

Just do it! Guilt as a moral intuition to cooperate

A parallel constraint satisfaction approach

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“Although algorithms and mechanisms are empirically more accessible, it is the top level, the level of computational theory, which is critically important from an information-processing point of view.

The reason for this is that the nature of the computations that underlie perception depends more upon the nature of the computational problems that have to be solved than upon the particular hardware in which their solutions are implemented.”

David Marr (January 19, 1945 - November 17, 1980)

British neuroscientist and psychologist

Contents

1	Theoretical Background: Moral emotions and intuitive decision-making	1
1.1	Introduction	1
1.2	Emotions as moral intuitions	3
1.2.1	Guilt as a moral intuition to cooperate	3
1.3	Intuitive moral decision-making	8
1.3.1	Two general modes of decision-making: rational and heuristic decision-making	8
1.3.2	Intuitions as experiential cues in decision-making	10
	Heuristic decision-making by experiential cues	10
	Summary and criticism	16
1.3.3	Intuitive emotional decision-making	20
	Constructive intuitions based on parallel constraint satisfac- tion processing	20
	Constructive emotion-elicitation and moral (self-)judgments	21
	Constructive emotion-elicitation and decision-making	23
	Summary	25
2	Implementation of emotional decision-making	27
2.1	Dissonance theory as a proxy for PCS-processing in guilt and coop- eration	33
2.1.1	Cognitive consistency and PCS information processing	33

2.1.2	Cognitive dissonance theory and the experience of guilt	34
2.1.3	Cognitive dissonance theory and decision-making by increasing coherence	37
2.2	Decision-making based on emotional experience vs. emotional decision-making	39
2.2.1	One process or two processes?	40
2.2.2	Decision-making based on coherence	41
2.2.3	Cooperation aims on reducing self-threat	42
2.3	Outline of the research agenda	43
3	Empirical evidence for emotional decision-making	47
3.1	Cooperative decisions are based on <i>one</i> PCS process	47
3.1.1	Hypotheses	50
3.1.2	Study Ia: autobiographical guilt-priming	51
	Participants and Design	51
	Procedure	51
	Materials	51
	Results	53
3.1.3	Study Ib: anticipated/imagined guilt	55
	Participants and Design	55
	Procedure	55
	Materials	55
	Results	56
3.1.4	Discussion	58
3.2	Cooperation is based on decision-making by coherence	60
3.2.1	Study II: Self-consistency, self-affirmation and the disambiguation of action tendencies	63

3.2.2	Hypotheses	65
	Participants and Design	66
	Procedure	67
	Materials	67
	Results	68
3.2.3	Discussion	70
3.3	Cooperation aims on reducing self-threat	73
3.3.1	Being responsible – agency	74
3.3.2	Feeling responsible – (self-)blame	74
3.3.3	Responsibility and the Doctrine of Double Effect	75
3.3.4	Study III: Cooperation and self-blame: Moral reputation	79
	Hypotheses	79
	Participants and Design	80
	Procedure	80
	Materials	80
	Results	82
3.3.5	Study IV: Cooperation, agency and self-blame	84
	Hypotheses	85
	Participants and Design	85
	Procedure	85
	Materials	87
	Results	89
3.3.6	Discussion	91
4	General discussion	97
4.1	Summary of hypotheses and findings	97
4.2	Limitations and suggestions for future research	107
4.3	Conclusion and outlook	115

References	117
Appendix	138
Deutsche Zusammenfassung	173

1 Theoretical Background: Moral emotions and intuitive decision-making

1.1 Introduction

Why be nice when selfishness pays? The reason may be that selfishness not always pays, and the perception of a moral shortfall is often accompanied by negative feelings (Frank, 1988, 2006; Haidt, 2003; Keltner, Horberg, & Oveis, 2006; Tangney & Dearing, 2002; Tangney, Stuewig, & Mashek, 2007; Tangney & Tracy, in press; Tracy & Robins, 2004). Hence, people have to judge if being nice pays or if being selfishly pays and then must decide.

Modern moral psychology started with the inquiry of how moral judgments and decisions evolve, pioneered by the work of Jean Piaget (1932) and Lawrence Kohlberg (1969). To get an insight into how moral understanding develops, children (and adults) of different ages were asked to report not only the moral judgment but also the reason, or substantiation, for their judgment.

Research conducted in the developmental field linked moral judgments to reasoning abilities, implying that moral judgments depend on moral reasoning while largely ignoring the influence of emotions and feelings (Haidt, 2001; Monin, Pizarro, & Beer, 2007). However, after the heyday of the cognitive revolution, researchers detected

that choices, judgments and even decisions can be guided by unconscious and automatic processes (e.g., Bargh, 1994; Dijksterhuis, 2004) which led to a revivification of ideas of moral sentimentalists like David Hume and Adam Smith.

In contrast to reasoning approaches, moral sentimentalists assume that making moral judgments is closer to making an aesthetic judgment than to reasoning about the moral justifications of an action (Haidt, 2001). These ideas inspired some moral psychologists to propose that emotions and moral intuitions, quick and evaluative gut-feelings, are etiological to moral judgments and decisions (Haidt, 2001, but see also Bloom, 2010; Cushman, Young, & Greene, 2010; Greene, 2007; Paxton & Greene, 2010; Pizarro & Bloom, 2003). From this vantage point, moral reasoning is secondary to moral judgment, which is actually based on a feeling of approval or disapproval, and functional for defending it. Therefore, the role of reasoning is literally to provide reasons (or arguments) for the intuitively made judgment if there is a need to communicate it (Haidt, 2001; Haidt & Kesebir, 2010), for instance, to be evaluated by others or in dialogue contexts (Mercier, forthcoming; Mercier & Sperber, 2011).

This somewhat counter-intuitive and provocative proposal is heavily discussed and disputed and (still) stimulates not only research in moral, but also in emotion psychology. Currently, evidence is accumulating that one of the most plausible candidates for moral intuitions are moral emotions, which seem to provide evaluative information and thus be able to directly influence moral judgment and decision-making (Haidt, 2001, 2003; Keltner et al., 2006). For instance, feelings of disgust elicited by disgusting environments (e.g., messy workplaces or uncomfortable smells) lead to an intensification of moral disapproval (Schnall, Haidt, Clore, & Jordan, 2008). Furthermore, there is substantial evidence that feelings of guilt are related to making “moral” decisions and showing prosocial behavior (Baumeister, Stillwell, & Heatherton, 1994, 1995; Hooge, Zeelenberg, & Breugelmans, 2007; Nelissen, Dijker, & deVries, 2007; Tangney, Miller, Flicker, & Barlow, 1996).

1.2 Emotions as moral intuitions

What is a “moral” emotion? According to Haidt (2003), moral emotions are emotions that are “linked to the interests or welfare either of society as a whole or at least of persons other than the judge or agent” (p. 853). Moral emotions can be distinguished from other emotions by two core features: “disinterested” elicitation and “disinterested” action-tendencies. Guilt is considered to be a “prototype” of a moral emotion (Haidt, 2003) because primarily, guilt is aroused by others in social contexts (disinterested elicitation, Baumeister et al., 1994, 1995; Baumeister, 1998 and fulfills social and interpersonal functions (disinterested action-tendencies like prosocial behavior and/or cooperation, cf. Frank, 1988, 2006; Keltner et al., 2006).

1.2.1 Guilt as a moral intuition to cooperate

In the literature, there is broad consensus that guilt is aroused by self-reflection in which people compare their behavior to their own expectancies of proper action or to the expectancies of other people (Haidt, 2003; Higgins, 1987; Tangney & Dearing, 2002; Tangney et al., 2007; Tangney & Tracy, in press; Tracy & Robins, 2004). Consequentially, guilt can be conceptualized as either an intra- or an interpersonal phenomenon.

Traditionally, guilt is considered to be an intrapersonal phenomena, hence a personal experience that “is only evoked from within the self” (Lewis, 1971, p. 85) and does not necessarily depend on real or imagined contact with others. When feeling guilt, people perceive a shortfall to their personal expectations and standards (personal norms/goals and/or standards of behavior, cf. Higgins, 1987, but see Tangney, Niedenthal, Covert, & Barlow, 1998), linked to *private* self-consciousness (Buss, 1980).

In contrast, guilt can also be conceptualized as an interpersonal phenomena, i.e. an affective experience that is inevitably linked to others (Baumeister et al.,

1994, 1995; Baumeister, 1998). Hence, people experience guilt as "an emotional response to hurting or harming someone with whom one has a positive social bond" (Baumeister, 1998, p. 129) instead of the perception of a mere discrepancy to a standard or norm.

Both conceptualizations do not necessarily preclude each other, but differ with respect to perceived responsibility. Intrapersonal approaches stress the importance of (causal) agency as a necessary precondition of feelings of guilt (no agency = no guilt, e.g., McGraw, 1987; Taylor, 1996). In contrast, interpersonal approaches stress the importance of attributed agency, or moral responsibility (guilt if *feeling* responsible, no need for causal responsibility, e.g., Baumeister et al., 1994; Berndsen & Manstead, 2007; Frijda, 1993). Hence, in intrapersonal approaches, responsibility is a mediator of guilt-feelings but a moderator in interpersonal approaches.

There is also a broad consensus that guilt motivates compensatory behavior aimed on making up for a moral transgression, e.g., by increasing prosocial action tendencies (e.g., Hooge et al., 2007; Ketelaar & Tung Au, 2003; Nelissen et al., 2007). Notably, research on transgression and compliance used guilt as an explanatory concept for the increase of prosocial tendencies after a moral misdeed but failed to measure guilt in most studies¹. Hence, it was unclear if emotional experience of guilt is a necessary or a sufficient precondition for the increase of prosocial (or altruistic) action tendencies.

Borrowing methods from evolutionary economics, Ketelaar and Tung Au (2003) used a more direct way to examine the role of guilt in motivating prosocial action: The authors induced feelings of guilt experimentally and measured prosocial behavior by the frequency of cooperative choices in a series of (economic) prisoner's dilemma games (cf. Axelrod & Hamilton, 1981; Kuhn, 2009).

¹According to O'Keefe (2000), "One curious lacuna in the transgression-compliance literature is the lack of direct assessment of the putative intervening state of guilt. Although guilt has commonly been supposed to be the operative mediating state, most investigators have examined the effects of transgression on compliance without directly assessing guilt." (p. 79)

Based on theorizing by Frank (1988), Ketelaar and Tung Au (2003) assumed that people use immediate feelings of guilt as an experiential cue to cooperate, because an immediate “pang” of guilt may signal negative long-term consequences of selfishness and serves as a counterweight to immediate temptation. Hence, guilt is assumed to increase commitment to social long term goals in the face of temptation to act selfishly (Frank, 1988, 2006; Keltner et al., 2006; Ketelaar, 2006; Ketelaar & Clore, 1997). The results of the study showed that immediate feelings of guilt evoked by an autobiographical priming procedure indeed led to an increase in cooperative choices.

Notably, only participants with low (but not high) chronic social motives (i.e. chronic social value orientations, Messick & McClintock, 1968; Van Lange, 2000; Van Lange, Otten, De Bruin, & Joireman, 1997) increased cooperation. If the informative value of feelings are restricted by prior experience, then only people who often felt guilty in social choice situations should be able to attribute feelings of guilt to uncooperative choice options (Ketelaar & Clore, 1997). Since people low in social orientation do not cooperate and people high in social orientation do cooperate regularly (McClintock, 1978), only people low in social orientation may increase cooperation because they can attribute guilt to the social situation based on prior experience². The findings of the study illustrate that people use their immediate feelings of guilt for the evaluation of outcomes unrelated to the situation that elicited the guilt-feelings (the situation reported in the autobiographical priming procedure). Despite providing preliminary evidence for the causal influence of feelings of guilt on

²This may sound implausible because it implies that people do not learn from their failures. Hence, I will provide the original citation from Hooge et al. (2007):

”Only recently Ketelaar and Au (2003) found empirical results that are consistent with these claims. They studied the effects of guilt on cooperation. Ketelaar and Au hypothesised that guilt would increase cooperation especially for people with the general tendency to act cooperatively. These people (hereafter referred to as proselves) would perceive their feelings of guilt as a consequence of their negative behaviour and use this as information about future costs of pursuing an uncooperative strategy. This would lead them to act more cooperatively compared to proselves who do not experience guilt. People with the general tendency to act cooperatively (hereafter referred to as prosocials) would already act cooperatively and thus not use the negative feeling state as an inference about their strategy.” (p. 1026)

cooperative action tendencies, iterated prisoner's dilemma games may be inappropriate to examine "intuitive" or "emotional" decisions because of its vulnerability to strategic concerns.

Hooge et al. (2007) bypassed this problem by using a single one-shot give-some game with a similar payoff-matrix like a prisoner's dilemma game. The results replicated the findings of Ketelaar and Tung Au (2003). Only participants chronically low in social orientation increased cooperation after feeling guilty. Because strategic concerns may be negligible in single interactions, experiencing guilt may have increased cooperative choices.

Further evidence for the prosocial function of guilt as a selective promoter of cooperation was provided by Nelissen et al. (2007). Because emotions are functionally linked to personal goals (Roseman, Wiest, & Swartz, 1994), Nelissen and colleagues assumed that people high in social orientation may have a chronically accessible goal to cooperate, thus eliminating any additional effect of priming (Higgins, 1996). In contrast, people low in social orientation may have a chronic goal to avoid exploitation, which may be associated with feelings of fear.

If this is true, then people low in social concerns should increase cooperation after guilt-priming, whereas people high in social concerns should decrease cooperation after fear-priming, and this is exactly what the authors found. Hence, feelings of fear may not only "inform" about the valence of an outcome but may also activate a goal-representation which either directly influences action or provides a cognitive frame helpful to infer the implications of the situation (Lerner & Keltner, 2000; Zeelenberg, Nelissen, Breugelmans, & Pieters, 2008).

While these findings show *that* the experience of guilt increases cooperative action, the underlying motivation is inconclusive. Though speculative, results of some studies suggest that the motivation to increase prosocial behavior is to some extent egoistically motivated. For instance, if it is not possible to compensate for

a moral transgression, people show "self-punishment"³ (e.g., by denial of pleasure etc., Nelissen & Zeelenberg, 2009). Furthermore, people sometimes compensate at the expense of third parties, i.e. they cooperate with one person by cheating on another person (Hooge, Nelissen, Breugelmans, & Zeelenberg, 2011). Hence, cooperative action may not be necessarily intended to benefit others but used for selfish, communicative purposes (self-punishment or denial of pleasure may signal moral integrity and willingness to cooperate in the future, cf. Nelissen & Zeelenberg, 2009). Then, the motivation to cooperate may not be due to a motivation to repair harm but an attempt to prevent altruistic punishment⁴. To summarize, research suggests that guilt is elicited by private reflection (intrapersonal elicitation) about a socio-moral transgression (interpersonal content) and is strongly linked to the motivation to compensate for the moral misdeed, which may lead to increased other-interested (e.g., cooperation) or decreased self-interested (e.g., denial of pleasure) behavior.

Despite that past research showed *that* feelings of guilt are functional for motivating prosocial behavior, it is not clear *why* guilt motives prosocial action and *how* guilt can serve as a moral intuition to cooperate.

In the remainder of the chapter, I will first outline how emotional experiences can serve as *moral intuitions* and hence be used as evaluative information for decision-outcomes in traditional, consequentialist models of decision-making. Afterwards, I will point out some shortcomings of consequentialist approaches in the domain of emotion and morality and will propose an alternative mode of intuitive decision-making based on emotional appraisal processes, parallel constraint satisfaction and coherence. Then, I will contrast both approaches empirically. Aim of my dissertation is to examine if people use emotional experience as intuitive information in an otherwise non-emotional, rule-based decision-making processes (the traditional,

³Please note that others do not benefit from such actions, hence they are, by definition, not "linked to the interests or welfare either of society as a whole or at least of persons other than the judge or agent" (Haidt, 2003, p. 853)

⁴Altruistic punishment means preventing freeriders from future gains, either by direct punishment (putting costs on defection) or retaliation (reciprocal defection, cf. Stevens & Hauser, 2004)

consequentialist approach) or if people decide “emotionally”, hence if they utilize the emotional appraisal process for decision-making.

1.3 Intuitive moral decision-making

1.3.1 Two general modes of decision-making: rational and heuristic decision-making

Decisions are choices between alternatives. To make a decision, people need to evaluate (or rank) alternatives according to a choice criteria.

Traditional accounts of decision-making (e.g., the expected utility model, Neumann & Morgenstern, 1944) emphasize the role of reasoning and rationality (Dawes, 1998). Rational decision makers anticipate the outcomes of an action, then carefully evaluate them (via cues) according to probability (cue validity) and valence (cue value) and then choose the option that yields the highest utility. Hence, utility of a choice option is the information that is needed to rank alternatives according to a choice ranking- or decision rule. Then, people may choose the option that yields the (subjectively) highest utility regarding the decision criteria.

Rational decisions can be considered as a use of the weighted additive rule (WADD, cf. Gigerenzer, Todd, & the ABC Research Group, 1999; Glöckner & Betsch, 2008a). According to the WADD, people calculate the weighted sum of probability and value for each choice option and choose the option that yields the highest weighted sum. The WADD is a compensatory decision rule, since probability can compensate for value and vice versa. Furthermore, it is considered the “traditional gold standard for rational preferences” and choices (Gigerenzer et al., 1999, p. 26) which is agreed to be the most accurate but also most effortful decision rule (Payne, Bettman, & Johnson, 1993). Hence, the application of the WADD may be cognitively demanding and time consuming, so people may use easier decision rules which require fewer

steps of information processing. Therefore, in most situations people may use easier decision rules, or heuristics (e.g., H. A. Simon, 1955).

Heuristics can be described as simple rules of thumb which are used to simplify judgment and decision-making (Kahneman, 2002; for the use of heuristics in moral judgment and decision-making, see Sinnott-Armstrong, Young, & Cushman, 2010; Sunstein, 2005; Tobler, Kalis, & Kalenscher, 2008). Heuristic judgment and decision making is characterized by the substitution of a target cue (e.g., utility), if the target cue is either not accessible at the time of decision-making or if people are not able and/or motivated to compute the target cue (Kahneman & Frederick, 2002). In other words, if people are not able or motivated to use a WADD strategy for making decisions, they change the decision rule to use different target cues for evaluation and choice. Since rules necessarily prescribe the use of a cue, changing the rule changes the evaluative cues and therefore can reduce the amount or complexity of evaluative information. Hence, heuristics are non-compensatory decision strategies, because people only focus on one cue (instead of two, e.g. only focusing on value while ignoring probability).

Heuristics people commonly use are the lexicographic heuristic (LEX, Fishburn, 1974) and elimination-by-aspects (EBA, Tversky, 1972). The LEX is a decision rule in which only the most important cue is considered, outcomes are ranked concerning the cue and people take the outcome that yields the highest value. According to the EBA-heuristic, people first set a decision criterion/threshold for the most important cue and then choose outcomes which remain after all options that do not exceed a certain threshold are eliminated. Both heuristics simplify decision-making because people ignore irrelevant information which otherwise would lead to more complicated and costly utility-calculations (e.g., by the WADD). In other words, heuristics simplify decision-making by simplifying the evaluation of the different outcomes (e.g., by ignoring cues considered to be irrelevant). The use of heuristics is considered to be deliberative, hence people consciously evaluate the respective information relevant

to a choice (Glöckner & Betsch, 2008a).

1.3.2 Intuitions as experiential cues in decision-making

What is an intuition? According to Kahneman and colleagues, intuitions are "thoughts and preferences that come to mind quickly without any reflection" (Kahneman, 2002, p. 449), dominated by affective or cognitive feelings (Kahneman, 2002; Kahneman & Frederick, 2002). More precise, an intuition is an "involuntary, difficult-to-articulate, affect-laden recognition or judgment, based upon prior learning and experiences, which is arrived at rapidly, through holistic associations and without deliberative or conscious rational thought" (Sadler-Smith, 2008, p. 31), thus, "We know, but we do not know why" (Hogarth, 2001, p. 29).

In moral psychology, Haidt (2001) defined moral intuitions as "the sudden appearance in consciousness of a moral judgment, including an affective valence (good-bad, like-dislike), without any conscious awareness of having gone through steps of searching, weighing evidence, or inferring a conclusion." (p. 818). Hence, moral intuitions may be understood as affective experiential information (or a trustworthy "gut-feeling") about a moral preference based on a holistic assessment of a situation which is elicited rapidly, or at least without insight into the underlying process.

Heuristic decision-making by experiential cues

How do people make an intuitive decision? Traditional consequentialist decision-making approaches assume that people choose the outcome that yields the highest utility (Loewenstein & Lerner, 2003). Furthermore, it is assumed that the decision rule prescribes what information is used for the utility-calculation, or the cue that is used as a utility-substitute (Glöckner & Betsch, 2008a; Glöckner & Witteman, 2010). Whereas the appliance of the WADD is assumed to integrate and rate information about expectancy and value, more simple decision rules like the LEX only use a

specific attribute, e.g., an immediate “gut-feeling”. Hence, changing the decision rule also changes how choice outcomes are evaluated (e.g., by directing attention to a specific attribute while ignoring other information).

As noted above, traditional consequentialist decision-making approaches assume that decision-making itself is a conscious and deliberate process, however the information people use (the target attributes or cues) may be provided by more automatic or unconscious processes like intuitions or emotions (Strack & Deutsch, 2009). Hence, intuitive decision-making can be explained by dual-process models.

Dual-process models distinguish between two qualitatively different types of information processing: an intuitive/automatic process and a deliberative/controlled process (for a review of dual-process models, see Evans, 2008). These models either propose that processes operate exclusively (mode selection, Petty & Cacioppo, 1986), parallel and competing (Slooman, 2002) or in an interventionist fashion (Haidt, 2001; Hogarth, 2001; Kahneman & Frederick, 2002; Strack & Deutsch, 2004). Whereas one process dominates in mode-selection and competition models, interventionist models assume that deliberative information processing is “turned on” if necessary, e.g., to correct or support the (default) automatic process by eliminating response conflicts (Strack & Deutsch, 2004). The deliberative process operates in a rule-based fashion⁵, is available to consciousness and controllable, in contrast, the intuitive/automatic process is experiential, largely automatic, unconscious, uncontrollable and based on perceptual information (Evans, 2008).

In dual-process models, intuitive decisions are the result of an interaction of automatic and rule-based processes: whereas the decision itself is carried out by the employment of a decision rule, the information used by the rule can be due to automatic processes (Strack & Deutsch, 2009). Moreover, intuitions are considered to be based on automatic information processing and dominated by feelings. This makes it tempting to link emotional experience to intuitive information, since emotion-

⁵i.e. the application of control structures on accessible information

elicitation processes are considered to be largely unconscious and are based on a holistic evaluation of a situation (e.g., Barrett, 2006; Frijda, 1993; Niedenthal, Barsalou, Winkielman, Krauth-Gruber, & Ric, 2005; Scherer, 1984). From this vantage point, it may be reasonable to infer that emotional experience is a “gut-feeling” which may serve as an “intuition” or experiential cue in heuristic decision-making.

If decision rules influences *what* cues are used, changing the decision rule (e.g., from WADD to LEX or EBA) changes the information considered to be relevant for decision-making. Since emotional experience can be defined as “affect, perceptions of meaning in the world, and conceptual knowledge about emotion that are bound together at a moment in time, producing an intentional state where affect is experienced as having been caused by some object or situation” (Barrett, Mesquita, Ochsner, & Gross, 2007, p. 377), different cues can be utilized as substitutes for utility: the mere affective feeling, conceptual knowledge, or the combination of both (i.e. when affect is experienced as being caused by a stimulus: an emotion).

Heuristic use of affective feeling The most basic form of using emotional experience as intuitive information is to use the affective feeling of approval/disapproval or liking/disliking of an entity (core-affect⁶, cf. Barrett, 2006; Russell, 2003).

How simple feelings can serve as intuitive evaluation is outlined by somatic marker hypotheses (Damasio, 1994). Somatic marker hypothesis is based on the findings that people with damaged ventromedial prefrontal cortex (VMPC) can still reason about the social implications of a situation, but are no longer able to make appropriate decisions tailored to the situation, because they have lost the ability to affectively “mark” or “tag” decision outcomes for helpful- or harmfulness. Thus, they can no longer *feel* the positivity of negativity of a decision-outcome.

Some research conducted in moral psychology emphasizes the importance of so-

⁶“Core affect (i.e., the neurophysiological state) is available to consciousness, and is experienced as feeling good or bad (valence) and to a lesser extent as feeling activated or deactivated” (Barrett, 2006, p. 48)

matic markers for judgment and decision-making. For instance, in a study by Batson, Engel, and Fridell (1999) participants received false feedback about their affective reactions while listening to stories that either threatened the values of freedom or equality. When afterwards asking people what topic should be chosen for a university program, people showed a preference for the value which they believed had caused an affective reaction presented by false-feedback.

Wheatley and Haidt (2005) tested the somatic-marker hypothesis more directly by hypnotizing participants to have a feeling of disgust every time they saw a specific word. Afterwards participants read stories about moral dilemma which either contained the word or not. Results show that people reported more disgust and moral condemnation when stories comprised the word associated with disgust by hypnosis. Thus, even an artificial attempt to raise gut-feelings can directly influence moral judgment and decision-making. Similar findings were reported by Schnall et al. (2008), who manipulated disgust more directly using disgusting environments. The findings show that immediate affective reactions can serve as immediate evaluations of a judgmental target if the affective experience is interpreted as an immediate reaction of liking or disliking a judgmental target or decision-option.

The use of pure affective reactions can be understood in terms of LEX. When people are not able or motivated to calculate utility by the application of the WADD, they may “ask” themselves how they feel about choice-outcomes and use the immediate feeling as a cue for utility of an outcome (e.g., affect-as-information, Schwarz & Clore, 1988; or the application of the “affect-heuristic”, Slovic, Finucane, Peters, & MacGregor, 2002). Then, consistent with the expected utility model, people should “take the best”, i.e. choose the option that feels best. For instance, when feeling guilty, people may take their core-affect and use it to evaluate choice options by literally asking oneself “how do I feel about outcome A”, “how do I feel about outcome B”, and so forth and afterwards choose the outcome that produced least negative (core-)affect. The mere use of the subjective feeling component (affect) of emotional

experience is similar to using one's mood and hence should be (mis-)attributable on nearly any source known to evoke negative affect.

Heuristic use of emotional experience Whereas most results supportive for affect-as-information were gathered by exploring the influence of mood states on judgment and decision-making, the underlying logic can be extended to emotions (e.g., Ketelaar & Clore, 1997; Schwarz, in press).

Emotions differ from mood states experientially, i.e. emotions are experienced as an immediate affective *reaction* towards a target or a situation (Harré, 1986). The attribution of affective experience to a source (objectively or subjectively) responsible for the change in feeling-state can be used as an immediate evaluation of a stimulus or situation (e.g., Frank, 2006; Ketelaar & Tung Au, 2003; Ketelaar & Clore, 1997). For instance, immediate feelings of guilt may be attributed to a source which is believed to be responsible for the affective shift, e.g., a behavior that maximizes own outcomes in a social exchange situation (Hooge et al., 2007; Ketelaar & Tung Au, 2003; Nelissen et al., 2007). If feelings of guilt are attributed to this option, it would be evaluated as guilt-producing and hence negative. From this follows that the attribution process is analogous to an evaluation process because it links valence to an entity. However, since people seem to have to infer the source of a feeling (e.g., by a process of self-perception), the attribution process is vulnerable to misattribution (e.g., Schwarz & Clore, 1983, 1988).

For instance, people may attribute feelings of guilt aroused by the reminiscence of a moral transgression in situation A to a decision-option in situation B which is known to be potent to arouse feelings of guilt (Hooge et al., 2007; Nelissen et al., 2007). Since emotional experience is assumed to “carry its own attribution” (i.e. that people learn how stimuli and emotional experience correspond because of past experience, e.g., that guilt is the result of unfair behavior), emotional experience may be less vulnerable to misattribution than mood states within a situation, but

vulnerable to cross-situational misattribution. In other words, whereas people may infer the correct source of their guilt feelings when retrieving past immoral behavior in one situation, they may misattribute the same feeling to a source that is known to elicit guilt in a subsequent situation if the feeling is still experienced (e.g., Ketelaar & Tung Au, 2003).

Using emotional experience may be understood in terms of the LEX which is constrained by conceptual knowledge. For instance, when feeling guilty, people may ask themselves “how do I feel about outcome A”, “how do I feel about outcome B”, and so forth, but only attend to outcomes on which guilt is applicable.

Heuristic use of emotional conceptual knowledge Another way how emotional experience may influence decision-making on an intuitive basis is if people use the conceptual knowledge of the emotion which is made accessible and match features of the emotional appraisal to features of the situation.

Heuristic use of conceptual knowledge can be understood in terms of matching features of emotional knowledge to features of an object or situation that needs evaluation. Hence, the use of conceptual knowledge can be understood as the application of a cognitive schema or exemplars on a situation or a stimulus, triggered by features of the situation and capable of producing an affective “echo” which is the result of the comparison process (Glöckner & Witteman, 2010).

The appraisal-tendency approach (Lerner & Keltner, 2000; Lerner & Tiedens, 2006; Keltner et al., 2006) is similar to the assumption of the intuitive use of conceptual knowledge for evaluation of information. The appraisal-tendency approach starts with the assumption that specific emotions incorporate *core-appraisals*, i.e. an abstract meaning of a situation. The activation of this appraisal, e.g., by emotional experience, then can direct attention “to features of the environment to the problem or opportunity that elicited the emotion” (Keltner et al., 2006, p. 4) which filters information, even in unrelated situations. Hence, emotional experience can “transfer”

from one situation to another by applying the conceptual knowledge of one situation to another situation (cf. Lerner & Keltner, 2000). Accessible conceptual emotional knowledge can be used to interpret novel situations in a knowledge-consistent way and lead to “appraisal-congruent judgment”. For instance, conceptual knowledge related to guilt and harming others may direct attention to potential negative consequences of selfish behavior.

Decisions based on the use of conceptual knowledge may be understood in terms of the EBA-heuristic. For instance, if people use conceptual knowledge to interpret a situation, attention should be strongly focused on some important aspects, hence all other aspects are eliminated from consideration. Next, people may choose the option that exceeds a certain threshold and ignore other (remaining) outcomes. For instance, if conceptual knowledge of guilt is activated, the probability should be increased that the person interprets another, unrelated situation in terms of guilt by focusing on the relevant information that is able to produce guilt. Then, people would be expected to choose the outcome that does not produce guilt (if not feeling guilty is the threshold).

Summary and criticism

Traditional, consequentialist approaches of decision-making assume that people choose outcomes that maximize utility. A precondition for making a choice is to calculate the utility of the choice options and people are expected to use different strategies to accomplish this.

A “rational” decision is assumed to be based on the WADD which calculates utility of outcome options by *integrating* information about each option. Since the application of the WADD is assumed to be time-consuming and depletive, to save resources, people use heuristics. Heuristics are decision rules that reduce the complexity of utility-calculations by focusing attention to experiential cues that are easy to access (e.g., feelings) and hence simplify the decision because the utility-calculation

is obsolete. Whereas the WADD is a compensatory decision rule or strategy, heuristics are non-compensatory decision rules (because information that could be used for compensation is ignored).

People make intuitive decisions by using emotional experience (or parts of it) as a valid cue for making a deliberative decision. The decision itself is regarded to depend on a rule but the cue that is used to rank outcome options is “intuitive” or “experiential”. Dual process models explain intuitive decision-making by the integration of information that is due to automatic processing within a rule-based process. Despite the intuitive plausibility of such a decision-making process within a dual-process model framework, it is not conclusive in the case of moral emotions like guilt.

First, in dual-process models, decision-making is based on the applicability of rules, and changing the decision-strategy is analogous to changing the decision rule. Because different decision rules utilize different cues, the use of heuristics first reflects a change in the strategy of evaluation of outcomes and not necessarily a change in information integration. Hence, heuristics like the LEX or EBA reduce complexity of evaluative information by directing attention to a cue, e.g., a feeling. The “use” of a heuristic doesn’t necessarily reflect a change in the decision rule but a change in the information-search rule. From this would follow that people do not change their decision rule when making an intuitive decision but their information search-rule (Glöckner & Betsch, 2008a, 2008b). This is important because it suggests that people may be able to always integrate information in a compensatory fashion, but if a heuristic ignores any information suitable for compensation, then the decision itself is non-compensatory but not necessarily the decision-making process.

Second, different decision rules can produce similar outcomes and the very same rule can produce different outcomes. In moral psychology, a classical distinction is made between “deontological” and “consequentialist” decisions: whereas deontological decisions are based on the evaluation of an action (e.g., “thou shalt not *steal*”,

Alexander & Moore, 2008), consequentialist decisions are based the evaluation of on an outcome (like economic decisions, Sinnott-Armstrong, 2008). When people cooperate (e.g., by making an equal split) after a guilt induction task, it is not possible to infer if guilt influenced the decision to cooperate by using feelings of guilt as a cue for negative long term outcomes, as expected by consequentialist decision models, or if people applied a fairness-rule, because both would lead to cooperation. In contrast, the same decision rule can lead to different outcomes. For instance, the affect-as-information framework suggests that people use their feelings as an experiential cue for judgment and decision, reflecting the application of the LEX. If people only use their affective feelings, theoretically they can attribute it to any outcome, which can be described as a one-to-many problem (cf. Pfister & Böhm, 2008). Hence, the appliance of the LEX-heuristic with an affective cue would lack precision in predicting the choice of a person.

Third, another problem, especially in the case of real emotional influences, is that emotion-elicitation and decision-making are considered to be experienced as different situations and hence both processes need to communicate via an interface: the influence of the emotion-elicitation task is considered to be based on the use of a conscious feeling. This is problematic if the emotion-elicitation task itself creates action-tendencies *and* subjective feelings, as assumed by some appraisal theorists (e.g., Frijda, 1986), because it is unclear if affect or emotional experience is a necessary or sufficient information for the decision process. For instance, when people complete an autobiographical guilt priming task, they normally report a “moral transgression” (e.g., Tangney, 1992). If moral transgressions are commonly violations of reciprocal altruism (Cosmides & Tooby, 2000; Tooby & Cosmides, 2008), then the priming task itself may lead to the decision to cooperate without the need to use the affective feeling as a cue for the evaluation of outcomes in a rule-based decision-making process. Hence, while postulating that decisions are based on rules how information (e.g., cues) is integrated, dual-process models of decision-making

neglect the possibility that the process that creates the experiential cue can also make a decision.

Fourth, it is evolutionarily implausible that cooperative decisions are made by using non-compensatory decision rules, because this would make cooperation extremely exploitable and hence reduce long term survival fitness of cooperators *and* freeriders. If a decision maker uses feelings of guilt in a non-compensatory fashion in social situations, then freeriders can utilize these feelings to provoke cooperation which would lead to a reduction of fitness and to an extinction of cooperators. Since freeriders do not cooperate, having no one to exploit would necessarily also lead to an extinction of freeriders. Hence, to make cooperation an evolutionary stable strategy, cooperation needs to be valued and freeriding needs to be punished (Fehr & Gächter, 2002; Gintis, Bowles, Boyd, & Fehr, 2003; Stevens & Hauser, 2004). If guilt-feelings influenced cooperative decision-making in a non-compensatory fashion, then cooperators cannot rationalize (or justify) guilt appeals by freeriders and hence would cooperate to compensate for guilt-inducing past transgressions.

To summarize, there are, at least, four points of criticism of intuitive decision-making based on non-compensatory, heuristic decision rules. First, it is unclear if people use different decision rules or if they use different information search rules. Second, the same decision rule can lead to different outcomes and different decision rules can produce equal outcomes. Third, distinguishing emotion-elicitation from decision-making is problematic because it neglects the possibility that the emotion-elicitation task itself calculates a decision. Fourth, the use of non-compensatory decision rules would increase the probability of exploitation and is evolutionarily implausible.

In the remainder of the chapter I will describe an alternative view of emotions as situated, constructive structures which process information in a compensatory fashion based on principles of parallel constraint satisfaction (PCS). First, I will describe how the same PCS-process can calculate both emotional experience and

decisions and relate it to moral judgment and decision-making.

1.3.3 Intuitive emotional decision-making

While discussing different modes of intuitive information processing, Glöckner and Witteman (2010) raised the possibility that “information is not only accumulated, retrieved from memory, and matched to exemplars, but that people construct mental representations based on information provided and further relevant information that is activated in memory” that go “beyond existing information in forming new consistent interpretations and possibly also in combining elements creatively in new ways” (p.11). Hence, the activated information is assumed to form an emergent *gestalt* which is experienced as a holistic evaluation of the whole situation instead of evaluations of parts of it (e.g., stimuli or action-consequences).

Constructive intuitions based on parallel constraint satisfaction processing

Constructive intuitions underlie the assumption that people are able to use compensatory decision rules in an automatic fashion and decision rules actually change the information that is utilized by compensatory decision-processes (e.g., Glöckner & Betsch, 2008a). Constructive intuitions are assumed to be based on principles of connectionism and parallel constraint satisfaction (Glöckner & Witteman, 2010).

In connectionist networks, information is organized in nodes which are functionally related by excitatory (feed-forward) and inhibitory (feedback) links (McClelland & Rumelhart, 1986; Read, Vanman, & Miller, 1997). Because of this interrelation, changing the activation of one node changes the activation of all other connected nodes via activation/inhibition-rules. Information processing is parallel and “stops” when the multiple interrelations of the nodes are satisfied and the network is in a stable state again.

In other words: connectionist networks that apply parallel constraint satisfaction

principles are functional models of how information is related to each other which enables them to process information due to gestalt-principles (Read et al., 1997; D. Simon & Holyoak, 2002). Hence, in these models information is “evaluated” on a holistic basis and provide *one* solution (or gestalt) which is based on the situational information but goes beyond the information given. Furthermore, parallel constraint satisfaction (PCS) processing is compensatory because it *balances* information.

Constructive emotion-elicitation and moral (self-)judgments

Connectionist modeling was applied to many information-processing problems in psychology, e.g., impression formation (Thagard, 1989; Thagard & Kunda, 1998), decision-making (Barnes & Thagard, 1996; Thagard & Millgram, 1995), but also to emotion-elicitation/-experience and -regulation (Barrett, 2006; Barrett, Ochsner, & Gross, 2007; Gross & Barrett, 2011; Nerb, 2007; Thagard & Nerb, 2002). A blueprint of a constructionist emotion-elicitation model which builds on parallel constraint satisfaction principles is the conceptual act model of emotion, which I will now explain in closer detail.

Partially drawing on Russell’s (2003) model of core-affect, the conceptual act model (Barrett, 2006; Barrett, Ochsner, & Gross, 2007) assumes that emotional experience is formed by a highly dynamic and holistic process in which information constrains itself until it forms a meaningful gestalt. Emotional experience is formed by two factors: core-affect and categorization. Core-affect is defined as an ever-changing neurophysiological state which can be foregrounded in consciousness by a process of categorization that assigns meaning by combining core-affect with external perceptions and internal conceptual (emotional) knowledge.

These two factors basic to emotional experience are assumed to mutually constrain each other. Hence, core-affect is categorized by the use of conceptual knowledge but the categorization process may also change the meaning of a situation and then

change core-affect⁷. This process of creating emotional experience is considered to be similar to the perception of color. Color perception is influenced by situational information as well as the previously acquired conceptual knowledge. The wavelength of light is continuous, but nevertheless light is perceived in distinct categories of color, based on acquired conceptual knowledge. According to Barrett, Ochsner, and Gross (2007), the same happens when people “feel” an emotion: conceptual knowledge is bounded to the perception of a change in core-affect by a process describable in terms of PCS, i.e. knowledge and core-affect mutually constrain each other and shape the information into the meaningful experience of emotion that humans perceive in all of its informational richness.

Because parts of the emotional categorization process may not be accessible to consciousness⁸, people *feel to have an emotion*, immediately and automatically (cf. Barrett, Ochsner, & Gross, 2007). The use of emotional words then is similar to a categorial judgment of how well the current experience coheres with a semantic emotional category (e.g., categorization of an exemplar according to similarity with other stored exemplars, cf. E. R. Smith & Zaraté, 1992). This PCS process may also apply to moral intuitions which are based on emotional experiences like feelings of guilt or disgust.

The analogy of emotion and perception is also inherent to sentimentalist approaches of moral judgment (cf. Haidt, 2002). For instance, sentimentalist approaches assume that making a moral judgment is similar to making an aesthetic judgment, i.e. people judge the “moral beauty” of an action holistically and based

⁷The idea of emotional appraisal as an unstable, fluctuating and dynamic process is not exclusive to the conceptual act model but also incorporated in some appraisal models of emotion (e.g., Scherer, 1993; C. A. Smith & Kirby, 2000; Reisenzein, 2001). However this fact is sometimes neglected presumably because “empirical research on appraisal typically tests the ”static“ structure or content of appraisal using a series of questions that need to be evaluated” (Nerb, 2007, p. 1386).

⁸Technically speaking, parallel processing of information should always lack conscious monitoring because this would presuppose that people can divide attention to many different processes at the same time. Hence, people may be able to monitor a part of the process to which they attend to but other processes that run at the same time may be ignored.

on an immediate feeling of approval and disapproval (Haidt, 2001, 2002). This process is similar to emotion-elicitation in constructionist approaches to emotion like Barrett's PCS model: people can perceive changes in affective feeling state which then is combined with external perception and internal knowledge to form a holistic evaluation of a situation. For instance, if the situation provides the information that one has harmed someone and the internal information that harming another person is immoral, then one might perceive a shift in core-affect that may be categorized as "guilt", but actually the combination of these three sources of information *implies* that one is an immoral person. Hence, the experience of guilt is then functionally analog to a moral self-judgment. This information is not necessarily inherent to the situationally accessible information but is the implication of the constellation of information. If applying a PCS approach, the process of emotion-elicitation is functionally equivalent to making a moral judgment since the moral judgment is the implication or gestalt of the emotion-elicitation process.

Constructive emotion-elicitation and decision-making

In the previous section, I discussed that people seem to use emotional experience as evaluative information in decision-making. Following the logic of emotional constraint satisfaction processing, emotional experience is a gestalt or an *implication* which is based on the constraints of accessible information, e.g., the functional interrelation of affect, situational available information as well as memories.

Appraisal approaches of emotion-elicitation assume that emotional experience is based on an evaluation of a stimulus with reference to a goal (i.e. a reference-value, e.g., Arnold, 1960; Frijda, 1986; Lazarus, 1966; Leventhal & Scherer, 1987; Ortony, Clore, & Collins, 1988; Scherer, 1984, for current reviews, see Moors, 2009, 2010). Traditional, consequentialist approaches of decision-making assume that people can utilize emotional experience as experiential cues for decision-making that indicate a discrepancy between a stimulus and a goal. Hence, the goal is considered to evaluate

the stimulus, which can be considered as “wishful thinking”, because the evaluation of the stimulus reflects the extent to which the stimulus coheres to the goal.

From a PCS vantage point, evaluations are not uni-directional but always bi-directional, hence people can also judge a goal with reference to a stimulus which can be considered as “rationalization”, because the evaluation of the goal reflects the extent to which a goal coheres to a stimulus (for a conceptually similar distinction, see McGuire, 1999).

If the stimulus is an action, then a goal is not necessarily evaluating an action but the action may also evaluate the goal. Since the emotion appraisal is considered to incorporate a goal representation, the emotion appraisal process can be used to order goals for importance (rationalization) and make a decision based on coherence (Barnes & Thagard, 1996; Thagard & Millgram, 1995). Hence, processes that evaluate outcomes can also be used to evaluate actions or goals and thus can give clear action-recommendations which relate to broad categories of actions instead of specific outcomes. For instance, imagine facing a decision situation in which you play with a game partner and you can donate between 0 and 10 tokens. Using LEX, you may ask yourself 11 times: how do I feel about the outcome. If you perceive being cooperative more important than being selfish and cooperation is defined as an equal split, then the re-ordering of both goals “chooses” to donate 5. Hence, in the case of guilt and cooperation, the emotional appraisal process of guilt can provide a clear action-recommendation to cooperate by only one step of information processing.

Evaluating goals by (past) actions instead of evaluating outcomes according to goals dramatically simplifies decision-making because it excludes whole categories of decision-options (e.g., all options that do not reflect cooperation)⁹. From this

⁹Note that this process is similar to the application of the EBA. However, EBA is a non-compensatory strategy to make decisions whereas, from a constraint satisfaction position, the “decision rule” is always compensatory but restricted by situational information. In this case, EBA is an information-search strategy, not a decision rule.

vantage point, the emotional appraisal process creates the decision and also the subjective feeling. In contrast to traditional decision-models, the subjective feeling may be sufficient for decision-making, but not necessary.

Summary

To summarize, constraint-satisfaction approaches were fruitfully applied to emotional experience and decision-making. According to Glöckner and Witteman (2010), information processing that follows PCS principles can account for intuitive decision-making. Above, I outlined how the same mechanism can integrate both affective information and conceptual knowledge and is able to form emotional experience *and* a clear action recommendation by ordering goals according to importance. Hence, processing of situationally available information can lead to emotional experience, i.e. a *subjective* evaluation of situation by the person, as well as an action tendency, i.e. the *objective* evaluation of the situation related to necessary action.

Traditional decision-making models treat intuitive decision-making as the application of a decision rule that is based on “intuitive” information, e.g., automatic evaluations. In these models, emotional experiences *influence* decisions by providing experiential cues that simplify decision-making (Pfister & Böhm, 2008), e.g., if people are not able (or motivated) to use a compensatory decision rule (like the WADD). Hence, the process of decision-making is actually based on a decision rule but the information for the evaluation of decision-options can be experiential or “intuitive” information. In contrast, PCS approaches assume that people are always able to use a compensatory strategy on an automatic basis and the appliance of “heuristics” are actually changes in the strategy of information-search (e.g., Glöckner & Betsch, 2008a). Hence, whereas traditional approaches assume that people can use intuitions to simplifying decision-making, PCS approaches assume that people can make *intuitive decisions*.

Aim of my dissertation is to examine if the guilt-cooperation link can alternatively

be explained by constructive intuitive information processing based on PCS. In the next chapter, I will contrast decision-making based on emotions with emotional decision-making.

2 Implementation of emotional decision-making

Traditional, consequentialist decision-making approaches assume that people use compensatory decision-making strategies when being able and motivated, but are also able to use “heuristics”, or simple rule of thumbs. Heuristics substitute the calculation of a cue with a situationally available cue, e.g., people use their immediate affective reaction towards a stimulus or a situation as valid and trustworthy information about value. Hence, people can simplify their decisions by using heuristic cues, because the cues may be situationally salient and hence do not need to be computed.

Naturally, consequentialist decision-making approaches focus on *how* people make decisions, hence how people use information to reach a conclusion. Decision rules describe how this information is used, e.g when using the WADD, people are expected to calculate utility by two different parts of information: expectancy and value. Hence, consequentialist decision-making is inherently rule-based, because the rules determine the information people utilize when choosing between options. However, these approaches ignore how the used information is processed and hence leave open the possibility that the process that calculates the decision-cues¹ may also calculate the decision.

In consequentialist decision-making approaches, when making heuristic decisions,

¹which is typically ignored if not part of the decision rule

people utilize emotional experience (or parts of it, e.g. conceptual knowledge or the affective feeling, cf. Pfister & Böhm, 2008) as information about the value of an outcome based on the decision criteria. Since people ignore other relevant information (e.g., outcome expectancy), heuristic decision-making is non-compensatory, because one part of the information cannot compensate another part (e.g., value cannot compensate for expectancy). In the remainder, I will use the term “information approaches” for decision-making that utilize emotional experiences in a rule-based fashion.

In contrast to consequentialist decision-making approaches, PCS models can *integrate* both decision-making and calculation of emotional (or intuitive) cues within one process. Hence, PCS-processing reflects the use of a compensatory information processing strategy (e.g., like using WADD in decision-making), but is *intuitive* because information processing is considered to be parallel and hence people may neither be aware of how information is processed nor be aware of all parts of information that enter information processing (Glöckner & Witteman, 2010). Because PCS information processing integrates information from different sources simultaneously (and thus is a constructive process, cf. Ferguson & Bargh, 2003), I will use the term “constructionist approaches” for PCS information processing.

The main difference between informational (heuristic) and constructionist (PCS) approaches is that informational approaches focus on the decision-making process whereas constructionist approaches focus on the process that calculates the cues used in heuristic decision-making, i.e. emotional experience. Hence, informational approaches explain which cues people use for evaluation and decision-making (e.g., immediate feelings of guilt) and assume two different and even unrelated processes (one process that elicits emotional experience or the decision-cue, e.g., guilt, and one process that “uses” the cue to make a decision). Constructionist approaches explain how people utilize situational information to calculate cues *and* decisions within one process.

To show that the decision to cooperate following guilt is actually based on constructionist (PCS) information processing bears some challenges.

First, both informational and constructionist approaches would predict that the experience of guilt increases cooperation. Hence, showing that emotional experience is based on constructionist information processing (as assumed by Barrett, 2006) does not necessarily exclude the possibility that people use their feelings of guilt as information to cooperate in a heuristic fashion. However, if people use a constructionist or informational decision strategy can be disentangled on a functional (or computational) level of analysis (Marr, 1982).

Information processing is problem solving, and processes solve problems based on their structure. To show the structure² of a problem-solving device, it is necessary to know *what* the problem is and to know *why* the process solves this problem and not another one (Cosmides & Tooby, 1994; Marr, 1982). According to Marr (1982), how a process solves a problem “depends more upon the computational problems that have to be solved than upon the particular hardware in which their solutions are implemented” (p. 27). In other words: form follows from function, or “knowing what and why places strong constraints on theories of how” (Cosmides & Tooby, 1994, p. 46).

If people use a constructionist or an informational processing strategy in guilt and cooperation hence depends on the processing problem and why it needs to be solved. In the theoretical part, I distinguished two different approaches to guilt: an intrapersonal approach and an interpersonal approach. From an intrapersonal approach, people experience guilt as the result of having violated an important norm (e.g., Higgins, 1987; Tangney, 1992), and people may cooperate to get rid of their feelings of guilt (compliance after transgression, e.g., Cialdini, Darby, & Vincent, 1973). From an intrapersonal vantage point, why people cooperate when feeling guilty may depend on the motivation to get relief from a negative feeling state. Or

²i.e. *how* it works

in other words: people cooperate in order to eliminate personal distress, which is may be considered as a *goal* to regulate emotional experience (cf. Tice, Bratslavsky, & Baumeister, 2001).

In contrast, the interpersonal approach postulates that guilt is inevitably linked to others, and committing moral transgressions threatens social bonds (Baumeister et al., 1994). Hence, people may cooperate because cooperation reduces threat of altruistic punishment. Why people may feel threatened depends on the fact that guilt has its evolutionary basis in violations of reciprocal altruism (Cosmides & Tooby, 2004; Tooby & Cosmides, 1990, 2008). In (biological) systems, cooperation can only prevail if it increases the overall fitness of the agents (Hamilton, 1964; Trivers, 1971). To make cooperation an evolutionarily stable strategy³, agents have to use conditional strategies for cooperation (Fehr & Gächter, 2002; Gintis et al., 2003; Stevens & Hauser, 2004; Trivers, 1971), i.e. to cooperate with agents that cooperate (reciprocal altruism) and to refuse cooperation and/or *punish* agents that do not cooperate (altruistic punishment). Humans seem to be quite good at detecting cheaters (Cosmides, Tooby, Fiddick, & Bryant, 2005; Ermer, Cosmides, & Tooby, 2007) which makes non-cooperation costly because the probability of being punished may be remarkably high. Selfish behavior thus may impose an immediate threat of being (altruistically) punished, either by the refusal of interaction (ostracism, cf. Ouwerkerk, Kerr, Gallucci, & Van Lange, 2005) or by refusing others future benefits (reciprocal defection, i.e. tit-for-tat, see Axelrod & Hamilton, 1981; Fehr & Gächter, 2002).

According to Marr (1982), how information is processed depends on the problem the process has to solve. From an intrapersonal vantage point, the problem may be that people experience guilt as personal distress and a negative affective feeling state. Cooperation hence would be a mean to reduce personal distress if cooperation leads

³An evolutionarily stable strategy is a decision-rule that is better or equal to other strategies in increasing overall fitness (Maynard Smith & Price, 1973)

to a better mood. If people use cooperation for *emotion-regulation* purposes (e.g., situation modification, cf. Gross & Thompson, 2007), then other emotion-regulation tasks should be potent to decrease feelings of guilt. Since reducing feelings of guilt by emotion-regulation would decrease its informational value for decision-making, the effectiveness of emotion-regulation tasks in reducing guilt would be an indicator for the informational use of emotional experience in decision-making.

From an interpersonal vantage point however, the problem is that failures to reciprocal altruism result in altruistic punishment by others, hence feelings of guilt pose a threat of punishment. From this follows that cooperation would be a mean to signal the willingness to engage in reciprocal altruism in order to prevent (altruistic) punishment by others, and is further aimed on defending or repairing the person's moral reputation (i.e. the frequency of the person's past cooperation, cf. Stevens & Hauser, 2004).

However, if the personal reputation is threatened should also depend on the frequency of cooperation by others: If others do not cooperate, then people do not have to fear punishment. If people cooperate to reduce threat, then they first have to check if the situation actually *is* threatening by comparing their moral reputation with the reputation of others, because otherwise others would be able to exploit the person by using guilt-appeals (cf. O'Keefe, 2000; O'Keefe, 2002).

Comparing the personal moral reputation to the reputation of others is necessarily a compensatory process, since people can compensate for own transgressions by, e.g., the reminiscence of transgressions of others by rationalization of justification. Hence, an influence of the moral reputation (own and others) on cooperative choices following guilt would be an indicator for a constructionist and compensatory information process.

However, the use of a compensatory information processing strategy in cooperative decision-making is not necessarily an indicator for an "intuitive" use of this strategy, because compensatory information processing is commonly linked to (effortful) rule-

based processing in dual-process models of decision-making⁴. To show that people use this information processing strategy on an intuitive basis, it is necessary to show that people are not aware of using this “decision-rule”. Hence, it is necessary to show that the same process that computes emotional experience (the emotion-appraisal, commonly considered to be automatic or unconscious, Barrett, Ochsner, & Gross, 2007) “intuitively” computes the decision based on a constructionist PCS information process.

I used cognitive dissonance theory (E. Aronson, 1968; Cooper & Fazio, 1984; Festinger, 1957; Harmon-Jones & Harmon-Jones, 2002; Steele, 1988; Stone & Cooper, 2001) as a proxy for guilt and cooperation based on PCS processing.

In its original form (Festinger, 1957), dissonance theory was conceptualized as a consistency theory, and consistency theories can be modeled by PCS information processing principles (Read et al., 1997; Shultz & Lepper, 1996; D. Simon & Holyoak, 2002). Furthermore, later revisions linked the experience of dissonance explicitly to moral transgressions and guilt (e.g., E. Aronson, 1968; Cooper & Fazio, 1984; Steele, 1988), hence cognitive dissonance theory can help to identify under which conditions people should experience and reduce feelings of guilt. Finally, the action-based revision of cognitive dissonance theory (Harmon-Jones & Harmon-Jones, 2002, 2007; Harmon-Jones, Amodio, & Harmon-Jones, 2009) linked the experience of dissonance to inconsistency of action-tendencies which can explain how people make decisions based on coherence, analogous to PCS approach of decision-making (e.g., Barnes & Thagard, 1996; Thagard & Millgram, 1995).

⁴Compensatory information processing can be regarded as the use of the WADD

2.1 Dissonance theory as a proxy for PCS-processing in guilt and cooperation

In the theoretical part, I described how the same process that elicits emotional experience may also be able to make decisions based on PCS information processing. Since this process can be understood as the emotional appraisal (or situation-analysis), I will now describe guilt arousal and decision-making in terms of dissonance theory. However, first I will relate dissonance theory to PCS information processing.

2.1.1 Cognitive consistency and PCS information processing

Emotion theories based on PCS-processing (e.g., Barrett, Ochsner, & Gross, 2007) assume that incoherent information creates a shift in core-affect. Core-affect and other situationally salient information then together form the experience of an emotion (Barrett, 2006; Barrett, Ochsner, & Gross, 2007; Wilson-Mendenhall, Barrett, Simmons, & Barsalou, 2011). This assumption is similar to how feelings of dissonance are aroused in the original formulation of dissonance theory.

Festinger (1957) postulated that inconsistent cognitions, e.g., attitudes, beliefs, values, feelings about oneself, others, the environment or behavior, create an aversive experiential state of “dissonance”. According to Festinger’s original formulation, “persons are motivated by the unpleasant state of dissonance to engage in ”psychological work“ to reduce the inconsistency, and this work will typically support the cognition most resistant to change” (Harmon-Jones & Harmon-Jones, 2007, p.7). The magnitude of dissonance in relation to a focal (= generative) cognition depends on the ratio of dissonant as well as consonant cognitions towards the focal cognition (amount of dissonance = sum dissonant cognitions / (sum dissonant + sum consonant cognitions). Each cognition is weighted for importance. Dissonance can be

removed by either adding consonant cognitions, removing dissonant cognitions, or decreasing the importance of dissonant cognitions (or increasing the importance of consonant cognitions, i.e. prioritization). Changing cognitions takes the path of least resistance, the reduction process changes that cognitions people feel least committed to or are least important, respectively (Brehm & Cohen, 1962). The motivation to reduce dissonant cognitions is due the aversive feeling of dissonance, conceptualized as arousal (Brehm & Cohen, 1962) or negative affect (Elliot & Devine, 1994; Festinger, 1957).

In its original formulation, cognitive dissonance theory was conceptualized as a consistency theory. Inherent to consistency theories is that information processing is dynamic, settles at a state of consonance and the informational content of a representation is not only based on its elements but also how the elements are related, forming a unique “gestalt” (cf. D. Simon, Snow, & Read, 2004).

Parallel constraint satisfaction processing make the same predictions (for a brief description of PCS-processing, see chapter 1.3.3, on page 20), which makes it possible to implement cognitive dissonance theory in connectionist networks based on PCS processing (Read et al., 1997; D. Simon & Holyoak, 2002; Shultz & Lepper, 1996). Hence, cognitive dissonance theory may serve as a psychologically plausible alternative for a PCS processing structure, since consistency versions of dissonance (E. Aronson, 1968; Festinger, 1957; Harmon-Jones & Harmon-Jones, 2002) should process information according to PCS-principles.

2.1.2 Cognitive dissonance theory and the experience of guilt

People experience guilt when they have the perception of having committed a moral transgression (e.g., Haidt, 2003; Tangney, 1992), i.e. people experience their behavior being deviant from a personal standard or a norm of the society. The experience of guilt can be explained by self-defense revisions (self-consistency theory, E. Aron-

son, 1968; Thibodeau & Aronson, 1992, and self-affirmation theory, Sherman & Cohen, 2006; Steele, 1988) as well as the aversive consequences revision (Cooper & Fazio, 1984) of cognitive dissonance theory.

Aronson's (1968; 1992) self-consistency revision assumes that people strive for (1) a stable, consistent and predictable self-concept, (2) want to be *competent* and (3) *morally good*. Dissonance is aroused when people show behavior that (1) astonishes them (e.g., is logically inconsistent), (2) makes them feel *stupid* (incompetence) or (3) makes them feel *guilty* (immorality). In other words: Since people hold standards for their behavior that are, by and large, consistent with conventional morality and prevailing standards of society, dissonance is aroused when people perceive a discrepancy between a self-standard and their behavior, e.g., when they perceive an action as stupid or immoral. Whereas self-consistency theory is based on the original formulation of cognitive dissonance being the result of cognitive inconsistency, later revisions rejected the notion of consistency and coherence in the explanation of dissonance-effects.

Another revision related to self-defense is self-affirmation theory (Sherman & Cohen, 2006; Steele, 1988). Just like self-consistency theory, self-affirmation theory emphasize the centrality of competence and morality for the self. In contrast to self-consistency theory however, self-affirmation theory assumes that dissonance is aroused when people experience a threat to self-integrity, i.e. their personal *perception* of being a moral and competent person. Reestablishment of integrity (i.e. an analogous process to reestablishing consistency) can be achieved by bringing to mind positive cognitions about the self. In contrast to consistency-based approaches, integrity can be re-established by *any* positive information, i.e. also positive information about the self unrelated to the threat.

Whereas both self-consistency as well as self-affirmation assume that the arousal of feeling of dissonance is based on a discrepancy to a personal standard of morality and/or competence, the aversive consequences model (or "new look") of dissonance

(Cooper & Fazio, 1984) assumes that the violation of social norms lead to feelings of dissonance. In other words, perceiving responsibility of having harmed another person leads to feelings of discomfort. The aversive consequences revision is the closest to the concept of guilt because it assumes that the aversive feeling of dissonance is due to the violation of social norms, i.e. actions which reliably lead to feelings of guilt (e.g., Tangney, 1992). From this vantage-point, despite not explicitly mentioned, dissonance is an instance of guilt which is due to behavior discrepant to a social norm (or moral standard). Hence, cognitive dissonance theory may be related to the arousal and elimination of feelings of guilt.

To summarize, both self-defense revisions as well as the aversive consequence model would predict that the violation of personal expectancies or the expectancies of others regarding morality leads to feelings of guilt. However, the revisions differ with respect to dissonance-reduction or affect-regulation. Self-consistency theory would assume that people can reduce dissonance (and guilt) if they either act in line with their moral standards or adjust their moral standards to their behavior (i.e. make both consistent, rationalization of reference-values). Self-affirmation theory would assume that people reduce dissonance (and guilt) by self-affirmation which may be related to the moral transgression, but does not necessarily need to. The aversive consequences model would assume that people can reduce dissonance and threat by obscuring responsibility of having done something harmful. In a nutshell, dissonance reduction according to the self-defense revisions is to reduce *blame*, in the aversive consequences model it is to reduce blame by obscuring *agency* (if no agency, then no blame).

2.1.3 Cognitive dissonance theory and decision-making by increasing coherence

In the theoretical part I outlined how people can make decisions by increasing consistency or *coherence* of information (Barnes & Thagard, 1996; Thagard & Millgram, 1995). Please note that I use the terms consistency and coherence interchangeably, since coherence of information means that it is related to each other, hence consistency is the strongest form of coherence. Consistency-based models of dissonance (E. Aronson, 1968; Festinger, 1957) postulate that dissonance arousal and reduction is due to the incoherence of cognitions. However, what makes cognitions inconsistent (or incoherent)?

Eddie Harmon-Jones and colleagues (Harmon-Jones & Harmon-Jones, 2002, 2007; Harmon-Jones et al., 2009) provided a clever solution to this problem by postulating that feelings of dissonance are aroused because cognitions are associated with action tendencies, and opposing action tendencies create a response conflict and prevent unconflicted action. Hence, cognitions are inconsistent if they lead to a behavioral approach/avoidance conflict. For instance, the perception of having violated a moral reference may be accompanied by action tendencies provided by the moral reference (e.g., avoidance of harming others) but also of the behavior which is compared to the reference value (e.g., approach of increasing personal gains). Or simpler: the reminiscence of a moral transgression related to fairness may be accompanied by cooperative as well as uncooperative action tendencies when people anticipate different outcomes related to cooperation or selfishness.

In line with this assumption, Amodio, Shah, Sigelman, Brazy, and Harmon-Jones (2004) found that the disconfirmation of self-beliefs is accompanied by feelings of dissonance as well as the activation of the anterior-cingulate cortex, a structure commonly linked to action- (or response-) conflict (cf. Amodio & Ratner, in press). In contrast to other consistency-models of dissonance, the action-based model provides

a simple reason for why inconsistency feels bad and motivates to increase consistency: inconsistency would otherwise block behavior and slow down information processing.

Inconsistency of action tendencies can be decreased by adding cognitions that provide action tendencies *consistent* with one or the other direction of behavior. Hence, adding cognitions can lead to a *coherence-shift* because additional information may be more coherent with one than the other information on the basis of its action-tendencies. Testing the behavioral implications of the action-based model of dissonance, Harmon-Jones, Peterson, and Vaughn (2003) found that people increase helping a person for whom they felt sympathy if they were reminded that they have not helped similar persons in the past. According to the authors, this depends on altruistic action tendencies that accompany feelings of sympathy towards a suffering person. Reminders of having failed to help similar persons are expected to provide opposing action tendencies which lead to a conflict. According to consistency-based approaches of dissonance, dissonance-reduction then follows the cognition that is easiest to change. If feelings of sympathy are more resistant to change than helping behavior, people change their behavior in order to remove the approach/avoidance conflict. Thus, people are expected to help if they feel high sympathy for a suffering person, and this is exactly what Harmon-Jones and colleagues found.

From this follows that incoherence of information on the basis of conflicting action tendencies can only be removed by information which provide action tendencies that lead to a coherence shift, i.e. that disambiguates the conflicting action tendencies. Since action tendencies may be either unconscious (or operate at the fringe of consciousness), the conflict may have to be evaluated by more conscious information processing. The negative feeling of dissonance thus may be interpreted by salient knowledge, which is analogous to the categorization process of core-affect in constructive emotion models like the conceptual act model (Barrett, 2006; Barrett, Ochsner, & Gross, 2007). Or in other words: not having helped a suffering person

may induce a conflict in action tendencies that is perceived as a change in core-affect, and if the change in core-affect is categorized with reference to helping behavior, it is perceived as a self-threat.

To summarize, following consistency theories, inconsistent cognitions are due to a response conflict that leads to a negative feeling and can only be solved if information processing leads to a coherence-shift in conflicting action-tendencies. Hence, this process is analogous to the assumption that information inconsistent with a reference (or “goal”) creates a shift in core-affect, as assumed by the conceptual act model (Barrett, 2006). Furthermore, it is consistent with the assumption that people make decisions by rearrangement of actions and goals by increasing coherence between options, as assumed by PCS approaches to decision-making (Barnes & Thagard, 1996; D. Simon & Holyoak, 2002; Thagard & Millgram, 1995)

2.2 Decision-making based on emotional experience vs. emotional decision-making

In the previous section, I outlined how cognitive dissonance theory and its revisions can serve as a proxy for the emotional appraisal process of guilt as well as make predictions how people should be able to reduce feeling of guilt. Furthermore, based on its heritage of being a consistency theory, cognitive dissonance theory can serve as a proxy for PCS processing because both cognitive dissonance and PCS processing follows consistency principles, i.e. information is processed based on coherence and forms a unique temporal gestalt. Dissonance theory can also predict decision-making based on coherence, as outlined in the action-based model: aversive feelings of dissonance are aroused when people experience conflicting action tendencies, and people hence need to increase coherence to one or another action-tendency to remove the conflict. This removal-process can be regarded as decision-making based

on coherence (cf. Barnes & Thagard, 1996; Thagard & Millgram, 1995).

Together, decision-making based on emotions differ from emotional decision-making on several dimensions which help to disentangle if people use feelings of guilt as an outcome-evaluation in a rule-based, consequentialist decision-making process (informational approaches) or if they use the emotional appraisal-process of guilt as a decision-making device (constructionist approaches).

Since both the informational as well as the constructionist approach assume that the experience of guilt increases cooperation, to examine what decision strategy people use, it is necessary to propose conditions under which both approaches make different predictions about cooperation. Informational and constructionist approaches make different predictions on at least three dimensions: the number of involved processes, how people decide to cooperate and the reason why people cooperate when experiencing guilt.

2.2.1 One process or two processes?

First, both approaches differ with respect to the assumed structure of information processing and thus the number of involved processes. Informational accounts assume that the process of decision-making is separate from the process of elicitation of emotional experience because emotional experience is regarded as information about outcome-utility. Since emotional experience is the only dimension of evaluation, the decision-making process is non-compensatory because people ignore information that may compensate for e.g., low utility based on emotional experience. For instance, when people evaluate outcomes regarding guilt⁵, they may ignore all other information that may compensate for guilt. In contrast, constructionist approaches assume that the process of decision-making and the process of emotion-elicitation are the same. Since the elicitation of emotional experience can be explained by PCS-processing (Barrett, Ochsner, & Gross, 2007) and PCS-processing is a com-

⁵e.g., by asking themselves “Would I feel guilty about that?”

pensatory multi-input process (Read et al., 1997; D. Simon & Holyoak, 2002), then decision-making is also due to compensatory information processing, because both experience and decisions are two different outputs of the same process.

In other words: informational accounts treat emotional experience as information for rule-based decision-making and assume *two* unrelated information *processes* (emotion-elicitation and decision-making). Hence, how emotional experience is calculated is not in the focus of interest. Constructionist approaches assume that both experience and decisions are *two* different *outputs* of the same process. Since emotion-elicitation can be based on a constructionist, compensatory information processing (Lindquist & Barrett, 2008; Moors, 2010; Niedenthal et al., 2005; Wilson-Mendenhall et al., 2011), the decision itself then is, compulsorily, also based on compensatory information processing.

To summarize, constructionist approaches assume *one* process with *two* different outputs (emotional experience and decision) and informational approaches assume *two* different processes in which the decision-process “uses” the output of the emotion-elicitation process as input (i.e. emotion-elicitation leads to emotional experience, rule-based decision-making utilizes emotional experience).

2.2.2 Decision-making based on coherence

Second, both approaches assume different principles of how people make decisions. Informational accounts assume that people use a decision-rule when having to choose between options. If people use emotional experience of guilt as a cue for the utility of an outcome, then one may expect that people choose an outcome that leads to least guilt. From a constructionist perspective however, what leads to least guilt is the option that increases coherence of information related to cooperation. In other words, informational approaches assume that people choose the best option on the dimension they use for evaluation (e.g., how much guilt an option elicits).

Constructionist approaches assume that people chose options that increase the coherence of incoherent information. Hence, the best decision is to choose the option that increases coherence. If incoherence is based on contradictory action-tendencies, then people should choose the option that increases coherence of action-tendencies. To summarize, in informational approaches the decision is based on the evaluative dimension of action-outcomes. In constructionist approaches, the decision is based on the dimension responsible for incoherence (i.e. action-tendency).

2.2.3 Cooperation aims on reducing self-threat

Third, both approaches differ in their assumptions about *why* people cooperate when feeling guilty. According to Marr (1982), information processing is problem solving and processes solve problems by their structure. From this follows that different problems call for different problem solving structures, thus what structure people use is linked to the problem that is needed to be solved.

In evolution, cooperation is a general problem because cooperation is costly for the individual (Hamilton, 1964; Trivers, 1971). In psychology, two different reasons for cooperation following non-cooperation are subject to conjecture: first, since guilt feels bad, people may cooperate because they want to feel better. Second, feelings of guilt result from a violation of reciprocal altruism and people have to fear (altruistic) punishment by others. Hence, people may not simply cooperate because they want to feel better (proximal reason) but cooperate because they want to prevent punishment (distal reason). From this follows that people cooperate either to reduce personal distress or to prevent punishment by others. In other words, people are either motivated to regulate personal emotions or to regulate social relations.

To summarize, both approaches also differ in their assumption about the influence of emotion-regulation tasks. Because in informational approaches, emotional experience is used but not necessarily generated by (heuristic) decision-making pro-

cess, emotion-regulation processes can reduce feeling of guilt. Hence, they should indirectly influence the informational impact of guilt on decision-making, because if people do not feel guilt any longer, then they shouldn't be able to use it for decision-making. In contrast, from a constructionist perspective, people cooperate in order to reduce personal threat, hence only emotion-regulation attempts capable to reduce blame by others should successfully eliminate guilt. In other words, from an informational perspective, unspecific emotion-regulation may indirectly influence cooperation by reducing the informational impact of guilt. From a constructionist perspective, emotion regulation needs to be specific in reducing blame and hence reducing threat of being punished.

2.3 Outline of the research agenda

Aim of my dissertation is to contrast decision-making based on emotions from emotional decision-making regarding guilt and cooperation. As outlined above, informational and constructionist approaches differ on at least three dimensions and thus make different predictions on these dimensions.

First, informational approaches assume two processes: one process that elicits emotional experience of guilt and one process that utilizes feelings of guilt for evaluation of outcomes in a decision process. Emotions are experienced as a reaction to something, hence people attribute their emotional experience to an outcome (Ketelaar & Clore, 1997; Schwarz & Clore, 1988). From this follows that emotion-elicitation and decision-making processes are linked by attribution-processes, because people are expected to attribute feeling of guilt to decision outcomes if the decision outcomes are known to be able to produce guilt (e.g., Hooge et al., 2007; Ketelaar & Tung Au, 2003).

From a constructionist perspective, emotional experience and decisions are two outputs of the same (constructionist) process and emotional experience is a gestalt

of core-affect and situationally activated knowledge which is incoherent but separate on a system level⁶. Hence, if cooperation following guilt is based on one or two processes can be shown by manipulating the specificity of affect-misattribution. In information-approaches, affect misattribution is restricted by applicability, hence current emotional feelings can only be attributed to sources which are known to lead to a specific emotion. For instance, feelings of guilt can only be used for outcome evaluation if people experienced feelings of guilt following a selfish choice in the past (e.g., Hooge et al., 2007). From a constructionist perspective, misattribution is actually misconstruction, because the situationally activated knowledge that is used for categorizing core-affect has changed. Since different information is related to different action-tendencies, changing the situational information also changes action-tendencies. Hence, if cooperation is based on one or two processes can be examined by the application of an unspecific misattribution task placed between the guilt-elicitation task and the decision task. If people use their specific experience of guilt, such a task should have no influence on cooperative decisions if it provides information not applicable to guilt. If however cooperative decision-making is based on one process that follows PCS processing principles, then an unspecific misattribution task should decrease cooperation, because people reconstruct the situation with different information unrelated to guilt and cooperation.

Second, informational approaches assume that decision-making is based on the evaluation of outcomes, and intuitive or emotional decision-making is based on an utilization of a current feeling for evaluative purposes. In contrast, constructionist approaches assume that people make decisions by increasing coherence on the dimension that is incoherent. According to the action-based model of dissonance, people feel uncomfortable when they perceive an incoherence in action tendencies, i.e. when they experience contradictory action tendencies. Coherence can be increased if peo-

⁶This means that the underlying information is temporarily “bound together” because of simultaneous experience, not on a structural level

ple find “reasons” that provide action tendencies in favor for either the one or the other action direction. Hence, people would “choose” an option that increases coherence of incoherent information. For instance, if feelings of guilt are accompanied by cooperative as well as non-cooperative action tendencies, people would choose an option that either increases coherence to cooperation or non-cooperation based on situationally available information. Importantly, what option people choose would depend on the underlying action-tendencies, because information is incoherent on the action-level. To summarize, informational approaches assume that the decision is based on the utilization of feelings of guilt for outcome evaluation and people are expected to choose the outcome that leads to least guilt. In contrast, constructionist approaches assume that decision-making is based on incoherent or contradictory action tendencies, and people choose the option that makes action-tendencies coherent. This implies that the situation needs to provide information that provides action-tendencies specific to the underlying conflict. If people however use feelings of guilt as an evaluation of outcomes, then information which is accompanied by unrelated action tendencies may reduce feelings of guilt and hence cooperation, if they can reduce experience of threat.

Third, informational approaches assume that cooperation is a mean to reduce personal distress whereas constructionist approaches assume that people cooperate to reduce social threat or the chance of altruistic punishment. Hence, people either cooperate to feel better or to repair social bonds. Informational accounts assume that people cooperate to feel better, hence to reduce personal distress. Because the emotion-elicitation process and the decision-making process are separate, people can reduce feelings of distress by other means. For instance, attributions approaches to guilt assume that personal agency is a prerequisite for experiencing guilt (e.g., Tracy & Robins, 2006; Weiner, Graham, & Chandler, 1982). People may be able to reduce feelings of guilt by obscuring agency, i.e. when attributing personal responsibility of having produced harm to others. If people use feelings of guilt as information for

outcome evaluation in an unrelated decision-making process, externally attributing agency should decrease feelings of guilt and hence reduce the evaluative impact on cooperative decision-making.

From a constructionist perspective however, agency is less important because “responsibility” is judged by others. As a consequence, when perceiving guilt people are expected to first verify/falsify if the situation is indeed threatening by comparing their behavior to their moral reputation and the reputation of others. In other words, people would blame themselves irrespective of having agency and cooperate if the comparison-process is not sufficient to reduce threat. Informational and constructionist approaches hence differ with respect to agency and blame. From an informational vantage point, obscuring agency may reduce feelings of guilt and thus reduce cooperation. In contrast, from a constructionist perspective, to feel better people have to reduce threat by reducing blame, and reduction of blame would lead to a reduction of cooperation.

To summarize, informational approaches differ from constructionist approaches regarding emotion-specificity of attribution, specificity of action tendencies regarding cooperation and specificity of emotion-regulation concerning responsibility (agency and blame). In five experiments, I contrasted both approaches regarding these three core-differences. In the next chapter, I will report empirical evidence.

3 Empirical evidence for emotional decision-making

In this chapter, I will provide empirical evidence for emotional decision-making based on PCS. First, I will provide evidence for the assumption of one instead of two different processes. Then I will show that cooperation is based on the disambiguation of action tendencies. Lastly, I will show that people who feel guilt use a compensatory information processing strategy to decide if they cooperate (or not).

3.1 Cooperative decisions are based on *one* PCS process

In this section I will provide evidence that feelings of guilt are based on two factors that temporarily form emotional experience as well as emotional decisions or action tendencies: core-affect and conceptual knowledge (Barrett, 2006; Barrett, Ochsner, & Gross, 2007). Hence, I will show that cooperative decision-making is based on one process that follows constructionist information processing principles.

A common way to elicit emotional experience is to use an autobiographical priming procedure (e.g., Harmon-Jones, Amodio, & Zinner, 2007; Strack, Schwarz, & Gschneidinger, 1985), i.e. asking people to remember a situation in which they experienced a specific emotion. Emotional recall is based on the assumption of network

theories (e.g., Bower, 1981) that different kinds of knowledge that co-occur within an emotional episode are associated with each other. Activation of any node can activate the whole network and hence (re-)activate emotional experiences. Dual-process models of emotions (e.g., Clore & Ortony, 2000; Leventhal & Scherer, 1987; C. A. Smith & Kirby, 2000, for a review, see E. R. Smith & Neumann, 2005) make a very similar assumption: the rules that constitute an emotional appraisal can be stored in associative memory, situational cues can reactivate the stored rule (e.g., Clore & Ortony, 2000), and the situation is appraised according to the rule which leads to emotional experience.

Basic emotion- (e.g., Ekman, 1992; Izard, 1993; Panksepp, 1998) as well as appraisal approaches (e.g., Arnold, 1960; Frijda, 1986; Lazarus, 1966; Leventhal & Scherer, 1987; Ortony et al., 1988; Scherer, 1984) treat emotions as discrete entities. Thus, people may be able to attribute emotional experience to other sources known for being capable to evoke the respective emotion (e.g., for evaluative purposes), suggesting that misattribution of emotional experience is emotion-specific (e.g., Ketelaar & Clore, 1997) From a constructionist vantage point, autobiographical priming is not a passive re-activation of an “emotion” but an active construction process in which the cognitive system is in a “retrieval” mode (Conway, 2001). The retrieval mode is qualified by different steps of information processing, i.e. an elaboration of the informational cue, a motivated memory search and an evaluation of the output which can trigger further processing if needed (Conway, 2001, but see also Kunda, 1990; Pyszczynski & Greenberg, 1987). This process is assumed to lead to a temporal representation of content-rich episodic memory “and a flood of event specific details in the form of visual images.” (Conway, 2001, p. 1378). In other words, autobiographical priming is considered to be an intentional process to retrieve specific information related to an emotion-electing event. From a constructionist perspective, emotional experience is *reconstructed* and not *reactivated*. This makes the process vulnerable to “misattribution” which is then actually a mis-

construction by using situational information that differs from the information that created the shift in core-affect.

Information- and constructionist approaches differ with respect to the assumed conditions under which emotional experience can be misattributed. From an information vantage-point, emotional experience can be misattributed to sources that are known to elicit the respective emotion. For instance, if a person acts selfishly and later feels guilt about it regularly, feelings of guilt are associated with selfish behavior and hence are applicable for evaluation (e.g., Ketelaar & Tung Au, 2003; Hooge et al., 2007). The experience of guilt is assumed to be transferable *between* different situations, i.e. the experience of guilt in situation A can be (mis-)attributed to a selfish behavioral option in situation B. Guilt however is only attributable to sources that are known to elicit guilt, e.g., because of experiences in the past or guilt-related conceptual knowledge.

From a constructionist vantage-point, emotional experience is reconstructed by using temporarily salient information, and core-affect together with conceptual knowledge form emotional experience (Barrett, 2006; Barrett, Ochsner, & Gross, 2007). Directing *attention* to another plausible source for the change in core-affect should change the affect-categorization process and finally the emotional experience as well as the action tendencies of situationally salient information. Hence, the experience of guilt may be due to a temporal construction of conflicting action tendencies categorized in terms of morality. If the negative feeling however can be “explained” by e.g., an uncomfortable laboratory room (Fried & Aronson, 1995), the change in core-affect would then be categorized by information the room provides and the configuration of action tendencies would change¹.

Information- and constructionist approaches hence differ with respect to the specificity of the misattribution-process. Whereas in informational accounts, emotional experience can be misattributed to targets that are applicable, in constructionist

¹i.e. reacting to a room is different from reacting to the perception of a moral transgression

accounts core-affect can be misattributed to any source that is known to lead to a change in core-affect. Hence, from a constructionist vantage-point, people can misattribute "guilt" to a laboratory room which is impossible, or at least implausible², from an information vantage-point.

3.1.1 Hypotheses

In line with informational approaches, I assume that the retrieval of information that made people feel guilty in the past increases cooperative action tendencies.

In contrast to information approaches, I assume that the misattribution³ of core-affect to salient and applicable source changes the meaning of the affective change in core-affect and thus decreases cooperative action tendencies.

I tested this assumption in two nearly identical studies which differed with respect to the emotion-priming-task. In the first study (study Ia), I used the common autobiographical guilt-priming procedure (Hooge et al., 2007; Nelissen et al., 2007). In the second study (study Ib), I used a mental-imagery task (cf. Holmes & Mathews, 2005). If the increase of cooperation following the experience of guilt is due to a constructive process, then cooperation should decrease if misattribution (miscategorization) of core-affect is possible. If people use episodic memory for constructing the situations, it should furthermore make no difference if people *recall* or *imagine* a moral transgression (because in both cases the temporal representation would be constructed).

²Attribution of emotional experience means that people believe a stimulus or situation is causal for their experience, hence misattribution of guilt to the room would imply that people perceive the room as causal for their experience of guilt.

³In constructionist terms, it is a "misconstruction".

3.1.2 Study 1a: autobiographical guilt-priming

Participants and Design

Eighty-five undergraduate students of the University of Würzburg (non-psychologists, 39 females, age $M = 24.06$, $SD = 3.08$) participated in the study for monetary compensation (€6). Each participant worked at their own terminal. They were randomly assigned to one condition of a 2 (emotion-priming: guilt vs. neutral) x 2 (misattribution: yes vs. no) between-factorial design. Participants who either refused to work on or had problems with the emotion-priming task were excluded from the analysis (6 participants). One participant was excluded because of missing data.

Procedure

Participants were told to complete several studies on emotion and decision-making. Participants started with the autobiographical emotion-priming, introduced as a memory task. Afterwards, the misattribution-task and a brief emotion questionnaire followed. Finally, participants completed the measure of cooperation which was framed as an unrelated study about decision-making. Participants read the rules of the game and donated tokens to an anonymous player. Afterwards, they were probed for suspicion, thanked, debriefed and paid.

Materials

Emotion manipulation Emotional experience was manipulated by an autobiographical priming procedure (Hooge et al., 2007; Strack et al., 1985). Guilt was induced by asking participants to report a memorable episode from the last two years in which they felt very guilty⁴. Participants in the control condition were asked to report an ordinary, typical day in their lives. The emotion-manipulation

⁴The instructions can be found in Appendix 1.1 on page 139.

took approx. 10 minutes.

Misattribution manipulation The misattribution manipulation was modeled after Fried and Aronson (1995) and was made of 5 short questions about lighting, temperature, noise level as well as an overall rating of the uncomfortable and dull laboratory room. Filling out the questionnaire⁵ took less than a minute. Only participants in the misattribution conditions received the questionnaire, while participants in other conditions went on with the study. The occurrence of the questionnaire was announced at the beginning of the session in the misattribution-conditions, though without mentioning the exact point of time.

Measure of emotional experience Emotional experience was measured with a short affect-questionnaire⁶ developed by Galinsky, Stone, and Cooper (2000). Participants rated their current mood state on a 7-point Likert scale (1 = does not apply at all, 7 = applies very much). The questionnaire measured negative self-directed affect, discomfort and positive affect.

Measure of cooperation I measured cooperation with a one-shot give-some game (Nelissen et al., 2007; Van Lange et al., 1997, study 3). At the beginning of the game, participants were told that the experimenter hand over 4 tokens exchangeable into raffle tickets for a lottery game. A token was worth one lottery ticket for the donor, whereas a donated token was worth two lottery tickets for the recipient. If a donor gave a token to the unknown recipient (actually non-existent), one lottery ticket was lost for the donor but the recipient gained two lottery tickets additionally. Participants decided how many tokens they would donate to an interaction partner without knowing how many tokens they would receive. In this game, participants earn the most collectively if both donate all their tokens, while earning the most

⁵The questionnaire can be found in Appendix 2.1 on page 145 as well as pictures of the room (App. 2.1 on page 146).

⁶The original questionnaire as well as the translation can be found in Appendix 3.2 on page 156.

Table 3.1: Study Ia: Means and standard deviations of discomfort and negative self-directed affect

Misattribution	discomfort		negative self-directed affect	
	yes	no	yes	no
guilt	3.06 (1.46)	2.73 (1.25)	2.94 (1.53)	2.46 (1.35)
neutral	2.97 (1.22)	2.59 (1.21)	2.24 (1.31)	2.07 (1.16)

Note: higher values indicate higher levels of negative affect or discomfort

for themselves if they keep all their tokens but receive tokens from the interaction partner. A matrix of all possible outcomes was presented. After making their choice, the envelope for the other participant was handed back to the experimenter, who handed over the envelope ostensibly from the other participant (all participants received two tokens in reality). Finally, the experimenter replaced the tokens of the participant with lottery tickets. Participants wrote their names and addresses on them and put them into a lottery-barrel ⁷.

Results

Emotional experience A 2 (guilt-priming: yes/no) x 2 (misattribution: yes/no) analysis of variance on reported negative self-directed affect revealed a marginally significant main effect of guilt-priming $F(3, 74) = 3.25, p = .08, \eta_p^2 = .04$. In the guilt-priming conditions, participants reported more negative self-directed affect ($M = 2.68, SD = 1.43$) than participants in the control conditions ($M = 2.15, SD = 1.22$). A 2 (guilt-priming: yes/no) x 2 (misattribution: yes/no) analysis of variance on reported discomfort and positive affect revealed no effects, all $F < 1.48, p > .23$. Means and standard deviations of discomfort and negative self-directed affect can be found in table 3.1 on page 53. Means and standard deviations of positive affect can be found in table 3.2 on page 54.

⁷Since the lottery and drawing was real, names and addresses were collected to be able to inform the participant of having won the prize. The prize was a gift certificate of a large German book-store chain worth €50. Pictures of the tokens as well as the payoff-matrix can be found in Appendix 5.1 on page 160.

Table 3.2: Study Ia: Means and standard deviations of positive affect

Misattribution	positive affect	
	yes	no
guilt	4.47 (1.12)	4.77 (1.32)
neutral	4.92 (.79)	4.87 (1.08)

Note: higher values indicate higher levels of positive affect

Cooperation A 2 (guilt-priming: yes/no) x 2 (misattribution: yes/no) analysis of variance on donated tokens revealed a significant two-way interaction of guilt-priming and misattribution, $F(3, 73) = 4.64$, $p = .04$, $\eta_p^2 = .06$. A pairwise contrast revealed that guilt-priming increased cooperative action tendencies in the non-misattribution conditions, $F(1, 73) = 3.30$, $p = .07$, $\eta_p^2 = .04$, replicating the standard guilt-priming effect. However, another pairwise contrast revealed that the opportunity for misattributing guilt on the laboratory-room decreased cooperative action tendencies in the guilt-priming condition ($F(1, 73) = 11.93$, $p = .001$, $\eta_p^2 = .14$) but not in the neutral priming condition ($F < 1$). Furthermore, a (less interesting) main effect of misattribution, $F(3, 73) = 8.39$, $p = .01$, $\eta_p^2 = .1$, revealed that participants in the no-misattribution conditions donated more tokens ($M = 2.21$, $SD = 1$) than in the misattribution conditions ($M = 1.60$, $SD = 1.98$). Means and standard errors of the mean can be found in figure 3.1 on page 55.

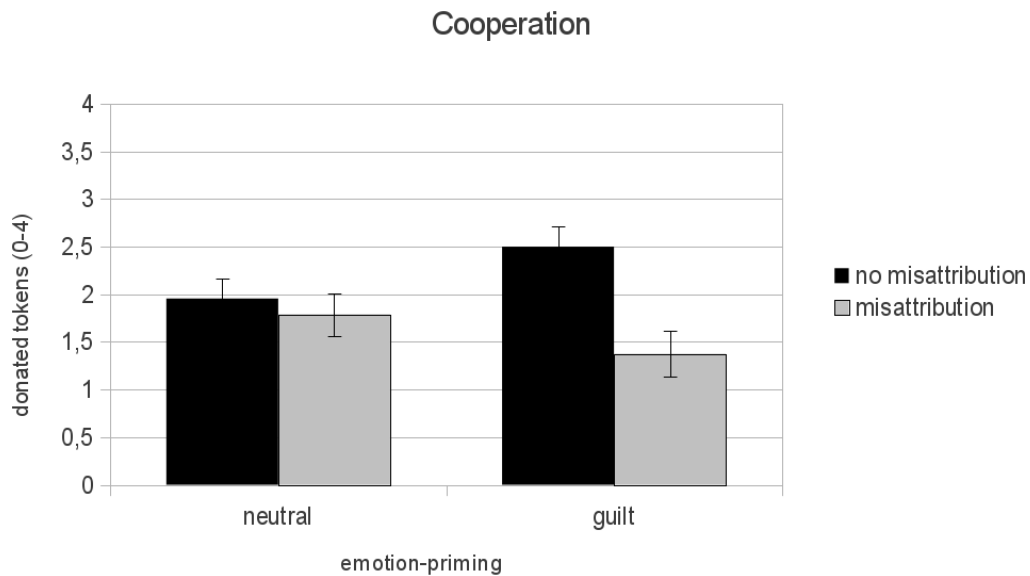


Figure 3.1: Study Ia: Cooperation

3.1.3 Study Ib: anticipated/imagined guilt

Participants and Design

Fifty-seven undergraduate students of the University of Würzburg (non-psychologists, 40 females, age $M = 24.16$, $SD = 4.28$) participated in the study for monetary compensation (€6). Each participant worked at their own terminal. They were randomly assigned to one condition of a 2 (guilt-priming: guilt vs. neutral) x 2 (misattribution: yes vs. no) between-factorial design. Seven participants were excluded from analysis because of missing data.

Procedure

The procedure was identical to study Ia.

Materials

Emotion-manipulation Emotion was manipulated by a mental imagery task modeled after Holmes and Mathews (2005). Participants were told to vividly imagine

situations presented on a computer screen⁸. In the guilt conditions, the computer presented situation descriptions like “You lied to your friend about an important matter.” (guilt-appraisal patterns, adapted from Siemer & Reisenzein, 2007). In the neutral condition, the computer presented situation descriptions like “You are standing at a bus station and wait for the bus.” (neutral day-to-day experiences). In both conditions, 13 situation descriptions were presented, each for 30 seconds. The whole task lasted 5-6 minutes.

Misattribution-manipulation The misattribution-manipulation was identical to study Ia.

Measure of emotional experience The measure of emotional experience was identical to study Ia.

Measure of cooperation A one-shot give-some game (Hooge et al., 2007; Hooge, Breugelmans, & Zeelenberg, 2008; DeSteno, Bartlett, Baumann, Williams, & Dickens, 2010) measured cooperation. Participants, believed they were playing with another participant, started with 10 tokens, each worth €0.50 for the donor but €1 for the recipient, and decided how many tokens they would like to donate. According to the rules of the game, the donor *and* the recipient earn most collectively if both donate all of their own tokens to the interaction partner and most for themselves if they keep all of their tokens but get tokens from the other interaction partner. The game is a computerized version of the game used in Study Ia⁹.

Results

Emotional experience A 2 (guilt-priming: yes/no) x 2 (misattribution: yes/no) analysis of variance on reported negative self-directed affect, discomfort and positive

⁸The instructions and appraisal patterns can be found in Appendix 1.2 on page 142.

⁹Instructions can be found in Appendix 5.1 on page 163.

Table 3.3: Study Ib: Means and standard deviations of negative self-directed affect and discomfort

Misattribution	discomfort		negative self-directed affect	
	yes	no	yes	no
guilt	2.29 (1.19)	2.95 (1.15)	1.98 (1.72)	2.18 (1.29)
neutral	1.98 (1.03)	2.29 (1.52)	1.98 (1.03)	2.28 (1.52)

Note: higher values indicate higher levels of negative affect or discomfort

Table 3.4: Study Ib: Means and standard deviations of positive affect

Misattribution	positive affect	
	yes	no
guilt	4.88 (1.50)	5.11 (1.01)
neutral	5.31 (.68)	4.78 (.75)

Note: higher values indicate higher levels of positive affect

affect revealed no influence of priming and/or misattribution on reported affect ratings. Means and standard deviations of discomfort, negative self-directed affect and positive affect can be found in table 3.3 and 3.4 on page 57.

Cooperation A 2 (guilt-priming: yes/no) x 2 (misattribution: yes/no) analysis of variance on donated tokens revealed a marginally significant two-way interaction of guilt-priming and misattribution, $F(3, 47) = 3.08$, $p = .09$, $\eta_p^2 = .062$. Because the omnibus test failed to reach significance, consistent with the guidelines of the APA Task Force on Statistical Inference (Wilkinson, 1999, see also Rosnow & Rosenthal, 1989) I will only report the two relevant contrasts (guilt-priming increases cooperation, misattribution following guilt-priming decreases cooperation, cf. Study Ia). Consistent with the findings of the previous study, an a-priori contrast revealed that guilt-priming increased cooperation in the no-misattribution conditions, $t(25) = 1.71$, $p = .05$, $d = .67$, (one-tailed). Another a-priori contrast revealed that the possibility for misattribution decreased cooperation in the guilt conditions, $t(24) = -1.84$, $p = .04$, $d = .74$, (one-tailed). Means and standard errors of the mean can be found in figure 3.2 on page 58.

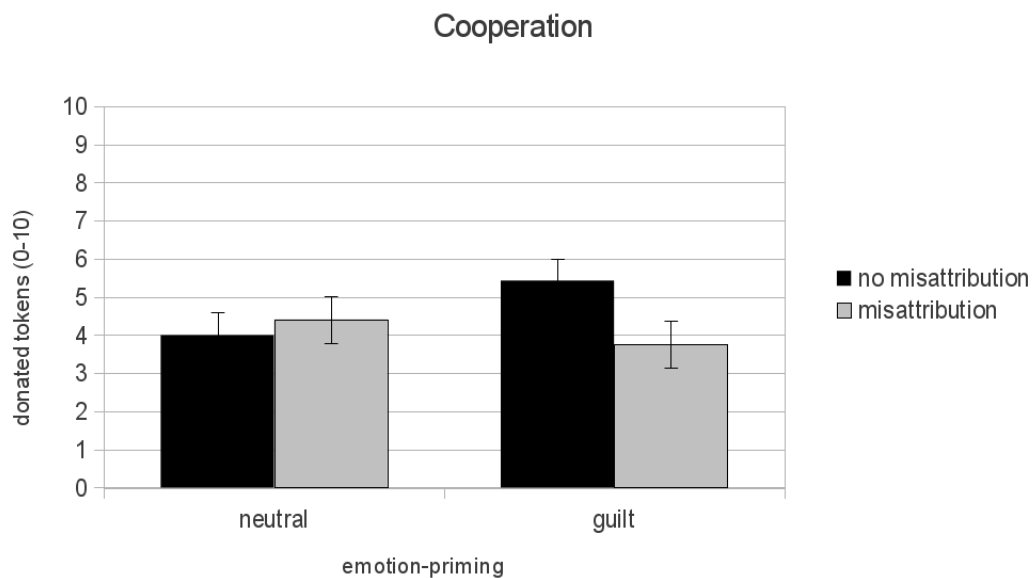


Figure 3.2: Study Ib: Cooperation

3.1.4 Discussion

In two studies, I tested the assumption that cooperative decision-making following guilt is due to one constructionist process based on core-affect and conceptual knowledge.

In contrast to information approaches, which assume that emotional experience is used as evaluative information by attributing the experience to a salient source, constructionist approaches assume that emotional experience is due to the categorization of salient information that forms a coherent gestalt. Changing the affect-categorization process is assumed to also change action tendencies. Information approaches assume that emotional experience is attributed to a source and attribution is regarded to be emotion-specific. Constructionist approaches assume that emotional experience depends on the categorization of core-affect, and affect-misattribution is regarded to be unspecific.

Results are in line with constructionist approaches. In both studies, guilt-priming increased cooperative action tendencies, which is a replication of the commonly found guilt-priming effect (Hooge et al., 2007; Ketelaar & Tung Au, 2003; Nelissen

et al., 2007). However, in both studies, the possibility of misattribution of core-affect to the uncomfortable laboratory room decreased cooperative choices. If people use emotional experience as information for cooperation, and use feelings of guilt as an evaluation of an outcome, then people must literally have attributed their feelings of guilt to the laboratory room. Furthermore, autobiographical recall as well as mental imagery of a moral transgression increased cooperative choices which may indicate that reminiscence and anticipation of a moral transgression both utilize episodic memory processes (Conway, 2001). Together, these findings imply that people use affect (as a motivator) for making cooperative decisions but do not necessarily use emotional experience *per se*.

Results of self-reports of emotional experience are in line with this assumption. In study Ia, people reported increased negative self-directed affect directly after the misattribution task in both guilt conditions, which may indicate that they were not aware of the misattribution and hence used knowledge about guilt while answering the questions about their emotional condition (e.g., that reflecting about guilt should also lead to feelings of guilt). In study Ib, the anticipation of a moral transgressions did not lead to any change in reported emotional experience, presumably because people are aware that they have not yet executed the moral transgressions or wrongdoings. Hence, being not (yet) responsible seems to make it unlikely that a change in core-affect is categorized as negative self-directed affect.

These findings further imply that people may rely on stereotypical knowledge when reporting their emotional experience. In study Ia, guilt was explicitly mentioned and participants may have inferred that reflecting about a moral transgression should lead to negative self-directed affect. In study Ib, participants were only instructed to read the sentences presented on the screen and vividly imagine the content. Hence, participants may just have used knowledge which was explicitly salient to infer how they *should* feel in the situation. If true, then self-reports of emotional experience may only reflect the result of a conscious self-reflection/perception process and

people do not use their immediate emotional experience as information for decision-making, but for communicative purposes (i.e. argumentation, Haidt, 2001; Mercier, forthcoming; Mercier & Sperber, 2011).

To summarize, the results of both studies imply that people may use affective feelings, but for the increases in cooperation, the informational use the experience of guilt is sufficient but not necessary. In contrast, emotional experience itself may be due to a compensatory and constructive process of selective memory retrieval and incoherence-detection and -elimination. Hence, action tendencies associated with the information that is retrieved by guilt-priming may be responsible for cooperative or non-cooperative decisions.

3.2 Cooperation is based on decision-making by coherence

In the theory chapter, I outlined how compensatory information processing (based on PCS processing) may lead to an intuitive decision (cf., chapter 1.3.3). I functionally separated two kinds of categorization processes: an "objective" or data-driven categorization process with reference to action tendencies and a "subjective" categorization process which refers to how people experience an emotion.

The data-driven categorization process, functionally equivalent to the input appraisal of emotion, detects incoherence of action tendencies, which is accompanied by a shift in core-affect (e.g., Harmon-Jones et al., 2009). The shift in core-affect is an (additional) perception that shapes, together with the temporal/situational information, a coherent gestalt or the emotional experience. Since action incoherence as well as self-threat necessarily operates on the same (situationally activated) information, changing the cognitions that change the "meaning" or "sense" also changes the underlying pattern of action tendencies (see Study Ia,b). Situational

information may be accompanied by *relevant* or *irrelevant* action tendencies and hence be able to provoke a coherence-shift of conflicting action tendencies related to cooperation. From this follows that both categorization processes jointly together produce emotional experience *and* eliminate the conflict between action tendencies. The experiential "output" may then be experienced as "having an intuition".

To show that the same categorization process that calculates emotional experience provokes a coherence-shift in conflicting action tendencies (the intuitive-emotional decision), it is necessary to increase the saliency of information able to change the experiential gestalt of an emotion (i.e. to reduce threat) *unspecifically* but to change the pattern of action tendencies *specifically*.

When reporting an instance of guilt, incoherent action tendencies are assumed to be experienced as a conflict between selfishness and cooperation (or egoism and altruism). The activation of information that is accompanied by cooperative action tendencies would lead to a coherence-shift in the cooperative direction, activation of information accompanied by selfish action tendencies would lead to a shift in the other direction. Hence, categorizing the meaning would be accompanied by a change in patterns of action tendencies, especially if the information builds on perceptual and episodic information from the past (cf. Conway, 2001). The constructive nature of emotional experience can be shown by a simple manipulation of misattribution specificity. To show that emotional decisions or intuitions are due to the disambiguation of action tendencies, a similar logic can be applied.

Emotions can be regulated by either changing emotional experience directly or by changing the cause of emotional experience (Gross & Thompson, 2007). Hence, people may use different strategies to "get rid" of their feelings. Following Gross and Thompson (2007), people may choose or modify a specific situation, deploy attention, change their cognitions and/or their responses. In the case of guilt, this implies that people may cooperate (change of external situation), may attribute responsibility to external sources (cognitive change), or just switch attention to other stimuli

which may lead to misattribution (attention deployment). People may change their external milieu, i.e. they change the situation by behavior. If not possible or too costly, people may change their internal milieu by changing the meaning of a situation (cognitive change, Gross & Thompson, 2007), e.g., by misattribution (Fried & Aronson, 1995), justification (Festinger & Carlsmith, 1959), or trivialization (L. Simon, Greenberg, & Brehm, 1995).

Importantly, from an information vantage point, changing emotional experience necessarily changes the informational content and thus should reduce or intensify emotional influence on decision-making. Hence, *any* process that changes emotional experience would be able to change the informational content of an emotion for decision-making. In contrast, from a constructionist vantage point, emotional experience is a temporal gestalt that reflects a specific action-conflict. Hence, information suitable for “emotion-regulation” needs to be accompanied by action tendencies that can provoke a coherence-shift on an action-level to be successful in reducing/changing core-affect (and subsequent categorization, which is equivalent to emotion-regulation, Gross & Barrett, 2011). Successful emotion-regulation hence should solve the underlying action-conflict.

In a nutshell: the emotion construction process can “decide” when attempts to change emotional experience are accompanied by action tendencies that can disambiguate the underlying conflict and provoke a coherence-shift in action tendencies (in one or the other direction). As noted in the implementation chapter (cf. section 2.1.2), conflicting action tendencies with reference to morality as well as the experience of this conflict as self-threat can be understood in terms of self-consistency theory and self-affirmation theory.

3.2.1 Study II: Self-consistency, self-affirmation and the disambiguation of action tendencies

Self-affirmation theory as well as self-consistency theory assumes that committing moral transgressions is accompanied by a feeling of self-threat, hence a threat of important parts of the self-concept like norms or standards.

According to self-consistency theory (E. Aronson, 1968; Thibodeau & Aronson, 1992), people hold *self-expectancies* of being moral and competent. The perception of a discrepancy between behavior and the associated self-expectancies are experienced as self-threat and motivate people to reduce it by establishing consistency between behavior and self-expectancies. From a self-consistency vantage point, self-threat can only be reduced if people can reduce the discrepancy between a specific expectancy and an action. Hence, reducing threat is assumed to be specifically related to the informational content that produced threat (e.g., moral behavior to eliminate a moral threat). In self-consistency theory, the self acts like a *standard* or *expectancy*.

In contrast, self-affirmation theory (Sherman & Cohen, 2006; Steele, 1988) postulates that the overall goal of the self-system is to *protect* an image of self-integrity. If the self is threatened, e.g., after acting immoral or incompetent, people try to eliminate self-threat by actions that can restore global self-worth, which is also possible by affirming an alternative domain of the self (and not exclusively the threatened domain). In self-affirmation theory, the self acts like a *resource* and reducing threat may be unspecific to the informational content that produced the threat (e.g., moral or competent behavior).

Both theories do not only differ with respect to the proposed role of the self in motivating behavior, they also differ with respect to their predictions about the role of global or chronic self-esteem. In self-affirmation theory, information about the self acts like a *resource*, thus people with high self-esteem are expected to have more

self-resources than people with low self-esteem. In contrast, self-consistency theory predicts that information about the self acts like a *reference*, thus people with high self-esteem are expected to have higher standards than people with low self-esteem and experience greater discrepancies (cf. Stone, 2001).

Whereas both theories differ with respect to their assumptions about the processes that elicit discomfort (or in the case of a moral transgression, guilt), both assume that people perceive this discomfort as an unspecific feeling of self-threat. Hence, to reduce self-threat, people should be able to use any positive self-related information that is able to increase (or repair) threatened self-esteem (which is analogous to emotion-regulation by changing the self-assessment, or cognitive change, Gross & Thompson, 2007). However, with respect to guilt, the underlying action-incoherence is specifically related to cooperation, then information aimed on reducing self-threat should only be successful if it provides action-tendencies that can disambiguate the underlying action conflict.

For instance, if guilt is due to an incoherence of cooperative and non-cooperative (selfish) action tendencies, then information accompanied by cooperative action tendencies would lead to a coherence-shift in the direction of cooperation. In contrast, information that provides action tendencies of non-cooperation would lead to a coherence-shift in the direction of non-cooperation or selfish behavior. If information is accompanied by action tendencies irrelevant to the conflicting action-tendencies (neither cooperative nor non-cooperative action-tendencies), information cannot provoke a coherence-shift in the cooperative or non-cooperative direction and hence wouldn't influence decision-making regarding cooperation.

In line with informational approaches, self-affirmation theory assumes that any positive information can reduce the experience of threat, which is analogous to emotion-regulation. Furthermore, if the self-threat is experienced as guilt, then any self-affirmation should reduce threat and therefore cooperative action tendencies.

From a self-consistency perspective however, conflicting action tendencies of coop-

eration and non-cooperation create negative affect which is experienced as guilt, or moral self-threat. Hence, to reduce guilt, people have to eliminate the affect-creating conflict in action-tendencies by activation of information that increasing coherence in the cooperative or uncooperative direction, based on accompanied action tendencies.

3.2.2 Hypotheses

I assume that cooperative decisions are due to the disambiguation of cooperative and non-cooperative action tendencies. The experience of guilt is assumed to be accompanied by conflicting action tendencies of cooperation and non-cooperation which are perceived as a self-threat on an experiential level. According to self-affirmation theory, people can reduce the experience of self-threat by affirming an important personal value. Research on moral licensing and compensation showed that the activation of negative self-relevant information (self-threat, e.g., episodes of guilt or shame, Hooge et al., 2007, 2008; Ketelaar & Tung Au, 2003) increases prosocial action tendencies whereas positive self-information (or self-affirmations) decreases prosocial action and cooperation¹⁰ (Khan & Dhar, 2006; Mazar & Zhong, 2010; Sachdeva et al., 2009). Hence, the reminiscence of immoral action (guilt-priming) seems to lead to the perception of being a immoral person (a moral self-threat). In contrast, the reminiscence of moral or benevolent action may lead to the perception of being a moral person (moral self-affirmation).

As described above, the perception of being an immoral person is assumed to depend on conflicting action tendencies regarding cooperation. If people attend to information that reminds them of being a moral person should be accompanied by uncooperative action tendencies, hence self-affirmation related to morality should re-

¹⁰For instance, Mazar and Zhong (2010) found that people increase cheating and stealing following the consumption of ethical products and Sachdeva, Ilev, and Medin (2009) found that reminding people of positive self-related information reduced charity donations. Both findings suggest that positive self-related information regarding morality (e.g., buying sustainable products) is related to decreased moral action. Hence, the reminiscence of moral action is related to (or associated with) uncooperative action-tendencies.

duce cooperation following guilt. However, affirmations unrelated to morality cannot disambiguate conflicting action-tendencies and hence people need to cooperate (i.e. show moral behavior) to affirm themselves to be moral persons¹¹.

In short: Information that leads to the perception of being a moral person hence should make action tendencies non-ambiguous and lead to a coherence shift in the selfish direction. In contrast, information that leads to the perception of being an immoral person should lead to a coherence-shift in the cooperative direction. Moreover, I expect an unspecific influence of self-esteem, e.g., people with high self-esteem may suffer more but also have more resources to compensate. In contrast, if people use emotional experience of guilt as information for evaluative purposes, then self-esteem should decrease cooperation unspecifically by decreasing self-threat.

Participants and Design

Seventy-nine undergraduate students of the University of Würzburg (non-psychologists, 40 females, age $M = 25.56$, $SD = 5.65$) participated in the study for monetary compensation (€6). Each participants worked at their own terminal. They were randomly assigned to one condition of a 2 (self-threat: moral vs. non-moral) x 2 (self-affirmation: moral- vs. non-moral) x 2 (self-esteem: high vs. low) mixed-factorial design with self-threat and self-affirmation as between factors.

¹¹Noteworthy, these predictions are contrary to self-consistency theory and self-affirmation theory. Self-consistency theory assumes that reminding people of an existing self-discrepancy cannot reduce threat because the experience of threat depends on the discrepancy. Hence, moral self-affirmations would increase the discrepancy between the self and (past) behavior (e.g., Blanton, Cooper, Skurnik, & Aronson, 1997). In contrast, self-affirmation theory would assume that people can reduce a moral self-threat by a moral affirmation, but people can also affirm themselves in another domain important for self-worth. Hence, even unrelated affirmations should reduce threat and hence cooperation. However, if a disambiguation of action-tendencies is responsible for cooperation, then only moral affirmations can reduce cooperation following the reminiscence of a moral transgressions.

Procedure

Participants were told to complete several studies on emotion and decision-making. Participants started with the self-threat manipulation which was followed by a self-affirmation task. Both manipulations were introduced as unrelated memory tasks. Afterwards a brief emotion questionnaire followed. Finally, participants completed the measure of cooperation which was framed as an unrelated study about decision-making. Participants read the rules of the game, were tested if they understood the rules¹² and then donated tokens to an anonymous (and fictitious) player via the computer. For the rest of the experimental session, participants worked on unrelated tasks. At the end, participants completed a measure of trait self-esteem, formal data and were probed for suspicion. Then they were thanked, debriefed and payed.

Materials

Self-threat manipulation Self-threat was manipulated by an autobiographical recall procedure (Hooge et al., 2007, 2008; Strack et al., 1985). Moral self-threat was induced by asking participants to report an episode in which they felt very guilty, non-moral self-threat was induced by asking participants to report an episode in which they felt very ashamed¹³. The emotion manipulation took approx. 10 minutes.

Self-affirmation manipulation The self-affirmation task was modeled after Cohen, Aronson, and Steele (2000). First, participants received a list of 13 values which they rated according to personal importance (1 = most important, 13 = least important).

¹²To assure that participants understood the rules they were not able to proceed if they failed to pass the questions on the questionnaire.

¹³Antecedents of shame can also be related to morality, however, from a constructionist perspective it is more important if people perceive the conflict as related to social skills or to performance and achievement (i.e. how people *frame* a situation). Emotional self-reports of shame-eliciting situations indicate that people frame the situation in terms of competence and achievement (e.g., Keltner & Buswell, 1996; Tangney et al., 1996), hence shame was chosen to serve as a non-moral self-threat. Instructions can be found in Appendix 1.1 on page 139

Afterwards, participants described 3-4 personal experiences in which their most important value had made them feel good about themselves¹⁴. Past research has shown that this procedure induces self-affirmation effectively (Steele, 1988). Participants either received values associated with morality (benevolence and universalism) or competence (achievement and power). Values were taken from the Schwartz Value Survey (Schwartz, 1992).

Self-esteem measure Trait self-esteem was measured with the Rosenberg self-esteem scale¹⁵ (Rosenberg, 1979). Following previous research (e.g., Stone, 2003), self-esteem was treated as a categorical variable and only participants who scored in the lower (≤ 30) and upper (≥ 35) 30th percentile of the self-esteem scale entered data analysis (27 participants were excluded from analysis).

Measure of emotional experience The measure of emotional experience was identical to study Ia/b.

Measure of cooperation The measure of cooperation was identical to study Ib.

Results

Emotional experience A 2 (self-threat: moral vs. non-moral) x 2 (self-affirmation: moral vs. non-moral) x 2 (self-esteem: high vs. low) analysis of variance on reported discomfort revealed a marginally significant two-way interaction of self-threat and self-affirmation, $F(7, 44) = 3.86$, $p = .06$, $\eta_p^2 = .08$. Pairwise contrasts revealed that participants only reported increased discomfort when first reporting a moral transgression which was followed by a moral self-affirmation ($F(1, 44) = 3.37$, $p = .06$, $\eta_p^2 = .077$). Means and standard deviations of discomfort can be found in table 3.5 on page 70

¹⁴The affirmation task can be found in the Appendix 2.2 on page 147

¹⁵The questionnaire can be found in Appendix 12 on page 159.

A 2 (self-threat: moral vs. non-moral) x 2 (self-affirmation: moral vs. non-moral) x 2 (self-esteem: high vs. low) analysis of variance on reported negative self-directed affect revealed a significant two-way interaction of self-threat and self-affirmation, $F(7, 44) = 4.63$, $p = .04$, $\eta_p^2 = .10$. Pairwise contrasts revealed that participants only reported increased negative self-directed affect when first reporting a moral transgression which was followed by a moral self-affirmation ($F(1, 44) = 8.40$, $p < .01$, $\eta_p^2 = .16$). Furthermore, I found a main effect of self-esteem, $F(7, 44) = 9.60$, $p < .001$, $\eta_p^2 = .18$, as well as and a (less interesting) main effect of affirmation-type, $F(7, 44) = 5.19$, $p = .03$, $\eta_p^2 = .11$. Low self-esteem participants reported more negative self-directed affect ($M = 2.94$, $SD = 1.14$) than high self-esteem participants ($M = 1.8$, $SD = 1.15$) and a moral affirmation led to more ($M = 2.67$, $SD = 1.37$) negative self-directed affect than an non-moral affirmation ($M = 2.15$, $SD = 1.15$). Means and standard deviations of negative self-directed affect can be found in table 3.5 on page 70

A 2 (self-threat: moral vs. non-moral) x 2 (self-affirmation: moral vs. non-moral) x 2 (self-esteem: high vs. low) analysis of variance on reported positive affect revealed a significant two-way interaction of self-threat and self-affirmation, $F(7, 44) = 4.61$, $p = .04$, $\eta_p^2 = .10$. Pairwise contrasts revealed that participants only reported decreased positive affect when first reporting a moral transgression which was followed by a moral self-affirmation ($F(1, 44) = 4.46$, $p = .04$, $\eta_p^2 = .09$). A significant main effect of self-esteem was found, $F(7, 44) = 4.08$, $p = .05$, $\eta_p^2 = .09$. Low self-esteem participants ($M = 4.53$, $SD = 1.18$) reported less positive affect than high self-esteem participants ($M = 5.26$, $SD = 1.08$). Means and standard deviations of positive affect can be found in table 3.6 on page 70

Cooperation A 2 (self-threat: moral vs. non-moral) x 2 (self-affirmation: moral vs. non-moral) x 2 (self-esteem: high vs. low) analysis of variance on donated tokens revealed a significant two-way interaction of self-threat and self-affirmation,

Table 3.5: Study II: Means and standard deviations of discomfort and negative self-directed affect

Self-threat	discomfort		negative self-directed affect	
	moral affirmation	non-moral affirmation	moral affirmation	non-moral affirmation
moral	3.7 (1.59)	2.67 (1.42)	3.44 (1.26)	2.02 (.97)
non-moral	2.63 (1.22)	3.04 (1.39)	2.20 (1.24)	2.29 (1.32)

Note: higher values indicate higher levels of discomfort and negative self directed affect, respectively

Table 3.6: Study II: Means and standard deviations of positive affect

Self-threat	positive affect	
	moral affirmation	non-moral affirmation
moral	4.31 (1.15)	5.32 (1.11)
non-moral	5.05 (1.13)	4.61 (1.11)

Note: higher values indicate higher levels of positive affect

$F(7, 44) = 6.55, p = .01, \eta_p^2 = .13$. Pairwise contrasts revealed that cooperation only increased when participants reported a moral transgression which was followed by a non-moral self-affirmation ($F(1, 44) = 4.39, p = .04, \eta_p^2 = .09$). Furthermore, a main effect of self-esteem ($F(7, 44) = 4.44, p = .04, \eta_p^2 = .09$), revealed that low self-esteem participants ($M = 4.96, SD = 2.15$) donated more tokens than high self-esteem participants ($M = 3.92, SD = 1.73$). Means and standard errors of the mean can be found in figure 3.2.2 on page 71.

3.2.3 Discussion

I assumed that the experience of guilt is accompanied by conflicting action tendencies of cooperation and non-cooperation which are perceived as a self-threat on an experiential level. Furthermore I assumed that cooperation results from the disambiguation of cooperative/selfish action tendencies by employing affirmative self-knowledge to reduce self-threat. According to self-affirmation theory, people can

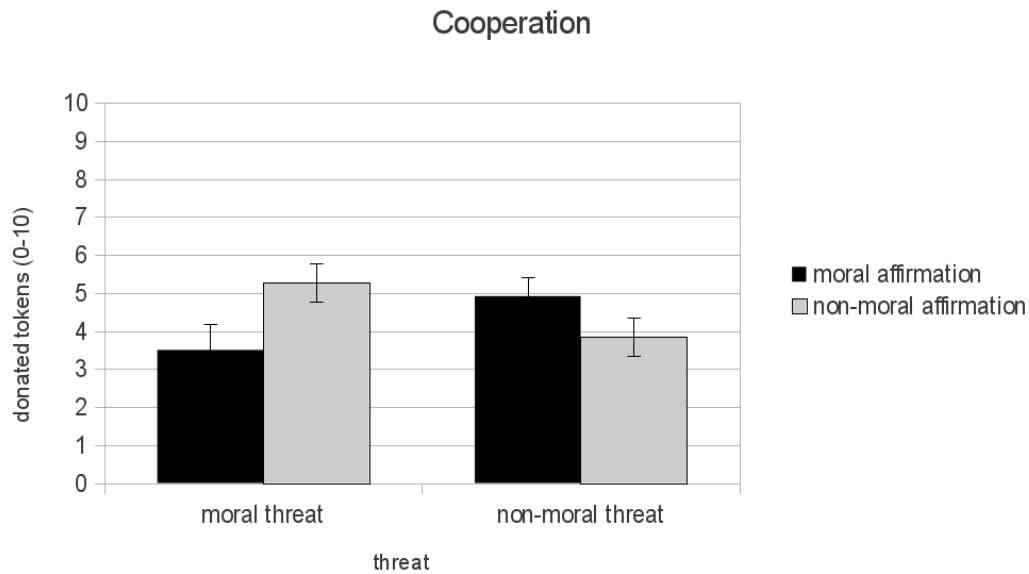


Figure 3.3: Study II: Cooperation

reduce the experience of self-threat by affirming an important personal value. People were expected to cooperate if self-affirmation provides action tendencies that can disambiguate conflicting action tendencies. Hence, action tendencies need to be specifically related to the underlying conflict.

Results show that people increased cooperation exclusively if a moral self-threat was followed by a non-moral self-affirmation. Participants who reported a non-moral self-threat did not show a difference in cooperation regardless of affirmation-type. Attempts to reduce moral self-threat by endorsing personal moral principles led to a decrease of cooperation, but an increase in self-directed negative affect and discomfort, and a decrease in positive affect. In other words, people report increased “guilt” and negative affect but show decreased cooperation, which is further evidence against an informational explanation for the guilt-cooperation link, but it is in line with the constructionist approach: when moral self-affirmations, i.e. the activation of moral self-information and the endorsement of moral principles, are accompanied by uncooperative action tendencies (e.g., Khan & Dhar, 2006; Mazar & Zhong, 2010; Sachdeva et al., 2009), then the affirmation of moral principles should disambiguate

conflicting action tendencies in the uncooperative/selfish direction.

The increase in negative affect is consistent with findings of research which compared self-affirmation with self-consistency theory. People avoid thinking about self-information that directs attention to a dissonance-inducing discrepancy (J. Aronson, Blanton, & Cooper, 1995) and if exposure cannot be avoided, the need for dissonance-reduction increases (Blanton et al., 1997). Hence, affirming/endorsing moral principles after reporting a moral transgression may lead to feelings of hypocrisy and increased self-blame and negative affect. Furthermore, it may indicate that exposure to even positive self-relevant information is experienced as threatening and people may try to avoid this mode of emotion-/threat-regulation.

Notably, there is an influence of chronic self-esteem which is in favor of informational approaches. People who have chronic low self-esteem report more negative affect than people who have chronic high self-esteem and also donate more tokens. This implies that chronic self-esteem seems to be used as a resource, able to reduce threat and hence cooperation. However, it is unclear why people high in self-esteem report less threat. According to Dunning (2007), people base much of their self-worth on how moral they believe they are. If true, then self-esteem may be related to the person's moral reputation, and people with a high moral reputation may experience less threat because moral reputation reduces conflict of action tendencies and thus influences the amount of core-affect produced. This however would imply that people experience less threat because they experience less conflict in general. Hence, it is unclear if people "use" self-esteem to reduce threat (emotion-regulation) or if high self-esteem yields a immaculate moral reputation and people hence experience less threat. The role of moral reputation will be addressed in the next section.

To summarize, the findings are in line with constructionist approaches. If people use their emotional experience as information, then the experience of negative self-directed affect should lead to an increase of cooperation. However, increased self-related negative affect was accompanied by a relative decrease of cooperation, which

makes it unlikely that people used their emotional experience of guilt as evaluative information for decision-making. Furthermore, results are supportive for the assumption that the decision to cooperate depends on information that disambiguates conflicting action tendencies related to morality.

3.3 Cooperation aims on reducing self-threat

The results of the previous study imply that cooperation following the experience of guilt is due to a constructionist process. Furthermore, results show that changing the information that creates emotional experience (or self-threat) can lead to a coherence-shift in action tendencies (analogous to a decision). However, self-reports on emotional experience suggest that people do not use this mode of self-threat reduction naturally because affirming a value that one has violated beforehand may be perceived as hypocritical and hence either increase suffering or prevent reduction of threat. Nevertheless, results show that affirmations directed to memory retrieval of benevolent and moral action led to a coherence-shift in the uncooperative direction.

Based on theorizing in evolutionary biology and -psychology, I assumed that a possible reason for an increase in cooperative action tendencies after reporting a moral transgression is fear of altruistic punishment imposed by others (cf. Stevens & Hauser, 2004). Another possibility to reduce self-threat (and punishment) is to justify immoral action by obscuring personal responsibility, which can be regarded as a self-defensive use of the Doctrine of Double Effect (DDE, cf. McIntyre, 2009). According to the DDE, people can justify immoral behavior if the harm they caused is a mere side-effect of the accomplishment of a higher goal. Hence, harm is morally permissible if harming another person is a foreseeable side effect (“error of omission”), but not the intended end-state (“error of commission”). This implies a key difference of “being responsible” and “feeling responsible”, or agency and (self-)blame.

3.3.1 Being responsible – agency

Agency is related to the intention to choose a distinct kind of action and linked to having control over a situation that leads to an outcome (Cooper & Fazio, 1984; Weiner et al., 1982). Agency is believed to be sufficient for the arousal of guilt-experiences (Taylor, 1996) and the intensity of guilt is supposed to be a linear function of agency (McGraw, 1987). Despite this intuitively plausible premise, people report more intense feelings of guilt following an accidental moral transgressions which seems to depend on the temporal sequence of intentional and accidental transgressions (McGraw, 1987). When people intend to harm another person, they might experience feelings of guilt *prior to* making the decision to harm and thus have to remove the conflict by e.g., justification/rationalization. Hence, they have to justify their behavior before they make the decision. When perceiving an accidental transgression, the wrongdoer didn't plan the action but may perceive it as "an abrupt norm violation" (McGraw, 1987, p. 254) and the act needs to be justified *afterwards*. In these cases, people often seem to attribute agency to the self, especially if they believe that the negative consequence was foreseeable, which can be understood as feeling moral responsibility or self-blame.

3.3.2 Feeling responsible – (self-)blame

As note above, people feel guilty even when they are not causally responsible for a moral misdeed, i.e. if they have neither agency nor intentionality (Baumeister et al., 1994). People can feel guilty even when they have not done *anything* wrong or blameful, e.g., surviving others (survivor guilt, e.g., Wayment, Silver, & Kemeny, 1995), not sharing the misfortune of others (e.g., Tesser & Rosen, 1972), receiving a larger reward than others (e.g., Austin, McGinn, & Susmilch, 1980), unreturned love (e.g., Baumeister, Wotman, & Stillwell, 1993), or "vicarious guilt" for the transgressions of others (e.g., Lickel, Schmader, Curtis, Scarnier, & Ames, 2005).

In all cases, people are not causally responsible for having intentionally shown immoral behavior but nevertheless seem to experience feelings of guilt. According to Baumeister and colleagues (Baumeister et al., 1994, 1995), guilt is an interpersonal phenomena. Hence, people experience guilt when a moral transgression threatens interpersonal bonds. This is functionally equivalent to the evolutionary explanation of fear of altruistic punishment. For instance, according to Frijda (1993), “one may infer that a major source of guilt emotions is not an appraisal of norm transgression or own responsibility for harm, but an appraisal of risk of loss of love” (p. 369). From this follows that responsibility may moderate but not mediate the experience of guilt (Baumeister et al., 1994; Frijda, 1993). In contrast to agency, from an interpersonal vantage point, the experience of guilt depends on the self-attribution of blame.

3.3.3 Responsibility and the Doctrine of Double Effect

Simplified, the Doctrine of Double Effect (DDE) postulates that people can justify immoral acts if the consequence of their behavior is a foreseeable but not intended side-effect of an action (McIntyre, 2009). For example, according to the DDE performing a hysterectomy¹⁶ on a pregnant woman with uterus cancer is morally permissible because the abortion of the child is a side effect of the hysterectomy. In contrast, performing an abortion to save the mother is not permissible, because the behavior is a mean to reach a goal and not a (foreseeable) side effect. Likewise, in the Trolley-Problem (Foot, 1967; Thomson, 1985), pushing a man to death to save 5 other men is morally impermissible because killing the man is a *mean* to save the others. Switching a lever that redirects a trolley and also kills one person would be justified because the killing of the one is the *side-effect* of switching the lever.

The important aspect for moral decision-making is that the application of the DDE can serve as a personal justification by obscuring personal intention, thus

¹⁶i.e. removal of the uterus

people can reduce self-threat if immoral behavior can be perceived as a mere-side effect of a moral behavior. Or in other words: people can justify behavior if they can reattribute responsibility (i.e. agency) to an *external* source. However, research on the interpersonal nature of guilt implies that people often even seem to attribute responsibility *to* the self even if they did not have any causal influence on the creation of harm (Baumeister et al., 1994).

According to theorizing in evolutionary-psychology and -biology, the reason for such an attribution may be based on the threat of punishment if others perceive the behavior as being intended by the person (e.g., Cosmides & Tooby, 2000; Cosmides et al., 2005; Stevens & Hauser, 2004). Hence, irrespective of causal responsibility, it may be adaptive to consult one's personal moral reputation to predict if punishment by others is likely or not. An indicator for the person's moral reputation is the chronic social orientation of a person.

Research showed that a crucial moderator of the guilt-cooperation link is the chronic social orientation of a person, i.e. chronic tendency to act cooperatively or uncooperatively (Messick & McClintock, 1968; Van Lange, 2000; Van Lange & Liebrand, 1991). Two broad response tendencies can be distinguished: people high in social orientation (HSO) show a *prosocial* response tendency and people low in social orientation (LSO) show a *proself* response tendency. HSO and LSO differ with respect to the increase of outcomes (HSO: joint outcomes, LSO: own outcomes; Messick & McClintock, 1968), the perception of social situations (HSO: moral, LSO: might; Liebrand, Jansen, Rijken, & Suhre, 1986), and rationality and intelligence (HSO: moral behavior is rational and intelligent, LSO: selfish behavior is rational and intelligent, Van Lange & Liebrand, 1991). Hence, HSO are orientated towards others, increase joint outcomes, value equality and perceive social dilemmas in terms of morality. Furthermore, they expect cooperative behavior from intelligent others and regard cooperative choices to be rational (collective rationality). In contrast, LSO are self-orientated and motivated to increase egoistic outcomes. Moreover,

LSO perceive social dilemma in terms of power, expect selfish behavior of intelligent others and consider selfish choices to be rational (individual rationality).

From an information vantage point, the chronic social orientation of a person is responsible for the possibility to use the experience of guilt as evaluative information in social situations. Hence, LSO are assumed to be able to attribute the experience of guilt to social situations because they often act uncooperatively and thus are expected to experience guilt on a regular basis (Hooge et al., 2007; Ketelaar & Tung Au, 2003). HSO however are assumed to cooperate on a regular basis and hence cannot use the experience because for them, it is not applicable to the situation.

From an evolutionary perspective, the relation of guilt and cooperation is a bit more complex. To make cooperation (or reciprocal altruism) an evolutionarily stable strategy, people have to cooperate *conditionally*, i.e. cooperation with cooperators and non-cooperation/punishment of non-cooperators/freeriders. Because cooperation is costly for the individual, people have to form expectations about who is freeriding and who is cooperating, i.e. people need to represent the moral reputation of others. Since cooperators are expected to interact with other cooperators and do not interact with freeriders, people have to build up a personal reputation for themselves by signaling others their willingness to cooperate. Hence, freeriding is harmful and cooperation is helpful to the personal reputation. Whether people cooperate or freeride should be based on people's expectancy of how others act *and* on their personal history of cooperation (or reputation).

If guilt is the emotional experience of having failed to cooperate, past non-cooperative behavior should only be experienced as a threat if the probability of punishment is high. The perceived probability of punishment after non-cooperation however should also depend on the moral reputation of others: if all freeride, then freeriding is no longer an uncooperative action (actually, then it would be cooperative to freeride and uncooperative to share).

In a nutshell: Non-cooperation that leads to guilt should only increase cooperative

action tendencies if it is experienced as a threat of being punished by others. The probability of punishment is low when people have either a positive moral reputation or when others have a negative moral reputation. Since cooperators should only interact with other cooperators, they should expect cooperation when interacting with others. If non-cooperation is regularly followed by altruistic punishment (i.e. refuse cooperation and/or punish agents that do not cooperate by refusal of interaction or by refusing others future benefits) people should expect non-cooperation by others, because altruistic punishment actually is conditional non-cooperation. Hence, in social situations HSO may expect cooperation whereas LSO expect freeriding of others (Van Lange & Liebrand, 1991). A negative feeling in social situations then may imply a threat which should trigger retrieval of the moral reputation of the person *and* the moral reputation of others. Cooperation should follow moral transgressions if people perceive a self-threat, because actual cooperation can signal willingness to cooperate and hence that the moral transgression was an exception to the rule. Then, people may use the moral reputation of others or of themselves to reduce potential blame by others.

To summarize, cooperation should follow a moral transgression if the transgression implies a threat of being punished. In contrast to informational approaches, which assume that emotional influence on decision-making is based on the use of a non-compensatory strategy (e.g., a heuristic), constructionist approaches assume that the decision to cooperate is based on the use of a compensatory strategy that integrates information of situational demands and past actions. Obscuring agency is considered to be irrelevant for blame since blame is assigned by others and hence self-blame may reflect a strategy to examine if punishment can be expected or not. I tested this assumption in two studies. In study III, I used the well established memory retrieval paradigm of Studies Ia and II. In study IV, to effectively manipulate agency, I used behavioral manipulations (cf. Ketelaar & Tung Au, 2003) which I will describe later in closer detail.

3.3.4 Study III: Cooperation and self-blame: Moral reputation

Hypotheses

From an information vantage point, people can reduce feelings of guilt by the attributing responsibility of having harmed another person to external sources. External attribution of agency however should reduce experienced guilt (cf. (Tracy & Robins, 2006; Weiner et al., 1982)) and hence the informational impact of guilt on cooperative choices. Furthermore, informational approaches assume that the applicability of guilt depends on (the frequency of) prior experience of guilt in social situations, hence their social orientation or moral reputation.

In contrast to information approaches, I assume that people use the moral reputation for justification or rationalization of past moral transgressions. Hence, I assume that memory-retrieval which directs attention on others increases the saliency of other people's reputation whereas memory retrieval which directs attention to the self increases the saliency of the personal reputation. For LSO the activation of other people's (uncooperative) reputation reduces threat, the activation of the personal (uncooperative) reputation increases threat. For HSO the activation of other people's (cooperative) reputation increases threat, the activation of the personal (cooperative) reputation reduces threat. A positive personal reputation should provide uncooperative action tendencies (e.g., Sachdeva et al., 2009) whereas a personal negative reputation should provide cooperative action tendencies (e.g., Hooge et al., 2007; Nelissen et al., 2007). For LSO, the activation of other people's (uncooperative) reputation is accompanied by an uncooperative action tendency and the activation of the person's (uncooperative) reputation is accompanied by a cooperative action tendency. In contrast, for HSO the activation of other people's (cooperative) reputation is accompanied by an cooperative action tendency and the activation of the person's (cooperative) reputation is accompanied by a uncooperative action tendency.

Participants and Design

Fifty-two undergraduate students of the University of Würzburg (non-psychologists, 34 females, age $M = 23.52$, $SD = 3.18$) participated in the study for monetary compensation (€6). Each participants worked at their own terminal and were randomly assigned to one condition of a 2 (reputation: self/other) x 2 (chronic social concerns: low/high) mixed-factorial design with reputation as the between factor. Participants who either refused to work on or had problems with the the emotion-priming task were excluded from the analysis (10 participants)

Procedure

Participants were told to complete several studies on emotion and decision-making. Participants started with the guilt induction task which was followed by the a self-justification task aimed on increasing saliency of the personal or other people's reputation. Both manipulations were introduced as (episodic) memory tasks. Afterwards, a brief emotion questionnaire followed. Finally, participants completed the measure of cooperation, which was framed as an unrelated study about decision-making. Participants read the rules of the game, were examined if they understood the rules¹⁷ and then donated tokens to a computer player. For the rest of the experimental session, participants worked on unrelated tasks. At the end, participants completed a measure of social value orientation, formal data and were probed for suspicion. Then they were thanked, debriefed and payed.

Materials

Guilt-activation All participants received an autobiographical guilt-priming procedure identical to Study Ia and II.

¹⁷To assure that participants understood the rules they were not able to proceed if they failed to pass the questions on the questionnaire

Reputation-manipulation Saliency of reputation was manipulated by an autobiographical recall procedure (Hooge et al., 2007; Strack et al., 1985). Participants were asked to generate *justifications* for the behavior they reported in the guilt activation task¹⁸. To direct attention to the self, participants were asked to generate justifications they would personally use (personal justification). To direct attention to others, participants were asked to generate justifications others would use (others justification, for a similar manipulation, see Stone, Wiegand, Cooper, & Aronson, 1997).

Measure of emotional experience The measure of emotional experience was identical to study Ia,b and II.

Measure of cooperation Cooperation was measured with the one-shot give some game identical to Study Ib and II. In contrast to the other studies, the person believed to interacted with a computer instead of a human player to provoke uncooperative decisions and to show that cooperative action tendencies aim on reducing personal threat by communicating willingness to cooperate¹⁹ instead of being prosocial to another person.

Measure of chronic social orientation Chronic social motives were measured with 9 decomposed games in which people could decide between a cooperative and a selfish choice (Triple Dominance Measure²⁰, Van Lange et al., 1997). A median-split was performed on the probability of prosocial choices²¹. Participants who scored

¹⁸Instructions can be found in Appendix 2.3 on page 150.

¹⁹For communicative purposes, it is irrelevant if a person cooperates with a human or a computer.

²⁰The questionnaire can be found in Appendix 4.1 on page 158.

²¹Originally, the Triple Dominance Measure assigns people to the prosocial or proself category by 6 of 9 consistent choices, e.g., people who make at least 6 prosocial choices are labeled “prosocial” and people who make at least 6 selfish choices are labeled “proself”. I performed a median split on the probability of cooperative choices because (1) I’m only interested in relative differences and (2) the results of my previous studies regarding cooperation denote that cooperative, or prosocial, people make approx. 50% cooperative choices. Hence, if people used this strategy for the whole questionnaire, then they would make either 4 or 5 (out of 9) prosocial choices, which would make these participants uncategorizable.

above the median ($md = .0$) were labeled "high social orientation" (HSO, 55.63% cooperative choices) and participants who scored below the median were labeled "low social orientation" (LSO, 0% cooperative choices).

Results

Emotional experience A 2 (reputation: self vs. other) x 2 (social orientation: self vs. other) analysis of variance on reported discomfort revealed a marginally significant two-way interaction of reputation and social orientation, $F(3, 37) = 3.18$, $p = .08$, $\eta_p^2 = .08$. Since the omnibus-test failed to reach significance and I furthermore didn't have explicit a-priori hypotheses, I refrain from reporting simple contrasts.

A 2 (reputation: self vs. other) x 2 (social orientation: self vs. other) analysis of variance on reported negative self-directed affect revealed a significant two-way interaction of reputation and social orientation, $F(3, 37) = 4.39$, $p = .04$, $\eta_p^2 = .11$. Pairwise contrasts revealed that LSO reported more negative self-directed affect when the personal reputation was made salient than when other person's reputation made salient, $F(1, 37) = 15.71$, $p < .001$, $\eta_p^2 = .30$. Reputation did not influence reported self-directed affect of people high in social concerns, $F < 1$. Furthermore, I found a significant main effect of reputation-type ($F(3, 37) = 10.65$, $p < .001$, $\eta_p^2 = .22$) which indicates that writing justifications from a personal perspective ($M = 3.56$ $SD = 1.47$) was accompanied by more negative self-directed affect than writing justifications from the other-person perspective ($M = 2.05$, $SD = 1.45$). Means and standard deviations of discomfort and negative self-directed affect can be found in table 3.7 on page 83.

A 2 (reputation: self vs. other) x 2 (social orientation: self vs. other) analysis of variance on reported positive affect revealed a significant two-way interaction of reputation and social orientation, $F(3, 37) = 5.35$, $p = .03$, $\eta_p^2 = .13$. Pairwise contrasts revealed that LSO reported less positive affect when the the per-

Table 3.7: Study III: Means and standard deviations of discomfort and negative self-directed affect

Reputation	discomfort		negative self-directed affect	
	self	other	self	other
LSO	4.54 (1.57)	2.6 (1.7)	3.86 (1.63)	1.48 (.62)
HSO	3.92 (.97)	3.69 (1.61)	3.16 (1.19)	2.64 (1.82)

Note: higher values indicate higher levels of negative affect or discomfort

Table 3.8: Study III: Means and standard deviations of positive affect

Reputation	positive affect	
	self	others
LSO	3.6 (1.15)	5.47 (.57)
HSO	3.95 (1.43)	4.23 (1.12)

Note: higher values indicate higher levels of positive affect

sonal reputation was made salient then when other person's reputation made salient, $F(1, 37) = 16.31$, $p < .001$, $\eta_p^2 = .31$. Reputation did not influence reported positive affect of HSO, $F < 1$. Furthermore, I found a significant main effect of reputation-type, $F(3, 37) = 9.91$, $p < .01$, $\eta_p^2 = .21$, which indicates that writing justifications from a personal perspective ($M = 3.75$, $SD = 1.26$) was accompanied by less positive affect than writing justifications the other-person perspective ($M = 4.85$, $SD = 1.08$). Means and standard deviations of positive affect can be found in table 3.8 on page 83.

Cooperation A 2 (reputation: self vs. other) x 2 (social orientation: self vs. other) analysis of variance on donated tokens revealed a significant two-way interaction of reputation and social orientation, $F(3, 38) = 11.21$, $p < .01$, $\eta_p^2 = .23$. Pairwise contrasts revealed that LSO donated more tokens when the personal reputation was made salient than when the other person's reputation was made salient, $F(1, 38) = 4.09$, $p = .05$, $\eta_p^2 = .10$. In contrast, HSO donated more tokens when the other people's reputation was made salient than when the personal reputation was made salient, $F(1, 38) = 7.26$, $p = .01$, $\eta_p^2 = .16$. As expected, I found a (less interesting)

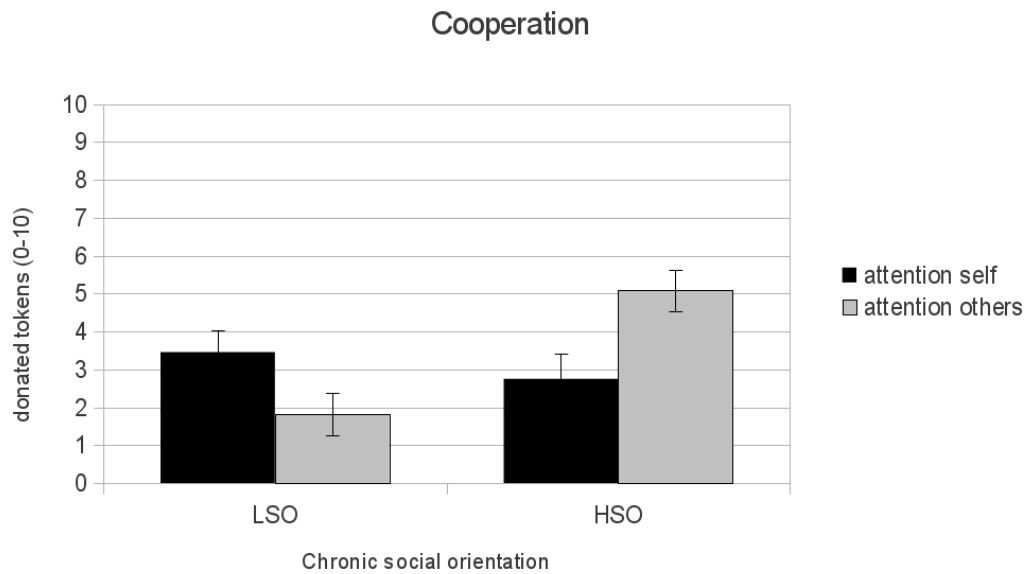


Figure 3.4: Study III: Cooperation

main effect of chronic social orientation $F(3, 38) = 4.67$, $p = .04$, $\eta_p^2 = .11$ which revealed that HSO ($M = 5.15$, $SD = 2.37$) donated more tokens than LSO ($M = 3.64$, $SD = 1.84$). Means and standard errors of the mean can be found in figure 3.3.4 on page 84.

3.3.5 Study IV: Cooperation, agency and self-blame

In the following study, I examined the influence of agency *and* blame on cooperation. From a constructionist vantage point, agency is assigned by others, i.e. interaction partners judge if they perceive a behavior as being intended by the person or as an unintended side-effect. In other words: intentionality is attributed *to* the person *by other* persons who perceive the immoral behavior and obscuring agency is a means to change this attribution process in others (cf., Jones & Harris, 1967). If people however cannot communicate non-intentionality²², reattributing agency should have no effect on cooperation because people then have to make sure that their reputation is not threatened and they do not have to fear punishment (imposed by others).

²²e.g., by behavior or verbally

Hence, even when people are not causally responsible (i.e. agency) for a moral transgression, they should show cooperation intended to communicate willingness of cooperation aimed on reducing threat of being punished. To prevent a possible confoundation with blame, agency and blame were manipulated independently.

Hypotheses

The hypotheses were identical to Study III. In line with evolutionary and interpersonal approaches, I further assume *no* influence of causal agency on cooperation.

Participants and Design

One hundred and twenty nine undergraduate students of the University of Würzburg (non-psychologists, all female ²³, due to a programming-error, information about age was lost) participated in the study for monetary compensation (€6 – €10). Each participants worked at their own terminal and were randomly assigned to one condition of a 2 (agency: yes vs. no) x 3 (self-focus: self vs. others vs. control) x 2 chronic social orientation (self vs. other) mixed-factorial design with agency and self-focus as between factors. Sixty participants were eliminated from data-analysis because they refused to be uncooperative or to harm the other player in the guilt/agency manipulation, which was mandatory to evoke guilt.

Procedure

After arriving at the laboratory, the experimenter greeted the participants and told them that they were participating in a study on decision-making by playing a computer game in which it was possible to win money additionally to their compensation. Then, the experimenter took a photograph of the participant for the later game and asked the participant to have a seat at a separate workplace. The experimenter

²³The study involved high interaction of participants and experimenters. To control for experimenter effects, only female participants were tested by two female experimenters

told the participant that in the next hour they will complete different studies about emotion and decision-making. First, participants read a short description of the study which introduced the rules of the prisoner's dilemma and completed a short questionnaire to test if they had understood the rules of the game. After the presentation of the instructions, they were told that they would play a first block of 15 rounds with a computer partner which "simulates" how an ordinary (human) participant would react. After the practice block, participants were told that they will now play with a real participant for real money, i.e. that they will receive the money they earn in the game, additionally to their compensation. Participants were told that the department webserver would randomly pair participants being tested in different laboratory rooms via the department intranet. The experimenter pretended to log the participant into the system and then a short picture and description of the other player appeared on the screen. Afterwards, the computer presented the agency-manipulation in a pop-up window. Then, participants believed to play 5 rounds with the other participant and afterwards recorded their benefits as well as the benefits of the other participant. To manipulate attention to the self or others, participants were placed at a separate table and worked on the self-/other focus task which was followed by an emotion questionnaire. Afterwards, participants returned to their computer workplace and were told that they would now play another 5 rounds of the game with the other participant, and if they were told to respond in a certain way in the last round of the game, they could now freely choose how they'd like to react. Finally, participants played the 5 rounds, recorded their benefits as well as the benefits of the other participant afterwards and worked on unrelated tasks for the rest of the experimental session. At the end of every session, participants were probed for suspicion, thanked, debriefed and payed.

Materials

The prisoner's dilemma game The prisoner's dilemma (Axelrod & Hamilton, 1981; Kuhn, 2009) is a problem in game-theory that shows why people do not cooperate even though it is in their best interest. In the classic prisoner's dilemma game, two players play with each other. Both players have the option to cooperate or to defect, thus the payoff of a player does not uniquely depend on the own decision but also on the decision of the other player. Cooperation of both players leads to a moderate positive outcome for both, defection of both players leads to a very negative outcome for both. The best payoff for a player occurs when the player defects and the other player cooperates, the worst payoff occurs when the player cooperates and the other player defects. Defection is tempting because it leads to higher outcomes for the defector. However if played repeatedly, defecting is costly because the other person can take revenge and *punish* the defector via denial of cooperation. Hence, the game models the evolutionary problem of costly cooperation as well as costly freeriding (when played repeatedly). Different rounds of the prisoner's dilemma²⁴ were used to assess the chronic social motives of a person and was also used as the depend behavioral measure of cooperation in the test-rounds. Furthermore, it was used to evoke feelings of guilt. The different functions of the game are explained in the respective paragraph.

Chronic social orientation Chronic social orientation was measured in the first (practice) block of the prisoner's dilemma game (Ketelaar & Tung Au, 2003). Participants were told that they would play 15 rounds of the game to get comfortable with it and to explore how it works. Furthermore, they were told that they would play with a computer player that would mimic the behavior of a human player. The computer was programmed to play "tit-for-tat", thus to take revenge for defection (or to show altruistic punishment). This strategy was implemented to make the

²⁴Instructions and screenshots can be found in Appendix 5.2 on page 165

participant aware that the other player might take revenge if she acts uncooperative in subsequent rounds and to increase the saliency of reciprocal altruism. Following Ketelaar and Tung Au (2003), the percentage of prosocial choices were splitted at the median (cf. Study III, section 3.3.4). Participants who scored above the median ($md = .4$) were labeled "high social orientation" (HSO, 60% cooperative choices), participants who scored below the median were labeled "low social orientation" (LSO, 20,93% cooperative choices)

Guilt induction and manipulation of agency To induce guilt, the practice round was followed by another round of repeated prisoner's dilemma games. Participants were told that they would now play with a real player (another participant sitting in another laboratory room). When people started the game, a small pop-window appeared on the screen. In the agency condition, participants read that for the success of the study, it would be nice to apply a certain response strategy whereas in the no-agency condition participants were told that it is their obligation to apply the strategy as a part of the study. Thus, in the agency condition, it was the participants own choice to defect whereas in the no-agency condition it was mandatory (and hence the choice of the experimenter). Furthermore, participants were told that just one of the players would get this message. To evoke guilt, unbeknownst to the participant, the other player was actually a computer-player programmed to play cooperatively in every trial while the proposed strategy for the participant was to defect. Hence, participants (unintentionally) increased their own payoffs at the cost of others, which is a behavior that elicits guilt (cf. Austin et al., 1980).

Self-/other focus To increase attention to either the self or to others, a procedure developed by Wiekens and Stapel (2008) was used²⁵. Self-focus manipulation was modeled after Brewer and Gardner (1996). Participants received a study about

²⁵Instructions can be found in Appendix 2.5 on 151

“comprehensive reading abilities” and were asked to circle all personal pronouns (I, me, my, mine) within a short text. Other-focus was induced by a mirror²⁶, i.e. people sat in front of a mirror while filling out a control version of the self-focusing task. In the control condition, the mirror was present but covered and personal pronouns were replaced by the letter strings (abc, xyz).

Measure of emotional experience Emotional experience was measured with an affect-questionnaire²⁷ developed by Devine, Monteith, Zuwerink, and Elliot (1991). Participants rated their current mood state on a 7-point Likert scale (1 = does not apply at all, 7 = applies very much). The questionnaire comprised 35 affect-items and measured 6 emotion dimensions: discomfort, negative self-directed affect, negative affect directed towards others, threat, depression and positive affect.

Measure of cooperation Cooperation was measured with another block of the iterated prisoner’s dilemma games. Participants believed that they would play another 5 rounds with the participant which was now programmed to “take revenge” for the first 5 rounds and defected on every trial.

Results

Emotional experience A 2 (agency: yes vs. no) x 2 (self-focus: self vs. others vs. control) x 2 (social orientation: self vs. other) analysis of variance on discomfort, negative self-directed affect, positive affect, other-directed negative affect, threat and depressive affect revealed no influence of agency and/or self-focus and/or social orientation on reported affect ratings.

²⁶There is a debate in self-awareness research if a mirror increases private or public self-awareness, i.e. self- or other-focus. According to Wiekens & Stapel, 2008, a mirror may increase awareness of both private and public self-aspects but the I-priming however may only increase private self-aspects, or self-focus. Hence, the main difference important for this study is that in the mirror-condition saliency of public self-aspects should be higher than in the I-priming-conditions.

²⁷Instructions can be found in Appendix 3.1 on page 155

Cooperation A 2 (agency: yes vs. no) x (self-focus: self vs. others vs. control) x 2 (social orientation: self vs. other) analysis of variance on cooperative choices revealed a (less interesting) main effect of self-focus, $F(11, 57) = 3.25$, $p = .05$, $\eta_p^2 = .10$, a (less interesting) main effect of social orientation, $F(11, 57) = 23.63$, $p < .001$, $\eta_p^2 = .29$ and the expected two-way interaction of self-focus and social orientation, $F(11, 57) = 4.19$, $p = .02$, $\eta_p^2 = .12$. As expected, no effect of agency was found. Thus, I eliminated this factor from further data analysis.

A 3 (self-focus: self vs. other vs. control) x 2 (social orientation: self vs. other) analysis of variance on cooperative choices revealed a (less interesting) main effect of self-focus, $F(5, 63) = 4.40$, $p = .02$, $\eta_p^2 = .12$ ($M_{self-focus} = .24$, $SD_{self-focus} = .13$; $M_{other-focus} = .35$, $SD_{other-focus} = .23$; $M_{nofocus} = .24$, $SD_{nofocus} = .18$), a (less interesting) main effect of social orientation, $F(5, 63) = 29.06$, $p < .001$, $\eta_p^2 = .32$ ($M_{HSO} = .37$, $SD_{HSO} = .19$; $M_{LSO} = .19$, $SD_{LSO} = .14$) and the expected two-way interaction of self-focus and social orientation, $F(5, 63) = 4.53$, $p = .02$, $\eta_p^2 = .13$.

Pairwise contrasts revealed that self-focus changed donation patterns in HSO, $F(2, 63) = 7.75$, $p = .001$, $\eta_p^2 = .20$, but not in LSO ($F < 1.14$, $p > .33$). HSO donate more tokens in the other-focus condition than in the self-focus condition ($p < .001$) and the no-focus control-condition ($p = .01$). Donated tokens in the no-focus control condition and self-activation conditions did not differ ($p > .1$)

Furthermore, pairwise contrasts revealed that HSO donated more tokens in the other- ($F(1, 63) = 23.57$, $p < .001$, $\eta_p^2 = .27$) as well as no-activation condition ($F(1, 63) = 12.77$, $p = .001$, $\eta_p^2 = .17$) than LSO, but not in the personal activation condition, $F < 1$. Means and standard errors of the mean can be found in figure 3.3.5 on page 91.

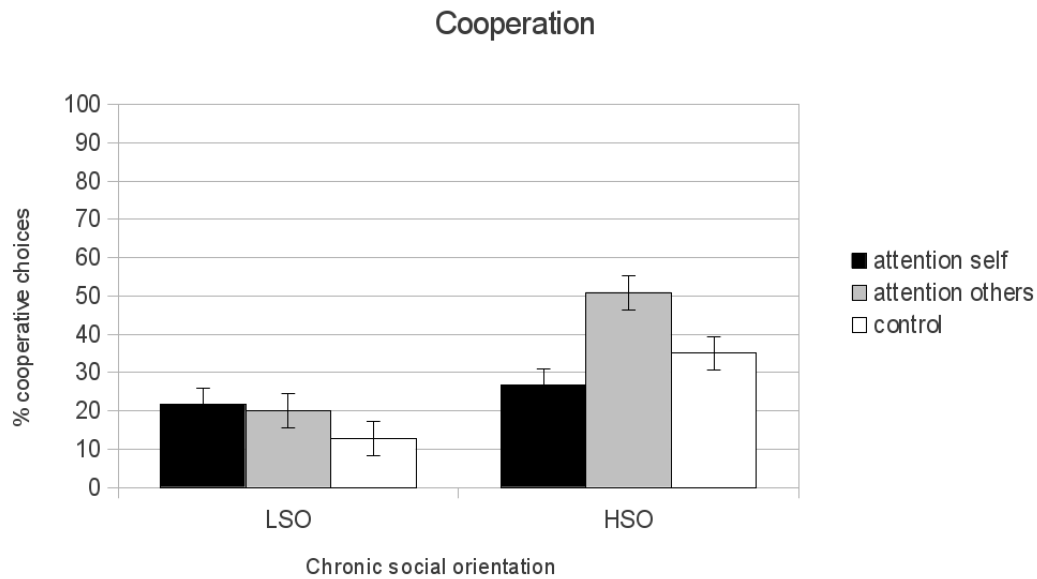


Figure 3.5: Study IV: Cooperation

3.3.6 Discussion

In this section, I examined the influence of two different types of responsibility on cooperation: agency and blame. From an intrapersonal standpoint, the experience of guilt is based on perceived causal responsibility, or agency. In contrast, interpersonal approaches assume that feelings of guilt lead to increased deliberation about the causes and people attribute guilt to the self. This re-attribution may reflect an examination of past moral transgressions and if altruistic punishment is likely. Hence, intrapersonal approaches assume that agency is a mediator for experiencing guilt causal to cooperation (e.g., Taylor, 1996; Weiner et al., 1982) but interpersonal approaches assume that self-blame moderates the relation of guilt and cooperative action (e.g., Baumeister et al., 1994, 1995, see also Frijda, 1993). This means that in informational approaches, which assume that people use emotional experience as an information for the evaluation of behavioral outcomes, agency is causal to cooperation, because no agency would reduce guilt and hence reduce the informational content of the emotion. The chronic social orientation is considered to moderate the applicability of guilt in such situations.

In contrast, from a constructionist perspective, blame is causal to cooperation because cooperation is only necessary if people have to fear altruistic punishment, and blaming oneself reflects an examination of the moral reputation (by past memories). The chronic social orientation serves as an indicator for the self- and other-expectancies regarding cooperative action, i.e. the moral reputation of the person and of others.

I contrasted agency with blame in two studies. In the first study (III), people were able to reduce agency by explicitly justifying their behavior. In the second study (IV), people were able to attribute agency of unfair behavior to the experimenter.

Results are supportive for the constructionist approach. In study III, people were able to reduce threat by justification, hence to make an external attribution of agency²⁸. However, justifications modulated cooperation with respect to the person's moral reputation: Results show that LSO increased cooperative action when writing justifications from a personal perspective but not when writing justifications from the perspective of others. In contrast, HSO increased cooperation when writing justifications from the other's perspective but not when writing justifications from a personal perspective. These findings indicate that people use their moral reputation to examine if the situation is threatening and people cooperate when justification fails. Hence, the decision to act cooperatively depends on a compensatory information processing strategy, since cooperation only increases if people are not able to use other memories to compensate for the remembered moral transgression.

In study IV, in which agency and blame were manipulated independently, results further revealed that cooperation is based on blame instead of agency, at least in HSO. Whereas HSO show the same pattern of cooperation like in study III, if real money is involved, LSO do not cooperate irrespective of self-focus. These findings

²⁸For instance, within the student population, a commonly reported moral transgression is cheating on one's partner, which is, also commonly, justified by drunkenness. Since alcohol reduces personal control, justifying unfaithful behavior by drunkenness can be regarded as an external attribution of agency, or situational control.

indicate that HSO reduce cooperation if attention is directed to their personal moral reputation, but cooperate if attention is directed to others. This is in line with the findings that HSO expect cooperation from others and if others cooperate, then non-cooperation would imply that the person is a freerider and has to expect altruistic punishment. Furthermore, for HSO it seems to be irrelevant whether they make hypothetical choices in which they do not lose personal resources (study III, cf. section 3.3.4) or real choices in which they lose money when cooperating (study IV, cf. section 3.3.5).

In contrast, LSO differ with respect to real and hypothetical choices. Whereas LSO donate more tokens when attention is directed to the personal reputation and choices are hypothetical (no loss, donation partner is a computer, cf. study III, section 3.3.4), they do not donate more when cooperation leads to personal losses.

This effect can be explained differently but may be due to the structure of the study. According to McGraw (1987), when deciding to harm another person, people have to justify their behavior beforehand. Since participants were either asked or forced to be uncooperative with the other player, this may have served as a “licence to cheat” and to increase personal gains. Then, directing attention to the self or others would have no effect because participants decided to cheat and attributed blame to the experimenter, which can be understood as a self-defensive use of the DDE. Another explanation why LSO do not increase cooperation may be due to the structure of the experimental manipulation. In the agency/guilt-manipulation block, the other player always cooperated but in the test-block, the partner always defected. If LSO expect non-cooperation, then the “behavior” of the other player may have neutralized cooperative action tendencies induced by the self/other attention-manipulation. However, it is unknown why LSO do not increase cooperation and both explanations would be plausible.

Again, findings related to cooperation suggest that people do not necessarily use their emotional experience as information for decision-making since agency (which

should mediate guilt and hence influence cooperation) does not have any effect on cooperative decisions. However, self-reports of emotional experience also reveal the situations in which the affective influence appears to reflect the use of a non-compensatory strategy. In study III, when first reporting a past moral transgression and then justifying it, LSO report an increase of negative self-directed affect, discomfort and reduced positive affect (relative to justifying behavior from an other's perspective) which mirrors cooperative action tendencies (cf. section 3.3.4). This pattern hence appears to reflect the use a non-compensatory strategy to decide, but however is actually based on compensatory information processing because even LSO decide with respect to their moral reputation. If LSO would not consult their moral reputation or the reputation of others, any justification (i.e. obscuring agency) should reduce cooperation. In study IV, results concerning emotional experience also suggest that how people report emotional experience seems to follow other principles than cooperative action (cf. section 3.3.5), since neither responsibility nor people's chronic social orientation systematically influenced participants' affect-ratings.

To sum up, findings suggest that cooperation following guilt is due to self-blame or inspection of the moral reputation of the person. Findings furthermore suggest that agency is unrelated to cooperation following the experience of guilt. If agency is necessary for the arousal of guilt, then the possibility to obscure agency should led to a decrease of feelings of guilt and also cooperation.

However, findings are in line with constructionist approaches, since chronic social motives are used as a moral reputation, which indicates the use of a compensatory decision strategy. The use of a compensatory strategy may not be aware, since people either do not report any change in emotional experience (e.g., HSO, which would be a precondition for the informational use) or they report changes in experience which however does not necessarily mean that the decision itself is also based on a non-compensatory strategy. For instance, if people would need their (conscious) feelings of guilt to decide, then obscuring agency should have led to a decrease of

negative feelings as well as a reduction of cooperation, which is not the case. Hence, both emotional experience and the decision to cooperate may be based on the same compensatory information integration, which is however not necessarily aware to the person. Furthermore, under some conditions, compensatory information processing appears to reflect the use of a non-compensatory decision strategy (cf. section 3.3.4).

In a nutshell: If people need emotional experience of guilt to infer how to decide (i.e. using a non-compensatory decision-strategy based on emotional experience), then the possibility to reattribute agency should lead to a decrease of cooperation because reducing agency would reduce experienced guilt. If people however use a constructionist strategy, agency is unimportant and people examine if others can blame them. Cooperation then results if people cannot activate information that compensates for the situationally activated moral transgression and people have to compensate by showing cooperative action. Findings are in line with the constructionist approach.

4 General discussion

Aim of my dissertation is to contrast decision-making based on emotions from emotional decision-making based on PCS-processing in the domain of guilt and cooperation.

4.1 Summary of hypotheses and findings

Traditional accounts of decision-making (e.g., the expected utility model, Neumann & Morgenstern, 1944) emphasize the role of reasoning and rationality (Dawes, 1998). Rational decision makers anticipate the outcomes of an action, then carefully evaluate them (via cues) according to probability (cue validity) and value (cue value) and then choose the option that yields the highest utility. Hence, utility of a choice option is the information that is needed to rank alternatives according to a choice ranking- or decision-rule. Then, people may choose the option that yields the (subjectively) highest utility.

Utility calculations are considered to depend on time-consuming and exhausting decision-rules (or strategies) like the WADD and people are expected to use simpler rules or heuristics (e.g., LEX or EBA) that utilize cues which are situationally available, for instance immediate affective experiences like emotions.

Emotions are experienced as a reaction to stimuli or situations (e.g., Harré, 1986), hence subjective emotional reactions may be considered as trustworthy “gut-feelings” which can be used for evaluating decision outcomes. In other words, from

the perspective of traditional, consequentialist approaches, intuitive, or emotional, decisions are based on affective experiences that are used in a “rational” decision-making process based on the maximization of e.g., utility. Hence, people are expected to change the decision rule when compensatory information processing (calculations of expectancy and value) is not possible or people are not motivated.

In contrast to traditional consequentialist accounts, decision-making approaches based on coherence and PCS assume that people always utilize a compensatory decision strategy (e.g., Barnes & Thagard, 1996; Glöckner & Betsch, 2008a, 2008b; Thagard & Millgram, 1995) and using “heuristics” are a change in the information search strategy (Glöckner & Betsch, 2008a). Thus, decision-making based on PCS principles reverses the logic of traditional approaches by assuming that there is only *one* compensatory decision rule that people can utilize in an automatic fashion, but deliberative processes influence *what* is processed (e.g., memory retrieval and attentional processes). In traditional decision-making approaches, intuitions and emotions can *influence* rational decision-making processes (Pfister & Böhm, 2008). In approaches based on PCS, the decision-making process (i.e. the information integration) itself is “intuitive” or emotional.

Both approaches differ on three dimensions: specificity of emotion-attribution (number of processes), specificity and relevance of action-tendencies for decision-making, and specificity of emotion-regulation (responsibility: agency vs. blame).

First, informational approaches assume that emotional experience serves as information in a decision-making process. The processes that elicit emotional experience may also be unrelated to the decision-situation, because emotional experience just “influences” a rule-based decision-making process by providing a substitute for utility. Hence, from an information vantage point, intuitive or emotional decision-making is based on two processes (emotion-elicitation and decision-making). In contrast, constructionist approaches based on PCS processing assume that emotion-elicitation and decision-making are two different outputs of the same process.

The first two studies examined if the process that elicits guilt is separate from the process that “uses” guilt as a decision-cue. Generally speaking, the results show, as expected, that guilt priming increases cooperative action tendencies. Hence, results are in line with previous findings (e.g., Hooge et al., 2007; Ketelaar & Tung Au, 2003; Nelissen et al., 2007). However, a simple affect-misattribution procedure that was placed between the emotion-elicitation task and the decision-making task eliminated cooperative action tendencies in the guilt-conditions¹. Furthermore, bringing to mind a past transgression did not lead to different results than merely imagine a moral transgression. Both findings indicate that information was constructed and may be based on episodic memory (Conway, 2001).

Importantly, misattribution did not influence emotional self-reports: in the guilt-priming conditions, people report increased self-directed negative affect even when they accomplished the misattribution task beforehand. Notably, people seem to use different strategies for self-judging their behavior and making decisions: whereas decision-making seems to be based on constructionist information processing (i.e. change in conceptual knowledge used to categorize core-affect), emotional self-reports would suggest that people use a non-compensatory strategy for decision-making, because the possibility for misattribution did not reduce reported negative self-directed affect. Whereas in the first study (in which autobiographical guilt-priming was used), “guilt” was explicitly mentioned in the instruction of the priming-task, in the second study that used an imagery task, “guilt” was not mentioned. In study Ib, people show the same pattern of cooperation then in study Ia, but do not report any differences in emotional experience. These findings furthermore indicate that people may not need to use their conscious emotional experience as “information” for decision-making. Furthermore, results may indicate that, when filling out emotional self-reports, people used an implicit theory to answer the questions about how they (should) feel (Nisbett & Wilson, 1977).

¹cf. study Ia, section 3.1.2, and study Ib, section 3.1.3

Results of the two misattribution-studies hence suggest that people do not need to “use” their emotional experience of guilt to make cooperative decisions and emotions may influence decision-making unconsciously. But if people do not need to use their conscious emotional experience of guilt to make a cooperative choice, how do emotions then influence decision-making?

Informational and constructionist approaches differ with respect to the assumptions about how decisions are made. Informational accounts assume that people use a decision-rule when having to choose between options. If people use emotional experience of guilt as a cue for the utility of an outcome, then one may expect that people choose an outcome that leads to least guilt. From a constructionist perspective however, what leads to least guilt is the option that increases coherence of information related to cooperation. In other words, informational approaches assume that people choose the best option on the dimension they use for evaluation (e.g., how much guilt an option elicits). Constructionist approaches assume that people choose options that increase the coherence of incoherent information. Hence, the best decision is to choose the option that increases coherence.

Following PCS approaches, people can make decisions by sorting outcomes, as assumed by traditional outcome-based decision-making approaches, but also by sorting “goals” (e.g., Barnes & Thagard, 1996). Since in PCS models, goals and actions do not strongly differ conceptually², a “goal” can be accompanied by an action tendency (or goals and actions are based on action tendencies). The reminiscence of a moral transgression may be accompanied by conflicting action tendencies related to cooperation and non-cooperation which leads to a shift in core-affect (or elicits dissonance, Harmon-Jones & Harmon-Jones, 2007; Harmon-Jones et al., 2009). This “conflict” can be solved if situationally salient information provides action tendencies in favor of one *or* the other action-option. Hence, information that provides

²For instance, Thagard and Millgram (1995) do not sharply distinguish between actions and goals, because what may best be described as an “action” in one situation may best be described as a “goal” in another situation.

action tendencies relevant to the underlying conflict can disambiguate it and provoke a shift in one or the other direction, which is analog to “making a decision”. In study II, participants were either primed with guilt or shame in order to induce a self-threat regarding morality (guilt) or competence (shame). Afterwards, participants had the possibility to reduce experienced self-threat by affirming themselves. Results show that people increased cooperation when a moral self-threat (guilt) was followed by a non-moral affirmation (power and achievement) but decreased cooperation when it was followed by a moral affirmation (benevolence and universalism). From this follows that the decision to cooperate is due to the disambiguation of action-tendencies, because cooperation only increases if people process information that is unrelated to morality and hence not accompanied by uncooperative action tendencies. Notably, people reported increased reported negative self-directed affect after completing a moral self-affirmation but however decreased cooperation, which furthermore indicates that people do not seem to use their consciously available emotional experience of guilt to infer what decision-option may be most appropriate in a situation.

Whereas the previous studies show that cooperation following guilt is based on one PCS-process that provides different outputs (action and experience, cf. study Ia and Ib), it is yet unclear how people can influence decision-making. As outlined in the theoretical part, people experience the incoherence of action-tendencies related to cooperation as negative affect, and if the affect is categorized according to cooperation, it is experienced as a moral self-threat, or guilt. Since people do not seem to be aware of the underlying conflict of action-tendencies, they can only manipulate the PCS process by changing information that is experienced, i.e. they need to employ information that reduces the experienced self-threat. Two different reasons for eliminating threat are reasonable: first, since guilt feels bad, people may cooperate because they want to feel better. Second, feelings of guilt result from a violation of reciprocal altruism and people have to fear (altruistic) punishment by

others if they do not cooperate.

In informational approaches, emotional experience is used, but not necessarily generated, by (heuristic) decision-making process, and emotion-regulation processes can reduce feeling of guilt. Hence, they should indirectly influence the informational impact of guilt on decision-making, because if people do not feel guilt any longer, then they shouldn't be able to use it for decision-making. In contrast, from a constructionist perspective, people cooperate in order to reduce threat, hence only emotion-regulation attempts capable to reduce blame by others should successfully eliminate guilt. In other words, from an informational perspective, unspecific emotion-regulation may indirectly influence cooperation by reducing the informational impact of guilt. From a constructionist perspective, emotion regulation needs to be specific in reducing blame and hence reducing threat of being punished. Guilt can be conceptualized as an intrapersonal phenomena and an interpersonal phenomena, or can be linked to agency and blame. From an intrapersonal perspective, agency is important because if a person is not causally responsible for having harmed another person, there is no need to feel guilty (Tracy & Robins, 2006; Weiner et al., 1982). Hence, from an intrapersonal vantage-point, the possibility to externally attribute guilt should change the emotional experience and hence reduce its impact on decision-making.

From an interpersonal perspective, people often feel guilty especially when they do not have agency, which may be understood in terms of evolutionary psychology. Moral principles are often linked to basic survival problems (Haidt & Joseph, 2007), and guilt is related to failures of cooperation and reciprocal altruism. Within biological systems, reciprocal altruism can only "survive" if people cooperate conditionally, i.e. if people cooperate with other cooperators and exclude or punish freeriders. Failures to reciprocal altruism increase the possibility to be judged as a freerider, and thus to be punished or excluded. From an evolutionary perspective, cooperation is following guilt if people cannot compensate for a moral transgression,

e.g., by using the moral reputation of oneself or of others. Hence, whereas agency can reduce the experience of guilt, self-blame can lead to information processing aimed on examining if the personal moral reputation is threatened or not. From this follows that agency can be used as an indicator for a non-compensatory process whereas blame can be used as an indicator for a compensatory process.

Results of two studies are supportive for the constructionist approach. First, writing justifications (i.e. having the opportunity to reduce agency by external attributions) did not lead to a general decrease of cooperation, which one may expect when people use guilt as information to cooperate. However, directing attention to the self or to others influenced cooperation based on people's moral reputation: if people have the perception of a positive moral reputation, they decrease cooperation (Mazar & Zhong, 2010; Sachdeva et al., 2009). In contrast, when people (still) have the perception of a negative moral reputation, they increase cooperation (Hooge et al., 2007; Ketelaar & Tung Au, 2003; Nelissen et al., 2007). These findings indicate that people use a compensatory strategy for decision-making, since past moral behavior can compensate for current transgressions and even the moral reputation of others can compensate for own moral transgressions (cf. section 3.3.4).

Under some conditions, it appears that people have used a non-compensatory decision-strategy. For instance, cooperative choices correspond with emotional self-reports in LSO, hence increased reports of negative self-directed feelings (and decrease of positive feelings) lead to an increase in cooperation. However, it is unlikely that LSO used a non-compensatory strategy because otherwise they would have been able to reduce feelings of guilt by mere justification (cf. section 3.3.4).

In a subsequent study, agency and blame were manipulated independently by either forcing or asking people to (monetarily) harm another participant. Blame was manipulated by a self-awareness manipulation aimed on focusing attention either on the self (personal reputation) or on others (reputation of others). The results show that HSO make compensatory choices, hence they increase cooperation when atten-

tion was directed to others but not when it was directed to the self (or if attention direction was not manipulated). However, LSO failed to show compensatory choices but also failed to increase cooperation in the agency-conditions.

Together, results of five studies are supportive for the assumption that emotional intuitions in moral decision-making are the result of compensatory information processing which follows principles of parallel constraint satisfaction. Furthermore, results suggest that people are not aware of this process since otherwise one may expect that people are able to report how they made the compensatory decision which should especially be reflected in emotional self-reports. However, cooperative choices and emotional experience seem to correspond only under specific conditions: if people can infer the feeling because it was brought into awareness by the instruction of the priming procedure (study I) and if people are chronically uncooperative and explicitly justify themselves (study III). In all other conditions, cooperation cannot be predicted by emotional self-reports, which makes it unlikely that people use emotional experience as an evaluation of decision outcomes.

In general, I did not find much support for the assumption that intuitions and emotions *influence* a *rational* and *conscious* decision-making processes, as expected by traditional approaches of judgment and decision-making. However, findings are mainly in line with current approaches of situated or grounded cognition.

Models of situated or grounded cognition assume that cognitive processing and conceptual knowledge is grounded in the perceptual and action systems (Barsalou, 1999, 2008; Niedenthal et al., 2005). According to these approaches, the experience of an emotion is based on the way a situation is temporarily conceptualized or categorized, i.e. the temporal and situational creation of a unique, meaningful representation of cognitions, actions, and subjective experience (e.g., Barrett, 2006; Wilson-Mendenhall et al., 2011).

Situated conceptualizations of emotions represent abstract conceptual constructs that aggregate information from different perceptual and action systems. Since

these approaches assume that conceptual knowledge is stored with relation to other information which was co-activated within a current situation, the situations itself can activate knowledge, similar to the assumption of network-models of emotion.

Situational conceptualizations are assumed to represent abstract conceptual knowledge that can either be retrieved or constructed online. For instance, situations may be accompanied by memory-retrieval of similar situations which then have to be adapted to the current situation. Hence, present and past situational information is integrated in a coherent fashion. This information-integration is assumed to depend on a pattern-completion mechanism, which “has the potential to change core affect and other bodily responses associated with the emotion, along with relevant actions and perceptual construals” (Wilson-Mendenhall et al., 2011, p.1109). In other words, situational information, memories from the past and current affective feelings can be integrated to form a meaningful gestalt that may be accompanied by action, executive control etc.

Results are supportive for situational cognition accounts. First, the influence of “emotions” on “decision-making” seem to be due to a conceptualization of a specific situation and if information within the situation changes, the whole psychological situation changes. Findings of the misattribution-studies are supportive for this claim because intentionally directing attention to the room obviously changed the psychological situation and hence information-categorization. These findings imply that the situational conceptualization of a feeling-state is responsible for the decision, i.e. the information is accompanied by action-tendencies, and if the conceptualization changes, action-tendencies also change.

Situated cognition models imply that information processing within a situation is directed by mechanisms of pattern completion, hence how people “decide” may be due to action-tendencies of situational information able to render an incoherent pattern coherent. Since not all information may be able to “fill the blank” within a temporal representation, situated conceptualizations from the past may be retrieved.

Results of the responsibility-studies (cf. section 3.3) are supportive for that assumption: directing attention to either the self or others seemed to activate information related to past personal experiences of cooperation and made the moral reputation of person and of other salient. Importantly, people do not seem to retrieve an e.g., expectancy, but reconstruct a whole situation and literally take a specific *perspective* within in this situation (self- vs. other-perspective). Findings are consistent with grounded- and situated cognition models that even abstract concepts can be represented by situated conceptualizations if they share the same structure (or grammar) and hence have the same meaning.

Another assumption of emotional situated cognition approaches is that people are not aware of the emotion constructionist process (Wilson-Mendenhall et al., 2011), which implies that how people perceive a situation is more a description (presumably based on an implicit theory, cf. Haidt, 2001; Mercier, forthcoming; Nisbett & Wilson, 1977) of how a person relates his "inner-world" to the environment instead of an objective judgment of a feeling state. Hence, it leaves open the possibility for "unconscious emotions". According to Kihlstrom (1999), unconscious emotions may be "changes in experience, thought and action that are attributable to one's emotional state, independent of his or her conscious awareness of the state" (p. 432). Constructionist situated cognition approaches that are based on PCS processing are consistent with this perspective. For instance, Glöckner and Witteman (2010) suggested that information processing based on PCS may incorporate information that differ in consciousness and hence information may help to categorize and form a gestalt, but people are not able to verbalize the information or how information relates to each other.

Furthermore, if parts of information may lack conscious awareness, or if the underlying causal structure is not clear, people may start to make sense out of the situational accessible information by a process of self-perception. Hence, they might ask themselves "how do I feel about it". Interestingly, people do not seem to re-

port how they feel but seem to try to communicate a psychological situation. For instance, despite that directing attention to the laboratory room decreased cooperative action-tendencies (in study Ia, cf. 3.1.2), people report feelings of guilt beforehand which let suggest that people may just conclude that thinking about harm should lead to feelings of guilt. Since rating the laboratory room is logically unrelated to feelings of guilt after anticipating or remembering harm, it cannot be used to explain the situation and people search for another explanation. Interestingly, these findings may illustrate that reporting a moral emotion may not be aimed on getting information for oneself which helps to make a judgment or decision but to communicate how the person relates to the standards of the group within a situation. This assumption is in line with sentimentalist approaches to moral judgment and decision-making like the Social Intuitionist Model (Haidt, 2001), and argumentative theories of the role of reasoning in morality (Mercier, forthcoming) as well as judgment and decision-making in general (Mercier & Sperber, 2011).

4.2 Limitations and suggestions for future research

The recent approach has some limitations which are rooted in the functional level of analysis I used. On a functional (or computational) level, information is described in terms of how it relates to each other, i.e. under which conditions situation A leads to situation B. Using such a functional approach imposes (at least) three limitations.

First, since functional approaches do not treat behavior as a proxy (or indicator) of a mental representation or process (De Houwer, 2011; Marr, 1982), they do (necessarily) strongly depend on situationally salient information. Hence, there is the need to replicate the findings under the same conditions and furthermore, to examine conditions under which constructionist information processing produce different results from those I reported here.

Results suggest that constructionist approaches can best predict cooperation when

the situationally salient information is relatively non-ambiguous and people have clear standards of behavior. For instance, including participants who either refused to recall an instance of guilt (study Ia and III) or had moderate levels of self-esteem (study II) dilute the influence of guilt on cooperation. From a situated cognition perspective, this is however not very surprising because small changes in the psychological situation may have dramatic consequences on the experiential as well as action level. In PCS-processing, ambiguous information should be more complex than non-ambiguous information and hence information integration should produce a “signal” that is more “noisy”. From a functional perspective, the elimination of people from the analysis who do not fulfill the conditional requirements is not problematic for the explanatory power of the findings because functional approaches only assume how different situations relate to each other and do not describe the relation by the use of mental constructs. Furthermore, the elimination of participants who did not fulfill conditional requirements may direct attention to conditions under which PCS-processing may not lead to cooperation any longer, which should make the reliance on emotional experience more likely. Since especially participants which scored in the mid-level of the self-esteem scale as well as people who refused to work on the guilt-priming task seem to dilute the influence of guilt on cooperation, future research may especially address the difference between informationally ambiguous as well as non-ambiguous situations. Or in other words, future research may explicitly focus on differences in complexity of information in moral judgment and decision-making.

A second limitation of functional approaches (at least from a cognitive perspective) is that functional approaches do not address cognitive information processing directly. However, since “knowing what and why places strong constraints on theories of how” (Cosmides & Tooby, 1994, p. 46), it is possible to infer what cognitive processes may influence PCS-processing in moral decision-making.

Decision-making based on coherence and PCS (e.g., Barnes & Thagard, 1996; Glöckner & Betsch, 2008a, 2008b; Betsch & Glöckner, 2010; Thagard & Millgram, 1995) somehow reverses the logic of traditional decision-making approaches by assuming that automatic information processing itself can handle compensatory information processing but strongly depends on the information situationally activated. Hence, they assume that deliberation and rule-based processing influence decision-making by selective activation of, or attention to, information. Hence, poor decisions are not the result of a poor decision-rule (e.g., a non-compensatory one, or heuristic) but the result of a poor information-search or attention-direction process (i.e. “garbage-in, garbage-out”). If true, then cognitive load or time pressure should influence judgment and decision-making indirectly by constraining information search and attentional processes.

Traditional models assume that cognitive load leads to a change of the decision rule, e.g., switching from WADD to heuristics (e.g., Kahneman & Frederick, 2002). In contrast, PCS approaches assume that load interferes with the controlled and deliberative process of information-allocation. In other words: decision-making is based on compensatory information processing, but what information feeds into the compensatory process may also be influenced by controlled and deliberative information-processing (Glöckner & Betsch, 2008a; Glöckner & Hodges, in press).

This assumption can be tested empirically. In moral psychology, a common distinction is made between moral judgments based on deontological principles (rules and duties, cf. Alexander & Moore, 2008) or based on the moral utility of the outcome (consequentialism, Sinnott-Armstrong, 2008). Whereas deontological decisions are assumed to be driven by associative processes and feelings, utilitarian decisions are assumed to be driven by controlled information processing and the application of a complex decision rules (e.g., WADD, cf. Cushman et al., 2010). Since PCS-processing necessarily relies on situationally salient information, moral dilemmas may direct attention automatically to either the behavior or to the outcome of

a behavior, which then should dramatically change the outcome of the PCS-process: When attention is directed to behavior, people should judge the appropriateness of a behavior. Hence, people compare an action to an action-rule and make a “deontological” judgment (which is analog to an emotional appraisal). In contrast, when the situation directs attention to the outcome, then PCS-processing integrates information with respect to different action-consequences. Since utility is typically based on action-consequences, people make a “utilitarian” judgment.

This difference may be illustrated with respect to music- and movie-piracy: many people do not seem to have a problem to download movies or music provided by file-sharing services or to “rip” DVDs or CDs by circumventing the copy protection (this act itself is illegal). However, from a deontological perspective, these actions are a clear case of copyright-infringement and stealing. Traditional theories treat such cases as conflicts between deontological (“stealing is wrong”) and utilitarian principles (e.g., no purchase intention, no loss for the music company or artist), hence people are able to justify their behavior if they focus on the outcome of their action and may trivialize the importance or re-frame the situation to be not an instance of stealing.

If action-rules are ambiguous, or if episodic memory of other instances of stealing is not accessible, people may redirect attention to the outcome, which may provide *more* information. If “downloading” is not associated with stealing a CD or DVD in a shop, then this information may disambiguate the situation (= downloading is not stealing) and people trivialize the moral transgression. Hence, from the PCS perspective, making moral judgments (and decisions) may be redactable to situational accessibility of information (external and internal), complexity, and attention focusing.

From this would follow that time pressure/load disturbs memory-retrieval processes and/or controlled attention-focusing. Cognitive load would then not lead to a “reliance” on “emotional information” but, because deontological decisions typ-

ically target a behavior and not an outcome (e.g., “thou shalt not steal” implies an action-evaluation, not the evaluation of an outcome), cognitive load would prevent attention to outcomes and hence people seem to decide “emotionally”. This implies that load/time-pressure selectively influences controlled attention-allocation and memory-retrieval: if the situation leads to an automatic focus on outcomes, then load should impair re-focusing on the action. If however the situation leads to an automatic focus on action, then load should impair attention allocation to an outcome.

To summarize, compensatory information processing approaches based on PCS reverse the logic of dual-process models by assuming that the automatic processes can use compensatory strategies but however need deliberative information processing that directs memory-search or attention-allocation. Following this approach, judgment and decision-making depends on memory-retrieval processes, the complexity of situationally accessible information and attention-allocation processes. Furthermore, it implies that people are able to use WADD decision-“rules” intuitively and hence may also make quite “good” decisions very fast and underline the adaptive function of intuitive decision-making. Future research therefore may focus on the joint influence of memory- as well as attentional-processes in intuitive moral decision-making.

Another shortcoming of functional approaches is that their findings cannot easily be generalized, because they focus on situational conditions and not on mental concepts. The results of my studies cannot be generalized to emotions unrelated to reciprocal altruism. Hence it is unclear if other emotional influences on judgment and decision-making can also be explained by PCS-processing. However, some research on moral disgust implies that people use PCS information processing when making moral judgments.

Schnall et al. (2008) found that experiencing disgust makes moral judgments more

severe, which was explained by embodiment and affect-as-information. When experiencing disgust, people are expected to link moral behavior to disgust by the use of metaphors, hence they draw an analogy between two different concepts. Similarly to moral guilt and cooperation, people are expected to use a non-compensatory strategy for making moral judgments: whereas the metaphor is a "rule" that links unrelated concepts by analogies, the affective feeling is used as an evaluator.

For instance, if a specific behavior is considered to be disgusting, then it is related to disease and survival and may be perceived as a contamination (Oaten, Stevenson, & Case, 2009; Rozin, Haidt, & McCauley, 2008). Since moral emotions are linked to evolution and basic survival problems (Haidt & Joseph, 2007), by drawing analogies, people may be able to *moralize* judgments and hence make nearly any behavior survival-relevant. Results on disgust and physical cleansing imply such a possibility. For instance, people seem to be able to wash away their own moral transgressions (e.g., Zhong & Liljenquist, 2006), but washing, or reminders of being clean, makes moral judgments more severe (Zhong, Strejcek, & Sivanathan, 2010). Furthermore, some results suggest that the influence seems to depend on the "contaminated" body part: Typing a lie in an email increases the preference for hand-sanitizer over a mouthwash, whereas speaking out the lie increases preference for mouthwash over a hand-sanitizer (Lee & Schwarz, 2010a).

A starting point for a PCS-approach to disgust and moral judgment is to first build a computational theory aimed on explaining *why* disgust should be related to morality at all. Despite that disgust is considered to be a multifaced and complex construct, all conceptualizations have in common that the core of disgust is disease-related and a threat to personal survival (Rozin et al., 2008; Oaten et al., 2009). This makes it possible to use terror-management theory (TMT) as a functional proxy for the underlying computational process and to link disgust to mortality salience.

TMT (Solomon, Greenberg, & Pyszczynski, 1991) assumes that human motivation is largely determined by a subconscious fear of death. As a consequence, people try

to make meaning out of their life by building cultural belief systems or worldviews and people gain self-esteem and meaning by adhering to those systems. Or in other words: they try to establish a "symbolic" identity and culture which makes them distinct from other animals.

Disgust can be triggered by reminders of our animal nature or heritage (Cox, Goldenberg, Pyszczynski, & Weise, 2007; Goldenberg et al., 2001; Rozin et al., 2008): "In sum, disgust can be viewed as an emotional response that distances us from any reminder of our own creatureliness and ultimate morality" (Goldenberg, Pyszczynski, Greenberg, & Solomon, 2000 p.205). As a consequence, immoral acts of others may remind us of our own creatureliness and then people perform actions that endorse their symbolic identity or cultural worldviews. In other words: The condemnation of another person that "acts like a pig" is then the result of a distancing to the animal nature made aware by the behavior of another person (cf. Zhong et al., 2010).

Condemnation may be one way to distance oneself from reminders of the animal nature, another possibility is to show behavior that is unique to humans or "cultural", e.g., behavior related to personal hygiene.

"Violations of social norms regarding hygiene may be disgusting because they bring to mind images of filthy bodies, dirty hands, and unwashed genitalia. Actual disgust reactions to poor hygiene, notably to body-related odors, may capitalize on the commonality of features between these cues and those that relate more directly to disease and thus allow such cues to be acquired during childhood." (Oaten et al., 2009, p. 309)

From this vantage point, (self-)cleansing may be an acquired signal of personal competence, especially if hygiene is related to cultural worldviews. If true, then washing should work as a self-affirmation in situations which signal personal incompetence and be able to eliminate compensatory behavior aimed on reestablishing a

personal perception of competence.

In support of this idea, Schwarz and colleagues found that cleaning one's hands can eliminate feelings of post-decisional dissonance. In one study, Lee and Schwarz (2010b) adopted a free-choice paradigm in which people were asked to rate several CDs and then chose a moderate one as a gift. In the free-choice paradigm, people normally increase favorability-ratings of chosen alternatives and decrease ratings of rejected alternatives (the commonly found spreading-of-alternatives effect, cf. Brehm, 1956). Afterwards, participants believed to participate in a product test in which they either rated a bottle of soap or used the soap by washing their hands. Results show that the standard post-decisional dissonance effect of attitude change in favor of the chosen product disappeared if people were able to wash their hand instead of mere evaluating the soap bottle. This findings may imply that washing signaled being competent and eliminated the threat of having done (or chosen) something stupid, which made an attitude change no longer necessary. Further evidence for the generalization of hand-washing to non-moral domains was provided by Xu, Zwick, and Schwarz (in press) which showed that people can even "wash away" good or bad luck. People who won in an experimental gamble situation showed less risk-taking behavior after hand-washing whereas people which lost in the gamble showed increased risk taking behavior. This findings furthermore indicate that washing is a reminder of competence, and being reminded of personal competence may encourage people to do risky or stupid things.

To summarize, even evolutionarily more basic emotions like disgust may influence moral judgment and decision-making based on PCS-based processing. Whereas guilt can be linked to transgressions concerning reciprocal altruism, disgust may be linkable to personal, or other person's, competence. From this would follow that feelings of disgust are a reaction to incompetent, animal-like behavior of others that threatens personal or group survival. Since, in contrast to guilt, the person is not the originator of the behavior, people may be able to compensate for being reminded

(by the behavior of others) of creatureliness by either showing cultural behavior (washing), or by distancing themselves from the originator of the behavior (moral condemnation of others). Based on the computational theory I outlined above, it would even be possible to contrast metaphor-approaches with PCS-approaches. Therefore, future research may address other moral emotions and the breath of PCS-processing approaches in moral judgment and decision-making.

4.3 Conclusion and outlook

Traditional, consequentialist models of decision-making assume that emotions can influence decision-making by providing experiential cues that can be used for evaluative purposes. In these models, decision-making itself is a rational process and emotions may help but also disturb decision-making (Loewenstein & Lerner, 2003; Rick & Loewenstein, 2007). Hence, decision-making can be influenced by emotions and intuitions, but is always a conscious and rule-based process, since people still have to choose between options (i.e. they have to make a conditional statement). In contrast, decision-making approaches based on PCS principles can process both decision-making and emotion-elicitation within the very same process, because decision and emotions are merely different (functional) layers of the same underlying and situationally accessible information. Results of 5 studies provide initial evidence for these constructive, intuitive information processing in moral decision-making when encountering emotion-eliciting events and situations.

Moral emotions like guilt may thus be regarded as an intuitive kind of information processing (instead of intuitive information), used when a situation is relevant to an evolutionary problem like balancing cooperative actions. This idea is analogous to the assumption that people use a universal moral grammar (Hauser, 2006; Mikhail, 2007) to infer the meaning of a situation, because if a stimulus or situation is morally relevant is assigned by the (psychological) situation in which it is bound,

not by the stimulus itself (cf. Mikhail, 2006). From this vantage point, emotions do not serve as intuitive information about the value of a decision-outcome, but provide the processing structure that assigns moral meaning to situationally accessible information.

Viewing emotions as information processing structures designed to solve a specific evolutionary problem may also help to explain how metaphors influence moral judgment and decision-making. If emotions incorporate a specific grammar and the grammar assigns value to an entity by categorization, then metaphors may be able to trigger a specific emotional grammar which leads to an emotion-consistent interpretation of a situation. If true, then using metaphors may be a way to intentionally utilize emotional grammar to process information or to influence information processing in others (cf. Haidt, 2001) by delivering a categorization structure.

To summarize, moral emotions may influence moral judgment and decision-making by providing a computational structure that helps to solve an evolutionary relevant problem. Linking research on emotion-elicitation to universal moral grammar may not only help to illuminate how emotions serve as moral intuitions, but also help to reconcile sentimentalist and rationalist approaches of moral judgment and decision-making.

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Appendix

1 Emotion-elicitation tasks

1.1 Autobiographical priming

Instruction

Liebe Teilnehmerin, lieber Teilnehmer,

herzlichen Dank, dass Sie sich bereit erklärt haben, an dieser Studie teilzunehmen. Im Folgenden bitten wir Sie einen kurzen Fragebogen auszufüllen, der jeweils als Vortests für weiterführende Studien in der Emotionspsychologie dienen soll. Es handelt sich um eine Erinnerungsaufgabe. Wir möchten Sie darauf hinweisen, dass alle Antworten, die Sie geben, anonym erhoben werden und nur für wissenschaftliche Zwecke Verwendung finden. Wenn Sie Fragen haben, wenden Sie sich bitte jetzt gleich an die Versuchsleitung. Um etwaige Fragen während der Aufgabenbearbeitung zu klären, heben Sie bitte die Hand und ein Versuchsleiter wird unverzüglich auf Sie zukommen.

Wir bitten Sie, sich während der nächsten 15 Minuten ausschließlich auf die beiden Aufgaben zu konzentrieren, da die Ergebnisse dieser Studie für die weitere Forschung ausschlaggebend sein werden. Bei beiden Aufgaben gibt es keine richtigen oder falschen Lösungen. Wir bitten Sie deshalb möglichst offen und spontan zu antworten.

Wenn Sie soweit sind, können Sie umblättern und die Instruktionen lesen.

Guilt

Instruction, study Ia Bitte erinnern Sie sich an ein bestimmtes Ereignis oder eine Situation, in der Sie etwas Bestimmtes getan hatten und sich danach sehr schuldig gefühlt haben. Bitte wählen Sie ein besonders wichtiges und einprägsames Erlebnis und beschreiben Sie die Situation so detailliert wie möglich. Für diese Aufgabe haben Sie 10 Minuten Zeit. Die Versuchsleitung wird Ihnen sagen, wenn die 10 Minuten vorbei sind. Geben Sie der Versuchsleitung bitte ein Handzeichen, wenn Sie mit dieser Aufgabe beginnen möchten.

Instruction, study II and III Bitte erinnern Sie sich an ein bestimmtes Ereignis oder eine Situation, in der Sie Ihren Partner oder eine andere Person, die Ihnen sehr nahe steht, angelogen oder betrogen haben, und Sie sich danach sehr schuldig gefühlt haben. Bitte wählen Sie ein besonders wichtiges und einprägsames Erlebnis und beschreiben Sie die Situation so detailliert wie möglich. Wählen Sie bitte ein Ereignis aus den letzten 2-3 Jahren. Für diese Aufgabe haben Sie 10 Minuten Zeit. Die Versuchsleitung wird Ihnen sagen, wenn die 10 Minuten vorbei sind. Geben Sie der Versuchsleitung bitte ein Handzeichen, wenn Sie mit dieser Aufgabe beginnen möchten.

Shame

Bitte erinnern Sie sich an ein bestimmtes Ereignis oder eine Situation, in der Sie sich sehr inkompetent verhalten und sich danach sehr geschämt haben. Bitte wählen Sie ein besonders wichtiges und einprägsames Erlebnis und beschreiben Sie die Situation so detailliert wie möglich. Wählen Sie bitte ein Ereignis aus den letzten 2-3 Jahren. Für diese Aufgabe haben Sie 10 Minuten Zeit. Die Versuchsleitung wird Ihnen sagen, wenn die 10 Minuten vorbei sind. Geben Sie der Versuchsleitung bitte ein Handzeichen, wenn Sie mit dieser Aufgabe beginnen möchten.

Control

Beschreiben Sie bitte einen gewöhnlichen Tag in Ihrem Leben. Beschreiben Sie diesen bitte so detailliert wie möglich. Für diese Aufgabe haben Sie 10 Minuten Zeit. Die Versuchsleitung wird Ihnen sagen, wenn die 10 Minuten vorbei sind. Geben Sie der Versuchsleitung bitte ein Handzeichen, wenn Sie mit dieser Aufgabe beginnen möchten.

1.2 Anticipatory priming

Instruction



Studie I: Vorstellungsaufgabe

Liebe Teilnehmerin, lieber Teilnehmer,

herzlichen Dank, dass Sie sich bereit erklärt haben, an dieser Studie teilzunehmen. Im Folgenden bitten wir Sie mehrere kurzen Fragebögen auszufüllen, die als Vortests für weiterführende Studien in der Emotionspsychologie dienen soll. Es handelt sich um eine **Vorstellungsaufgabe**.

Wir möchten Sie darauf hinweisen, dass alle Antworten, die Sie geben, anonym erhoben werden und nur für wissenschaftliche Zwecke Verwendung finden.

Wenn Sie Fragen haben, wenden Sie sich bitte jetzt gleich an die Versuchsleitung. Um etwaige Fragen während der Aufgabenbearbeitung zu klären, heben Sie bitte die Hand und ein Versuchsleiter wird unverzüglich auf Sie zukommen.

Wir bitten Sie, sich während der nächsten 11 Minuten ausschließlich auf die Aufgabe zu konzentrieren, da die Ergebnisse dieser Studie für die weitere Forschung ausschlaggebend sein werden.

Bei beiden Aufgaben gibt es keine richtigen oder falschen Lösungen. Wir bitten Sie deshalb möglichst offen und spontan zu antworten.

Wenn sie soweit sind, klicken Sie bitte auf "Continue"

Figure 1: Anticipatory priming, general instruction



Ihnen werden nun mehrere kurze Szenarien präsentiert. Wir möchten Sie bitten, sich jedes Szenario **aufmerksam durchzulesen** und sich **möglichst gut in die entsprechende Situation hineinzusetzen**.

Stellen Sie sich bitte vor das SIE sich genau in dieser Situation befinden würden und versuchen Sie, die Situation **möglichst gut vor Ihrem geistigen Auge zu visualisieren**.

Sie haben dafür jeweils 30 Sekunden Zeit.

Nach jedem Szenario wird Ihnen eine kurze Frage gestellt.

Klicken Sie nun bitte auf "Continue"

Figure 2: Anticipatory priming, imagery instruction

Neutral appraisal-patterns

- Sie stehen im Supermarkt vor der Obsttheke und überlegen, was Sie kaufen wollen.
- Sie sitzen auf einer Bank und beobachten die Menschen, die vorbeigehen.
- Sie machen an einem sonnigen Tag eine Fahrradtour am Main entlang.
- Sie haben Freunde zum Essen zu sich nach Hause eingeladen und kochen.
- Sie gehen ins Kino und schauen sich einen Film an.
- Sie sitzen vor dem Fernseher und schalten durch die Kanäle.
- Sie sitzen vor Ihrem Computer und rufen ihre Emails ab.
- Sie stehen am Main und schauen ins Wasser.
- Sie treffen einen Freund in der Straßenbahn und unterhalten sich.
- Ihr Wecker klingelt; Sie stehen auf und machen sich Frühstück.
- Sie stehen an der Haltestelle und warten auf den Bus.
- Sie kaufen sich in der Mensa etwas zu essen.
- Sie gehen ins Bad und putzen sich die Zähne.
- Sie gehen in die Videothek und leihen sich einen Film aus.

Guilt appraisal-patterns

- Weil Sie einen Termin nicht eingehalten haben konnte ein Kollege seine Arbeit nicht fertig stellen.
- Als Sie mit dem Auto abbiegen wollen übersehen Sie einen Fußgänger und fahren ihn an.

- Sie sind bei der Arbeit leichtsinning und ein Arbeitskollege wird verletzt.
- Sie vergessen Ihr Auto aufzutanken und ein Freund, dem Sie es geliehen haben, bleibt damit liegen.
- Sie hatten keine Lust einem Freund/einer Freundin zu helfen; er/sie fällt deswegen durch die Prüfung.
- Sie erzählen anderen Leuten, dass ein Freund für Ihren Dummejungenstreich verantwortlich ist; er wird dafür bestraft.
- Sie vergessen, einem Freund dringend von ihm benötigtes Geld zurückzugeben.
- Sie lügen einen Freund in einer wichtigen Sache an.
- Ihr Partner ist tief verletzt als er/sie herausfindet, dass Sie ihm/sie angelogen haben.
- Sie machen sich in seinem Beisein über das Aussehen eines Freundes lustig.
- Sie vergessen versehentlich die Vorlesungsaufzeichnungen eines Freundes in der Strassenbahn.
- Sie machen einen Freund im Beisein von anderen Leuten lächerlich.
- Sie vergessen ein Treffen Ihrer Lerngruppe, die anderen müssen ihre Arbeit mitübernehmen.
- Sie werfen eine Bananenschale weg und jemand rutscht darauf aus.

2 Emotion-regulation tasks

2.1 Misattribution

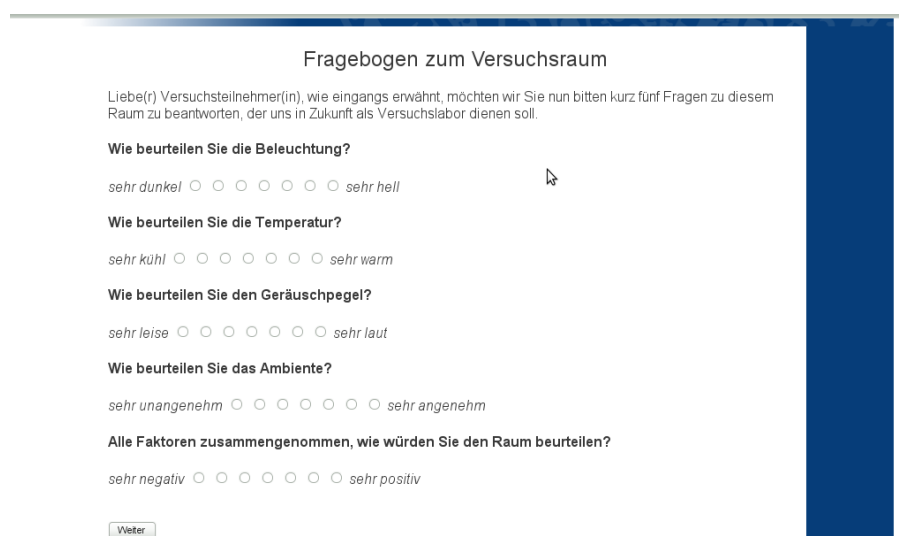
The misattribution-questionnaire was modeled after Fried and Aronson (1995).

Instruction

Bevor Sie beginnen, noch ein kurzer Hinweis:

Der Raum, in dem Sie sich befinden wurde kürzlich frisch renoviert und soll dem Lehrstuhl für Psychologie zukünftig als Versuchsraum dienen. Wir möchten Sie im Laufe dieser Sitzung bitten, den Raum in Hinblick auf das Ambiente, Licht, Geräuschpegel und Temperatur zu bewerten. Diese Faktoren können, obwohl scheinbar subtil, starke Auswirkungen auf Personen haben, insbesondere auf deren Gefühle. Um ein möglichst klares Bild zu erhalten wird Ihnen der entsprechende Fragebogen entweder nach 15min, 30min oder 45min präsentiert. Bitte klicken Sie auf "Continue" um mit der ersten Studie zu beginnen.

Misattribution questionnaire



The screenshot shows a web-based questionnaire titled "Fragebogen zum Versuchsraum". The text reads: "Liebe(r) Versuchsteilnehmer(in), wie eingangs erwähnt, möchten wir Sie nun bitten kurz fünf Fragen zu diesem Raum zu beantworten, der uns in Zukunft als Versuchslabor dienen soll." The questionnaire consists of five Likert-scale items, each with seven radio buttons. The first item is "Wie beurteilen Sie die Beleuchtung?" with labels "sehr dunkel" and "sehr hell". The second is "Wie beurteilen Sie die Temperatur?" with labels "sehr kühl" and "sehr warm". The third is "Wie beurteilen Sie den Geräuschpegel?" with labels "sehr leise" and "sehr laut". The fourth is "Wie beurteilen Sie das Ambiente?" with labels "sehr unangenehm" and "sehr angenehm". The fifth is "Alle Faktoren zusammengenommen, wie würden Sie den Raum beurteilen?" with labels "sehr negativ" and "sehr positiv". At the bottom left, there is a "Weiter" button.

Figure 3: Misattribution questionnaire

Laboratory room



Figure 4: Uncomfortable laboratory room, picture 1



Figure 5: Uncomfortable laboratory room, picture 2

2.2 Self-affirmation

All values are derived from the Schwartz-Value-Survey (Schwartz, 1992). The Self-Affirmation Task was modeled after Cohen et al. (2000).

Morality-unrelated values: Power and achievement

2. Erinnerungsaufgabe

Rangliste persönlicher Charakteristiken und Werten.

Unten sehen Sie eine Liste von persönlichen Charakteristiken und Werten, manche mögen wichtig für Sie sein, andere mögen unwichtig für Sie sein.

Bringen sie die Werte und Charakteristiken nun in eine Rangreihe. Benutzen Sie für den **Ihnen am wichtigsten Wert die 1, für den unwichtigsten die 13**. Benutzen Sie jede Zahl bitte nur einmal.

- _____ Selbstachtung (Glauben an den eigenen Wert)
- _____ Soziale Macht (Kontrolle über alles, Dominanz)
- _____ Reichtum (materieller Besitz, Geld)
- _____ Soziale Anerkennung (Achtung, Zustimmung durch andere)
- _____ Autorität (das Recht zu führen und zu bestimmen)
- _____ Unabhängig (selbständig, sich auf sich selbst verlassen)
- _____ Eigene Ziele wählen (eigene Absichten verfolgen)
- _____ Ehrgeizig (hart arbeiten, zielstrebig)
- _____ Einflußreich (Einfluß auf Menschen und Ereignisse ausüben)
- _____ Fähig (kompetent, effektiv und effizient)
- _____ Intelligent (logisch denken)
- _____ Erfolgreich (Ziele erreichen)
- _____ In der Öffentlichkeit Ansehen bewahren (das Gesicht wahren)

Vielen Dank! Blättern Sie nun bitte um.

1

Figure 6: Self-affirmation: Non-moral values

Morality-related values: Benevolence and universalism

2. Erinnerungsaufgabe

Rangliste persönlicher Charakteristiken und Werten.

Unten sehen Sie eine Liste von persönlichen Charakteristiken und Werten, manche mögen wichtig für Sie sein, andere mögen unwichtig für Sie sein.

Bringen sie die Werte und Charakteristiken nun in eine Rangreihe. Benutzen Sie für den **Ihnen am wichtigsten Wert die 1, für den Ihnen am unwichtigsten Wert die 13**. Benutzen Sie jede Zahl bitte nur einmal.

- _____ Gleichheit (gleiche Chancen für alle)
- _____ Weisheit (ein reifes Verständnis des Lebens)
- _____ Soziale Gerechtigkeit (Ungerechtigkeiten beseitigen, sich um die Schwachen kümmern)
- _____ Soziale Anerkennung (Achtung, Zustimmung durch andere)
- _____ Eine Welt in Frieden (frei von Krieg und Konflikt)
- _____ Reife Liebe (tiefe geistige und emotionale Intimität)
- _____ Wahre Freundschaft (engen, unterstützende Freunde)
- _____ Toleranz (gegenüber verschiedenen Ideen und Überzeugungen)
- _____ Loyalität (verlässlich gegenüber meinen Freunden und Gruppen)
- _____ Ehrlichkeit (echt, aufrichtig)
- _____ Hilfsbereitschaft (sich für das Wohlergehen anderer einsetzen)
- _____ Verantwortung (zuverlässig, verlässlich)
- _____ Vergeben (bereit, anderen zu vergeben)

Vielen Dank! Blättern Sie nun bitte um.

Welcher Wert ist für Sie der wichtigste (steht auf Nr. 1)?
Tragen Sie diesen nun bitte hier ein:

Uni Würzburg, Lehrstuhl für Psychologie II(ben)

1

Figure 7: Self-affirmation: moral values

2.3 Activation of moral reputation

Personal reputation / personal justification

Nun interessiert uns, welche Entschuldigungen Leute in dieser Situation benutzen. Schreiben Sie nun bitte so viele Gründe auf, wie Ihnen einfallen, die SIE als Entschuldigung, Ihren Partner oder eine andere nahestehende Person betrogen oder angelogen zu haben, benutzen würden oder in der Vergangenheit bereits benutzt haben. Sie haben für diese Aufgabe mehrere Minuten Zeit. Geben Sie der Versuchsleitung bitte ein Handzeichen, wenn Sie mit der Aufgabe beginnen möchten

Other's reputation / other's justification

Nun interessiert uns, welche Entschuldigungen Leute in dieser Situation benutzen. Schreiben Sie nun bitte so viele Gründe auf, wie Ihnen einfallen, die ANDERE PERSONEN (z.B. Freunde oder Bekannte) als Entschuldigung, deren Partner oder eine andere nahestehende Person betrogen oder angelogen zu haben, benutzen würden oder in der Vergangenheit bereits benutzt haben. Sie haben für diese Aufgabe mehrere Minuten Zeit. Geben Sie der Versuchsleitung bitte ein Handzeichen, wenn Sie mit der Aufgabe beginnen möchten

2.4 Agency manipulation

Agency

Sehr geehrte Versuchsperson, bevor Sie das Spiel mit der anderen Person starten, haben wir eine Bitte an Sie. Vorhergehene Forschung hat gezeigt, dass Personen in diesem Spiel häufig die Strategie ihrer Mitspieler adaptieren, d.h. sie kopieren deren Entscheidungen. Da sie um echtes Geld spielen können wir Ihnen nicht vorschreiben eine von uns vorgeschlagene Strategie wählen, allerdings wäre es für unsere Forschung von hoher Bedeutung, wenn Sie immer die entgegengesetzte Op-

tion wählen würden wie Ihr Mitspieler. Wählt ihr gegenüber in Durchgang 1 zum Beispiel Option A, so sollten Sie im folgenden Durchgang 2 Option B wählen. Die Entscheidung liegt jedoch ganz allein bei Ihnen! Beachten Sie, dass immer nur einer der Interaktionspartner diese Instruktion erhält, Ihr Mitspieler erhält folglich keine Anweisung. Wer die Instruktion erhält bestimmt der Computer per Zufall. Klicken sie nun auf weiter um das Spiel zu beginnen.

No agency

Sehr geehrte Versuchsperson, vorhergehene Forschung hat gezeigt das Personen in diesem Spiel häufig die Strategie ihrer Mitspieler adaptieren, d.h. sie kopieren deren Entscheidungen. Ihre Aufgabe in diesem Spiel ist es daher, immer die entgegengesetzte Option Ihres Mitspielers zu wählen. Wählt ihr gegenüber in Durchgang 1 zum Beispiel Option A, so müssen Sie im folgenden Durchgang 2 Option B wählen. Beachten Sie, dass immer nur einer der Interaktionspartner diese Instruktion erhält, Ihr Mitspieler bekommt folglich keine Anweisung und entscheidet frei. Wer die Instruktion erhält bestimmt der Computer per Zufall. Klicken sie nun auf weiter um das Spiel zu beginnen.

2.5 Manipulation of self/other focus

Self-focus

Aufgabe zum Textverständnis

In der folgenden Aufgabe bitten wir Sie, den Text auf der nächsten Seite aufmerksam zu lesen und alle Personalpronomen zu unterstreichen. Beispiel:

Es gibt nicht viele Menschen - und da es wünschenswert ist, daß ein Erzähler und sein Leser einander so rasch als möglich vollkommen verstehen, so bitte ich, darauf zu achten, daß ich meine Bemerkung nicht auf junge oder kleine Leute beschränke, sondern sie auf alle ausdehne,

mögen sie nun klein oder groß, jung oder alt, erst im Aufschließen oder bereits wieder im Verwelken begriffen sein - ich sage, es gibt nicht viele Menschen, die gern in einer Kirche schliefen.“

Charles Dickens, Silversterglocken

Falls sie alles verstanden haben, wenden Sie nun bitte das Deckblatt und beginnen Sie mit der Aufgabe

Other-focus

Other-focus was manipulated by the presence of a mirror. After participants completed the Prisoner´s Dilemma tasks, they were asked to take a seat on a workplace next to the computer workplace and worked on a control version of the self-focus task.

Aufgabe zum Textverständnis

In der folgenden Aufgabe bitten wir Sie, den Text auf der nächsten Seite aufmerksam zu lesen und die Buchstabenfolgen abc“ und xyz“ zu unterstreichen. . Beispiel:

Es gibt nicht viele Menschen - und da es wünschenswert ist, daß ein Erzähler und sein Leser einander so rasch als möglich vollkommen verstehen, so bitte abc, darauf zu achten, daß abc xyz Bemerkung nicht auf junge oder kleine Leute beschränke, sondern abc auf alle ausdehne, mögen xyz nun klein oder groß, jung oder alt, erst im Aufschließen oder bereits wieder im Verwelken begriffen sein - abc sage, es gibt nicht viele Menschen, die gern in einer Kirche schliefen.“

Charles Dickens, Silversterglocken

Falls sie alles verstanden haben, wenden Sie nun bitte das Deckblatt und beginnen Sie mit der Aufgabe

Text, personal pronouns

Der Urlaub

Ich hatte geplant nur für ein paar Tage wegzubleiben, morgens von meiner Wohnung zum Bahnhof und dann mit dem Zug nach Prag, ich würde nachmittags ankommen, früh genug um mir ein Zimmer in einer Herberge zu suchen. Die Zugfahrt war gnädigerweise angenehm kurz, und so hätte ich das ganze Wochenende zu meiner Verfügung um mir die Stadt anzusehen. Aber kaum war ich angekommen wusste ich schon, dass ich viel länger bleiben würde. Ich hatte sowieso zwei Wochen Ferien und nichts Wichtiges zu erledigen, und meine Freunde in meiner Heimatstadt würden schon verstehen. Wie bei den meisten Großstädten war es einfach unmöglich, in wenigen Tagen wirklich alles Sehenswerte, oder zumindest den Grossteil davon, zu besichtigen. Ich verbrachte die ersten Tage damit, mir alle wichtigen Sehenswürdigkeiten anzuschauen, die Festung, den jüdischen Friedhof und dergleichen. Ich war wie verzaubert von der Atmosphäre der historischen Stadt. Schließlich merkte ich, dass ich genug alte Bauwerke und dergleichen gesehen hatte. Den Rest meines Urlaubs in Prag verbrachte ich damit, ziellos durch die Stadt zu schlendern und mir die kleineren Gassen anzusehen. Das ehemalige Künstlerviertel hat mich besonders beeindruckt, mit den kleinen Häuschen und den Straßencafes. Die Menschen, denen ich auf der Strasse begegnete, machten größtenteils einen sehr freundlichen Eindruck auf mich, auch wenn ich kein Wort Tschechisch verstand und dies die Kommunikation natürlich etwas erschwerte. Ich war allerdings etwas überrascht von der großen Anzahl an Leuten, denen ich über den Weg lief, die Deutsch sprachen. Nach ein paar Tagen bereitete ich mich schließlich auf die Heimreise vor. Ich fühlte mich noch nicht wirklich dazu bereit zurückzukehren, aber irgendwann musste ich ja wieder nach Hause.

Text, no pronouns

Der Urlaub

Abc hatte geplant nur für ein paar Tage wegzubleiben, morgens von xyz Wohnung zum Bahnhof und dann mit dem Zug nach Prag, abc würde nachmittags ankommen, früh genug um xyz ein Zimmer in einer Herberge zu suchen. Die Zugfahrt war gnädigerweise angenehm kurz, und so hätte abc das ganze Wochenende zu xyz Verfügung um xyz die Stadt anzusehen. Aber kaum war abc angekommen wusste abc schon, dass abc viel länger bleiben würde. Abc hatte sowieso zwei Wochen Ferien und nichts Wichtiges zu erledigen, und xyz Freunde in xyz Heimatstadt würden schon verstehen. Wie bei den meisten Großstädten war es einfach unmöglich, in wenigen Tagen wirklich alles Sehenswerte, oder zumindest den Grossteil davon, zu besichtigen. Abc verbrachte die ersten Tage damit, xyz alle wichtigen Sehenswürdigkeiten anzuschauen, die Festung, den jüdischen Friedhof und dergleichen. Abc war wie verzaubert von der Atmosphäre der historischen Stadt. Schließlich merkte ich, dass abc genug alte Bauwerke und dergleichen gesehen hatte. Den Rest meines Urlaubs in Prag verbrachte xyz damit, ziellos durch die Stadt zu schlendern und xyz die kleineren Gassen anzusehen. Das ehemalige Künstlerviertel hat xyz besonders beeindruckt, mit den kleinen Häuschen und den Straßencafes. Die Menschen, denen abc auf der Strasse begegnete, machten größtenteils einen sehr freundlichen Eindruck auf xyz, auch wenn abc kein Wort Tschechisch verstand und dies die Kommunikation natürlich etwas erschwerte. Abc war allerdings etwas überrascht von der großen Anzahl an Leuten, denen abc über den Weg lief, die Deutsch sprachen. Nach ein paar Tagen bereitete abc xyz schließlich auf die Heimreise vor. Abc fühlte mich noch nicht wirklich dazu bereit zurückzukehren, aber irgendwann musste abc ja wieder nach Hause.

3 Questionnaires

3.1 Measure of emotional experience – long version

The questionnaire was developed by Devine et al. (1991) and consists of 35 items. The questionnaire measures six different affective dimensions: discomfort, negative self-directed affect, positive affect, depressed affect, negative other-directed affect, and threat.

Instruction

Fragebogen zur momentanen Befindlichkeit Wir möchten Sie nun bitten, einige Fragen zu Ihrer momentanen Befindlichkeit zu beantworten. Kreuzen Sie bitte denjenigen Zahlenwert an, der ihre momentane Stimmung am besten widerspiegelt bzw. der am besten beschreibt, was Ihnen im Moment durch den Kopf geht. Antworten Sie zügig und spontan!

Items

- **discomfort:** negative (schlecht), concerned (beunruhigt), frustrated (frustriert), tense (angespannt), distressed (bekümmert), anxious (bedrückt), bothered (genervt), uneasy (unruhig), uncomfortable (unbehaglich), irresponsible (verantwortungslos).
- **negative self-directed affect:** angry at myself (Ärger über mich selbst), guilty (schuldig), embarrassed (verlegen), annoyed at myself (Wut auf mich selbst), regretful (Reue), disappointed with myself (enttäuscht von mir selbst), disgusted with myself (Ekel vor mir selbst), shame (Scham), self-critical (selbstkritisch).
- **positive affect:** friendly (freundlich), happy (glücklich), energetic (voller Energie), optimistic (optimistisch), content (zufrieden), good (gut), neutral (neu-

tral).

- **negative affect others:** angry at others (Ärger auf andere), irritated with others (genervt von anderen), disgusted with others (angeekelt von anderen).
- **threat:** threatened (bedroht), fearful (ängstlich)
- **depressed:** depressed (deprimiert), sad (traurig), helpless (hilflos)

Scale

1	2	3	4	5	6	7	
trifft überhaupt nicht zu							trifft vollkommen zu

Figure 9: Scale of emotion-questionnaire: Long version

3.2 Measure of emotional experience – short version

The questionnaire was developed by Galinsky et al. (2000) and is a short version the Devine et al. (1991) questionnaire (see also Elliot & Devine, 1994) and consists of 11 items. The questionnaire measures three different affective dimensions: discomfort, negative self-directed affect, positive affect.

Instruction

Wir möchten Sie nun bitten, einige Fragen zu Ihrer momentanen Befindlichkeit zu beantworten. Drücken Sie bitte die Taste der Zahl, die Ihre momentane Stimmung am besten widerspiegelt bzw. am besten beschreibt, was Ihnen im Moment durch den Kopf geht. Antworten Sie zügig und spontan! Falls Sie keine Fragen mehr haben, drücken Sie nun bitte die Leertaste.

Items

- discomfort: uncomfortable (unbehaglich), uneasy (unruhig), bothered (aufgewühlt)
- negative self-directed affect: angry towards myself (wütend auf mich selbst), dissatisfied with myself (unzufrieden mit mir selbst), disgusted with myself (empört über mich selbst), annoyed with myself (ärgerlich auf mich selbst)
- positive affect: happy (fröhlich), good (gut), friendly (freundlich), energetic (energetisch), optimistic (optimistisch)

Scale:

1	2	3	4	5	6	7	
trifft überhaupt nicht zu							trifft vollkommen zu

Figure 10: Scale of emotion-questionnaire: Short version

4 Trait-measures

4.1 Chronic social concerns

Chronic social concerns were measured with the Triple Dominance Questionnaire (Van Lange et al., 1997).

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Institut für Psychologie
Lehrstuhl für Psychologie II

TDM-Fragebogen

Absenden

Lieber Versuchsteilnehmer,

In dieser Aufgabe bitten wir Sie, sich vorzustellen, dass Sie zufällig mit jemand Anderen gepaart worden wären, der im Weiteren als "die andere Person" bezeichnet wird. Diese andere Person ist jemand, den Sie nicht kennen und auch in Zukunft nicht bewusst treffen werden. Sowohl Sie als auch die andere Person werden gebeten, eine Wahl zu treffen, indem Sie angeben, ob Sie sich für Option A, B, oder C entscheiden. Ihre eigene Wahl wird sowohl zu Punkten für Sie selbst als auch für die andere Person führen.

Ebenso wird auch jede Wahl der anderen Person zu Punkten für diese als auch für Sie führen. Jeder Punkt hat einen Wert. Je mehr Punkte Sie erlangen, desto besser für Sie, und je mehr Punkte die andere Person erhält, desto besser für diese. Hier ein Beispiel, wie die Aufgabe aussieht:

	A	B	C
Sie erhalten	500	500	550
Die andere Person erhält:	100	500	300

Falls Sie in diesem Beispiel A wählen, erhalten Sie 500 Punkte und die andere Person erhält 100 Punkte; falls Sie B wählen erhalten Sie 500 Punkte und die andere Person erhält 500 Punkte; und falls Sie C wählen erhalten Sie 500 Punkte und die andere Person erhält 300 Punkte. Wie Sie sehen beeinflusst Ihre Wahl sowohl wie viele Punkte Sie erhalten als auch wie viele Punkte die andere Person erhält.

Bevor Sie beginnen, denken Sie bitte daran, dass es hier keine richtigen oder falschen Antworten gibt - wählen Sie einfach die Option aus, die Sie aus welchen Gründen auch immer am stärksten präferieren.

Beachten Sie zudem, dass jeder Punkt einen Wert hat: Je mehr Sie ansammeln, desto besser ist dies für Sie. Umgekehrt, aus der Perspektive der anderen Person: Je mehr Punkte diese ansammelt, desto besser für diese Person.

Bearbeiten Sie bitte nun die neun Wahlsituationen auf der rechten Seite. Entscheiden Sie sich entweder für A, B, oder C. Denken Sie daran, dass es keine richtigen oder falschen Antworten gibt.

1)	A	B	C	A	B	C
<p>Sie erhalten: 480 Die andere Person erhält: 80</p>	480 240	540 270	480 240	Ihre Wahl	<input style="width: 100px;" type="text"/>	<input style="width: 100px;" type="text"/>
<p>Sie erhalten: 500 Die andere Person erhält: 80</p>	A	B	C	Ihre Wahl	<input style="width: 100px;" type="text"/>	<input style="width: 100px;" type="text"/>
<p>Sie erhalten: 520 Die andere Person erhält: 50</p>	A	B	C	Ihre Wahl	<input style="width: 100px;" type="text"/>	<input style="width: 100px;" type="text"/>
<p>Sie erhalten: 500 Die andere Person erhält: 100</p>	A	B	C	Ihre Wahl	<input style="width: 100px;" type="text"/>	<input style="width: 100px;" type="text"/>
<p>Sie erhalten: 560 Die andere Person erhält: 300</p>	A	B	C	Ihre Wahl	<input style="width: 100px;" type="text"/>	<input style="width: 100px;" type="text"/>
<p>Sie erhalten: 500 Die andere Person erhält: 500</p>	A	B	C	Ihre Wahl	<input style="width: 100px;" type="text"/>	<input style="width: 100px;" type="text"/>
<p>Sie erhalten: 510 Die andere Person erhält: 300</p>	A	B	C	Ihre Wahl	<input style="width: 100px;" type="text"/>	<input style="width: 100px;" type="text"/>
<p>Sie erhalten: 500 Die andere Person erhält: 500</p>	A	B	C	Ihre Wahl	<input style="width: 100px;" type="text"/>	<input style="width: 100px;" type="text"/>
<p>Sie erhalten: 480 Die andere Person erhält: 100</p>	A	B	C	Ihre Wahl	<input style="width: 100px;" type="text"/>	<input style="width: 100px;" type="text"/>

Vielen Dank! Klicken Sie nun bitte auf "Absenden"

Figure 11: The Triple Dominance Questionnaire

4.2 Rosenberg self-esteem scale



Füllen Sie bitte den kompletten Fragebogen aus. Mittels des Mausekursors können Sie nach unten scrollen.

Alles in allem bin ich mit mir selbst zufrieden.

trifft gar nicht zu *trifft voll und ganz zu*

Hin und wieder denke ich, daß ich gar nichts taue.

trifft gar nicht zu *trifft voll und ganz zu*

Ich besitze eine Reihe guter Eigenschaften.

trifft gar nicht zu *trifft voll und ganz zu*

Ich kann vieles genauso gut wie die meisten anderen Menschen auch.

trifft gar nicht zu *trifft voll und ganz zu*

Ich fürchte, es gibt nicht viel, worauf ich stolz sein kann.

trifft gar nicht zu *trifft voll und ganz zu*

Ich fühle mich von Zeit zu Zeit richtig nutzlos.

trifft gar nicht zu *trifft voll und ganz zu*

Ich halte mich für einen wertvollen Menschen, jedenfalls bin ich nicht weniger wertvoll als andere auch.

trifft gar nicht zu *trifft voll und ganz zu*

Ich wünschte, ich könnte vor mir selbst mehr Achtung haben.

trifft gar nicht zu *trifft voll und ganz zu*

Figure 12: The Rosenberg self-esteem scale

5 Measures of cooperation

5.1 Give-some games

Lottery (Study I)

The lottery give-some game was adapted from Nelissen et al. (2007).

Instruction: Give-some game Tauschspiel. Sie werden nun von der Versuchslleitung vier (4) Gutscheine erhalten, die Sie in Lotterielose umtauschen können. Zudem erhalten Sie einen Briefumschlag. Sie haben nun die Möglichkeit, die Anzahl Ihrer Lose und somit Ihre Gewinnchancen mittels einen kleinen Tauschspiels zu erhöhen. Hier die Regeln:

- Sie werden zufällig einer anderen Person zugeordnet.
- Sie können dieser Person Gutscheine von Ihnen zukommen lassen, indem Sie entweder einen, zwei, drei oder vier Ihrer Gutscheine in den Briefumschlag stecken.
- Sie erhalten den Briefumschlag der anderen Person und somit die Gutscheine, die die andere Person in den Briefumschlag gesteckt hat.
- Jeder Gutschein, den Sie von uns erhalten können Sie in ein Los umtauschen.
- Jeden Gutschein, den Sie von der anderen Person erhalten können Sie in zwei Lose umtauschen

Klicken Sie bitte auf "Continue", um sich ein Beispiel anzeigen zu lassen

Beispiel: Angenommen, Sie stecken 2 Ihrer Gutscheine in den Briefumschlag für die andere Person, und die andere Person steckt einen Gutschein in den Briefumschlag, den Sie erhalten. Ihnen bleiben somit 2 Ihrer Gutscheine, während Sie 1 Gutschein von der anderen Person erhalten. Da ein Gutschein der anderen Person für Sie den Wert von 2 Losen hat, erhalten Sie nun von uns 4 Lose.

- 2 Ihrer Gutscheine = 2 Lose
- 1 Gutschein der anderen Person = 2 Lose

Der anderen Person bleiben 3 Gutscheine (da Sie Ihnen einen der Gutscheine gibt), und sie erhält noch 2 Gutscheine von Ihnen. Da einer Ihrer Gutscheine von der anderen Person in 2 Lose umgetauscht werden kann (also 2 Ihrer Gutscheine in 4 Lose) erhält die andere Person 7 Lose. Klicken Sie nun bitte auf "Continue", um sich eine Übersichtstabelle aller möglichen Kombinationen anzeigen zu lassen.

Anzahl der Gutscheine, die Sie von der anderen Person erhalten		Anzahl der Gutscheine, die Sie der anderen Person geben				
		4	3	2	1	0
4	Sie erhalten (Lose):	8	9	10	11	12
	Andere Person erhält (Lose):	8	6	4	2	0
3	Sie erhalten (Lose):	6	7	8	9	10
	Andere Person erhält (Lose):	9	7	5	3	1
2	Sie erhalten (Lose):	4	5	6	7	8
	Andere Person erhält (Lose):	10	8	6	4	2
1	Sie erhalten (Lose):	2	3	4	5	6
	Andere Person erhält (Lose):	11	9	7	5	3
0	Sie erhalten (Lose):	0	1	2	3	4
	Andere Person erhält (Lose):	12	10	8	6	4

Falls Sie dazu Fragen haben, geben Sie der Versuchsleitung bitte ein Handzeichen. Ansonsten klicken Sie bitte auf "Continue"

Figure 13: Give-some game: Matrix of all possible outcomes

Give-some game: Choice situation Liebe(r) Versuchsteilnehmer(in), falls Sie alles verstanden haben erhalten Sie von der Versuchsleitung nun die Gutscheine und den Briefumschlag, in dem Sie der anderen Person Gutscheine von Ihnen übermitteln können. Falls Sie dies tun möchten, stecken Sie diese in den Briefumschlag. Die anderen Gutscheine behalten Sie bitte. Sie werden dann den Briefumschlag der anderen Person erhalten. Anschließend können Sie Ihre Gutscheine bei der Versuchsleitung in Lose umtauschen. Beachten Sie bitte, dass jeder der Gutscheine, den Sie von uns

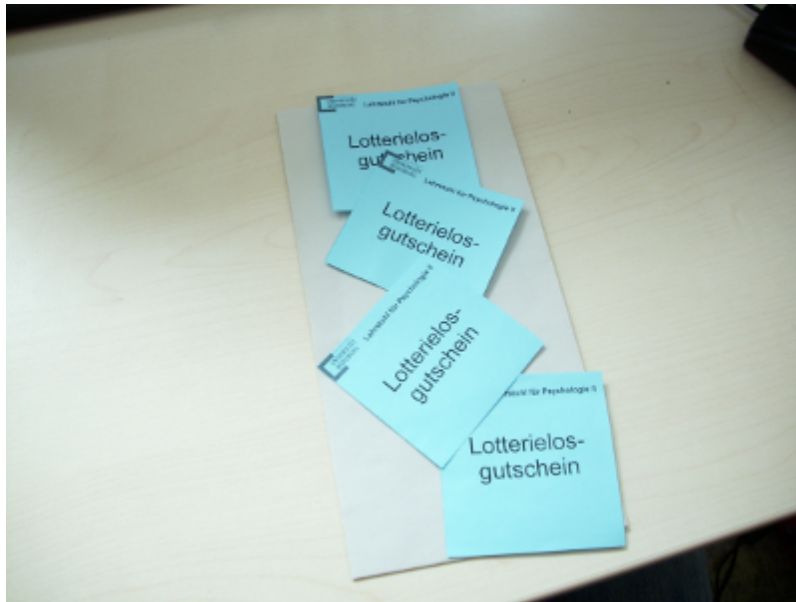


Figure 14: Give-some game: Lottery tokens

erhalten in ein Los umgetauscht werden kann, während jeder Gutschein, den Sie von der anderen Person erhalten in zwei Lose umgetauscht werden kann. Beachten Sie zudem, daß sich die Person, von der Sie den Briefumschlag erhalten, sich nicht zwingend hier in diesem Raum befinden muss. Geben Sie der Versuchsleitung nun bitte ein Handzeichen.

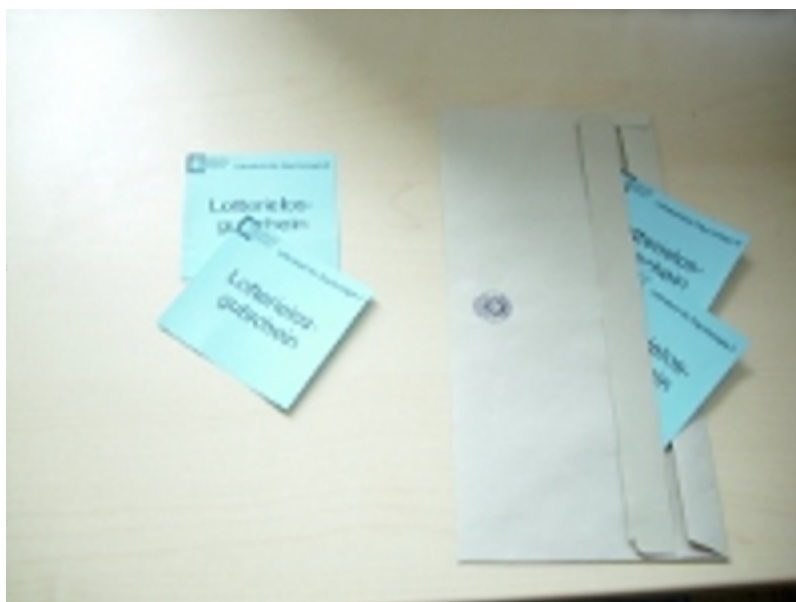


Figure 15: Give-some game: Example of cooperative choice

Computerized games

General Instruction Tauschspiel


Stellen Sie sich vor, Sie würden von uns 10 Jetons erhalten. Der Wert eines Jetons entspricht 50 Cent. Der Computer wählt nun zufällig einen Mitspieler für Sie aus. Ihren Mitspieler werden Sie nicht bewußt treffen. Sie können alle Ihre Jetons behalten, jedoch auch Jetons an Ihren Mitspieler abgeben, die Ihnen dann verloren gehen. Ebenso kann Ihr Mitspieler alle seine Jetons behalten oder Ihnen welche von seinen Jetons abgeben, die ihm dann verloren gehen. Jeder Jeton, den Sie an Ihrem Mitspieler abgeben hat für diesen den doppelten Wert, d.h. 1 Euro, genauso wie jeder Jeton, den Sie von Ihrem Mitspieler erhalten, für Sie den Wert von 1 Euro hat.

Beispiel:


Angenommen, Sie geben Ihrem Mitspieler 5 von Ihren Jetons, und Ihr Mitspieler gibt Ihnen 2 von seinen Jetons. Ihnen bleiben 5 Jetons und Sie erhalten zwei Jetons Ihres Mitspielers, die für Sie den doppelten Wert Ihrer Jetons haben. Eine Ihrer Jetons hat für Sie den Wert von 50 Cent, also bleiben Ihnen 2,50 Euro. Da Sie von Ihrem Mitspieler zwei Jetons bekommen, die für Sie jeweils 1 Euro wert sind, wäre Ihr Gesamtgewinn 4,50 Euro. ($5 \times 0,50\text{€} + 2 \times 1\text{€} = 4,50\text{€}$) Ihrem Mitspieler bleiben 8 seiner Jetons, und er erhält noch 5 Jetons von Ihnen. Eine seiner Jetons hat für ihn den Wert von 50 Cent, also bleiben ihm Mitspieler 4 Euro. Da er von Ihnen 5 Jetons bekommt, die für ihn 1 Euro wert sind, wäre der Gesamtgewinn Ihres Mitspielers 9 Euro ($8 \times 0,50\text{€} + 5 \times 1\text{€} = 9\text{€}$). Falls Sie zu den Regeln des Spiels noch Fragen haben, geben Sie der Versuchsleitung bitte ein Handzeichen. Ansonsten klicken Sie bitte auf "Continue"


Tauschspiel

Sie werden nun eine Runde des Tauschspiels spielen. Falls Sie keinen Fragen mehr haben können Sie nun mit dem Spiel beginnen. Schließen Sie bitte das Browserfenster und klicken Sie anschließend auf "Continue"


Studie II: Entscheidungen


Tauschspiel





 Geben Sie nun bitte an wieviel von Ihren Jetons Sie der anderen Person abgeben möchten.
 Bedenken Sie: Es gibt keine richtigen oder falschen Antworten.


0 1 2 3 4 5 6 7 8 9 10

Figure 16: Computerized give-some game, study Ib and II


Studie II: Entscheidungen

Tauschspiel




 Geben Sie nun bitte an wieviel von Ihren Jetons Sie dem Computer abgeben möchten.
 Bedenken Sie: Es gibt keine richtigen oder falschen Antworten.

0 1 2 3 4 5 6 7 8 9 10

Figure 17: Computerized give-some game, study III

5.2 Prisoner's dilemma

Instructions

Start instruction Studie zu Entscheidungen

Liebe(r) Versuchsteilnehmer(in), in der nächsten Studie geht es um Entscheidungen. Sie haben nun die Möglichkeit, an einer Lotterie teilzunehmen. Unter allen Teilnehmern wird ein Gutschein von Hugendubel im Wert von 50€ verlost. Wie's geht erfahren Sie auf der nächsten Seite. Klicken Sie nun bitte auf "Continue"

Screenshots

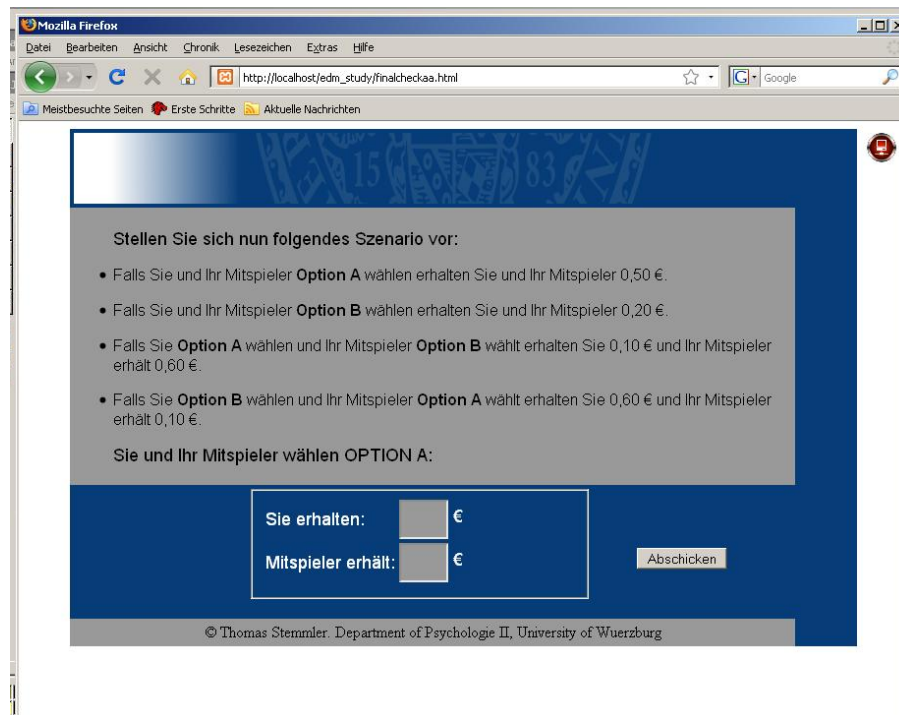


Figure 18: Prisoner's dilemma: Manipulation check

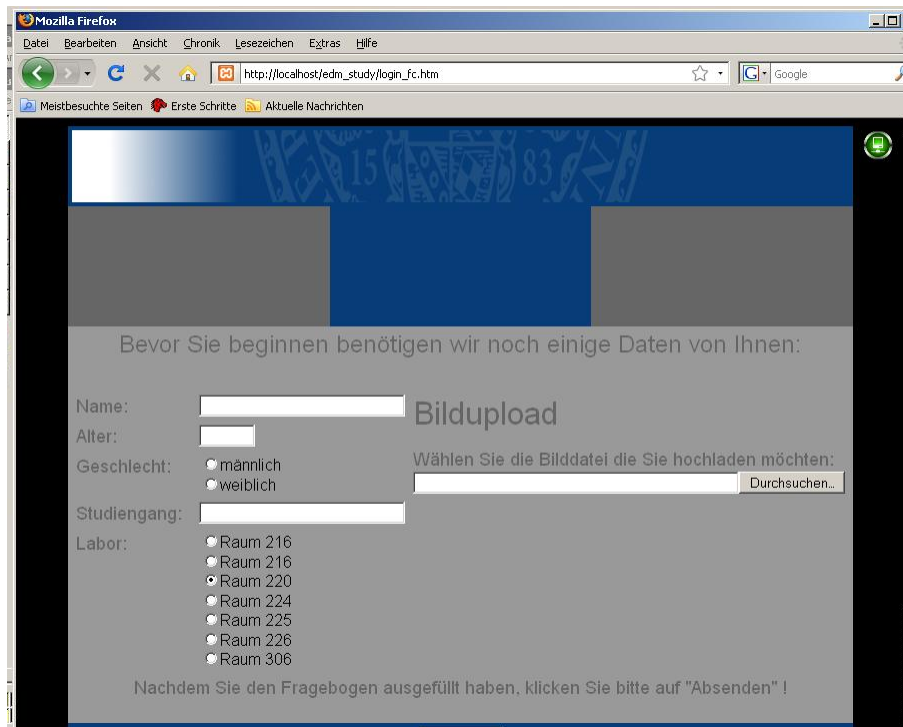


Figure 19: Prisoner's dilemma: Login screen

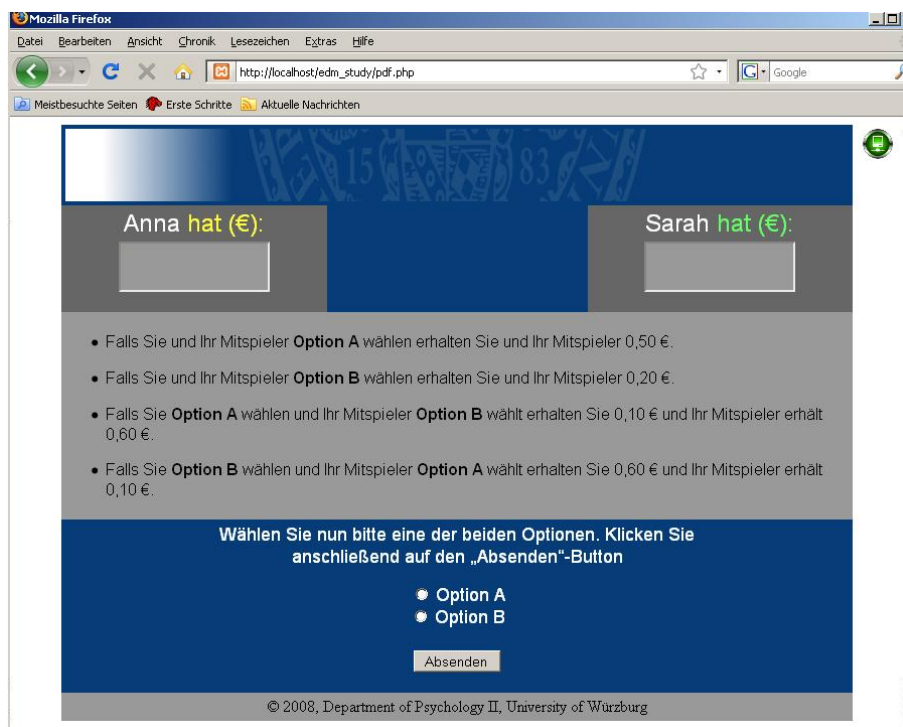


Figure 20: Prisoner's dilemma: Choice screen

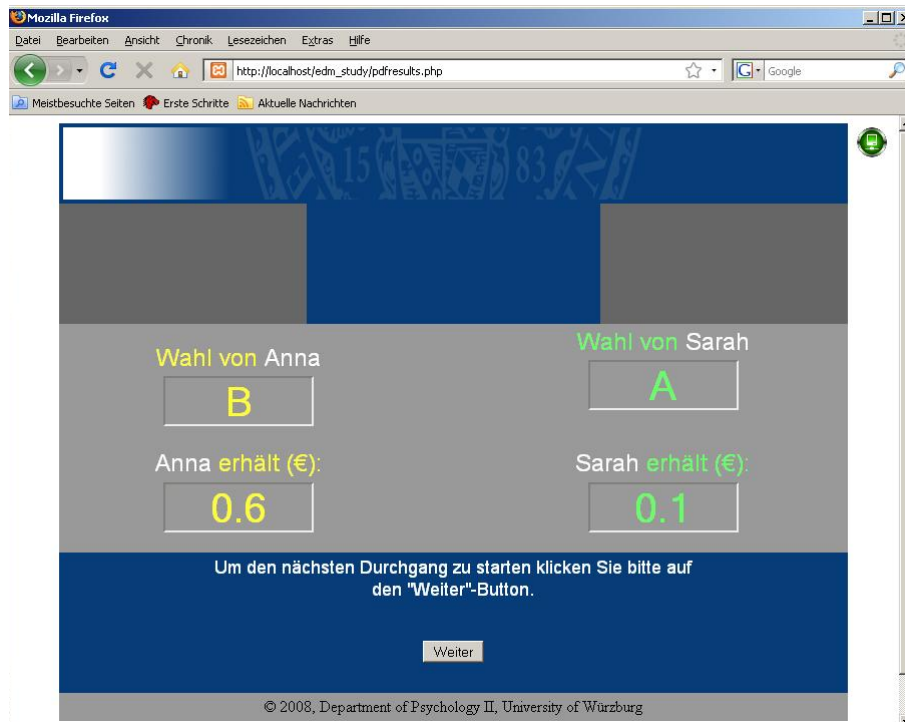


Figure 21: Prisoner's dilemma: Immediate results



Figure 22: Prisoner's dilemma: End results

List of Figures

3.1	Study Ia: Cooperation	55
3.2	Study Ib: Cooperation	58
3.3	Study II: Cooperation	71
3.4	Study III: Cooperation	84
3.5	Study IV: Cooperation	91
1	Anticipatory priming, general instruction	142
2	Anticipatory priming, imagery instruction	142
3	Misattribution questionnaire	145
4	Uncomfortable laboratory room, picture 1	146
5	Uncomfortable laboratory room, picture 2	146
6	Self-affirmation: Non-moral values	147
7	Self-affirmation: moral values	148
8	Self-affirmation: Memory task	149
9	Scale of emotion-questionnaire: Long version	156
10	Scale of emotion-questionnaire: Short version	157
11	The Triple Dominance Questionnaire	158
12	The Rosenberg self-esteem scale	159
13	Give-some game: Matrix of all possible outcomes	161
14	Give-some game: Lottery tokens	162
15	Give-some game: Example of cooperative choice	162

16	Computerized give-some game, study Ib and II	164
17	Computerized give-some game, study III	164
18	Prisoner's dilemma: Manipulation check	165
19	Prisoner's dilemma: Login screen	166
20	Prisoner's dilemma: Choice screen	166
21	Prisoner's dilemma: Immediate results	167
22	Prisoner's dilemma: End results	167

List of Tables

3.1	Study Ia: Means and standard deviations of discomfort and negative self-directed affect	53
3.2	Study Ia: Means and standard deviations of positive affect	54
3.3	Study Ib: Means and standard deviations of negative self-directed affect and discomfort	57
3.4	Study Ib: Means and standard deviations of positive affect	57
3.5	Study II: Means and standard deviations of discomfort and negative self-directed affect	70
3.6	Study II: Means and standard deviations of positive affect	70
3.7	Study III: Means and standard deviations of discomfort and negative self-directed affect	83
3.8	Study III: Means and standard deviations of positive affect	83

Deutsche Zusammenfassung

In der vorliegenden Arbeit wurden zwei unterschiedliche Modi intuitiven, emotionalen Entscheidens verglichen: Entscheidungen, basierend auf emotionalem Erleben, und emotionales Entscheiden, basierend auf dem emotionalen Bewertungsprozess.

Stand der Forschung

Nach langer Dominanz rationaler Urteils- und Entscheidungsmodelle in der Moralpsychologie (z.B. Kohlberg, 1969) besteht seit einiger Zeit verstärktes Interesse an intuitiven, emotionalen Einflüssen auf moralische Urteile und Entscheidungen (z.B. Greene, 2007; Haidt, 2001; Monin et al., 2007). So konnte gezeigt werden, dass Emotionen wie Ekel moralische Verurteilung verstärken (Schnall et al., 2008; Wheatley & Haidt, 2005), Schuldgefühle aber auch zu verstärkter Kooperation führen (Hooge et al., 2007; Ketelaar & Tung Au, 2003; Nelissen et al., 2007). Der Einfluss von Emotionen auf moralische Entscheidungen wird in der Literatur mittels heuristischen Entscheidungsstrategien erklärt (z.B. Sinnott-Armstrong et al., 2010; Sunstein, 2005; Tobler et al., 2008).

Heuristiken sind Faustregeln, die Menschen benutzen um sich Entscheidungen zu vereinfachen: Rationale, konsequenzbasierte Entscheidungsmodelle (wie das *expected-utility* Modell, vgl. Neumann & Morgenstern, 1944) nehmen an, dass für jede Entscheidungsoption die Konsequenz antizipiert wird und der Nutzen aufgrund der Eintrittserwartung und dem persönlichen Wert berechnet wird. Anschließend wählt die Person die Option, die den höchsten Nutzen verspricht. Obwohl diese Entschei-

dungsstrategie als “Gold-Standard” gilt (Gigerenzer et al., 1999), greifen Menschen häufig, da die Nutzenberechnungen kognitiv sehr aufwendig sind (Payne et al., 1993), auf Faustregeln oder Heuristiken zurück (z.B. H. A. Simon, 1955), v.a. wenn die kognitive Kapazität knapp ist oder die Motivation fehlt (Strack & Deutsch, 2004, 2009).

Heuristische Entscheidungsstrategien können als Vereinfachung der Evaluation von Entscheidungsoptionen verstanden werden, d.h. ein zu berechnendes Zielattribut wird mittels eines unmittelbar verfügbaren (Alternativ-) Attributs ersetzt (Kahneman, 2002; Kahneman & Frederick, 2002): So lassen sich bspw. Entscheidungsoptionen evaluieren, indem die Person ihre unmittelbare affektive Reaktion als Indikator für den Nutzen der Entscheidungsoption heranzieht (Loewenstein & Lerner, 2003; Pfister & Böhm, 2008; Slovic et al., 2002; Schwarz & Clore, 1988; Schwarz, in press). Da Emotionen als Reaktionen auf Umweltveränderungen betrachtet werden (z.B. Harré, 1986) liegt es nahe, dass emotionales Erleben als experimenteller Hinweisreiz in der Entscheidungsfindung herangezogen werden kann.

So konnte gezeigt werden, dass das Wiedererleben von Schuldgefühlen, ausgelöst durch autobiografisches Priming, zu erhöhter Kooperation führt, jedoch nur bei Personen die sich chronisch unkooperativ verhalten (Hooge et al., 2007; Ketelaar & Tung Au, 2003; Nelissen et al., 2007). Da zur Evaluation von Entscheidungsoptionen das (bewußte Schuld-) Gefühl auf die Option zurückgeführt (attribuiert) werden muss, legt dieser Befund nahe, dass nur Personen, die sich in sozialen Situationen häufig schuldig fühlen, das Gefühl auch korrekt zuordnen können (vgl., z.B. Ketelaar & Clore, 1997). Diese Befunde legen zudem nahe, dass Personen ihre Schuldgefühle als Information benutzen, die einen bewußten und regelbasierten Entscheidungsprozess beeinflussen, der an sich jedoch “unemotional” (bzw. “rational”) ist (Pfister & Böhm, 2008).

Intuitives Entscheiden mittels emotionalem Erlebens bezieht sich somit auf den Nutzen des Gefühls zur Evaluation von Entscheidungsoptionen. Heuristische Verar-

beitung kann als non-kompensatorisches Entscheiden verstanden werden, da Entscheidungsoptionen auf einer Dimension miteinander verglichen werden, und ein Zielattribut nicht ein anderes ausgleichen kann (wie bspw. bei Erwartung x Wert Berechnungen). Obwohl non-kompensatorische Entscheidungsregeln in einer Vielzahl von Situationen die Entscheidung vereinfachen können, erscheint ihre Benutzung im Hinblick auf Schuld und Kooperation unplausibel.

Erstens: Die Veränderung der Entscheidungsstrategie von kompensatorischer (z.B. Erwartung x Wert) zu non-kompensatorischer Entscheidung scheint sich eher auf die Informationssuche zu beziehen als auf die Informationsintegration, da die Reduktion auf einen Hinweisreiz eher einem aktiven Ausblenden von Information gleichkommt (z.B. Glöckner & Betsch, 2008a). Daraus folgt, dass Menschen möglicherweise durchaus kompensatorische Entscheidungsstrategien benutzen können, diese aber durch die Menge und Komplexität situational zugänglicher Information beeinflusst werden. Dadurch können unterschiedliche Entscheidungsregeln zu gleichen Ergebnissen führen und gleiche Entscheidungsregeln zu unterschiedlichen Ergebnissen.

Zweitens ignorieren Entscheidungsmodelle, in denen emotionales Erleben als evaluative Information genutzt werden kann, wie Emotionen entstehen. Dies schließt zwangsweise aus, dass der Prozess, der emotionales Erleben entstehen lässt, auch zur Entscheidung genutzt wird (oder werden kann).

Drittens: die Anwendung einer non-kompensatorischen Entscheidungsstrategie (wie einer Heuristik) würde, bei Schuld, zu einer relativ automatischen Auslösung von Kooperation führen, was den kompletten Prozess ausbeutbar macht und evolutionär sehr unplausibel erscheint (vgl. Fehr & Gächter, 2002; Gintis et al., 2003; Stevens & Hauser, 2004; Trivers, 1971). Da moralische Emotionen als Reaktion auf das eigene oder das Verhalten anderer verstanden werden können bietet sich die Möglichkeit, dass nicht das emotionale Erleben als bewußte Information zur Evaluation genutzt wird, sondern dass der Prozess, der emotionales Erleben auslöst, bereits die Entscheidung trifft.

Emotionen entstehen falls ein Stimulus diskrepant zu einem Ziel ist (z.B. Arnold, 1960; Frijda, 1986; Lazarus, 1966; Leventhal & Scherer, 1987; Ortony et al., 1988; Scherer, 1984, für aktuelle Reviews, vgl. Moors, 2009, 2010). Schuld wird als affektive Reaktion auf eine moralische Verfehlung betrachtet (Haidt, 2003; Tangney & Dearing, 2002; Tangney et al., 2007; Tangney & Tracy, in press; Tracy & Robins, 2004). Da Schuld zu Kooperation führt, ist ein plausibles Ziel das Einhalten von reziprokem Altruismus, d.h. konditionaler Kooperation. Emotionsentstehung und (intuitive) Entscheidungen können in einem Model vereint werden sobald man bei beiden Prozessen eine konnektionistischen Struktur (z.B. Barnes & Thagard, 1996; Read et al., 1997; D. Simon & Holyoak, 2002; Thagard & Millgram, 1995) zugrunde legt. Konnektionistische (oder "neuronale") Netzwerke bestehen aus assoziierten Knoten, die über Aktivierungs-/Deaktivierungsregeln miteinander verknüpft sind (McClelland & Rumelhart, 1986; Read et al., 1997). Aktivierung breitet sich innerhalb des Netzes entlang der Aktivierungsregeln aus, d.h. sobald die Aktivierung eines Knotens verändert wird, verändert sich die Aktivierung aller Knoten. Konnektionistische Netzwerke verarbeiten Informationen kompensatorisch, da die Aktivierungsveränderung in einem Knoten mittels eines anderen ausgeglichen werden kann. Konnektionistische Netzwerke können eindeutige Entscheidungs-Intuitionen erzeugen, da sie Informationen nach Gestalt-Prinzipien verarbeiten (Glöckner & Wittman, 2010): das Ganze ist mehr als die Summe der Teile, jedoch lassen sich die Teile separat manipulieren. Emotionales Erleben wäre demnach nur die wahrgenommene Gestalt, während die eigentliche Entscheidung durch die zugrunde liegende Information "getroffen" wird. Falls Schuld eine Verfehlung von reziprokem Altruismus darstellt, dann besteht die Möglichkeit, dass ein konnektionistisches Netzwerk sowohl das emotionale Erleben von Schuld als auch die "Entscheidung", zu kooperieren, in Form einer emotionalen Aktionstendenz, erzeugt.

Hauptziele und Hypothesen

Die vorliegende Arbeit vergleicht beide Möglichkeiten intuitiver Kooperation im Hinblick auf Schuld, d.h. klassischen, informationsbasierten Einfluss von Emotionen auf Entscheidungen mit emotionalen Entscheiden, basierend auf paralleler, kompensatorischer Verarbeitung. In anderen Worten: emotionsbeeinflusstes Entscheiden vs. emotionales Entscheiden.

Beide Ansätze lassen sich auf drei Ebenen unterscheiden. Erstens: In klassischen Ansätzen ist emotionales Erleben die wahrgenommene Reaktion auf eine Veränderung in der Umwelt (z.B. Harré, 1986), die als evaluative Information zur Entscheidungsfindung benutzt wird (z.B. Ketelaar & Clore, 1997). In konnektionistischen Ansätzen ist emotionales Erleben ein Epiphänomen, das durch die Verarbeitung situativer Information entsteht. Während traditionelle Ansätze davon ausgehen, dass die Person ihr spezifisches emotionales Erleben auf eine Ursache attribuiert, gehen konnektionistische Ansätze davon aus, dass das Gefühl prinzipiell unspezifisch ist (z.B. Barrett, Ochsner, & Gross, 2007). Beide Ansätze unterscheiden sich somit bez. der Spezifität der Möglichkeit zur Affektattribution: während traditionelle Ansätze von emotionsspezifischer Attribution ausgehen, gehen konnektionistische Ansätze von einer unspezifischen Affektattribution aus.

Des Weiteren unterscheiden sich bei Schuld und Kooperation beide Ansätze hinsichtlich des Einflusses von Verantwortung. Schuld lässt sich als intrapersonales (z.B. Buss, 1980; Lewis, 1971; Higgins, 1987) und als interpersonales Phänomen konzeptualisieren (z.B. Baumeister et al., 1994, 1995; Frijda, 1993). Vom intrapersonalen Standpunkt betrachtet wird Schuld durch die Verletzung einer moralischen Norm erweckt, vom interpersonalen Standpunkt wenn die Verletzung bedeutende soziale Beziehungen bedroht. Somit unterscheiden sich intra- und interpersonale Ansätze bezüglich kausaler Verantwortung und selbst zugeschriebener Verantwortlichkeit (vgl. Berndsen & Manstead, 2007): Externale Attribution von

Verantwortlichkeit sollte bei Verwendung einer nicht-kompensatorischen Entscheidungsstrategie Schuldgefühle reduzieren und somit indirekt Kooperation beeinflussen. Falls Personen eine kompensatorische Strategie benutzen, sollten Personen hingegen kooperieren falls soziale Beziehungen bedroht sind und nicht kooperieren, falls eine moralische Verfehlung soziale Beziehungen nicht bedroht, bspw. wenn die moralische Reputation der Person dadurch nicht gefährdet wird. Wichtig ist hierbei, dass der Vergleich der eigenen Reputation mit der Reputation anderer eine Kompensation darstellen kann, und somit konditionale Kooperation in Abhängigkeit der moralischen Reputation auf die Benutzung einer kompensatorischen Entscheidungsstrategie hinweist.

Ein weiterer Unterschied bezieht sich auf die Ursache der Kooperation. Dissonanztheorie (Festinger, 1957) legt nahe, dass Schuld als Bedrohung des Selbst wahrgenommen wird (E. Aronson, 1968; Steele, 1988; Thibodeau & Aronson, 1992). Die Motivation zur Kooperation sollte somit auf dem Versuch, die Bedrohung zu reduzieren, beruhen. Der Selbstaffirmationstheorie (Sherman & Cohen, 2006; Steele, 1988) zufolge lassen sich Selbstwertbedrohungen mittels Selbstbestätigungen reduzieren, wobei es auch möglich ist, sich in einem anderen Bereich als dem bedrohten zu bestätigen. Vom konnektionistischen Standpunkt aus würde man jedoch davon ausgehen, dass die Selbstbedrohung die temporäre Gestalt einer Inkohärenz von kooperativen und unkooperativen Aktionstendenzen darstellt, die durch situativ aktivierte Information entsteht. Da die "Entscheidung" auf der Kohärenz von Information beruht (Barnes & Thagard, 1996; Thagard & Millgram, 1995), würde eine kooperative Entscheidung getroffen werden, falls Information aktiviert wird, die eine Kohärenzverschiebung (vgl. D. Simon & Holyoak, 2002) bez. Kooperation möglich macht. In anderen Worten: Personen kooperieren falls Versuche, die experimentelle Gestalt (die erlebte Bedrohung des Selbst) zu verändern, mit kooperativen Aktionstendenzen einher geht. Andernfalls kooperieren sie nicht.

Zusammenfassend unterscheiden sich non-kompensatorische und kompensatorische

Entscheidungsstrategien in drei Bereichen: die Anzahl der Verarbeitungsprozesse (d.h. die Spezifität zur Affektmisattribution; non-kompensatorisch: spezifisch, kompensatorisch: unspezifisch), der Einfluss von Verantwortung auf das Erleben von Selbstbedrohung (non-kompensatorisch: Einfluss von kausaler Verantwortung, kompensatorisch: Einfluss von selbst zugeschriebender Verantwortung) und der Spezifität von Aktionstendenzen, die zur Reduktion der Selbstbedrohung genutzt werden kann (non-kompensatorisch: unspezifisch, kompensatorisch: spezifisch).

Kernbefunde

Um zu überprüfen, ob Schuld Kooperation mittels non-kompensatorischer oder kompensatorischer Entscheidungsstrategien beeinflusst wurden fünf Studien durchgeführt.

In den ersten beiden Studien wurden bei Personen entweder Schuldgefühle oder eine neutrale Stimmung induziert. Bei Studie Ia wurde autobiografisches (vgl. Hooge et al., 2007; Harmon-Jones et al., 2007) und bei Studie Ib antizipatorisches Emotionspriming (vgl. Holmes & Mathews, 2005) genutzt. Anschließend wurde die Hälfte der Versuchspersonen auf den ungemütlichen Laborraum aufmerksam gemacht, der als alternative, unspezifische Attributionsquelle für negative Gefühle dienen sollte (Fried & Aronson, 1995). Darauf folgte ein kurzer Emotionsfragebogen (Galinsky et al., 2000) und ein kooperatives Spiel (Nelissen et al., 2007; Van Lange et al., 1997), in dem die Versuchspersonen einer anderen Person Lose spenden konnten. Wie erwartet zeigen die Ergebnisse beider Studien, dass sowohl die Erinnerung als auch die Vorstellung moralischen Fehlverhaltens zu verstärkter Kooperation führt. Falls die Versuchspersonen jedoch danach auf den Versuchsraum aufmerksam gemacht wurden, verschwand dieser Effekt. Des Weiteren berichteten die Versuchspersonen nach autobiografischem Schuldpriming, jedoch nicht bei antizipatorischem Schuldpriming, erhöhten negativen selbstgerichteten Affekt. Diese Befunde deuten darauf hin, dass Personen offenbar nicht ihre Schuldgefühle zur Bewertung von Entschei-

dungsoptionen benutzen, da sie entweder keine zu empfinden scheinen (Studie Ib) oder Schuld berichten (Studie Ia), aber nicht kooperieren. Somit sind die Ergebnisse ein erstes Indiz für die Benutzung von kompensatorischer Informationsverarbeitung, die den Versuchspersonen offenbar aber nicht bewußt ist.

Ob Versuchspersonen eine kompensatorische Entscheidungsstrategie benutzen wurde in zwei weiteren Studien direkter überprüft. Wie bereits erwähnt sollte die Möglichkeit zur externalen Attribution von Verantwortlichkeit Schuldgefühle reduzieren und somit zu geringerer Kooperation führen. Falls Personen jedoch eine kompensatorische Entscheidungsstrategie benutzen, sollten sie kooperieren falls die Situation eine Bedrohung sozialer Beziehungen darstellt. In Studie III wurden alle Versuchspersonen autobiografisch mit Schuld geprint und hatten anschließend die Möglichkeit, Entschuldigungen für ihre berichtete Tat aufzuschreiben. Die moralische Reputation der Person oder anderer Personen wurde aktiviert, indem sie gebeten wurde, Entschuldigungen aus ihrer Perspektive oder der Perspektive anderer zu schreiben. Hier zeigte sich ein Interaktionseffekt von chronisch sozialer Orientierung und Aufmerksamkeitslenkung auf die eigene Reputation oder die Reputation anderer: Egoisten kooperierten wenn die persönliche (negative) Reputation salient gemacht wurde und kooperierten nicht, falls die Reputation anderer Personen salient gemacht wurde. Altruisten hingegen kooperierten wenn die (positive) Reputation anderer salient gemacht wurde und kooperierten nicht, wenn die persönliche (ebenfalls positive) Reputation salient gemacht wurde. Da sich Egoisten und Altruisten in ihren Erwartungen an Kooperation anderer unterscheiden (Egoisten erwarten keine Kooperation, Altruisten erwarten Kooperation, vgl. Van Lange & Liebrand, 1991) spricht dieser Befund für das Benutzen einer kompensatorischen Entscheidungsstrategie.

Interessanterweise berichten Egoisten eine Veränderungen im emotionalen Erleben, dass analog zu ihren kooperativen Entscheidungen ist: Selbstsalienz führt zu erhöhtem negativen Affekt und die Salienz anderer zu verringertem negativem Affekt, was für die Benutzung einer non-kompensatorischen Strategie (oder affekt-

basierten Heuristik) spricht. Allerdings scheinen die Selbstberichte ebenfalls durch kompensatorische Informationsverarbeitung zu entstehen, was die Verwendung einer non-kompensatorischen Entscheidungsstrategie zwar nicht ausschließt, aber auf Systemebene keinen Vorteil bringen würde, d.h. es wäre keine Ersparnis an z.B. Ressourcen. Zudem sprechen die Befunde dafür, dass externale Attribution weder das Verhalten verändert noch das emotionale Erleben, was ebenfalls für einen kompensatorischen Verarbeitungsprozess spricht. Altruisten berichten generell keine Unterschiede im emotionalen Erleben.

Da in letzterer Studie nur Selbstzuschreibung von Verantwortung manipuliert wurde, wurde in Studie IV zusätzlich kausale Verantwortlichkeit manipuliert. Um Schuld und kausale Verantwortlichkeit zu manipulieren wurden die Teilnehmer entweder gebeten, sich unkooperativ zu einem anderen Teilnehmer zu verhalten, oder das entsprechende Verhalten war als Teil der Untersuchung "Pflicht". Anschließend wurde die Selbstaufmerksamkeit oder die Aufmerksamkeit auf andere manipuliert. Abschließend wurden kooperative Verhaltenstendenzen mittels eines Prisoner's Dilemma (Axelrod & Hamilton, 1981) gemessen. Wie in Studie III wurde kooperatives Verhalten der Versuchsperson ausschließlich (d.h. kausale Verantwortlichkeit spielte keine Rolle) von der Aufmerksamkeit auf die Reputation von sich selbst oder anderen beeinflusst, wobei Egoisten in dieser Studie generell nicht kooperierten. Dies lag möglicherweise daran, dass in der Testphase der kooperative Mitspieler sich für das unkooperative Verhalten der Versuchsperson während der Schuldmanipulation rächte und dies zur Bestätigung der Erwartung, dass andere Personen unkooperativ sind, führte und sich die Personen vor Ausbeutung absichern wollten (was Egoisten offenbar chronisch tun, vgl. Nelissen et al., 2007). Die Befunde dieser Studien deuten wieder auf eine kompensatorische Entscheidungsstrategie hin, zumindest bei den Altruisten. Somit legen die Befunde nahe, dass die Entscheidung, bei Schuldgefühlen zu kooperieren, auf der Benutzung einer kompensatorischen Entscheidungsstrategie beruht.

In einer weiteren Studie wurde überprüft, ob die Entscheidung zur Kooperation durch die erlebte Selbstbedrohung an sich oder durch die Aktionstendenzen, die mit Informationen zur Bedrohungsreduktion assoziiert sind, beeinflusst werden. Personen wurden entweder mit einer moralischen Selbstbedrohung oder einer nicht-moralischen (Kompetenz-)Selbstbedrohung autobiografisch geprimt (autobiografisches Schuldpriming vs. autobiografisches Schampriming). Anschließend hatten die Versuchspersonen die Möglichkeit, sich entweder mit moralisch relevanten oder mit moralisch irrelevanten Werten zu affirmieren (vgl. Cohen et al., 2000). Die Ergebnisse zeigen, dass kooperatives Verhalten absinkt, falls Personen eine moralische Selbstbedrohung berichten und sich mittels moralischer Werte affirmieren können. Dieser Effekt tritt bei moralisch irrelevanter Affirmation nicht auf. Da frühere Forschung gezeigt hat, dass moralische Selbstaaffirmationen generell zu unkooperativen Verhalten führen (z.B. Khan & Dhar, 2006; Mazar & Zhong, 2010; Sachdeva et al., 2009), spricht dieser Befund dafür, dass die Entscheidung zu kooperieren an einer Kohärenzverschiebung innerhalb in Konflikt stehender Aktionstendenzen führt. Zudem berichteten Versuchspersonen erhöhten negativen selbstgerichteten Affekt wenn eine moralische Affirmation einer moralischen Selbstbedrohung folgte. Da hier jedoch Kooperation absank spricht dieser Befund ebenfalls gegen die Annahme einer non-kompensatorischen Entscheidungsstrategie, basierend auf emotionalen Erleben.

Zusammenfassend sprechen die Befunde relativ eindeutig für die Benutzung einer kompensatorischen Entscheidungsstrategie bei Schuld und Kooperation, die den Leuten offenbar so jedoch nicht zwangsweise bewußt ist.

Fazit

In der vorliegenden Arbeit wurden zwei unterschiedliche Modi intuitiven, emotionalen Entscheidens verglichen: Entscheidungen basierend auf emotionalem Erleben und emotionales Entscheiden basierend auf dem emotionalen Bewertungsprozess. Die Befunde sprechen für emotionales Entscheiden in Kontrast zu emotionsbeeinflusstem Entscheiden. In anderen Worten, bei Verfehlungen von reziprokem Altruismus scheinen Menschen den emotionalen Bewertungsprozess auch benutzen zu können um Entscheidungen zu treffen, die nicht auf dem bewußten Erleben beruhen (müssen) und der Grund für die kooperative Entscheidung möglicherweise erst im Nachhinein generiert wird, falls er kommuniziert werden muss (Haidt, 2001; Mercier, forthcoming; Mercier & Sperber, 2011). Jedoch legen die Befunde nicht zwangsweise nahe, dass *jegliche* Entscheidung mittels intuitiver, kompensatorischer Informationsverarbeitungsprozesse getroffen werden muss, sondern möglicherweise nur solche die direkt einen Überlebensvorteil oder -nachteil mit sich bringen können (z.B. wenn Non-Kooperation zu altruistischer Bestrafung führt) und eine bestimmte Struktur aufweisen (z.B. eine bestimmte moralische Grammatik, vgl. Hauser, 2006; Mikhail, 2006, 2007). Aktuelle Forschung zum Einfluss von Metaphern legt diese Vermutung nahe (z.B. Lee & Schwarz, 2010a, 2010b; Xu et al., in press): Falls für das Überleben nicht direkt relevante Probleme mittels Metaphern dazu gemacht werden, mögen Leute diese “intuitiven”, emotionalen Verarbeitungsmechanismen bewußt aktivieren können und somit relativ schnell zu guten Entscheidungen kommen, auch ohne aufwendige Kosten/Nutzen-Abwägungen. Zusammenfassend deuten die Befunde darauf hin, dass moralische Emotionen wie Schuld evolutionäre Probleme “intuitiv” lösen können, da sie eine bestimmte Verarbeitungsstruktur oder Grammatik bereitstellen. Die Nutzung des affektiven Gefühls zur Evaluation unterschiedlicher Entscheidungsoptionen im Sinne von Heuristiken scheint, zumindest bei Schuld, nicht notwendig zu sein, auch wenn der Prozess des Entscheidens anders

erlebt und kommuniziert wird.