (negative) self-perceptions, and that global versus local processing drives these effects. In a subsequent study, we further demonstrated that rumination and reflection also influence judgments of an ambiguous target person (i.e., rumination leading to more negative target judgments). Finally, in our last study we showed that perceptual differences, rather than mood-repair goals, are driving the differences in judgment, thus further ruling out motivational accounts.

In sum, Chapters 2 and 3 focused on the effects of mood on how accessible information (such as internal mental representations) is construed and used in subsequent social judgment. In the next two chapters, we went on to investigate how moods affect *the degree* to which one attends to contextual information when judging a salient target stimulus. Specifically, we addressed the intriguing question of how moods influence the basic, lower-order processes that elicit context effects in target perception and judgment.

The work we report in *Chapter 4* was inspired by decades of research showing that how one perceives, evaluates, and judges a target stimulus is not only driven by the target itself, but also by the context in which it is embedded. Based on evidence that the degree to which one *attends to* contextual information determines the magnitude of context effects, and evidence for the influence of mood on attentional scope, we hypothesized that the magnitude of context effects will be moderated by mood. More specifically, we predicted that in a negative mood, one's attention will be mainly focused on a salient target, whereas in a positive mood one will attend to both the target *and* the context.

Therefore, context effects should be larger in a positive than in a negative mood. Put differently, although everything is relative, it should be more so when one is happy.

We tested this hypothesis in five studies employing different paradigms and tasks. Using judgments of temperature, weight, and size, we found that, as expected, people are more strongly affected by (both relevant and irrelevant) contextual information in a positive than in a negative mood. Moreover, we showed that these effects extend to the social domain: Happy, as compared to sad, people were more likely to assimilate their perceptions of a target person's emotions to the emotional context.

Whereas Chapter 4 explored the effects of mood on basic perception, in *Chapter 5* we tested our logic in a more complex social domain by looking at how moods affect our tendency to attribute observed behavior to dispositional versus situational causes. Research on the *correspondence bias* and the *fundamental attribution error* has revealed that observers typically focus on the person and somehow "forget" about the context. One approach to explaining attribution biases is in terms of *perceptual salience*: An actor's behavior is typically more perceptually salient than the situation in which it unfolds or any external forces that may be constraining or facilitating it. Being unaware of the role of subtle contextual factors, observers tend to explain the actor's behavior in dispositional rather than in situational terms. On the other hand, previous research has shown that when the context is extra salient or relevant, people tend to draw situational attributions, thus reducing the fundamental attribution error. In other words, what one attends to is what one attributes to.

Once again building on evidence from two different fields, namely evidence that attention is critical for the type of attribution one makes, and evidence that mood affects attention to target and context, we hypothesized that positive and negative moods should differentially affect attributions. Chapter 5 reports the results of four studies providing support for our predictions. Specifically, when the actor was more salient, negative mood led to more dispositional attributions than positive mood. On the contrary, when the situation (context) was made more salient, the effects reversed, such that negative mood led to more situational attributions than positive mood. This pattern once again showed that sad people are more likely to focus on a salient target (which can be either the actor, or the context), whereas happy people are more likely to also take less salient information into account.

The final *Chapter 6* of the present dissertation looks at how our spotlight model relates to other mood theories and how it can accommodate a host of previous findings. The General Discussion also describes some implications of our findings to other domains (e.g., social perception, legal decision-making, consumer behavior), as well as potential limitations of the present work.

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