TWO ROUTES TO THE PERCEPTION OF NEED: THE ROLE OF AFFECTIVE VS.

DELIBERATIVE INFORMATION PROCESSING IN PROSOCIAL BEHAVIOR

by

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        Emotional reactions are a critical element in the motivation to help others. For

the purpose of the current research, these reactions are broadly conceptualized as focused

either on the self or on other human beings. Self-focused affect (e.g., anticipated regret)

motivates helping through the reduction of an unpleasant emotional state, whereas other-

focused affect (e.g., sympathy) motivates helping due to concern for the victim.

        This dissertation investigates the role of affective vs. deliberative information

processing in the genesis and use of emotional reactions in decisions to provide financial

aid to people in distress. In five studies, a model of affective vs. deliberative information

processing is examined within the domain of prosocial behavior. Three main hypotheses

investigated whether information processing mode influenced participants' donations,

affective reactions, and the relationship between affective reactions and donations. Processing mode was manipulated by a cognitive load paradigm, a priming procedure, the number and identifiability of victims, serial vs. single presentations, and the addition of background statistics related to the victim's situation. Furthermore, participants' ability to visually focus on a single target presented with and without distractor victims was investigated as part of an attentional mechanism that generates affective responses. The results supported a model in which deliberative processing has potentially disruptive effects on the generation of other-focused affect and on the extent to which these types of emotions predicted donations. The importance of other-focused affect in donation decisions was augmented by reducing deliberative capacity, priming affective processing, and increasing the affective salience of victims by identifying them. The influence of self-focused affect on donations was robust to changes in information processing mode and appeared to be governed by different mechanisms than other-focused affect. Humanitarian aid organizations should be sensitive to these issues when eliciting donations from potential donors. Implications and future research are discussed.

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CHAPTER I

GENERAL INTRODUCTION

At times, people are unmoved by tragedies such as genocide or mass murder and fail to actively engage in behavior that ameliorates the suffering of others. Yet other times when witnessing the suffering of an individual we often care enough to go to great lengths to provide aid. The decision to help a single victim but not a faceless mass raises an important question: how can people be sensitive to the suffering of individuals yet also oblivious or unresponsive to the seriousness and scale of mass tragedies?

Recent psychological research on these disparate reactions to the suffering of others suggests that the way we process information influences the decision to help those in need (e.g., Loewenstein & Small, 2007; Slovic, 2007, Small, Loewenstein, & Slovic, 2007). At least some of the psychological factors that determine helping seem to revolve around how emotionally salient the victims are, which in turn depends, at least in part, on how these victims and their tragedies are presented to us. Helping others, and prosocial behavior in general, is thought to be robustly related to emotional reactions (e.g., Batson, 1990), and victims who evoke stronger affective reactions might have a higher chance of being helped (e.g., Kogut & Ritov, 2005a). In fact, apathetic responses to others in need could be a result of us not meaningfully representing the victims' situation and suffering. Meaningful representations, in turn, seem to depend on our ability to emphasize and emotionally react to the distress of others.

An important reason why calamities that cost large number of people their lives sometimes evoke less of a helping response than an individual victim appears, in part, related to our inability to bring meaning to large numbers (e.g., Fetherstonhaugh et al., 1997; Slovic, 2007). While most people would probably agree that it is better to save many lives vs. just one, our affective reactions might speak a different language when these two situations are considered separately. For example, Kogut and Ritov (2005a)

show that a single life can evoke stronger affective reactions and be valued higher than several lives. The feelings we experience when confronted with the suffering of others and the ways emotions motivate us to provide help are not well understood and need further exploration.

The relation between our affective responses and donations for victims in need, for example, is of special interest to private aid foundations and non-profit charity organizations. If affective responses to victims are a core ingredient in helping, then organizations such as Save the Children, United Children's Fund, World Vision, and World Food Programme (to name just a few) need to be aware of the sometimes subtle ways in which emotions influence the decision to donate. Whether the charity serves starving children, homeless people displaced by war, people suffering and dying from AIDS, or any other charitable cause, the basic mechanisms of affect are important to understand.

The experiments in this dissertation were designed to investigate how information about others in need of help is processed, and to elucidate the psychological factors related to helping and the affective reactions that determine helping. Specifically, affective vs. deliberative information processing in decisions associated with donations were investigated. Before outlining the studies that were conducted to shed further light on these issues, relevant research related to the affective and deliberative determinants of helping will be reviewed.

CHAPTER II

LITERATURE REVIEW

Considerable research addresses the question of when affect determines people's decision to help others in distress. Specifically, research on affect, how it can motivate people to donate, mechanisms by which people determine the amount to donate, the relationship between attention and affect, and the role of deliberation in donations, will be the subject of the literature review. At the end of the review, results of prior research on donations will be linked to a dual information processing model which is tested empirically in this dissertation.

Affective Experience: Appraisal Theories and Dimensional Structure of Emotions

Before addressing the motivational aspects of feelings, this section will present a selective review of research on the subjective experience of affect. Of specific interest for this dissertation is people's propensity to experience emotions related to helping others. Research on prosocial behavior has identified feelings like empathy (Batson, 1990), sympathy, and compassion (Kogut & Ritov, 2005) that determine helping, and related affective reactions such as anticipated regret (Connolly & Butler, 2006; Connolly & Zeelenberg, 2002) that might also guide decision making in these contexts.

Irrespective of the specific emotion (e.g., sympathy or regret), defining the subjective experience of an emotion is a "very thorny issue" (Izard, 1993, p.71), and considerable disagreement exists among researchers on how to best conceptualize and measure affect (Izard, 2007). According to Russell (2003) the initial question of what an emotion truly is has not yet been adequately answered by researchers since first proposed by James (1890). Attempts to circumvent the definitional problem of the subjective experience of emotions have been made, including the decomposition of emotions into response modes (e.g., experiential, behavioral, and physiological; Gross, 2002), core dimensions inherent to all emotions (e.g., activation and valence; Russell, 2003), and

causal antecedents that determine the nature of the emotional experience (e.g., cognitive appraisals; Lazarus, 1991). Influenced by contemporary research on cognitive mechanisms, Schachter and Singer (1962) proposed a model of emotions that emphasizes the role of cognitive appraisal and attribution. Lazarus (1991) expanded on this model and asserted that all forms of emotions are either mediated or generated by some form of cognitive processing (e.g., cognitive appraisal, attribution, and construal processes).

Many cognitive theories of emotion maintain that subjective appraisals of situations are the major determinant for the type and flavor of affective responses (reviewed in Izard, 2007; 1993). For example, Siemer, Mauss, and Gross (2007) state that appraisals are necessary and sufficient to produce different emotions and different intensities across individuals within the same situations. Consequently, the same situation can arouse different emotions across different individuals depending on how they cognitively interpret (i.e., appraise) and make sense of the information that they perceive. Siemer et al. (2007) identify four primary appraisal dimensions that influence the subjective experience of emotions: 1. The judged importance of an event; 2. how likely the event is to happen; 3. who the responsible agent is; and 4. how able one is to control the emotion-arousing situation (p.592). According to cognitive theories of emotions, feelings such as regret and sympathy for others in need of help are at least partly based on one's subjective appraisal of the situation. Whether one feels compassion, for example, might depend on how much responsibility is ascribed to the person in need. For example, Levin and Chapman (1990) found that people were more willing to ensure that acquired immune deficiency syndrome (AIDS) victim groups would receive help when they were not responsible for the contraction of the disease.

A counterpoint to the importance of cognitive appraisal in the generation of affect is provided by research on the neurological basis of emotions (e.g., Damasio 1994: LeDoux 1996), which suggests that emotions can arise without extensive cognitive involvement. Izard (1993) proposes that emotions are activated by four different interactive mechanisms (e.g., non-cognitive and neural evaluations, as well as motivational processes), only one of which is related to cognitive appraisal. Siemer et al.

(2007) also mention that the causal chain leading to an emotion is "notoriously difficult to test" (p.593), and that whether cognitive appraisal precedes or completely replaces non-cognitive causes (such as pain or hunger) is not settled as of yet. An example of how non-cognitive mechanisms can give rise to emotions is provided by the possible biological underpinnings of feelings related to helping. According to Batson (1990), feelings such as sympathy might be genetically informed emotional reactions (i.e., they are evolutionarily adaptive in helping kin). Similarly, decision making guided by a desire to avoid regret about a loss might also be biologically informed (Camerer, 2000; Hamo & Heitfetz, 2002). Although it is not clear to what extend feelings like sympathy and regret are products of cognitive appraisal vs. non-cognitive mechanisms, it is likely that both types of mechanisms play into the generation of these kinds of feelings (Izard, 2007; 1993). Moreover, if sympathy and regret are distinct emotional experiences it is likely that the cognitive and non-cognitive mechanisms are different for each emotion.

Another viewpoint on how to define and classify the subjective experience of feelings (such as sympathy and regret) focuses on decomposing these emotions into their basic dimensions (e.g., Mellers, 2000; Osgood, Suci, & Tannenbaum, 1957; Russell, 2003; Russell & Barrett, 1999; Tellegen, Watson, & Clark, 1999; Västfjäll & Garling, 2002). Note that these models usually do not elaborate the mechanisms by which emotions are generated (i.e., cognitive appraisals), but define emotional experiences by their distinct characteristics. They identify underlying dimensions of affective reactions, but reach no consensus on how many dimensions are necessary to best describe an emotion (Reich, Zautra, & Davis, 2003). The seminal work of Osgood, Suci, & Tannenbaum (1957) argues for three independent bipolar dimensions: evaluation, potency, and activation (EPA model)[1]. These components refer to the dimensions of pleasure/pain, ability/inability to influence a situation, and activity-passivity, respectively, and combine to form distinct emotions (Russell & Mehrabian, 1977).

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[1] Later models attempt to reduce the number of dimensions to two (Russell & Barrett, 1999; Tellegen, Watson, & Clark, 1999), or one dimension (Mellers, 2000; Slovic et al, 2002). While two-dimensional models usually stress the importance of valence (positive / negative) and activity (active / passive), one-dimensional models focus on valence only.

According to the EPA model, sympathy and regret are arguably best conceptualized on at least three core dimensions. In the context of helping, both sympathy and regret have a distinct negative valence (Batson, 1990; Connolly & Reb, 2005), and an activation level that gives rise to the motivation to provide help. Most importantly, these two types of emotions appear to differ on a third core dimension (potency), which is related to the ability to influence or control the emotion-arousing event. If one experiences regret after a decision (e.g., not helping others in need), one first must be able to help (i.e., high degree of potency).

According to this reasoning, a low degree of potency would result in lower regret, as low ability to provide aid precludes any decisions to provide help. On the other hand, feelings of sympathy do not require high potency, and can emerge regardless of how able one is to change the situation of those in need. In the specific case of prosocial behavior, a further distinction of emotions focused on regulating one's own emotional state vs. the wellbeing of someone else should be made (Batson, 1990). This distinction is based on the different affective focus (either on the self or on others) and different underlying motivations to provide help.

Motivational Aspects of Affect

Affect towards an object or person can represent a source of motivation for behavior (e.g., Izard, 1993; Mowrer, 1960; Peters, 2006). This seems to be the case for basic integral affect (i.e., the goodness and badness of an object measured on the valence dimension) as well as for discrete emotions (Lerner, Small, & Loewenstein, 2004). Objects that elicit positive affect are likely to signal tendencies to approach, while those that elicit negative affect are likely to be avoided (e.g., Chen & Bargh, 1999). Similarly, discrete emotions can also motivate behavioral tendencies, such as helping others in distress.

The motivational aspects of feelings focused on the self and those that are focused on others have been linked to prosocial behavior in studies investigating determinants for altruism (Batson, 1990). Providing help to others in need can arise from selfish or selfless reasons. The scientific debate about the motivations to help other people

revolves around the question of whether we help others because we care about them or because we care primarily about ourselves? (Batson, 1990; Cialdini et al., 1987, Eisenberg & Miller, 1987). One consistent determinant for helping seems to be the ability to feel empathy, defined as an "other-oriented emotional response congruent with the perceived welfare of another" (Batson, Lishner, Cook, & Sawyer, 2005, p.15; see also Batson 1991). These authors have investigated the role of empathy in helping and propose a model in which empathy acts as a mediator for prosocial behavior (Batson, 1990, 1987; Batson et al., 1989; Coke, Batson, & McDavis, 1978). In several experiments investigating the "empathy-altruism hypothesis", they demonstrate that people can provide help from an empathic concern for a victim, while controlling for more selfish motivations to help (such as aversive-arousal reduction and empathy-specific rewards or punishments[2]; Batson et al., 1989, 1988).

Empathic concern for others is usually a consequence of valuing the welfare of the person in need (Batson et al., 2007), perspective taking (Batson et al., 2003; Coke, Batson, & McDavis, 1978; Davis et al., 2004), and perceptions of similarity (Cialdini et al., 1997; Maner et al., 2002). The role of perceived similarity in motivating helping is disputed, however. While Batson et al. (2005) found no empirical evidence of similarity affecting other-focused feelings or helping behavior, several researchers reported that people provided more help to an in-group than an out-group (e.g., Kogut & Ritov, working paper; Ritov & Kogut, 2007), and Small (2007) found similar results with a minimal-group paradigm.

Several determining factors of helping seem to revolve around the key issue of people's ability to empathize and "feel" for the victims[3]. However, while empathic

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[2] Empathy-specific punishments are negative feelings (such as regret and guilt), that are experienced due to the failure to fulfill social obligations, while empathy-specific rewards are positive feelings about the self that result from helping and counter any negative affect that is experienced due to the (depressing) situation of the person in need (Batson, 1990).

[3] Other accounts for prosocial behavior exist, and focus primarily on an evolutionary explanation of helping. However, the key role of affect as a mechanism which motivates helping is not contrary to these accounts. In fact, emotional reactions such as sympathy are central to evolutionary explanations of prosocial behavior (VanVugt & VanLange, 2006).

concern about others is a key characteristic of feelings that are focused on the victims (Batson, 1990), it is not the sole potential motivator for helping.   One competing explanation of prosocial behavior focuses on the motivating aspects related to negative arousal of the self (Hoffman, 1981). Exposure to the suffering of others usually evokes some form of negative arousal in the perceiver, which then motivates helping in order to feel better. Thus, providing help due to an aversive emotional state is generally seen as motivated by self-serving and self-focused feelings (Batson, 1990). An example of this is anticipated regret[4] for not helping, or making oneself feel better by helping others. Research on anticipated regret suggests that a wide range of decisions can be influenced by the anticipation of "psychological pain" (Miller & Taylor, 2002; p. 371), including health-related decisions (Connolly & Reb,2005; 2003) and financial investments (Kahneman & Tversky, 1982). In order to feel anticipated regret, one has to mentally simulate the future and decide whether choosing one course of action leads to subjectively worse outcomes than others (Miller & Taylor, 2002; Zeelenberg & Pieters, 2007).

Janis and Mann (1977) outline four determinants for anticipated regret, which include choice options that do not clearly dominate each other, situations where the negative consequences of a decision materialize sooner rather than later, when outcomes that are socially important (i.e., other people care about the outcomes as well), and situations in which the expected feedback from the rejected option can be obtained. Although any one of these four determinants can be the reason for anticipated regret, in the specific case of helping others all of them can be present simultaneously. First, if the decision to help is not judged to be clearly superior to not helping, the decision maker is faced with a situation wherein either choice will leave him with regret for the non-chosen option. Second, the immediate negative consequences of not helping victims in need are

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[4] Theorists disagree whether anticipated regret should be classified as an emotion or a mere cognitive prediction of the future resulting in "virtual" emotions (Zeelenberg & Pieters, 2007; Frijda, 2004). This dissertation will side with Zeelenberg & Pieters (2007), as the "prospect of future regrets feeds into the present experience, and thus acquires the experiential qualities of any other emotion" (p. 9), even though it may be cognitively based.

readily apparent and observable. Finally, cultural values often include some form of prosocial behavior (Malle & Dickert, 2007), and it is likely that others in one's environment care about the outcomes to some degree. If the potential helper is aware of any one of these determinants, pre-decisional (i.e., anticipated) regret is equivalent to an emotional barometer that forecasts feelings about the self in the context of the misery of others. This forecast of a future emotional experience often informs current feelings (Zeelenberg & Pieters, 2007) and, thus, motivates helping.

Affect and Affect-Related Mechanisms of the Construction of Value

Research on the construction of values suggests that people do not exclusively retrieve their preferences and values from memory, but often construct their value for something on the spot (Lichtenstein & Slovic, 2006; Slovic, 1995). For example, Peters, Slovic, and Gregory (2003), found that positive and negative affect towards lottery tickets were predictive of buying and selling price, while results from Kogut & Ritov (2005a) indicate that affective reactions are related to donation amounts. Affective reactions to the victims (or perpetrators, as in Small & Loewenstein, 2005) can serve as information about how much value is placed on helping.

In a situation where financial donations are elicited for victims in need, people have to decide whether they should provide aid by donating as well as the amount of the donation. Affective reactions not only motivate people to help, but also inform them about how much value they place on the victim (e.g., Small, Loewenstein, & Slovic, 2007). Affective reactions, whether in the form of discrete emotions (e.g., sympathy or regret) or bipolar affect (positive vs. negative), are an important mechanism by which people construct their values (Peters, 2006; Schwartz and Clore, 2003).

This affect-as-information hypothesis is advanced by several different lines of research, including neuroscience (Damasio, 1994), medical decision making (Peters, Dieckmann, Västfjäll, Slovic, and Hibbard, in review), economic decision making and the endowment effect (Lerner, Small, & Loewenstein, 2004, Peters, Slovic, & Gregory, 2003), and risk perception (Rottenstreich & Hsee, 2001; Johnson & Tversky, 1983; Loewenstein, Weber, Hsee, & Welch, 2001). Thus, when confronted with the possibility

of donating money to victims in need, it is likely that people will use cues from the situation and their affective responses as a source of information.

Further evidence for the role of affect in the construction of value comes from research on joint and separate evaluations. Hsee and colleagues (Hsee, 1998; 1996; Hsee & Hastie, 2006; Hsee & Zhang, 2004) suggest that affective reactions inform people's valuation of objects (and others) when these objects possess characteristics that are affectively meaningful and easy to evaluate. Thus, the value placed on an object relies on the degree to which it is affectively meaningful. For example, Hsee (1996) compared preferences for dictionaries that had either 10,000 entries and were like new, or had 20,000 entries and a torn cover. Results showed that, when evaluated separately, participants preferred the dictionary with an easily evaluable, affect-rich characteristic (i.e., the condition of the book). However, when evaluated jointly, participants preferred the dictionary with the (arguably) more important characteristic of 20,000 entries. Hsee (1996) argues that some characteristics are affect-rich and useful for preference judgments in isolation, whereas affect-poor characteristics are only used in judgments when they become affectively meaningful (i.e., through comparisons).

The effects of joint vs. separate evaluation modes on decisions sheds light on how people make donations when confronted with a choice of either donating to one vs. several victims. It is possible that affective-rich information about an individual victim (e.g., how much sympathy it evokes) is used as a cue for donations when evaluated separately, but that other aspects of the victim gain in importance when making a donation for a single victim that is part of a group or for an entire group. In fact, Kogut and Ritov (2005b) found that a single victim received higher donations compared to a group of victims when evaluated separately, but found the reverse when the single victim was evaluated jointly with the group. When given a choice, participants donated to the group, not to the individual victim[5]. The practical importance of joint vs. separate

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[5] The design used by Kogut & Ritov (2005b) does not address the possibility that this effect was the result of non-affective moral reasoning and the resulting moral demand effects. For example, when having to make a choice between helping one victim vs. a group it is hard to justify donating to a single victim.

evaluation modes is illustrated when considering that charity organizations, such as 'Save the Children', at times present victims in a joint-evaluation mode on their website (www.savethechildren.org) and ask for donations to one victim after giving donors the chance to browse through several candidates. This joint evaluation mode could potentially influence people's affective response as well as their willingness to contribute to the individual victim. For example, exposure to other victims might reduce attention to the victim that one donates money to, and also reduce affective reactions to it. Moreover, it is also possible that an increase in the total number of victims leads to more deliberative processing (e.g., Hsee & Rottenstreich, 2004; Small, Loewenstein, & Slovic, 2007).

Mechanisms and Effects of Manipulating Affect in Donation Studies

Victim number (i.e., changing the size of the victim group) and identifiability have been studied to examine how these manipulations influence cognitive and perceptual mechanisms involved in affective responses to victims. To explain the effect of changing the number of victims and their identifiability on people's affective responses, one needs to examine the roles of attentional mechanisms, mental imagery, and perceptions of group cohesiveness (i.e., entitativity).

Affective Reactions to Identifiability and Victim Number Manipulations. Recent research on donations has focused on two seminal, interrelated effects[6]: changing the number of victims and identifiability of the victims (Kogut & Ritov, 2005a, 2005b; Small, Loewenstein, & Slovic, 2007, Slovic, 2007). Research on the effects of changes in victim number often compares people's donations to one vs. several victims (e.g., Kogut & Ritov, 2005a, 2005b). Results suggest that, when evaluated separately, single victims often receive higher donations and elicit stronger affective reactions compared to groups of victims. This "singularity effect" seems to be evident even when the size of the group is quite large (Small, Loewenstein, & Slovic, 2007) and also when it is as small as

[6] Loewenstein & Small (2007) propose several other determinants of a very specific emotional reaction (i.e., sympathy), including one's own personal state (e.g., ability to feel sympathy), past experiences, proximity, similarity, newness, and vividness.

two victims (Västfjäll et al., in preparation). Small et al. (2007) compared donations for a single identified victim to a much larger group of statistical victims (several millions). Their results suggest that a single identified victim receives higher donations than statistical victims. Moreover, adding statistics to the identified victim had the effect of reducing donations. While no apparent differences in participants' affect towards the single identified vs. statistical victims was found, affective reactions were more strongly correlated with donations for the single identified victim. This suggests that affect is related more closely to actual helping behavior when the victim is identified and the number of victims is small (i.e., as small as it can be).

Research on proportional reasoning supports the notion that victims are seen in contrast to their reference group. In particular, people are reluctant to help others when their donation is just a "drop in the bucket" (Fetherstonhaugh et al., 1997). Seeing a victim as part of a much bigger problem (as was the case in Experiment 3, Small, Loewenstein, & Slovic, 2007) can produce this drop-in-the-bucket effect and reduce people's willingness to help. The effect is a direct consequence of how large the "bucket" is (Friedrich et al., 1999), and it is likely that reduced willingness to help for larger buckets is a result of people's diminished affective reactions (i.e., psychic numbing, Slovic, 2007) as well as lower perceived efficacy in helping a victim. It is of note that people exhibit insensitivity to changes in victim number (i.e., psychophysical numbing) when the number grows large enough (Frederick & Fischhoff, 1998) regardless of whether the number of victims who can be saved remains constant and the size of the victim reference group increases (Fetherstonhaugh et al., 1997), or when the proportional effect of the contribution is held constant (i.e., when the percentage of victims changes proportionally to the changes in the victim reference group, Baron, 1997). In this context it is not difficult to explain why the hundreds of thousands of displaced refugees from violent conflicts such as the genocide in Rwanda or the civil war in the Congo are unlikely to evoke the same emotional reaction as a single victim or small group of victims do when one tries to comprehend their suffering (Slovic, 2007). It is arguably

very difficult (if not impossible) to mentally process large groups of people to the same degree of detail as one is able to do with just a single individual.

Even when no reference group is provided and donations are elicited for just a single victim or a small group of victims, people can be insensitive to changes in numbers (Hsee & Rottenstreich, 2004; Pham, 2007; Rottenstreich & Hsee, 2001). These authors found that sensitivity to numbers might depend on the amount of affect that victims evoke. When asking people to donate to rescue efforts for either one or four pandas, Hsee and Rottenstreich found that depicting the animals in an affect-rich presentation mode (i.e., identified by pictures) caused insensitivity to the number of pandas to the extent that participants donated similar amounts to each rescue effort. However, when the pandas were depicted in an abstract and affect-poor presentation mode (i.e., dots), participants donated more money to the four animals, suggesting that affective reactions are relatively insensitive to changes in victim numbers.

Apart from exploring the effects of numbers, research on donations has also investigated the effect of identifiability (Jenni & Loewenstein, 1997; Kogut & Ritov, 2005a; Schelling, 1968; Small & Loewenstein, 2005; 2003; Small, Loewenstein, & Slovic, 2007). Typical ways to identify victims are to present them by name, age, picture (e.g., Kogut & Ritov, 2005a), and background history (e.g., Small, Loewenstein, & Slovic, 2007). These bits of information are designed to make the victims affectively more salient, and are likely to increase caring about the victims because they are more vivid and the consequences of not helping the victims are psychologically more real to the helper (Jenni & Loewenstein, 1997). The effects of identifiability can even change people's willingness to help when the victim is determined but not yet identified. Small & Loewenstein (2003) found that participants donated more money to a family that had already been determined from a charity list compared to a family that was yet to be determined. Furthermore, identifying an individual can also result in an increased likelihood to punish perpetrators (Small & Loewenstein, 2005). Utilizing a social dilemma game, these authors found that when participants were able to penalize defectors (i.e., those who did not contribute money to the group), they punished more severely

when the defector was identified (by a number). Moreover, Small and Loewenstein report that participants had stronger emotional reactions of anger to identified vs. unidentified perpetrators. It is of interest that the effect of identifiability on the severity of punishments was fully mediated by the emotional responses, thus demonstrating the role of feelings in the identifiable perpetrator effect.

Differences in identifiability of single individuals vs. groups are somewhat inherent in the changes in victim numbers. For example, in contrast to the identifiability of a single victim in need, masses of people are difficult to identify at the same level. It is possible that even if one were to try to identify large number of displaced refugees in Africa by their name, age, and pictures, our perceptual and emotional systems would still have a difficult time comprehending the suffering of the masses. However, when small in number, identified victims are likely to evoke more affective responses (such as sympathy and compassion), and these emotions are a source of motivation to help (Kogut & Ritov, 2005a, 2005b; Slovic, 2007; Small, Loewenstein, & Slovic, 2007). If masses of victims do not elicit these emotional responses, little motivation exists to intervene and provide help.

Mechanisms Involved in Affective Perceptions of Victims

Imagery. As mentioned in the previous section on number of victims and identifiability, single identified victims are typically more vivid and easier to imagine or mentally represent than groups of victims (Jenni & Loewenstein, 1997). Affective reactions to stimuli depend, at least in part, on the perceivers' ability to mentally represent them in a clear and concrete form (Damasio, 1994). A concrete mental image contains affective tags that signal to the decision maker how the object should be valued (Slovic, Finucane, Peters, & MacGregor, 2002). Slovic et al. (2002) formulated the "affect heuristic", which proposes that people's affective reactions are based on the degree to which they engage in mental imagery (Peters, Slovic, & Gregory, 2003; Peters & Slovic, 1996). These reactions then guide decisions (Peters & Slovic, 2000) and are associated with the value that is placed on choice options (MacGregor, Slovic, Dreman,

& Berry, 2000). Applying these findings to the study of donations suggests that if a victim is represented in a concrete and affectively salient way (i.e., if he/she is identified), then the helpers' mental image of the victim should be clearer and lead to stronger affective reactions.

It is likely that single victims are easier to mentally represent than groups of victims. Using abstract objects, Ariely (2001) found that people are more accurate in mentally representing a single item compared to a group of items. However, it is also possible that information about a group of stimuli is abstracted and stored in memory as a prototype (Posner & Keele, 1968). If this is the case, then donations and affective reactions to a group of victims might be based on a prototype. In the context of donations, it is presently not clear whether people use prototypes to mentally represent a group of victims. If the identifying information about individual victims is not abstracted, then single victims should be represented differently (and may be more affectively salient; Slovic et al., 2002) than mental images of a group of victims. Part of this dissertation will explore whether people have a clearer mental image of a group or an individual victim.

Entitativity. Another potential reason for people's differential affective reactions to changes in victim numbers and identifiability lies in the fact that our perception of groups often differs from our perception of individuals, even when equivalent identifying information is provided about both (Hamilton & Sherman, 1996). Evidence suggests that individuals are perceived differently than groups on a number of personality and perceptual dimensions (McConnell, Sherman, & Hamilton, 1997; Hamilton & Sherman, 1996; McConnell, Sherman, & Hamilton, 1994). Specifically, a group of people can be perceived as more diverse and less unitary than an individual, and it is likely that this lack of unity leads to a less concrete and coherent mental representation of the victims. As affective reactions are usually stronger for concrete vs. abstract representations (Slovic et al., 2002), the lack of perceived unity contributes to the lack of emotional reactions from potential donors. The predisposition to perceive groups as less unitary has been

addressed by research on entitativity[7] (i.e., the tendency to perceive social targets to have unity and coherence).

The concept of entitativity is closely connected to Gestalt theories of perception, which highlight that perceptual processes are closely related to other, more complex impression formation processes (Kahneman, 2003). Principles such as common fate, similarity, proximity, and organization are Gestalt explanations for judgments of perceptual similarity, but can also be used for judgments of psychological similarities (Campbell, 1958; Hamilton & Sherman, 1996). Translating these Gestalt theories into impression formation terminology would suggest that group members are arguably perceived as having less common fate (i.e., they differ in their actions and intentions), as being less similar (i.e., they differ in their appearance as well as their state and trait characteristics), and as having lower proximity and organization (i.e., they are perceived as less unitary and coherent). Susskind et al. (1999) found that perceived entitativity was predictive of stronger trait judgments, faster response times (indicative of on-line processing for individual targets vs. memory-based processing for groups), and greater confidence in these judgments for individuals vs. groups. This connection between Gestalt principles of perception and impression formation is of particular interest, as perceptual processes impose limitations on our ability to process large numbers of people in the same way that psychological processes may restrict our ability to feel compassion for large numbers of victims (Slovic, 2007).

Attention. In addition to the role of imagery and entitativity perceptions as mechanisms involved in affective perceptions of victims, a critical analysis of how feelings determine helping behavior must take into account the role of attention[8] in the

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[7] The concept of entitativity applies to both groups as well as individuals, as groups can share certain psychological features that make them appear cohesive as a group and individuals might seem less unitary if they are inconsistent in their preferences or behavior (Hamilton & Sherman, 1996).

[8] Research on attention, just as research on emotions, has progressed sufficiently to the point where it becomes problematic to use terminology that encompasses an array of different mechanisms and neural networks (e.g., Fan et al, 2002; Posner, 1994; Posner & DiGiralamo, 2000; Posner & Raichle, 1994). For the purpose of the dissertation, "attention" refers both to focusing on a victim in terms of visually attending to him/her, as well as mentally representing the victim and his/her characteristics.

generation of feelings towards the victims. The complex interaction of attention and emotions is observable on several levels. While emotions can direct attention to affectively salient objects (e.g., threatening faces; Fox, 2002; Ochsner & Phelps, 2007; Vuilleumier, 2005, Vuilleumier, Armony, Driver, & Dolan, 2003), attention is able to enhance as well as inhibit emotional reactions (Fenske & Raymond, 2006). For example, Vuilleumier (2005) reviews the effects that affective salience have on attentional processes, and proposes a two-stage model of emotional control of perception. According to this model, perceptual (i.e., visual) information is initially appraised by neural networks involving the amygdala before more elaborate processing takes place in the cortex. Encoding of emotionally significant (vs. insignificant) information is enhanced resulting in better performance in reaction time and identification tasks (e.g., Phelps, Ling, & Carrasco, 2006; Zeelenberg, Wagenmakers, & Rotteveel, 2006). This lends further support to behavioral findings that stress the role of affect in information processing (e.g., Slovic et al., 2002), specifically in the context of prosocial behavior (Small & Loewenstein, 2003). Identified victims (e.g., when identified by a picture) may be more likely to capture attention than unidentified victims are, which leads to different encoding and processing[9].

Just as emotional salience can direct attention to particular stimuli (e.g., facial expressions, Fenske & Eastwood, 2003), focal (spatial) attention is needed for subsequent emotional processing and has a profound effect on the generation of emotions (Holmes, Vuilleumier, & Eimer, 2003). For example, attending to a specific location in someone's field of view is likely to enhance the emotional reaction to affectively salient objects that are focused on (Fenske & Raymond, 2006), while attention can also effectively regulate one's own negative emotional state (Gross, 2002; Posner & Rothbart, 2006; Rueda, Posner, & Rothbart, 2005). The effects of (visual) attention on the generation of emotions is effectively demonstrated in a series of experiments that highlight the emotional inhibitory consequences of attending to specific locations in one's visual field

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[9] The effects of this 'enhanced' encoding and processing include greater affective reactions as well as greater attention to identified victims.

(e.g., Fenske et al., 2005; Fenske, Raymond, & Kunar, 2004; Raymond, Fenske, & Tavassoli, 2003). These authors consistently show that not attending to 'distractor' stimuli devalues them on affective dimensions. For example, distractor faces were seen as less trustworthy than attended faces, and abstract mondrian stimuli were evaluated as more cheerful when attended vs. not attended. It is of interest that distractors in close proximity to the target were devalued more than those farther away (Raymond, Fenske, & Westoby, 2005).

When confronted with victims in need, attentional networks interact with affective processes to direct people's focus to affectively salient information, which may or may not result in feelings related to the victims. This depends heavily on the characteristics of the victims one is able to focus on. When presented with an identified victim, we are able to attend to many features of his/her individuating information and thus generate some kind of feeling for the victim. Conversely, when confronted with an abstract number of unidentified victims, we are unable to focus on specific information that makes the victims more emotionally salient. Thus, the attentional mechanisms related to the generation of emotions seem to play a vital part in analysis of the role of feelings in helping others.

The Role of Deliberation in Prosocial Behavior

The review of affect and affective mechanisms in the context of prosocial behavior must take the role of deliberation into account. While emotions can act as specific guides and motivations for behavior (e.g., Peters, 2006; Zeelenberg & Pieters, 2006), it is important to address deliberative mechanisms that either interact with or result in these affective reactions. Just as people's affective reactions to victims vary (e.g., Batson, 1990), it is also likely that individual differences in deliberation contribute to helping (Small & Loewenstein, 2007). For example, recent research on individual differences in affective and deliberative information processing suggests that people differ in their ability to understand and draw meaning from numbers (e.g., Lipkus, Samsa, & Rimer, 2001; Peters et al., 2007, 2006; Schwartz, Woloshin, & Welch, 2005). When

presented with tragedies on the scale of those in Darfur or Rwanda, large numbers of killed, displaced, and otherwise injured victims are often represented as statistics.

While it may be difficult to understand such large numbers affectively (Slovic, 2007), people with better skills to draw meaning from numbers (i.e., high in numeracy[10]) might perceive the information differently. Some evidence exists that people with high numeracy skill are able to derive meaning from numbers regardless of how they are presented (e.g., in probability or frequency formats), and that people with low numeracy are sensitive to how concretely (vs. abstractly) numbers are represented (Peters et al., 2006). These authors found that highly numerate individuals were less influenced by attribute framing, made more rational choices, and were able to derive more affect from abstract number comparisons than low numerate people. Based on these findings, it is possible to speculate that people with low numeracy skill are more likely to be affected by concrete processing and by the affective tags that are associated with particular outcomes. Thus, presenting concrete information (e.g., an identifiable victim) is likely to have a greater impact on the feelings of someone low in numeracy, while highly numerate persons may be better able to see the bigger problem and derive meaning (and feelings) from statistical representations of large numbers of victims. *New York Times* columnist David Pogue has speculated about the ability of high numerate individuals such as Bill Gates to understand the greater tragedy that lies behind the statistics of victims in the following equation: "Preventable death = bad; preventable death x 1 million people = 1 million times as bad" (David Pogue, *The Psychology of Numeracy*, August 23, 2007).

In addition to numeracy, another important deliberative aspect of helping concerns the extent to which people engage in reasoning about moral and social obligations. In a seminal article on the (lack of) morality of letting other people suffer, Singer (1972) proposed that in order to be moral, all one needs to do is to "prevent what

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[10] Numeracy is also defined as the ability to deal "comfortably with the fundamental notions of numbers and chance" (Paulos, 1988, p.3), and is, among other things, a measure of how good people are at understanding exceptionally large numbers and grasping infinity.

is bad and promote what is good" (p. 231). However, researchers and theorists disagree on whether the moral judgment of "goodness" and "badness" is driven primarily by deliberative or affective information processing. Theories about moral reasoning, which is defined as reasoning that is "intentional, effortful, and controllable", Haidt, 2001, p. 818) have stressed the importance of a cognitive (i.e., deliberative) approach to successful resolution of moral dilemmas (Gibbs 2006; Kohlberg, 1973). These theories suggest that the highest form of moral reasoning is based on abstract reasoning. Nonetheless, moral judgments can also be reached without deliberation (Krebs & Denton, 2005) and may rest more on affective responses than on deliberation. Theorizing by Haidt (2007, 2004, 2003, 2001) and colleagues (Greene & Haidt, 2002) question the causal link between moral reasoning and moral judgment (i.e., how good or bad an action or person is). Instead, they propose a social intuitionist model, in which people first react to a moral dilemma by moral intuition (and affect[11]) and later search for reasons to justify their moral judgment.

This kind of motivated reasoning is also proposed by Kunda (1990) and can explain how intuitive and affective information processing influence moral reasoning that, supposedly, is based solely on deliberation. According to Haidt's (2001) and Kunda's (1990) models, when people are confronted with the misery of a victim, they first react affectively to the situation (e.g., by having sympathy) and only then engage in moral reasoning related to their gut-reaction to provide help or not. Based on these theoretical considerations, it seems likely that deliberating about moral and social obligations is, at least in part, informed by one's affective and intuitive reactions to the victims, and that moral reasoning is not necessarily causally related to donations. Instead, affective reactions are often better predictors of behavior than deliberative reasons (e.g., Damasio, 1994; Peters & Slovic, 2000; Slovic et al., 2002; Zeelenberg & Pieters, 2002). In sum, several aspects should be considered when attempting to answer

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[11] Haidt (2001) emphasizes that the difference between moral reasoning and moral intuition is not one of cognition vs. emotion but rather one between two kinds of cognitions. However, he draws a distinct parallel to intuitive vs. reasoning Systems which include affective reactions and affective information processing (e.g., Epstein, 1994).

the questions of why and under what conditions people help others in distress. Crucial to encouraging prosocial behavior and helping victims in need is one's propensity for experiencing feelings related to those victims. These feelings can be focused on the victims and their situation, or they can be focused more on the self, thus motivating behavior by prompting one to act to relieve a negative mood state that may arise from feelings of guilt or anticipated regret. Whether feelings arise in the first place and if so, whether they motivate behavior through altruism (i.e., based on sympathy and compassion for the victims) or through more self-focused ways (based on how one feels about oneself), possibly depends on the information processing mode that one engages in. Information processing theories will be reviewed next. Existing research on donations will be linked to these theories, and research questions will be extrapolated that address prosocial behavior in the context of dual processing frameworks.

Dual Information Processing Framework

An extensive amount of research addresses the central question of how affect determines people's decision to help others in distress. Several theories of human information processing point towards two qualitatively different yet interconnected processing modes[12] (Chaiken & Trope, 1999; Epstein, 1994; Kahneman, 2003; Kahneman & Frederick, 2002; Sloman, 1996; Stanovich & West, 2000): One mode is characterized by relatively quick, automatic, effortless, associative, concrete and affective processing, while the other is thought to be more slow, effortful, rule-based, controlled, and abstract. These two processes are not orthogonal, and often inform and influence each other. In fact, their relationship is rather complex. Kahneman (2003) suggests that the slower and reason-driven process (System 2) can control the output of the more

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[12] Research on dual processing has generated different terminology for the two different processes. This dissertation will adopt Stanovich and West's (2000) and Kahneman's (2003) terminology of System 1 and System 2.

immediate and affective-driven process (System 1)[13]. While different theorists have used different labels for these two processes, the described effects of each processing mode are largely congruent across theories and are summarized in *Table 1*.

Table 1: Two Information Processing Modes

Information Processing Mode

System 1	System 2
• Fast	• Slow
• Automatic	• Controlled
• Parallel	• Serial
• Effortless	• Effortful
• Associative	• Rule-based
• Affective	• Deliberative

For example, Sloman (2002, 1996) suggests that two forms of conceptually different mental computations are performed by the associative System (i.e., System 1) and the rule-based System (i.e., System 2). System 1 is sensitive to perceptual similarities of the features in one's environment, and processes information based on the degree to which it can be meaningfully grouped into a coherent set of clusters that reflect one's perceptual reality. System 2, on the other hand, processes information on the bases of abstractions and logical, rule-based reasoning. This formulation is largely compatible with Epstein's (1994) suggestion that information can be processed in an experiential way (i.e., System 1) and an analytical way (i.e., System 2).

An earlier proposition for a separation between affective and cognitive processing was advanced by Zajonc (1984, 1980), who suggested that (unconscious) emotions are

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[13] Some dual process models incorporate the possibility that affective reactions can arise out of processing information in deliberative ways in System 2 (e.g., Berkowitz, 1993). For the present discussion of dual process models, I focus primarily on the fast and automatic affective reactions that are specific to the objects they are attached to.

able to precede cognitions[14]. Zajonc argued that unconscious emotions are not dependent on subjective, cognitive representations, yet they are able to substantially influence preferences and behaviors[15]. With the advent of brain imaging techniques and neuroscience, further support was found for a distinction between two systems of information processing (e.g., Bechara, Damasio & Damasio, 2000; Bush, Luu, & Posner, 2000; Damasio, 1994). Damasio and colleagues found that neurological damage to specific brain regions (Ventromedial Prefrontal Cortex; Brodmann's area 10 and 11) impedes affective processing without impairing deliberative ability. Similarly, Bush et al. (2000) review findings that point to different neural pathways in the anterior cingulate cortex for cognitive tasks (e.g., a counting stroop task) vs. affective tasks (e.g., an affective stroop task).

Research on the operations of and connections between these two Systems has suggested that System 1 functions similarly to the perceptual System and is monitored by System 2 (Kahneman & Frederick, 2002). System 1 processing shows parallels to perceptual systems as it seems to be tied to the concrete and associative processing reminiscent of perceptual processes. These perceptual processes are the basis of affective reactions to victims who are perceived in a concrete and psychologically coherent (i.e., entitative) way (Hamilton & Sherman, 1996). The perceptual system, just like System 1, handles large numbers differently than small numbers, and is responsive to a single, identified, and affectively meaningful and salient victim. Deliberative reasoning about victims and the victims' situations can interfere with the affective output of System 1. Specifically, deliberating about the victim can lead to a reduction of the impact of immediate affective responses and make the helper aware of the larger problem and

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[14] The proposition that "reasons" and "passions" are separate, and often disparate influences on behavior actually dates back to more than 2,500 years in the works of Aristotle (cited in Zajonc, 2004).

[15] Lazarus (1991, 1982), disagreed with this and maintained that all emotions require prior conscious or unconscious cognitive appraisal mechanisms and that emotions cannot exist without prior appraisal. Depending on how broad "cognition" is defined (e.g., including sensation, perception, and more complex deliberation), one could say that it always has to precede emotions.

realize that a donation would just be a drop in the bucket (Fetherstonhaugh et al., 1997; Loewenstein & Small, 2007).

The results reported in the literature on donations (and specifically the role of affect in donations) can be conceptualized in the dual processing framework presented in *Table 1* and *Figure 1*. The framework in *Figure 1* is the basis for the experiments in this dissertation. Different outcomes in the decision to help are expected depending on which system is engaged and has greater influence on information processing, Engaging System 2 processing by focusing on the many millions in need instead of a single victim, estimating the efficacy of a donation (i.e., how likely a donation would actually help), and reasoning about how deserving a victim is of a donation (possibly in the context of other victims; Loewenstein & Small, 2007), or thinking about other possible uses of the money are likely to reduce donations, affective reactions to the victim, and the extent to which donations are related to these affective reactions[16].
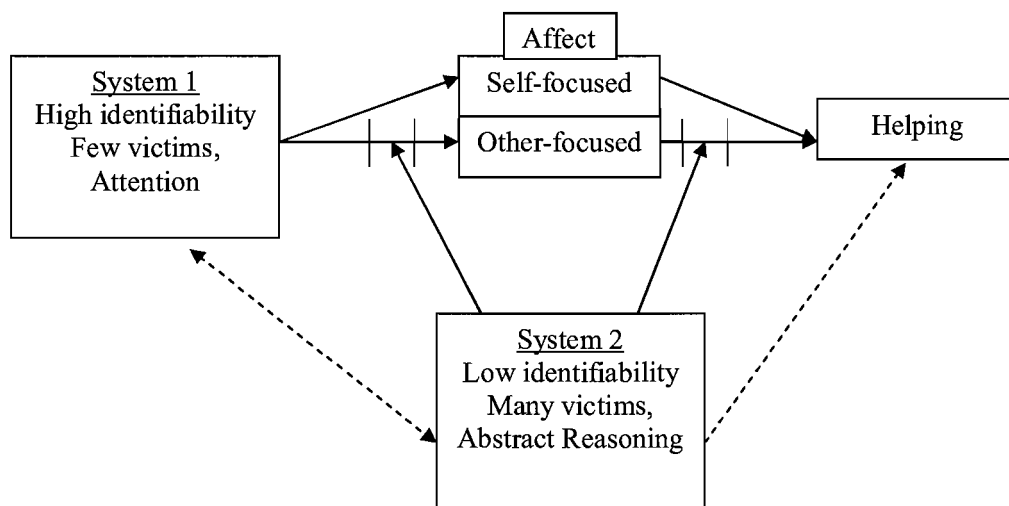
Figure 1: System 2 Inhibits the Generation and Impact of Other-Focused Affect on Helping.

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[16] However, in theory it is possible that System 2 processing also results in an affective reaction (e.g., higher-order affect), but this reaction is thought to be less strong and influential as immediate affective responses (Loewenstein et al, 2001).

Conversely, if processing is done primarily with System 1, then affective reactions, donations, and the extent to which donations are related to affect might all increase. This is the case when victims are identified (e.g., Small & Loewenstein, 2003), and when only a single coherent victim is presented (e.g., Kogut & Ritov, 2005a, 2005b, Västfjäll et al., in preparation). To map these findings onto a dual processing framework, we have to revisit the underlying mechanisms that lead to affective reactions (i.e., imagery, high perceived entitativity, and attention). When a single victim is identified, people's ability to attend exclusively to him/her (as there are no distractors), its high perceived entitativity, and its vivid mental image facilitate the generation of immediate affective reactions, which then guide people's decision to donate and influence construction of a donation amount. On the other hand, when victims are represented numerically (i.e., as statistics) then the mechanisms of System 1 (i.e., entitativity, imagery, and attention) might not be as engaged (as there may be less perceived entitativity, imagery, and nothing affective to attend to) and System 2 processing becomes relatively more important. It should be noted that System 2 processing can be manipulated directly and indirectly. In contrast to presenting victim statistics (which is an indirect manipulation as it does not interfere with information processing directly), it is also possible to restrict people's deliberative capacity or prime them to feel vs. deliberate, which are examples of direct information processing manipulations.

Note that the model presented in *Figure 1* allows for direct interactions between System 1 and System 2, and also for the direct influence of System 2 on helping behavior. System 1 and System 2 information processing is generally thought to interact and influence each other (e.g., Kahneman, 2003), and their effects on affective reactions are only one of the ways that this interaction might take place. However, this dissertation will primarily focus on the role that affect plays in the decisions to donate. Furthermore, while deliberative (i.e., System 2) processing undoubtedly plays an important part in helping behavior, in this dissertation the investigation of the extent to which deliberative processing influences helping is limited to its impact on affective factors.

CHAPTER III

PURPOSE AND OUTLINE

The goal of this dissertation is to examine the role of information processing mode and the link between affect and decisions to help others. While research has demonstrated that feelings motivate helping behavior (e.g., Batson, 1990; Slovic, 2007), we have only begun to understand how different characteristics of the victims and the potential helpers influence such behaviors. Apart from examining the effects of victim identifiability, changes in victim numbers, imagery, perceptions of entitativity, and attention on the generation and impact of feelings, the studies in this dissertation will take into account whether donations are motivated by feelings focused on the self vs. others. Feeling sympathy and compassion for others in need can give rise to helping because one is aware of the need-arousing condition (e.g., famine or war). On the other hand, when confronted with the misery of others in need, one might also feel guilt and regret for not helping. Regret and guilt are reminders of social and moral obligations, of how we "should" treat our fellow human beings. It is crucial to identify how these feelings depend on information processing. Specifically, it is possible that different types of motivations surface depending on how information about victims is processed.

At present it is not clear whether information processing moderates the impact of feelings that are focused on the self (e.g., regret) or those focused on others (e.g., sympathy for the victims) on people's tendency to help. While several studies (see literature review) have examined the effects of identifying victims and changes in the number of victims on people's willingness to help others, the studies in this dissertation will expand on those findings and provide a dual processing framework within which these effects can be conceptually understood. In five experiments, different aspects of the role of dual information processing in prosocial behavior will be investigated. Information processing mode will be manipulated in both direct and indirect ways, and

the relationship between people's willingness to help and their feelings regarding themselves vs. the victims are of primary concern to this investigation. For a proposed model of how information processing may moderate the way feelings motivate behavior, refer back to *Figure 1*.

In this conceptual framework, System 1 processing leads to affective reactions that predict helping motivated by self-focused affect and other-focused affect. System 2 processing partially controls the output of System 1 and may inhibit the generation of affect and its motivating influence on helping behavior. It is possible that the mechanisms for self vs. other-focused affect are different (e.g., Batson, 1990) and dependent on information processing mode (Rossnagel, 2000). Feelings focused on the self are thought to be less effortful than feelings focused on others (Rossnagel, 2000; Sabbagh & Taylor, 2000) and might be less dependent on processing mode. Awareness of self-focused affect is more automatic and should be more difficult to disrupt by deliberative processing. Lamm, Batson, and Decety (2007) found that other-focused affect (such as empathy) depended on people's perspective taking and cognitive appraisal. This suggests that other-focused affect is moderated by the type of information processing mode. The question is whether a shift in processing from concrete affective processing (i.e., System 1) to more abstract processing (i.e., System 2) will increase or decrease affective reactions that are focused on others. While an increase in deliberative processing might increase perspective taking, it is also possible that a shift towards more abstract deliberative processing reduces sympathy, compassion, and other victim-focused affect because it takes attention away from the immediate need of the victims. This does not imply that more abstract processing necessarily results in less helping, as there are several ways in which abstract reasoning can result in prosocial behavior. The realization of one's social and moral obligations, for example, can emerge from a reasoned analysis of the problems that victims face, even if this reasoned analysis is informed by moral intuitions (Haidt, 2001). Moreover, individual differences in processing styles can lead some people (i.e., those high in numeracy) to process information more abstractly compared to others (those low in numeracy)

Some of the characteristics that research has identified as determinants of helping behavior (including victim identifiability and number of victims) are predicted to manipulate information processing mode in specific (and indirect) ways that are explained by the conceptual framework presented in *Figure 1*. For example, being presented with a single, identified victim is likely to encourage affective processing of System 1, while being presented with large numbers of victims in the form of abstract statistics may encourage more deliberative processing[17]. If presentation of large numbers increases abstract System 2 processing, then feelings such as sympathy and other victim-focused affect should be lower and less related to helping behavior. Similarly, if people have a more vivid imagery of the victims, see them as more entitative, and focus their attention on them, System 1 processing should result in stronger affective reactions for those victims (e.g., sympathy) and use of that affect as a motivating source to entice helping.

While presentation modes are thought to influence information processing (e.g., Slovic, 2007), they can also be manipulated directly. Instead of only focusing on the way that information about victims is presented, it is possible to manipulate the influence of System 2 by overloading its capacity (e.g., by a cognitive load paradigm; Shiv & Fedorikhin, 1999), or by sensitizing participants to deliberating vs. focusing on their feelings for the victims (Hsee & Rottenstreich, 2004). These manipulations target information processing directly, and the proposed model predicts that if System 2 is overloaded or when people are primed to focus on their feelings (i.e., System 1), it is possible that the generation and use of other-focused affect in the decision to help will not be disrupted. To test this, the experiments presented in Studies 1 – 4 employ both direct and indirect manipulations of processing mode. Furthermore, they also address the effects that other research has identified as determinants of helping and how they are related to affective reactions.

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[17] It should be noted that presentation of numbers does not automatically favor System 2 processing. Slovic et al. (2002) and Peters et al (2006) show that presentation of numbers can engage (higher-order) affective processing if they are affectively evaluable (i.e., comparable).

As outlined in *Table 2*, the main research questions revolve around the effects of dual information processing on peoples' donations, feelings, and the impact of feelings on donations. The mechanisms that play into these effects consist of the number of victims, entitativity perceptions, identifiability, numeracy, and attention. Number of victims, identifiability, and attention will be manipulated in the respective studies, while entitativity perceptions and numeracy are measured.

Table 2: Main Research Questions Addressed in Each Study.

Research questions and specific psychological mechanisms	Studies				
	1	2	3	4	5
1. What are the effects of dual processes on donations?	x	x	x	x	
- Number of victims	x	x	x	x	
- Entitativity	x		x		
- Identifiability			x		
- Numeracy			x		
2. What are the effects of dual processes on feelings?	x	x	x	x	x
- Number of victims	x	x	x	x	x
- Entitativity	x		x		
- Identifiability			x		
- Numeracy			x		
- Attention					x
3. What are the effects of dual processes on the relationship between feelings and donations?	x	x	x	x	
- Number of victims	x	x	x	x	
- Entitativity	x		x		
- Identifiability			x		
- Numeracy			x		

Studies: 1= Cognitive Load; 2= Priming; 3= Rokia; 4= Serial Presentation; 5= Attentional Mechanisms

In Studies 1 - 4, the focus is on people's willingness to help, as measured by how much money they are willing to contribute hypothetically (Studies 1, 2, & 4) and with real money (Study 3) to children in need. In Study 5, the main focus is on the role of attention in the generation of sympathy. The victims' situation and the reasons why they are in need of money vary across studies. All studies either directly or indirectly

manipulate information processing and measure donations, affective reactions, and the correlation between affect and donations.

In addition to the three main research questions about how donations, affect, and the link between donations and affect depend on information processing mode, Table 2 lists the mechanisms which are investigated. For example, varying the number of victims is one mechanism by which dual processes are manipulated in Studies 1, 2, 3, and 4. This is done for all three main research questions, and so the first four studies address the impact of changes in victim number as a means to manipulate information processing and observe effects on donations, affect, and the link between affect and donations. Before detailing each study, I present an overview of the general hypotheses.

General Hypotheses

Manipulating processing mode is expected to influence people's donations, affect, and the relationship between their affective reactions and donations. These affective reactions are broadly separated into those that are focused on the self (e.g., anticipated regret) and those that are focused on others (e.g., sympathy). If System 2 processing regulates the affective output from System 1 and more deliberation results in more abstract information processing, then shifting processing towards System 1 might increase other-focused affective reactions (e.g., more sympathy). Moreover, a shift towards System 1 processing should increase the predictive strength of other-focused affect (compared to a shift away from System 1 processing), as increased deliberation is expected to interfere with affective processing (e.g., Kahneman, 2003). Self-focused affect, on the other hand, might be less sensitive to processing modes (e.g., Rossnagel, 2000), and a shift towards abstract deliberative processing should not affect self-focused emotions. For a summary of the studies and the research questions they address please refer back to *Table 2*.

Studies 1 and 2 will directly manipulate information processing by means of a cognitive load task (Study 1) and a priming task (Study 2). Specifically, Study 1 addresses how a reduction of deliberative capacity influences participants' affective

reactions towards victims in need, and the extent to which affect predicts their willingness to help. Furthermore, it investigates the role of varying the number of victims and how reductions in deliberation influence perceptions of entitativity. If more deliberation results in more abstract processing it is possible that lower processing capacity will lead to more sympathy, higher donations, and a stronger relationship between these two[18]. Moreover, lower processing capacity could lead to higher perceptions of entitativity, as a reduction in processing resources is likely to also reduce people's ability to focus on how different victims are from each other. Study 2 manipulates processing mode by priming participants to evaluate the victims' lives either by means of calculation or feeling, and addresses whether a shift in processing mode as well as variations in the number of victims influence affective reactions and the extent to which these reactions predict willingness to help. It is predicted that shifting processing towards System 1 will increase victim-focused affect, donations, and the degree to which this affective reaction is related to donations.

Studies 3 and 4 examine the effects of indirectly manipulating information processing, by presenting victims in ways that may change their affective salience. Specifically, Study 3 manipulates identifiability and availability of background statistics about the size of the total victim group, and measured people's affective reactions, willingness to help, the extent that feelings are related to real financial contributions, participants' numeric ability, and perceptions of entitativity. Identified victims are expected to elicit stronger victim-focused affect (e.g., sympathy), more donations, and the relationship between the two measures should be stronger compared to unidentified victims. Additionally, identifying victims is expected to increase entitativity perceptions. Study 4 manipulates information processing by showing a different number of victim pictures in serial order prior to presenting a "target" victim that participants can donate money to. Presenting victims prior to a target victim functions as a manipulation of victim number, and is designed to increase the number of victims participants process

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[18] If deliberation results in more perspective taking, then we should observe lower sympathy when cognitive capacity is restricted.

while holding the target victim constant (i.e., there is always only one target). The main hypotheses for this design are that affective reactions to the target victim will be modulated by the number of victims shown, and that these emotions predict donations differentially depending on the number of victims.

Study 5 investigates the role of (visual) attention in the generation of victim-focused affect. Target victims are presented either by themselves or among other distractor victims. Participants will be cued to a spatial location where the target picture will appear prior to its appearance or immediately after it. It is hypothesized that attending to a specific location prior to the appearance of a victim will result in higher sympathy ratings compared to attending to it after the appearance. Additionally, presentation of a single victim should lead to higher sympathy compared to presentations of target victims flanked by distractor victims.

General Methods

All studies were run at the University of Oregon between September 2006 and August 2007, and used undergraduate as well as graduate students. Undergraduate students were primarily psychology and marketing students, and graduate students were recruited irrespective of their major. Studies 1, 2, 4 and 5 were run on a computer, whereas Study 3 used a paper-and-pencil format. Hypothetical donations were used as a dependent measure for Studies 1, 2, and 4, whereas Study 3 used real donations.

CHAPTER IV

STUDY 1: RESTRICTING DELIBERATIVE PROCESSES

Rationale and Hypotheses

Helping people in need has been linked to both affective and deliberative causes (Loewenstein & Small, 2007). Loewenstein and Small suggest that apart from distinct affective reactions to the victims, several relevant factors in decisions to donate are processed in deliberative fashion (e.g., how much money is available for a donation or likelihood that a donation would have an impact on the victim). When investigating the different roles that deliberation and emotional reactions have on donations, the dynamic interaction between thoughts and feelings has to be taken into account. This study was designed to further our understanding about the extent to which the underlying mechanisms of donations use affect (i.e., System 1) vs. deliberation (i.e., System 2) as a source of information for decisions.

A direct approach to investigate this relationship between affective vs. deliberative processing and willingness to contribute (WTC) is to restrict people's ability to deliberate about the victims and their predicament. One way to achieve this shift in processing is to employ a cognitive load paradigm, which is designed to tax the deliberative processing pathway (i.e., System 2). Research suggests that judgments and decisions that have affective processing as a basis are relatively unaffected by such processing restrictions (Pham, 2007). Affective aspects about an object (or person) are accessible even when cognitive resources are low (e.g., Slovic et al., 2004), and are reached more quickly compared to those based on slow and careful deliberation (Pham, 2007). Thus, taxing deliberative processing should lead to decision making that relies more on affective input (e.g., Slovic et al., 2002). Empirical support for this notion was found by Shiv and Fedorikhin (1999), who administered a 7-digit memory load to decrease participants' ability to cogitate about their choices so that affective attributes of

options are given relatively more weight. Shiv and Fedorikhin report that their participants were more likely to choose an affectively salient snack option over a healthier (and deliberatively sound) option when they were under high cognitive load.

However, the effects of cognitive load on emotional processing are not always straight-forward and seem to at least partly depend on the type of decisions and emotions involved. For example, Drolet and Luce (2004) found that participants under cognitive load exhibited relatively more normative behavior by reducing the need to cope with negative emotional consequences of attribute trade-off making. These authors report that cognitive load served as a disruption of participants' access of relevant self-goal information, which reduced participants' negative emotions that resulted from choosing one alternative and losing the benefit on another.

On the other hand, cognitive load can also accentuate the role of affective information (Pham, 2007; Rottenstreich, Sood, & Brenner, 2007; Shiv & Fedorikhin, 1999). Rottenstreich et al. (2007) argue that when the ability to deliberate is available, mental processes are more elaborate and comparisons between choice options are made in a different way than when this ability is absent. Specifically, it is likely that the ability to reason about choices and weigh the different attributes and consequences will lead to different outcomes compared to when choices are based on feelings. The pivotal role of affect towards victims has been demonstrated in various studies on donations (e.g., Kogut & Ritov, 2005a, 2005b; Slovic, 2007; Small, Loewenstein, & Slovic, 2007), and Small, Loewenstein and Slovic (2007) suggest that increased deliberation may have the effect of reducing donations.

To investigate the extent to which System 1 vs. System 2 processing influences donations, the current study manipulated cognitive load and the number of victims. The reduction of deliberative resources could have two, generally opposite effects. Deliberative thought can increase (higher-order) emotional reactions, possibly through attributional and appraisal processes or other cognitive mechanisms (e.g., comparisons of victim numbers, Peters et al., 2006). This would lead to higher-order affect, which is based on thoughts more than on immediate affective responses to the victim (e.g.,

Berkowitz, 1993: Loewenstein et al., 2001; Slovic et al., 2002). However, it is also possible that deliberative processes reduce (i.e., over-ride) immediate affective reactions (e.g., Slovic et al., 2004; Small, Loewenstein, & Slovic, 2007) and, because affective reactions are thought to be primarily a product of System 1, restricting cognitive load should result in an increase of donations, affective reactions, and the relationship between affect and donations. Thus, Study 1 was designed to explore the effects of cognitive load on decisions and emotional reactions in a donation task. The emotional reactions typically measured in studies on helping are related to other-focused affect (e.g., sympathy and compassion, Kogut & Ritov, 2005a, 2005b), but should also include a measure of self-focused affect (e.g., anticipated regret, Connolly & Zeelenberg, 2002).

The following exploratory hypotheses are based on the assumption that participants under high cognitive load will engage in more System 1 processing compared to participants in the low cognitive load condition. Given the important role of System 1 in donations (e.g., Small, Loewenstein, & Slovic, 2007), this would lead to the following predictions:

Hypothesis 1: High cognitive load should lead to less deliberation (i.e., System 2 processing). Less deliberation, in turn, is expected to result in greater affective reactions. These affective reactions might be different for self vs. other-focused emotions. If self-focused affect is easier to access and more robust than other focused-affect, then the difference between high and low cognitive load should be particularly visible for victim-focused affect, but not necessarily for self-focused affect.

Hypothesis 2: Following from *Hypothesis 1*, stronger affective reactions should lead to higher donations. These affective reactions might be a function of the participants' ability to deliberate about the victims and their situation. If affective reactions to the victims are primarily driven by System 1 processing, then high cognitive load should lead to stronger emotions, and, in turn, to higher donations. It is possible that the effect of cognitive load is different for single victims vs. a group of victims. Affective reactions for a group of victims might be reduced if

participants are able to deliberate about the effectiveness of their donation, and should therefore increase if deliberative capacity is reduced.

Hypothesis 3: Depending on whether the ability to deliberate leads participants to process victims individually and notice their differences (when part of a group), it is possible to speculate that a reduction in deliberation can lead participants to perceive victims as more entitative. If participants are able to deliberate about the victims, they might pay attention to a less cohesive set of characteristics of the targets and lower entitativity perceptions. This would suggest that a reduction of deliberative processing can lead to a more entitative perception of the victims. However, if deliberation leads to an abstraction or formation of a mental prototype of the victims, then the ability to deliberate might increase entitativity perceptions.

Hypothesis 4: Higher cognitive may increase the role that affect plays as a source of information in the decision to donate. Consequently, one might expect that feelings towards the victims (e.g., sympathy) will be more predictive of donations in the high vs. low cognitive load condition.

Method

Participants. One-hundred and ninety-three undergraduate students at the University of Oregon took part in this study. The mean age was 22.3 years ($SD = 2.9$), and 51% of the participants were female.

Design. In a 2 cognitive load (high vs. low) x 2 number of victims (one vs. eight) between-subjects design, cognitive load was manipulated by randomly selecting half of the participants to remember a 10-letter sequence (high load) and the other half a two-letter sequence (low load). The number of victims were manipulated by randomly presenting either one victim (identified by age, name, and picture) or eight victims (also identified by their ages, names, and pictures). Willingness to contribute (WTC) to the victim(s) and participants' feelings towards the victims were the main dependent variables of interest.

Materials and Procedure. Participants were randomly assigned to one of the four independent conditions (high vs. low load x one vs. eight victims). All materials were presented on a computer screen (screen resolution = 1024 x 768). The instructions informed participants that they were to memorize a given letter sequence, rehearse them throughout the task, and that they would be asked to recall it at the end of the experiment. In the low-load conditions, participants saw a randomly generated two-letter sequence ("XD"), whereas in the high-load condition participants saw a randomly generated 10-letter sequence ("DKZZVHTRKJ"). Half of the participants were randomly selected to be in the one-victim condition, and the other half to be in the eight-victims condition. After viewing the information about the victim(s) and being informed that he/she is (they are) in danger from an unspecified life-threatening disease, participants indicated whether they would make a (hypothetical) financial contribution to the victim(s). If so, they were next asked to enter the amount they would be willing to contribute. Several questions related to the participants' feelings towards and perceptions of the victim(s) followed on a second page. These questions included how much participants were worried about the victim(s), how much sympathy and compassion they felt, how much they would regret not donating, how much better they felt if they donated, how much a donation would help, and how clear a feeling and how coherent a picture they had of the victim(s). Of these questions, the first four (worry, sympathy, feeling better, and anticipated regret) were designed to measure affect. Ratings of how much a donation would help measures participants efficacy judgments. The last two questions (clear feeling and coherent picture) were designed to measure participants' entitativity perceptions. After answering the questions, participants were instructed to recall their letter-sequence (see Appendix A for details).

Results

Descriptive and Preliminary Analyses. Of the 193 participants, 41 (21%) either failed to follow instructions or did not accurately recall their letter-sequence. Eight (4%) of these were in the low-load condition, and the remaining 33 (17%) in the high-load

condition. Analyses of these participants' willingness to contribute (WTC) scores show that they did not differ significantly from participants who recalled their letter-sequence correctly, but they were excluded on the grounds that it is not clear whether they actually followed instructions and rehearsed the letters of the cognitive load task during the experiment[19].

Descriptive analyses showed that two variables of interest (WTC and sympathy) were significantly skewed[20]. Four percent of WTC scores were winsorized before all WTC scores were log-transformed. The extreme positive skew and hypothetical nature of the donation justify this statistically corrective procedure, which is common with these kinds of measures (e.g., Peters, Slovic, & Gregory, 2003).

Affect Structure. Before testing the effect of cognitive load on participants' affect responses, the underlying structure of participants' affect and related responses were investigated. Analyses of correlational patterns showed that all affect variables had a significant positive relationship to each other (see *Tables 3* and *4*).

Table 3: Means and Standard Deviations of WTC and Affect Variables

Dependent Variable	N	Mean	Standard Deviation
WTC	152	88.02	303.62
WTC[a]	152	2.53	1.89
Worry	151	3.04	1.68
Sympathy	151	4.19	1.53
Sympathy[b]	151	19.84	10.76
Feel better	151	2.70	1.54
Anticipated Regret	151	2.48	1.97
Donation help	151	2.30	1.62
Clear a feeling	151	2.55	1.59
Coherent a picture	150	2.48	1.58

[a]Log-transformed variable [b]Squared variable
Note: All variables except WTC were measured on a 1-7 point Likert scale.

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[19] Inclusion of these participants resulted in the same general pattern. See Appendix A for details.

[20] Sympathy was negatively skewed due to 72% of participants using the upper half of the 7-point Likert scale). Willingness to contribute was positively skewed due to the top four percent reporting donations between $500 - $3000, while the bottom 82.5% indicated donations ranging from 0$ to $50.

Table 4: Correlations Between WTC and Affect Variables

	WTC[a]	Worry	Sympathy	Feel better	Regret	Donation help	Clear Feeling
WTC[a]	1						
Worry	.42**	1					
Sympathy[b]	.35**	.66**	1				
Feel better	.42**	.42**	.34**	1			
Anticipated Regret	.44**	.48**	.36**	.50**	1		
Donation help	.38**	.38**	.31**	.49**	.25**	1	
Clear feeling	.37**	.55**	.37**	.36**	.25**	.47**	1
Coherent picture	.30**	.45**	.36**	.42**	.35**	.41*	.64**

** $p<.01$ **$p<.05$ [a]Log-transformed variable [b]Squared variable
Variables in order: Willingness to contribute; Worry, upset, and sad; Sympathy and compassion; Feel better if donation is made; Regret if donation would not be made; How much a donation would help; How clear a feeling participants' had about the victim(s); How coherent a picture of the victim(s) participants had.

While all variables are positively correlated, closer inspection of Table 4 shows that some variables are slightly more related than others. For example, a strong relationship exists for how clear a feeling participants had and how coherent a picture of the victim(s) ($r = .64$). Both of these were designed to measure participants' entitativity perceptions. Furthermore, sympathy and worry are highly correlated ($r = .66$). Worrying about the victim and feeling sympathy and compassion are arguable measurements of participants other-focused affect (e.g., Batson, 1990). How much better they felt about themselves after donating and how much regret they anticipated for not donating are arguably measurements of self-focused affect. Participants' judgments of how much better a donation would make them feel and how much regret they anticipated if they did not donate also correlated highly ($r = .50$). To investigate whether the data support a distinction between self and other-focused affect, a principle components analysis (PCA) was performed on these four affect variables. An unrotated solution with eigenvalues

above 1 as a criterion suggests that worry, sympathy, feel better, and anticipated regret all load on one affect component (see *Table 5* for details).

Table 5: Component Loadings for Affect Variables on Single Component

Affect Variables:	Affect Component
Sympathy	.794
Worry	.843
Feel better	.719
Anticipated Regret	.747
Eigenvalue	2.4
Percentage of Variance explained	60.4

However, a varimax-rotated[21] two-factor solution with eigenvalues above 1 revealed that sympathy and worry load on a different factor than feeling better and anticipated regret (see *Table 6* for details. The first rotated component (other-focused affect) accounted for 41.5% of the variance of these four affect variables, while the second rotated component (self-focused affect) accounted for 38%. The component loadings in *Table 6* suggest that sympathy and worry are indeed structurally different from feeling better due to a donation and anticipated regret.

Table 6: Component Loadings for Affect Variables on Other- and Self-Focused Affect Components

Affect Variables:	Other-focused Affect	Self-focused Affect
Sympathy	.909	.184
Worry	.852	.318
Feel better	.192	.853
Anticipated Regret	.269	.811
Eigenvalue	1.7	1.5
Percentage of Variance explained	41.5	38.0

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[21] While it is not hypothesized that affect focused on the self is orthogonal to affect focused on others, a varimax rotation was applied to obtain a more conservative estimate of the relationship between the affect variables of interest. A principal components analysis with oblique rotation showed similar results.

Hypothesis 1 addressed the possible effects of cognitive load on affective reactions. If deliberation leads to less affective processing then a reduction in deliberation due to high cognitive load could produce higher affective ratings towards the victims. Results of a factorial ANOVA with a combined other-focused affect rating (consisting of the sum of sympathy and worry towards the victims) revealed that victims evoked slightly higher affective ratings in the high-load condition ($M = 7.5$, $SD = 3.0$) than in the low-load condition ($M = 6.8$, $SD = 2.9$), but this difference failed to reach significance, $F(1,147) = 2.1$, $p < .2$, $\eta_p^2 = .01$. Groups of victims ($M = 7.7$, $SD = 2.6$) elicited significantly higher other-focused affective ratings than single victims ($M = 6.7$, $SD = 3.2$), $F(1,147) = 4.1$, $p < .05$, $\eta_p^2 = .03$ (see *Figure 2*). Neither the cognitive load manipulation nor varying the number of victims had an effect on self-focused affect, as a similar ANOVA with anticipated regret and feeling better as dependent variables showed, *Fs < 1, ns*. Additionally, a similar 2 x 2 factorial ANOVA with judgments of how much a donation would help the victim(s) showed no significant results, $F < 1$, *ns*.

Note: Error bars represent 95% confidence intervals
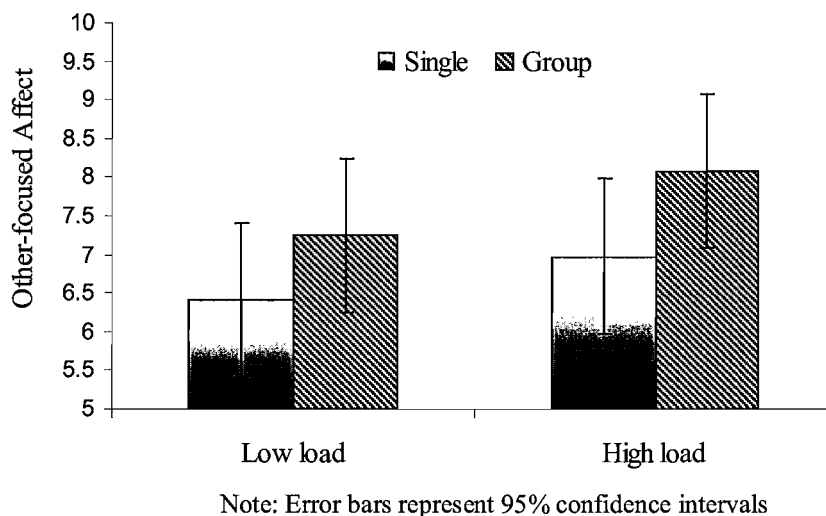
Figure 2: Other-Focused Affect by Cognitive Load and Number of Victims

Donations. Of the 152 participants who recalled their letter sequence correctly, 112 (74%) indicated that they would donate money towards the victims (see *Table 7* for details).

Table 7: Frequency Counts (and Percentages) of Contributors by Cognitive Load and Number of Victims

	Low Cognitive Load	High Cognitive Load	Totals
One victim	24 of 30 *(80%)*	30 of 42 *(71%)*	54 of 72 *(75%)*
Eight victims	27 of 41 *(66%)*	32 of 39 *(82%)*	59 of 80 *(74%)*
Totals	51 of 71 *(72%)*	62 of 81 *(77%)*	113 of 152 *(74%)*

A χ^2 test of independence revealed that the frequency of participants who indicated that they would donate did not depend on the number of victims and cognitive load $\chi^2(1, N = 112) = 2.56, p > .1$. However, inspection of *Table 7* suggests that a higher percentage of participants donated to one victim (80%) than to eight victims (66%) in the low load condition. The opposite pattern was observed under high load, where a higher percentage of participants donated to eight victims (82%) than to one victim (71%). Goodness of fit χ^2 tests for cognitive load (high vs. low) and victim number (one vs. eight) were not significant, *ps* > .5

The preliminary analyses reported in *Table 7* suggest that the patterns of participants' decision to donate are different for the cognitive load conditions. To test whether these donation decisions are related to participants' affect in the high vs. low cognitive load condition, logistic regression analyses were performed for each cognitive load condition with the four affect variables of interest (sympathy, worry, feeling better, and anticipated regret) and with participants' judgment about how much a donation would help. Based on theoretical considerations and the PCA analysis presented in *Table 6*, sympathy and worry were combined into one variable to denote other-focused affect, while anticipated regret and how much better a donation made participants feel were combined to denote self-focused affect. Results are presented in *Table 8*, and indicate that regression models with these three independent variables were significantly

predictive of donation decisions. Examination of the individual predictor variables reveals that participants' efficacy judgment of how much a donation would help was predictive of donation decisions under low load, but not under high load. Under low cognitive load, an increase in efficacy judgments was accompanied by participants being 2.3 times more likely to donate. The odds of donating (related to changes in efficacy judgments) were almost reduced by half (1.2) under high load. Furthermore, self-focused affect was highly predictive of donation decisions in both high and low load conditions.

Table 8: Affective Predictors of Donation Decisions by Condition

Model	Individual Predictors	*Exp(b)*	*Wald*	*p*
Low Cognitive Load: $\chi^2 (3) = 28.5$, p < .001	Other-Focused Affect	1.031	.05	.819
	Self-Focused Affect	1.532	8.05	.005
	Donation Help	2.314	5.70	.017
High Cognitive Load: $\chi^2 (3) = 29.9$, p < .001	Other-Focused Affect	1.075	.04	.526
	Self-Focused Affect	1.811	11.98	.001
	Donation Help	1.222	.76	.384

To test the effect of cognitive load on participants' donation amounts (*Hypothesis 2*), a factorial ANOVA was run on the non-linearly transformed WTC-variable with cognitive load and number of victims as factors. Results indicate a marginally significant main effect for cognitive load, so that participants in the high-load condition ($M = 2.8$, *SD* $= 1.94$) donated more money than participants in the low-load condition ($M = 2.3$, *SD* $= 1.8$), $F(1,148) = 2.9$, $p = .09$, $\eta_p^2 = .02$. Inspection of the means presented in *Figure 3* suggests that groups of victims elicited higher donations than the single individual under high load, and that this difference did not exist under low cognitive load. Although the interaction between number of victims and cognitive load was not significant ($p < .2$),

simple effects analyses showed that groups received higher donations under high-load (M = 3.2, SD = 2.0) compared to low-load (M = 2.2, SD = 2.0), $t(78)$ = 2.0, p <.05, r^2 = .05, and that groups received marginally higher donations than individuals (M = 2.4, SD = 1.8), $t(79)$ = 1.81, p <.08, r^2 = .04 (see *Figure 3*).

Note: Error bars represent 95% confidence intervals
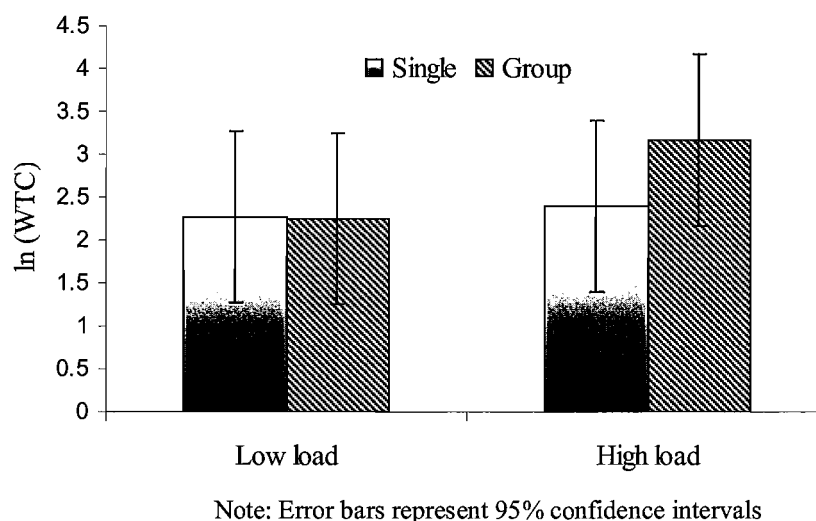
Figure 3: WTC for Cognitive Load by Number of Victims

It was further investigated whether participants' perceived entitativity of the victims (as measured by clearer feelings and a more coherent picture of the victims) depended on cognitive load and victim number. Groups might be seen as more unitary and more coherent when participants have less cognitive resources to process the members of a group individually. To test this possibility, a 2 x 2 factorial univariate ANOVA was performed with the combination of how clear a feeling and how coherent a picture the participants had of the victims. Results revealed a significant main effect for cognitive load, such that participants reported higher entitativity perceptions in the high-load condition (M = 5.6, SD = 2.7) than in the low-load condition (M = 4.4, SD = 2.9), $F(1,146)$ = 6.1, p < .05, η_p^2 = .04 (see *Figure 4*).

Note: Error bars represent 95% confidence intervals
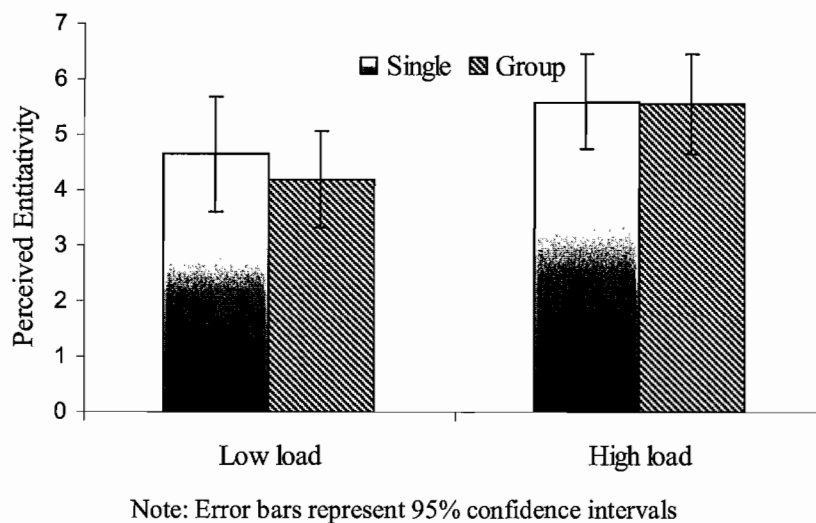
Figure 4: Perceived Entitativity for Cognitive Load by Number of Victims

Closer inspection of this main effect showed that participants reported higher perceived entitativity for the group of victims in the high-load condition ($M = 5.6$, $SD = 2.7$) than in the low-load condition ($M = 4.2$, $SD = 2.6$), $t(77) = 2.3$, $p < .05$, Cohen's $d = .53$. The difference between entitativity judgments for single victims in the high load condition ($M = 5.6$, $SD = 2.7$) did not significantly differ from that in the low-load condition ($M = 4.6$, $SD = 3.4$), $t(69) = 1.3$, $p > .2$, Cohen's $d = .23$. Neither the main effect for number of victims nor the interaction between cognitive load and number of victims was significant.

Finally, a reduction in deliberative capacity might influence participants' use of affect as a source of information when constructing their donation amount. To test this, regression analyses of donation amounts were run separately for each of the cognitive load conditions[22]. Self- and other-focused affect were used as affective predictors of WTC (see *Table 9* for results). For high-load, these affective predictors significantly predicted WTC, $F(2,78) = 16.5$, $p < .01$, adj$R^2 = .28$. Both affective measures

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[22] Similar analyses were conducted for one vs. eight victims and are presented in Appendix A.

independently predicted WTC in this model, $\beta = .23$, $t(78) = 2.2$, $p < .05$; and $\beta = .40$, $t(78) = 3.7$, $p < .01$, for other- and self-focused affect, respectively. The same model also significantly predicted WTC in the low-load condition, $F(2,67) = 12.8$, $p < .01$, adj$R^2 = .26$, but only self-focused affect was independently predictive of donations, $\beta = .37$, $t(67) = 2.8$, $p < .01$, while other-focused affect was not, $\beta = .21$, $t(67) = 1.6$, $p > .1$. Feelings directed towards the self (i.e., anticipated regret and how much better a donation would make one feel) are predictive of WTC regardless of load, whereas feelings directed towards the victim(s) (i.e., sympathy and worry about the victims) are predictive of WTC when participant's deliberative capacity is restricted.

Table 9: Regression Analyses of Affect Predicting WTC by Cognitive Load Condition

Model	Individual Predictors	β	t	p
Low Cognitive Load $F(2,67)=12.8$, $p<.01$, adj$R^2=.26$	Other-focused affect	.21	1.6	.112
	Self-focused affect	.37	2.8	.006
High Cognitive Load $F(2,78)=16.5$, $p<.01$, adj$R^2=.28$	Other-focused affect	.23	2.2	.031
	Self-focused affect	.40	3.7	.001

Discussion

Study 1 was designed to investigate the effects of cognitive load on affective reactions and donations to others in need of a financial contribution. Of special interest was whether a reduction in processing resources would lead to higher or lower affective reactions, and whether differences emerged for self- vs. other-focused affect. It was expected that participants under high cognitive load would engage in more affective (i.e., System 1) processing and show a stronger relationship between their affective reactions and donations. This was taken as an indication that they used these feelings as a source of information to guide their donation decisions.

Analysis of the affect variables shows some support for a distinction between self- and other-focused affective reactions. While a principle components analyses revealed only one affect component for sympathy, worry, feeling better, and anticipated regret, a rotated two-factor solution clearly indicated that sympathy and worry loaded on a different factor than feeling better and anticipated regret. This distinction between self- and other-focused affect dovetails nicely with research on different motivations for prosocial behavior (Batson 1990).

A central question was whether the initial decision to donate (irrespective of the amount) depended on participants' affective reactions, and whether this relationship was moderated by the availability of processing resources. Slovic and Lichtenstein (1968) suggest a two-step model by which decisions to pay for a gamble are different from decisions concerning how much to pay. Similarly, it is possible that different mechanisms govern decisions to donate money compared to decisions on how much money to donate. Results indicated that under low load slightly more participants donated to a single victim than to a group of victims. This pattern reversed when participants were under higher cognitive load. A logistic regression showed that participants' self-focused affect was predictive of their decision to donate under high and low load, but that their efficacy judgment of how much a donation would help the victims predicted donations only under low load. Several different variables are important when people decide whether to donate or not, and it is possible to speculate that participants' judgments of how much a donation would help are an indication of a more deliberative factor in the decision to donate (Loewenstein & Small, 2007). While no difference in these efficacy judgments was found under high and low load, they predicted participants' decision to donate only when participants were under low load and presumably more able to deliberate.

Further analyses were performed to investigate whether the donation amount differed by cognitive load and victim number. Results suggested that participants reported higher donations for groups of victims in the high load condition compared to the other three conditions. One explanation of why a group of victims received higher

donations than a single victim in the high load condition is that each victim in the group picture was assessed individually (i.e., in a serial fashion) and that this taxed the deliberative processing capacity on top of the cognitive load manipulation. The compound effect of high cognitive load together with the demands of processing a group of victims likely contributed to the highest donations in this condition. Thus, the present results suggest that the mere availability of deliberative resources can have a negative effect on the level of donations people are willing to give. Another explanation for this effect is the possibility that participants engaged in deliberative processing about other uses of their money or the bigger problem at hand (Loewenstein & Small, 2007). When the capacity to engage in these forms of deliberation is reduced, however, the relative weight of other-focused affect becomes more relevant in the decision to donate.

This notion is supported by results showing that high cognitive load produced higher (albeit not significant) ratings of worry and sympathy towards the victims. These affect ratings mirror the donations in that the highest affect was reported for the group of victims in the high load condition and the lowest for the single victim in the low load condition. Feelings focused on others (e.g., sympathy towards the victims) seem to be sensitive to the cognitive load manipulation, whereas feelings focused on the self (e.g., anticipated regret) are more robust against possible disruptive effects of deliberative (i.e. System 2) processing. Research on empathy and perspective taking supports this result by showing that self-focused affect is easier to access and less effortful than other-focused affect (Batson, 1990; Hodges & Wegner, 1997; Rossnagel, 2000; Sabbagh & Taylor, 2000).

The effect of high cognitive load on slightly higher other-focused affect for groups of victims might also be partially explained by possible differences in group perceptions. Higher entitativity should lead to clearer images, and consequently, stronger affective reactions (Slovic, 2007). Results support this and show that high cognitive load leads to more extreme judgments on group coherence and clarity of feelings towards the victims. Specifically, participants reported having clearer feelings towards the groups and a more coherent picture when they were under high load. This finding can be

explained by participants with more deliberative resources being able to form a more diverse mental representation of the victims. In contrast, participants with low processing recourses formed a mental representation that is not sensitive to the individual members of the victim group. Otherwise their entitativity judgments would likely be lower. The present results suggest that the capacity to process information in a more deliberative way can lead to lower entitativity judgments, lower affect directed towards the victims, and lower donations.

Results from Study 1 further supported that participants' other-focused affect was more related to donation amounts under high vs. low cognitive load. Specifically, feelings focused on the victims were predictive of donations only in the high cognitive load condition. Feelings focused on the self were predictive of donations regardless of cognitive capacity. This finding suggests that feelings focused on others are accessed when other, competing calculations or judgments cannot be carried out while deciding to donate to the victims due to less available deliberative capacity. When the processing resources allow for mental computations that do not necessarily involve affective processing, feelings like sympathy might lose importance and do not predict donations amounts[23].

These results offer tentative support for a model of helping behavior that posits System 2 as a potentially disruptive influence on the effects of other-focused affect (see *Figure 1*). In the next study, information processing was manipulated by a priming paradigm to investigate whether the general findings of this study could be replicated with a different processing manipulation.

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[23] The above interpretations rest on the assumption that deliberative capacity was used to detract from affective reactions towards the victims. It is also possible that more deliberation leads to higher-order affect (e.g., Berkowitz, 1993), but our data do not support this explanation as affect towards the victims was slightly lower when participants were under low cognitive load. Another caveat of the present interpretation is that memory load paradigms do not control for the possibility of information being shifted to long-term memory and thus freeing deliberative resources.

CHAPTER V

STUDY 2: AFFECTIVE VS. CALCULATION PRIMING

Introduction and Rationale

The following study was designed to test the effect of shifting the balance between deliberative and affective information processing by means of a priming paradigm. Research in both social psychology (e.g., Murphy & Zajonc, 1993) and judgment and decision making (e.g., Fedorikhin & Cole, 2004; Hsee & Rottenstreich, 2004) has used priming manipulations to influence participants' information processing in both subtle (i.e., "suboptimal") and perceptible (i.e., "optimal") methods. For example, Murphy and Zajonc (1993) compared the impact of suboptimal and optimal primes that were either affect-rich (happy and angry facial expressions) or affect-poor (small and large polygon shapes) on attractiveness judgments of Chinese ideographs. Their results suggest that affect-rich primes lead to higher attractiveness ratings than affect-poor primes, which is indicative of differential information processing depending on the affective content of the primes.

Using perceptible (i.e., optimal) primes, Hsee and Rottenstreich (2004) had their participants either focus on calculations or feelings to construct a value for a consumer good (Madonna CDs). Hsee and Rottenstreich demonstrate that it is possible to prime participants to use either a more deliberative (i.e., calculation-based) approach or a more affective (i.e., feeling-based) approach in the construction of prices for either five or ten CDs. Results indicate that priming participants to focus on their feelings resulted in a different valuation process and outcome compared to when participants were primed to calculate. Specifically, priming calculation resulted in pricing sensitive to the quantity of the consumer good (i.e., participants were willing to pay more money for greater quantities). Further research on the effect of affective primes was conducted by

Fedorikhin and Cole (2004), who contend that the extent to which mood influences information processing is a function of both mood valence and level of processing. According to affect priming models, inducing a particular mood in people will make it more likely that information with congruent mood states is recalled and processed (Forgas, 1995; Bower, 1981). It is likely that affective information (compared to non-affective information) about a specific stimulus can become more salient if participants are already focused on their affective state.

Similar to Hsee and Rottenstreich's (2004) manipulation, participants in the current study will be presented with an optimal affect prime, optimal deliberation prime, or with a no-prime control. It is hypothesized that affect-rich priming will focus participants on their feelings, which should make them more sensitive to the affective aspects of the victims and their predicaments. In contrast, priming affective-poor information processing by means of a calculation prime should focus participants on deliberative aspects of the victims' situation (e.g., how much money each victim receives if $X are donated) and be less sensitive to the affective aspects. This difference in information processing gives rise to the following predictions:

Hypothesis 1a: Participants will report higher other-focused affective ratings (e.g., sympathy) in the affect prime condition vs. the calculation prime condition.

Hypothesis 1b: Based on results from Study 1, it is possible that a greater number of victims evokes stronger affective reactions than a single victim[24]. This should particularly be true for the affective prime condition, as it will shift information processing towards affective valuations and away from deliberative (i.e., calculation-based) valuations (Hsee & Rottenstreich, 2004).

It is of note that only affect that is focused on the victim should be influenced by the affective prime condition. As in Study 1, self-focused affect (e.g., how the participant feels about him/herself if they donate money) is expected to be robust to information processing manipulations because participants should access information focused on themselves more effortlessly compared to affect focused on others (Rossnagel, 2000;

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[24] Reducing deliberative capacity resulted in greater affective reactions for groups vs. single victims.

Sabbagh & Taylor, 2000). Based on *Hypotheses 1a* and *1b*, if donations are informed by the level of affect that is attached to the victims, higher affect should lead to higher donations. Therefore, it is further hypothesized that donations will be dependent on priming and victim number.

Hypothesis 2: Affective priming will lead to higher donations compared to neutral and calculation priming. Additionally, in line with Study 1 and *Hypothesis 1b*, a greater number of victims are expected to elicit stronger affective reactions and higher donations. This should be particularly true for affective priming, as participants will engage in more affective information processing (compared to deliberation).

It is further expected that affective priming makes the affective features of the victims more salient. With a shift towards affective processing, these (affective) features should increase the relationship between emotions that are based on the victims and their situation (e.g., sympathy, compassion, and worry about the victim) and donations. Self-focused affect, on the other hand, is expected to be related to donations regardless of processing mode.

Hypothesis 3: Affect towards the victims will be more predictive of donations in the affective priming condition compared to the calculation priming condition.

Method

Participants. Two-hundred and fifty-six undergraduate students at the University of Oregon took part in this study. The mean age was 22.1 years ($SD = 2.4$), and 52% of the participants were female.

Design. In a 3 prime (calculation vs. affective vs. neutral) x 2 number of victims (one vs. eight) between-subjects factorial design, prime was manipulated by asking subjects to either engage in mathematical calculations (adapted from Hsee and Rottenstreich, 2004), emotional processing, or neither (neutral prime). Number of victims was manipulated by showing participants either one victim or eight (adapted from Kogut & Ritov, 2005a). The dependent variables of interest were participants'

willingness to contribute (WTC) a hypothetical financial donation, as well as participants' affective reactions.

Materials and Procedure. At the beginning of the experiment, participants were randomly assigned to one of the six independent conditions (calculation vs. affect vs. neutral prime by one vs. eight victims). All materials were presented on a computer screen (screen resolution = 1024 x 768). Participants in the calculation prime condition were asked to perform six mathematical algebraic calculations (e.g., "If an object travels at five feet per minute, then by your calculations how many feet will it travel in 360 minutes?"), whereas those in the affective prime condition were asked to describe in writing (one attribute) how they felt about specific objects or people (e.g., a newborn baby or George Bush; see Appendix B for details). These affective primes were designed to prime participants to access their feelings, but were also intended to be balanced in valence (three positive and three negative objects) to not strongly bias participants' moods. Participants in the neutral prime condition were not primed to calculate or express their feelings about anything. Half of the participants were randomly selected to be in the one-victim condition, and the other half in the eight-victim condition. Victims were identified by picture, name, and age. The identifying information about the victims was identical to the stimuli used in (Kogut & Ritov, 2005a; see also Study 1).

After viewing the information about the victims and that they are in danger from an unspecified acute life-threatening disease, participants indicated whether they would make a hypothetical financial contribution to the victim(s). Four questions about the participants' feelings towards the victim(s) followed on a second page (e.g., how much they were worried, upset, and sad about the victim(s), how much sympathy they felt for the victim(s), how much they felt for the victim(s), and the extent to which participants felt better if they donated money. All four affect variables were measured on a 1-7 point Likert scale; see Appendix B for details).

Results

    Manipulation Check and Descriptive Analyses. An analysis of participants' responses to the algebra questions in the calculation condition showed that, on average, participants answered more than half of the six questions correctly ($M = 3.94$; SD $= 1.14$). Of all n $= 87$ participants in this condition, 76 (87.4%) answered at least half of the questions correctly[25]. Two subjects did not answer any of the questions correctly and were excluded from further analysis.

    To analyze participants' responses in the affect priming condition, each response was individually and independently coded by two coders blind to the hypotheses (inter-rater reliability $r = .83$). The responses were coded for positive and negative valence, and each participant's total number of positive minus number of negative emotional responses was computed. As the priming condition featured three positive and three negative items, it was intended that, on average, participants would express three positive and three negative emotional states. Analyses showed that of the n $= 87$ participants in this condition, 44 (50.6%) reported three positive and three negative emotional reactions. Of the remaining participants in this condition, 22 (25.3%) expressed more negative than positive emotions, and 21 (24.1%) expressed more positive than negative emotions[26].

    Affect Structure. Before testing the effect of priming on participants' affect responses, the underlying structure of participants' affect responses was investigated. Analyses of correlational patterns showed that feelings focused on the victims were all highly correlated (Pearson's r ranged from .72 to .78). It should be noted that feelings focused on the self (i.e., the extent to which donating would make the participants feel better) were also significantly positively correlated with the other affect measures, however less strongly so (Pearson's r ranged from .39 to .41). See *Tables 10 and 11* for details.

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[25] For a more detailed description of participants' calculation responses and their relationship to other variables of interest in this study please refer to Appendix B.

[26] For a more detailed description of participants' affective responses and their relationship to other variables of interest in this study please refer to Appendix B.

Table 10: Means and Standard Deviations of WTC and Affect Variables

	N	Mean	Standard Deviation
WTC	254	409607.1	6375654.2
WTC[a]	254	3.56	1.87
Sympathy	254	3.98	1.54
Worry	254	2.94	1.60
Feel for victims	254	2.74	1.54
Feel better if I donate	254	2.71	1.60

WTC[a] = log-transformed variable

Note: All variables except WTC were measured on a 1-7 point Likert scale.

Table 11: Correlations Between WTC and Affect Variables

	WTC[a]	Sympathy	Worry	Feel for victims	Feel better if I donate
WTC[a]	1				
Sympathy	.33**	1			
Worry	.38**	.73**	1		
Feel for victims	.39**	.72**	.78**	1	
Feel better if I donate	.44**	.39**	.41**	.41**	1

** $p < .001$ WTC[a] = log-transformed variable

To investigate whether these four affect variables are best explained by one or two factors, a principal components analysis was conducted. Using an unspecified number of components with an eigenvalue above 1 as a criterion, results show that all four affect variables load on one factor. This component had an eigenvalue of 2.8 and accounted for 69.1% of the variables' variance (see *Table 12*).

Table 12: Component Loading of Affect Variables on Single Component

Affect Variables:	Affect Component
Sympathy	.875
Worry	.902
Feel for victims	.900
Feel better if I donate	.612
Eigenvalue	2.8
Percentage of Variance explained	60.4

As indicated in *Table 12* when only one component is extracted, sympathy, worry, and feeling for the victims are somewhat better explained than feeling better due to a donation. A rotated two-factor solution with eigenvalues above 1 revealed that the first rotated component (other-focused affect) accounted for 60% of the variance of all affect variables, while the second rotated component accounted for 27%. The component loadings (i.e., the proportion of each variable's variance that is accounted for by the principal components) are represented in *Table 13,* and strongly suggest that feelings focused on the victim and feelings focused on the self are best represented by two different components.

Table 13: Component Loadings of Affect Variables on Other- and Self-Focused Affect Components

Affect Variables:	Other-focused Affect	Self-focused Affect
Sympathy	.873	.195
Worry	.895	.211
Feel for victims	.892	.214
Feel better if I donate	.227	.974
Eigenvalue	2.4	1.1
Percentage of Variance explained	60.3	27.0

While the first component accounts for 87.3 – 89.5% of the variance of the affect variables that are focused on the victim, it only accounts for 22.7% of the variance of the feelings focused on the self (i.e., "feeling better" if money is donated). The second component shows a reversed pattern, where the variability of feelings focused on others are accounted for by only 19.6 – 24.1%, and the variability of feelings focused on the self is accounted for by 97.3%. Based on these findings, participants' sympathy, worry, and feelings for the victims were averaged into one variable measuring the extent of their affect towards the victim(s). Feelings focused on the self were measured by how much better participants felt due to a donation.

Effect of Priming on Affect. It was hypothesized that affective reactions focused on the victim(s) (e.g., the combination of sympathy, worry, and feelings for the victims) are higher in the affective prime condition compared to the other conditions.

Results of a 3 (prime) x 2 (number of victims) ANOVA confirmed that other-focused affect was dependent on priming condition, $F(2,248) = 5.7$, $p < .01$, $\eta_p^2 = .04$. A planned contrast showed that affective priming ($M = 3.6$, $SD = 1.5$) led to higher victim-focused affect than calculation priming ($M = 3.0$, $SD = 1.4$), $t(248) = 2.8$, $p < .01$, $\eta_p^2 = .03$. In addition to the significant main effect for priming, the factorial ANOVA also revealed a marginally significant interaction between priming and victim number, $F(2,248) = 2.3$, $p = .1$, $\eta_p^2 = .02$. Inspection of *Figure 5* suggests that this interaction is a result of affective priming increasing feelings focused on others especially when participants rated multiple victims. However, this pattern was not present in the calculation prime and no prime conditions. The main effect for number of victims was not significant, $F < 1$, *ns*. These results corroborate and extend findings presented in the previous, because more affective processing led to stronger victim-focused affect similar to the high cognitive load condition in Study 1.
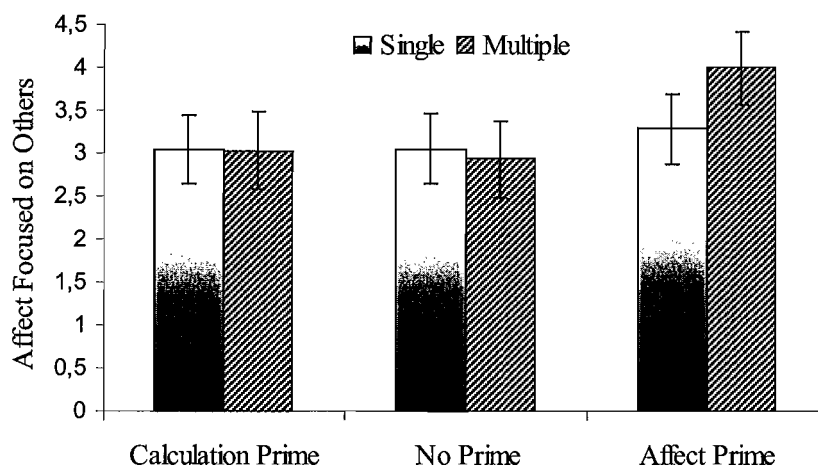
Note: Error bars represent 95% Confidence Intervals.

Figure 5: Effect of Priming and Victim Number on Feelings Focused on Others

To investigate the effect of priming on self-focused feelings, the same factorial analysis was conducted with participants' report of how much better they feel if they donate money as a dependent variable. Results indicate no significant effects of either priming or number of victims, $Fs < 2, ps > .15$.

Donations. Willingness to contribute responses were winsorized (less than 4% of the data) and then log-transformed to reduce skewness. Of the 254 participants, 228 (90%) indicated that they would donate money towards the victims. The percentage of participants in each prime condition (calculation vs. affect vs. no prime) x victim number condition (one vs. eight victims) who chose to donate money ranged from 81 percent (for a group of victims presented in the calculation prime condition) to 100 percent (for a group of victims in the affect prime condition). A χ^2 test of independence and goodness of fit tests for number of victims and prime condition showed that no significant difference existed in participants' proportion to donate. However, when averaging across victim number, the lowest proportion of donations was found in the calculation prime condition (83%) and the highest was in the affect prime condition (96%). This gives tentative support to the possibility that priming participants to deliberate (i.e., calculate) reduces the likelihood for a donation compared to the affective prime and no prime conditions.

To test whether participants' decisions to donate are related to participants affect in the high vs. low cognitive load condition, a logistic regression analysis was performed for each priming condition with the two different types of affect (self- and other-focused). Results are presented in *Table 14* below. The model with self- and other-focused affect significantly predicts donation decisions for the calculation and affect prime conditions. For these two conditions, affect discriminates between participants who donated and those who did not. Examination of the individual predictor variables reveals that only participants' self-focused affect was predictive of the decision to donate. An increase in self-focused affect made participants 3.1 times more likely to donate in the calculation prime condition, and almost 5 times as likely to donate in the affect prime condition.

Table 14: Affective Predictors of Donation Decisions by Condition

Model	Individual Predictors	Exp(b)	Wald	p
Calculation Prime χ^2 (2) = 18.4, p < .001	Other-Focused Affect	.804	.69	.405
	Self-Focused Affect	3.143	10.38	.001
No Prime χ^2 (2) = 4.2, p > .1	Other-Focused Affect	1.306	.77	.379
	Self-Focused Affect	1.444	1.58	.209
Affect Prime χ^2 (2) = 11.3, p < .01	Other-Focused Affect	1.256	.36	.547
	Self-Focused Affect	4.986	4.00	.046

It was hypothesized (*Hypothesis 2*) that affective priming would lead to higher donation amounts compared to calculation priming. Results of a 3 (prime) x 2 (victim number) ANOVA revealed a main effect for prime, $F(2,248) = 6.0, p < .01, \eta_p = .05$. A planned contrast between calculation priming and affective priming supported the hypothesis that affective priming led to higher WTC ($M = 4.1, SD = 1.7$) than calculation priming[27] ($M = 3.1, SD = 1.9$), $t(248) = 3.4, p < .01, \eta_p = .05$. Neither the main effect for number of victims nor the interaction between number of victims and prime were significant, $Fs < .1, ns$ (see *Figure 6*). Even though no significant difference was found for number of victims, the difference between one victim and a group of victims was largest in the affect prime condition. Similar to Study 1, participants reported higher donations for a group of victims when primed affectively.

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[27] A Tukey post-hoc test found no other pairwise comparisons significant.
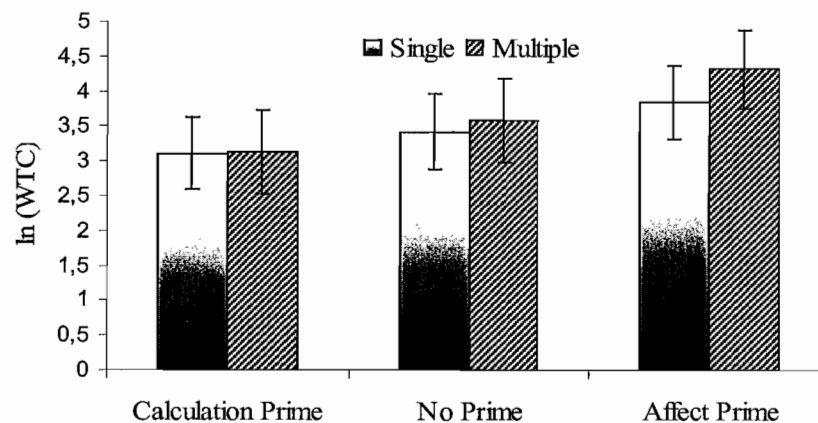
Note: Error bars represent 95% Confidence Intervals.

Figure 6: WTC for Prime Condition by Number of Victims

Finally, it was hypothesized (*Hypothesis 3*) that affective reactions towards the victims would be predictive of donation amounts in the affective priming condition, but not in the calculation prime condition. Feelings that are focused on the victims should be more salient and easier to access when participants are primed to evaluate others on affective dimensions (i.e., with System 1). Feelings focused on the self, on the other hand, should be less influenced by the priming manipulation. To test this hypothesis, regression analyses were run with feelings focused on others (i.e., the combination of sympathy, worry, and feelings for others) and feelings focused on the self (i.e., how much better participants felt due to donating money) as the predictor variables and donation amount as the criterion variable. Separate regression analyses were run for each of the three priming conditions (calculation prime, affect prime, and no prime). *Table 15* details the zero-order correlations and *Table 16* presents the results of the regression analysis.

Table 15: Zero-order Correlations of Donations and Affective Predictors by Condition

	Calculation Prime (N=87)	No Prime (N=82)	Affect Prime (N=87)
Affect focused on victims	.33**	.42**	.39**
Affect focused on self	.52**	.34**	.47**

Table 16: Regression Analyses of Affect Predicting WTC by Priming Conditions

Overall Model	Individual Predictors	β	t	p
Calculation Prime $F(2,82) = 15.3$, $p<.001$, $adjR^2=.26$	Affect focused on victims	.07	.64	.522
	Affect focused on self	.48	4.28	.000
No Prime $F(2,79) = 11.2$, $p<.001$, $adjR^2=.20$	Affect focused on victims	.35	3.26	.002
	Affect focused on self	.20	1.84	.070
Affect Prime $F(2,84) = 15.2$, $p<.001$, $adjR^2=.25$	Affect focused on victims	.24	2.31	.023
	Affect focused on self	.37	3.65	.001

These results indicate a clear difference in the predictive strength of affect focused on the self vs. on others on donation amount. As expected, affect focused on the self was predictive of donations in all priming conditions (albeit only marginally in the no prime condition). However, and more importantly, affect focused on others was predictive of donations in the affective prime and no prime condition, but not in the calculation prime condition.

To further explore the impact of priming on affect and donations, a mediation analysis was conducted. This explorative analysis was motivated by Västfjäll et al. (in preparation), who found that willingness to donate money was mediated by the level of affect felt towards the victims. Using Baron & Kenny's (1986) regression approach to mediation analyses, the current study found that the impact of priming was partially mediated by other-focused affect. A test of the indirect effect (Sobel, 1982) of affect on donations was significant, *Sobel test statistic* = 2.55, $p<.05$, supporting the mediator role of affect focused on the victim. This suggests that the effect of priming on donations is, at least partly, better explained by its effect on other-focused affect. A similar analysis with how much better participants felt due to a donation revealed that these self-focused feelings did not mediate donations, *Sobel test statistic* = .77, $p > .4$.

Discussion

Study 2 used a priming manipulation to focus participants' information processing on either more affective (i.e., System 1) or deliberative (i.e., System 2) dimensions. Affective priming consisted of asking participants to answer six questions about how they feel concerning specific objects or people, while priming deliberation involved solving mathematical calculations. Both of these priming manipulations were not directly relevant to the donation task, but instead were designed to focus participants on affective aspects of the donation task (e.g., how they felt towards the victims) or the deliberative aspects (e.g., using a calculative approach to valuing the victims lives). Furthermore, number of victims was manipulated similarly to Study 1.

Affective priming highlights participants' emotional reaction towards the victims compared to the affect-poor calculation priming condition (Hsee & Rottenstreich, 2004). Consequently, it was predicted that affective priming will lead to higher affective reactions as well as higher donations in comparison to the calculation priming condition. As expected, participants who were primed to feel reported higher other-focused affect towards the victims in conjunction with greater willingness to donate. A mediation analysis found that other-focused affect (e.g., sympathy) is a partial mediator for participants' willingness to donate in the affective and calculation priming conditions. Even though other-focused affect did not fully mediate the effect of priming on donations, the indirect effect of priming through other-focused affect was significant. It is therefore likely that the effect of priming on donations is better explained by changing people's other-focused affect towards the victims, which, in turn, predicts donations.

The priming paradigm was effective in manipulating participants' focus on different aspects of the donation task. Asking participants to perform mathematical calculations prior to being exposed to the victims had the effect of lowering affective reactions and donations, indicating that emotional reactions towards the victims were of lesser intensity (and importance). Conversely, asking participants to focus on their feelings about unrelated objects and people resulted in greater affective reaction towards the victims and higher donations. Inspection of the donation means suggests that the

calculation prime reduced the donation amount relative to the no-prime control condition, whereas affective priming increased it. Feelings focused on the victims were similar for the calculation and no-prime conditions, and lower compared to the affective prime condition.

Investigating participants' willingness to donate (vs. not donate) suggests that self-focused affect is more important in the initial decision to donate. For both affective and calculation prime conditions, the degree to which a donation would make participants feel better is more important than other-focused affect. This result, together with Study 1, suggests a two-step process of people's donation decisions. They rely more on social-egoism motivations (Batson, 1990) when deciding on whether to donate or not, but the donation amount is also based on other-focused affect when participants focus on their feelings (i.e., engage in System 1 processing).

No significant differences were found for the number of victims manipulation. The largest difference between a group and a single victim was found in the affective prime condition. This suggests that a shift from deliberative to affective processing might benefit a group of victims more than a single victim. These results are in line with Study 1, where a group of victims was valued more when participants were unable to deliberate (and therefore presumably System 1 processing was not regulated or disrupted by System 2 processing). Relative to a group of victims, single individuals are valued higher when participants are able to engage in deliberation and use a deliberative (i.e., calculation-based) approach to donations.

Taken together with the results of Study 1, Study 2 supports a model which posits differential information processing strategies as a cause for differences in the construction of donation values[28]. Specifically, priming participants to use System 1 processing resulted in higher victim-focused affect, higher donations, and a stronger

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[28] While the general model is supported, both Study 1 and 2 failed to find evidence of the "singularity" effect (Kogut & Ritov, 2005a), as groups of victims always received either close to or greater donation amounts than single victims. However, it is possible that a key difference in the reported study and Kogut and Ritov is use of direct information processing manipulations (e.g., cognitive load and priming paradigms), and possibly the fact that children in need were culturally different from the donors.

relationship between these two. Priming to calculate (i.e., using System 2) produced the opposite effects on victim-focused affect and its use in the construction of donation values. Furthermore, the structural and functional difference between these self- and other-focused affect reported in this study are consistent with results reported in study 1. To provide further evidence for the proposed model in *Figure 1*, Studies 3 and 4 were conducted in order to manipulate information processing in an indirect way by varying the presentation modes of the victims.

CHAPTER VI

STUDY 3: IDENTIFIABILITY AND BACKGROUND STATISTICS

Rationale and Hypotheses

To rally support for the victims of famine, disease, and warfare, (to name only a few calamities) humanitarian aid organizations typically identify a few individual victims who people can donate to. While these identified victims are only a disproportionately tiny fraction of the suffering total, this form of presentation is thought to entice potential donors to form an emotional impression of victim and increase the likelihood of a contribution (Slovic, 2007). However, even if only a few victims are identified to the potential donors, these victims are representative for a faceless mass of unidentified victims. Study 3 investigates whether reminding people of this faceless mass by adding statistical background information of the victims (e.g., how many other victims are suffering in addition to the identified victim) to the individuating information has a deleterious effect on donations and affective reactions.

Research on the effects of identifying victims suggests that presentation of identified victims results in higher donations. Kogut and Ritov (2005a, 2005b) presented their participants with either identified or unidentified victims of a life-threatening disease, and found that they donated more money to victims identified by name, age, and picture. This "identified victim effect" seems to impact both affective responses to the victim as well as people's willingness to contribute (WTC) to a humanitarian cause. It is easier to attach emotional impressions to an identified victim due to a more concrete level of mental representation (Slovic et al., 2002) and higher entitativity (Hamilton & Sherman, 1996). Viewing an identified victim is likely to result in stronger affective reactions, and can lead donors to base their decisions on these affective reactions. Conversely, presenting a victim in an unidentified way may engage abstract thinking and less affective information processing. To some people, an unidentified victim is just an

abstract mental figure or a number without emotional significance, which should have similar effects on donations and affective reactions as adding background statistics. Supporting this notion, Small, Loewenstein, and Slovic (2007) found that adding background statistics to an identified victim reduced donations to the victim.

Their results point towards an affective account of the drop in the bucket effect. Specifically, presenting background statistics might encourage participants to calculate the (small) probability of actually making a difference or deliberate about the deservingness of one out of many victims. Even though presenting background statistics can impact both System 1 and System 2 processing, results from Study 1 and Study 2 suggest that it is likely that these calculations and deliberations are based more on System 2. Thus, adding background statistics can have the effect that both affective reactions to the victim (e.g., sympathy) and the reliance on affective processing in donation decisions are reduced.

The present study was designed to manipulate information processing indirectly by varying victim identifiability and number of victims. Specifically, a single victim was either identified or not, and was presented by herself or as part of 20,000 other victims. These 20,000 other victims serve as a background statistic similar to Small, Loewenstein, & Slovic (2007)[29], and function as a reference group to the single victim. Even though results from Study 1 and 2 found no support for this, research on donations has found that donations to a single victim are sometimes special in that affective reactions are strongest for an individual victim (Kogut & Ritov, 2005b; Slovic, 2007; Small, Loewenstein, & Slovic, 2007). Moreover, when people engage in System 1 processing they have been found to be less sensitive to changes in the number of victims than when they are processing information with System 2 (Hsee & Rottenstreich, 2004). Thus, the present study explored whether the affective reactions arising from System 1 are malleable when background information about the size of the victim reference group is presented, and

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[29] These authors used numbers that were larger (ranging into the millions), but the effect on information processing should be similar since the affective system is sensitive to changes only when numbers are quite small (e.g., 1 vs. 2 victims; Västjäll et al, in preparation).

whether manipulating the identifiability of a victim increases victim-focused affective reactions.

It is not clear how the presentation impacts self- vs. other-focused affect. If adding statistics increases deliberative processing, as suggested by Small, Loewenstein, and Slovic (2007), then this deliberation might have negative effects on the System 1 output. To the extent that self- and other-focused affect spring out of System 1 processing, both should be reduced when statistical background information is added to a single victim. However, Studies 1 and 2 have shown that other-focused affect is more sensitive to how information is processed, and shifting people's information processing towards deliberation could reduce other-focused affect more than self-focused affect. Nonetheless, self-focused affect could also be impacted by changes in background statistics, but not because of changes in deliberative vs. affective processing. For example, if the motivation to help others springs out of a need to make oneself feel better, then the efficacy of the donation should be of more importance. If a donation is judged to have a larger impact on one identified victim (vs. an identified victim that is part of a larger mass of victims) then it is likely that more help is provided to a victim that is presented alone without statistics. Donating to a large group of victims, where the donation has little impact, could reduce the extent to which one would feel better after making a donation.

If the target is emotionally salient (i.e., an identified victim), it should be less dependent on changes in the referent group size. Conversely, if the target is not affectively salient, then changing the size of the referent group may produce a "drop in the bucket" effect, produced by participants' sensitivity to the size of the reference group.

It is possible that participants' numeric ability influences their perception of the victims that are presented with background statistics. High numeracy is thought to enable people to derive meaning even from abstract numbers (e.g., percentages: Peters et al., 2006), and might lead them to react differently to the addition of victim statistics. Higher numeracy might lead to more abstract (i.e., System 2) processing, and lower affective reactions (e.g. sympathy towards victims). This shift in processing might also impact

participants' entitativity perceptions, as people with greater deliberative capacity have been shown to see groups as less entitative than people will less capacity (e.g., Study 1). These considerations lead to the following hypotheses:

Hypothesis 1: If the target victim is identified, it should be less dependent on changes in the size of the referent group (i.e., whether victims are part of a bigger group). Thus, an interaction is predicted so that presenting a victim alone will produce higher donations compared to when it is presented as part of a larger group only when it is unidentified.

The predicted interaction between identifiability and numbers of victims is based on the notion that when victims are not emotionally salient (i.e., unidentified), donations to them will be sensitive to the referent group size. Helping unidentified victims who are part of a bigger group would thus appear to be just a drop in the bucket. Furthermore, identifying a victim is predicted to increase System 1 processing and lead to stronger victim-focused affective reactions.

Hypothesis 2: Providing identifying information for a single victim should increase participants' affective responses.

Feelings such as sympathy and compassion are hypothesized to be sensitive to how information is processed, while affect focused on the self (e.g., anticipated regret) should not be dependent on identifiability because it does not take the individuality of the victim into consideration (after all, the focus of the affective reaction is on the self). Additionally, victim-focused affect is expected to predict participants' willingness to contribute only when information processing depends on System 1 (i.e., when the victim is identified). Identifying a victim should lead to more affective information processing, which should not only influence mean differences in victim-focused affect, but also in the extent to which this affect is used in the decision to donate money

Hypothesis 3: It is expected that affective reactions related to the victim will predict willingness to contribute in the identified condition. Other-focused affect should predict donations only when the victim is identified and presented alone. Self-

focused affect should be less sensitive to presentation mode and predict donations regardless of identifiability.

Finally, the tendency to deliberate about choices has been, at least in part, found to be dependent on people's numeric ability (Peters et al., 2006). Higher numeracy should lead to more abstract processing and less reliance on immediate affective reactions in the decision to donate. Conversely, low numerate persons base their decisions to donate more on affective (i.e., System 1) processing. Thus, less numerate persons may rely more on their immediate affective reactions when forming an impression of the victim and might therefore perceive higher victim entitativity than high numerate people.

Hypothesis 4: Low numerate persons are expected to have clearer (and less abstract) mental representations and clearer feelings for the victim. This should be especially the case when the victim is identified.

Method

Participants. One-hundred and sixty-eight students at the University of Oregon took part in this study. Of these participants, 52% were graduate students. The mean age was 25.8 years (SD = 7.6), and 51% of the participants were female.

Design. In a 2 identifiability (identified vs. unidentified) x 2 background statistics (one victim vs. one out of 20,000 victims) between-subjects design, victim identity was manipulated by randomly selecting half of the participants and presenting them with identifying information about a victim (picture, name, and individuating information) while the other half did not see this information. Presentation of background statistics was manipulated by presenting the victim alone or informing the participants that the victim was part of 20,000 victims in a similar situation. The dependent variables of interest included participants' willingness to contribute (WTC) a real donation to the victim, as well as participants' feelings in regard to the victims and the victim's situation.

Materials and Procedures. The materials to this study were presented as part of a larger survey unrelated to the present experiment. Participants completed a portion of another study and were then paid $14 for their participation together with a charity request letter and an envelope. The experimenter instructed them to read the charity

request letter, fill out several questions on the letter, and return the letter together with any money they wished to donate in the envelope. Participants were instructed to fill out the charity request letter even if they did not want to donate any money, and further requested that they sealed the envelope before returning it. This was done purposefully to minimize experimenter demand effects on participants' donations. The charity request letter used similar information as a study done by Small, Loewenstein, & Slovic (2007), and informed participants that:

> "You have the opportunity to donate any of your just-earned money to the humanitarian aid organization *Save the Children*. Any money that you donate will go toward relieving the severe food crisis in Southern Africa."

Half of the participants were presented with detailed information of the victim, while the other half was only informed that they would be able to donate to "a child in Africa". The detailed information included a picture (used previously by Västfjäll et al., in preparation), the victim's name (Rokia) and age (7 years old). Depending on which condition participants were assigned to, they were then further informed that:

> "Rokia (the child) is desperately poor, and faces a threat of severe hunger or even starvation. Her (his or her) life will be changed for the better as a result of your financial gift. With your support, and the support of other caring sponsors, *Save the Children* will work with Rokia's (this child's) family and other members of the community to help feed her and provide her (him or her) with education, as well as basic medical care and hygiene."

Victim identity (identified vs. unidentified) was crossed with background statistics (one victim vs. one out of 20,000 victims), so that half of the participants were presented with additional information that Rokia (the child) is "one of 20,000 needy children in the same region who are desperately poor..." to increase the dimension of the tragedy. (See Appendix C for details). After reading their respective information about the victim, participants were asked to indicate whether they would be willing to make a financial contribution and, if so, to state the amount. On a second, attached page participants were asked several questions with 7-point Likert response scales that targeted their feelings in regard to the victim and victim's situation (e.g., how much worry and sympathy they felt for the victim). Finally, participants were asked to put the completed

charity request letter in an envelope and return it to the experimenter. After the charity request letter was turned in, the experimenter handed the participants other, unrelated materials to complete (e.g., Lipkus' numeracy scale; Peters et al., 2006). The numeracy scale consisted of 15 questions that test participants' ability to correctly answer mathematical questions related to percentages, fractions, and probabilities. For example, participants were asked to identify which of the following represents a greater risk of getting a disease: 1%, 10%, or 5%. The complete numeracy scale is presented in Appendix C.

Results

     Descriptive and Preliminary Analyses. Of the 168 participants, 113 (67%) donated money to the victim. The percentage of participants who contributed per condition ranged from 64 – 71%, and a χ^2 test of independence failed to reach significance, $\chi^2(1, N=168) = .19$, *ns*. Descriptive analyses showed that several variables of interest were significantly skewed and were therefore non-linearly transformed to conform to the assumptions of normality. Specifically, these variables included participants' WTC scores, sympathy, clear and coherent picture of the victim, the impact of the donation, and numeracy.

     Affect Structure. Before testing the effects of identifiability and presence vs. absence of background statistics on donations and affective reactions, descriptive zero-order correlational analyses were performed (see *Tables 17* and *18*).

Table 17: Means and Standard Deviations of WTC and Affect Variables

	Identified Single Victim (N = 42)		Identified Victim with Statistics (N = 42)		Unidentified Single Victim (N = 42)		Unidentified Victim with Statistics (N = 42)		Totals Across Conditions (N = 168)	
	Means	(SD)	Means	(SD)	Means	(SD)	Means	(SD)	Means	(SD)
WTC	2.76	(4.0)	2.57	(3.0)	3.26	(4.23)	2.38	(3.39)	2.74	(3.7)
WTC[a]	.94	(.84)	.96	(.81)	1.03	(.90)	.86	(.82)	.95	(.84)
Worry	4.3	(1.6)	4.0	(1.7)	3.8	(1.5)	4.1	(1.8)	4.0	(1.6)
Sympathy	5.4	(1.3)	5.3	(1.4)	4.6	(1.7)	5.0	(1.8)	5.1	(1.6)
Sympathy[a]	30.1	(12.8)	30.5	(13.9)	24.3	(14.2)	28.4	(16.4)	28.5	(14.5)
Feel better	3.5	(1.9)	3.1	(1.8)	3.5	(1.7)	2.8	(1.5)	3.2	(1.7)
Anti. Regret	3.8	(2.2)	3.5	(2.2)	4.0	(1.9)	3.4	(2.1)	3.7	(2.1)
Impact	3.1	(1.7)	2.7	(1.4)	3.0	(1.6)	2.5	(1.4)	2.8	(1.6)
Impact[a]	1.3	(.42)	1.2	(.37)	1.3	(.39)	1.2	(.39)	1.6	(.45)
Clear Feeling	3.8	(1.6)	3.8	(1.6)	3.2	(1.7)	3.2	(1.6)	3.5	(1.6)
Coherent Picture	3.6	(1.9)	3.1	(1.6)	2.9	(1.7)	2.6	(1.6)	3.0	(1.7)
Coherent Picture[a]	1.8	(.52)	1.7	(.47)	1.6	(.52)	1.5	(.49)	1.7	(.50)

[a]Non-linearly transformed variable
Note: All variables except WTC were measured on a 1-7 point Likert scale.

Table 18: Correlations Between WTC and Affect Variables

	WTC	Worry	Sympathy	Feel Better	Regret	Impact	Clear Feeling
WTC	1						
Worry	.02	1					
Sympathy	.12	.68**	1				
Feel better	.22**	.31**	.26**	1			
Anticipated Regret	.33**	.29**	.28**	.59**	1	.	
Impact	.26**	.33**	.34**	.43**	.31**	1	
Clear Feeling	.10	.56**	.61**	.28**	28**	.42**	1
Coherent Picture	.16*	.38**	.39**	.66**	.33**	.30**	.47**

* = sig. at p<.05;   ** = sig. at p<.01

Results show that all variables were positively correlated. Of special interest are those affect variables that are thought to measure self- vs. other-focused affect. Participants' sympathy and worry ratings were highly correlated ($r = .68$), as were their ratings of how much better they felt due to donating and their anticipated regret ($r = .59$). Entitativity perceptions, measured by how clear a feeling and how coherent a picture participants had of the victim was also highly positively correlated ($r = .47$), but both variables also highly correlated with the other affect variables.

Similar to Study 1 and Study 2, a principle components analysis was conducted with sympathy, worry, feeling better, and anticipated regret. Results with an eigenvalue above 1 as a criterion reveal two affect components, which account for 82.5% of the variables' variance (see *Table 19*). While all four variables load highly on the first factor, a second factor seems to distinguish between those variables that measure self- vs. other-focused affect.

Table 19: Component Loadings of Affect Variables on Unrotated Affect Factors

Affect Variables:	Affect Component 1	Affect Component 2
Sympathy	.756	-.524
Worry	.776	-.485
Feel better	.720	.541
Anticipated Regret	.727	.526
Eigenvalue	2.2	1.1
Percentage of Variance explained	55.5	27.0

A rotated component solution shows a similar pattern as the principle components analyses in Study 1 and 2 (see *Table 20)*. Specifically, sympathy and worry load highly on the first component ("affect focused on others") and feeling better and anticipated regret load highly on a second factor ("affect focused on self").

Table 20: Component Loadings of Affect Variables on Rotated Affect Factors

Affect Variables:	Other-focused Affect	Self-focused Affect
Sympathy	.909	.140
Worry	.879	.183
Feel better	.150	.888
Anticipated Regret	.165	.882
Eigenvalue	1.7	1.6
Percentage of Variance explained	42.0	40.5

Effects of Identifiability and Victim Number on Donations. A logistic regression analysis was run for each of the four experimental conditions to test whether participants' decision to donate any money at all was dependent on their affective responses. Findings from Study 1 and 2 suggest that the decision to donate anything is more related to self- vs. other- focused affect, which is the reason why only these two variables were used as predictors[30]. Results are shown in *Table 21*, and indicate that self-focused affect is indeed predictive of the initial decision to donate in all conditions. An increase in self-focused affect increases the odds of making a donation. As in the previous studies, other-focused affect did not significantly predict participants' decision to donate.

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[30] Inclusion of the other individual difference variables yielded identical results, but to test the model that the initial decisions to donate are based on affect, only self- and other focused variables are included here. In a full model, none of the other predictor variables (i.e., impact of donation, clear feelings, and coherent picture of the victim) significantly predicted donation choices in any condition.

Table 21: Affective Predictors of Donation Decisions by Condition

Overall Model	Individual Predictors	*Exp(b)*	*Wald*	*p*
Identified Victim χ^2 (2) = 17.5, p < .001	Other-Focused Affect	1.379	.82	.365
	Self-Focused Affect	1.573	8.90	.003
Identified Victim with Statistics χ^2 (2) = 17.2, p < .001	Other-Focused Affect	.989	.01	.970
	Self-Focused Affect	1.792	9.03	.003
Unidentified Victim χ^2 (2) = 5.5, p < .07	Other-Focused Affect	.999	.01	.996
	Self-Focused Affect	1.321	4.18	.041
Unidentified Victim with Statistics χ^2 (2) = 16.8, p < .001	Other-Focused Affect	.627	2.58	.108
	Self-Focused Affect	1.898	8.442	.004

To test the effect of victim identity and background statistics on participants' donation amount, a 2 (identified vs. unidentified) x 2 (one victim vs. one out of 20,000 victims) factorial ANOVA was run on the dependent variables. It was hypothesized that identifying the victim by a picture, name, and age (as was done in Kogut & Ritov, 2005a; 2005b) would increase participants' WTC. Additionally, it was expected that increasing the number of victims by adding statistics (i.e., 20,000 victims) would decrease participants' WTC to the target victim. Contrary to expectations, results show that neither identification of the victim nor the addition of background statistics had a significant effect on WTC (reported in *Table 17*). Furthermore, the predicted interaction also failed to reach significance, all *Fs* (1,164) < 1, *ns*.

Effects of Identifiability and Victim Number on Affect Focused on Others. Similar ANOVAs were run on participants' affective responses to the victim. Of particular interest were feelings that are focused on others (e.g., sympathy and worry about the victims) vs. feelings focused on the self (e.g., regret and feeling better if a donation was made). As expected, participants' sympathy ratings for the victim were higher (*M* = 5.4,

$SD = 1.4$) when identified compared to when she was unidentified ($M = 4.8, SD = 1.7$), $F(1,163) = 4.7, p < .05, \eta_p = .03$. Adding background statistics did not have a significant impact on sympathy ratings, and neither did the interaction between identification and background statistics, $Fs(1,163) < 1, ns$. Participants further reported a higher degree of worrying about the victim in the identified conditions ($M = 4.1, SD = 1.6$) than in the unidentified condition ($M = 3.9, SD = 1.6$), but this difference failed to reach significance, $F(1,162) < 1, ns$. As with sympathy, worry also did not depend on whether background statistics were provided or not, and the interaction between background statistics and victim identifiability was also not significant, $Fs(1,162) < 1.5, ns$. A combination of sympathy and worry showed no significant main effects or interaction, $Fs < 2.1, p > .1$.

Effects of Identifiability and Victim Number on Affect Focused on Self. Similar ANOVAs with feelings focused on the self as dependent variables showed a significant main effect of background statistics on how much better participants felt if a donation was made, $F(1,163) = 4.2, p<.05, \eta_p=.03$. Specifically, participants reported that a donation would make them feel better when the victim was presented without statistics (i.e., by herself) ($M = 3.5, SD = 1.8$) than when statistics were included (i.e., as part of 20,000 other victims) ($M = 2.9, SD = 1.7$). No other effects were significant, $F(1,163) < 1, ns$. Results with anticipated regret as a dependent variable showed similar, but non-significant patterns. A combination of anticipated regret and the extent to which participants felt better due to a donation showed higher self-focused affect when the victim was presented without statistics (i.e., by herself) ($M = 7.4, SD = 3.4$) than when statistics were included (i.e., as part of 20,000 other victims) ($M = 6.4, SD = 3.5$), $F(1,162) = 3.6, p < .06, \eta_p=.02$.

The results of higher self-focused affect when victims were presented without statistics point to the possibility that this type of affect is sensitive to how effective one's donation would be. To test this, participants' impact judgments were analyzed. A 2 (identifiability) x 2 (background statistics) ANOVA with impact judgments as a dependent variable (i.e., how much of an impact a donation would make to the victim's

situation) revealed a marginally significant main effect, so that participants reported their donations to have a greater impact when the victim was presented by herself ($M = 1.7$, $SD = .47$) than when she was presented as part of a bigger group ($M = 1.5$, $SD = .42$), $F(1,156) = 3.0$, $p<.09$, $\eta_p=.02$. This result dovetails with the main effect of background statistics found for self-focused affect. The potential mediating effect of impact judgments on feelings focused on the self was tested with an 2 (identifiability) x 2 (background statistics) ANCOVA, and found that after controlling for the significant effects of impact judgments, $F(1,155) = 36.7$, $p < .001$, $\eta_p = .19$, the main effect of background statistics on feelings focused on the self (i.e., feeling better about the self) was no longer significant, $F(1,155) = 1.3$, $p > .2$, $\eta_p = .01$.

Before testing the hypothesis that affect predicts donations better in the identified conditions (*Hypothesis 3*), a correlational analysis was performed on zero-order correlations between WTC and the individual variables in each of the four experimental conditions[31]. The correlations of each variable with WTC are presented in *Table 22* (means were presented in *Table 17*).

Table 22: Correlations Between WTC and Affect Variables by Condition

	Identified Single Victim	Identified Victim with Statistics	Unidentified Single Victim	Unidentified Victim with Statistics
Worry	.18	.01	-.04	.00
Sympathy[a]	.39*	.14	-.01	.06
Feel better	.45**	.27	.15	.35*
Anticipated Regret	.47**	.45**	.30*	.43**
Impact[a]	.36*	.25	.22	.21
Clear Feeling	.27	.00	-.09	.27
Coherent Picture[a]	.27	.12	.12	.26

* = sig. at p<.05; ** = sig. at p<.01; [a]Non-linearly transformed variable;

[31] For complete correlation tables including the relationship of the affect variables to each other, see Appendix C.

Inspection of *Table 22* shows that feelings focused on the victim (i.e., worry and sympathy) are more positively correlated to WTC when the victim was identified and presented without statistics. Feelings focused on the self (i.e., anticipated regret and how much better participants felt about themselves if they donated), on the other hand, are significantly positively correlated with WTC in all conditions. To test whether victim-focused affect was differentially predictive of WTC while controlling for self-focused affect, separate regression analyses were run in each condition with sympathy and regret as predictor variables and WTC as the dependent variable[32]. Results are shown in *Table 23* and suggest that, when controlling for the impact of regret, sympathy is only predictive of WTC in the identified single victim condition. Anticipated regret, on the other hand, was predictive of donations in all conditions[33]. Thus, it appears as though feelings focused on the self (as measured by anticipated regret) are robust predictors of donations, regardless of victim identifiability or whether statistics were shown. Feelings focused on others (as measured by sympathy and compassion) show a different pattern, and are only predictive of donations when a victim was identified and presented without statistics.

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[32] Using combinations of sympathy and worry as indicators of other-focused affect and anticipated regret and feel better as indicators of self-focused affect revealed that only self-focused affect was predictive of donation amount. However, a more nuanced approach (informed by the main effects identified earlier) with only sympathy and anticipated regret as predictors is presented here.

[33] A similar regression analysis that substituted how much better participants felt if they donated money to the victim for regret showed the same general results.

Table 23: Regression Analyses of Affect Predicting WTC by Identification x Background Statistics

Overall Model	Individual Predictors	β	t	p
Identified Single Victim $F(2,38)=7.3, p < .01,$ $adjR^2 = .24$	Sympathy	.25	1.7	.05 (one-tailed)
	Anticipated Regret	.38	2.5	.015
Identified Victim with Statistics $F(2,38)=4.9, p < .05,$ $adjR^2 = .16$	Sympathy	.06	.4	.688
	Anticipated Regret	.44	3.0	.005
Unidentified Single Victim $F(2,39)\ 2.1,\ \ p> .1,$ $adjR^2 = .05$	Sympathy	-.10	.6	.552
	Anticipated Regret	.32	2.0	.050
Unidentified Victim with Statistics $F(2,39)=4.7, p < .05,$ $adjR^2 = .15$	Sympathy	-.09	-.6	.576
	Anticipated Regret	.46	3.0	.004

Effects of Numeracy. Finally, it was hypothesized that affective responses to the victim depend on participants' numeracy (*Hypothesis 4*). Specifically, it was expected that higher numeracy will lead to more abstract (i.e., System 2) processing of the information and, possibly, less concrete mental representation of the identified victim. To test this, a correlational analysis of identified vs. unidentified conditions[34] was conducted and is presented in *Table 24.*

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[34] Results for presentation of a single victim with and without statistics are presented in APPENDIX C.

Table 24: Correlations with Numeracy for Identified vs. Unidentified Victim

	Identified Victim	Unidentified Victim
WTC[a]	.25*	.13
Worry	-.21	-.07
Sympathy[a]	-.21	-.10
Clear Feeling	-.22*	-.04
Feel better	.07	.05
Anticipated Regret	.08	.01
Impact[a]	-.08	-.19
Coherent Picture[a]	-.31**	.07

* = sig. at p<.06 ** = sig. at p<.01; [a]Non-linearly transformed variable

Inspection of *Table 24* shows that numeracy was only related to donations and entitativity perceptions (i.e., "clear feelings" and "coherent picture") in the identified victim conditions. Specifically, numeracy was positively correlated to WTC, and negatively correlated with how clear a feelings participants had and how clear and coherent a picture they had of the victim. This supports the notion that although higher numeracy may lead to higher WTC, it is also related to a less clear and possibly less concrete representation of the victim. To test this directly, a factorial ANOVA with identifiability (identified vs. unidentified victim) and a median split for numeracy[35] (high vs. low) as between-subject factors was conducted with "how clear and coherent a picture" participants had of the victim as a dependent variable. Results showed that participants in the identified condition ($M = 1.74$, $SD = .49$) had a significantly clearer picture of the victim than those in the unidentified condition ($M = 1.58$, $SD = .50$), $F(1,162) = 4.4$, $p < .05$, $\eta_p = .03$. Furthermore, high numerate participants ($M = 1.58$, $SD = .49$) had a significantly less clear picture of the victim than low numerate ones ($M = 1.73$, $SD = .21$), $F(1,162) = 4.0$, $p < .05$, $\eta_p = .02$. In addition to these main effects, numeracy and identifiability showed a significant interaction, $F(1,162) = 6.6$, $p < .05$, $\eta_p = .04$. Low numerate participants ($M = 1.91$, $SD = .43$) had a clearer picture of the victim compared to high numerate participants in the identified condition ($M = 1.56$, $SD = .46$).

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[35] A median split for numeracy was justified due to its significant skewness (McCallum et al, 2002; Peters et al, 2006).

However, this difference was not present in the unidentified conditions, where high and low numerates had a similarly clear picture of the victim ($M = 1.56$, $SD = .52$; and $M = 1.55$, $SD = .49$. for high and low numerates, respectively). A combination of how clear a feeling and how coherent a picture measured participants' entitativity perceptions, and showed a significant main effects for numeracy and identifiability, as well as a significant interaction. Results showed that participants in the identified condition ($M = 3.58$, $SD = 1.47$) reported significantly higher entitativity perceptions than those in the unidentified condition ($M = 2.97$, $SD = 1.55$), $F(1,163) = 4.9$, $p < .05$, $\eta_p = .03$. Furthermore, high numerate participants ($M = 2.95$, $SD = 1.48$) reported significantly lower entitativity perceptions than participants low in numeracy ($M = 3.56$, $SD = 1.53$), $F(1,163) = 5.9$, $p < .05$, $\eta_p = .04$. In addition to these main effects, a statistically significant interaction was found, $F(1,163) = 5.7$, $p < .05$, $\eta_p = .03$. Inspection of *Figure 7* reveals that low numerate participants reported higher entitativity judgments than other participants. A simple effects analysis showed that when presented with an identified victim, low numerate participants ($M = 4.03$, $SD = 1.38$) reported significantly higher entitativity perceptions than high numerate participants ($M = 2.93$, $SD = 1.37$), $t(81) = 3.6$, $p < .01$. When the victim was unidentified, the difference between high and low numeracy disappeared.
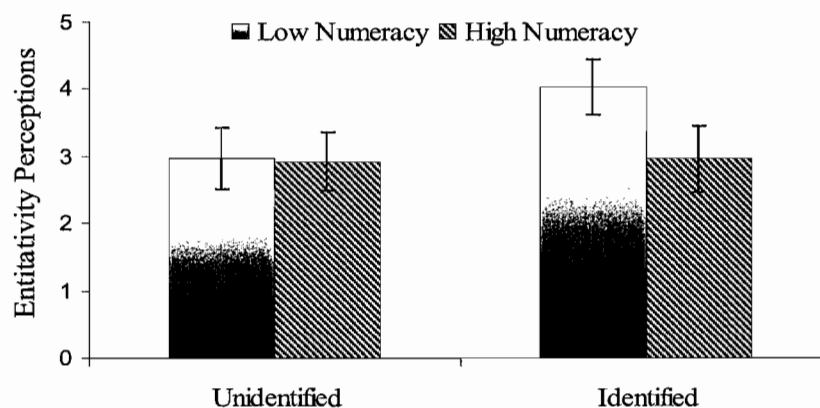
Note: Error bars denote 95% Confidence Intervals.

Figure 7: Entitativity Perceptions as a Function of Numeracy and Identifiability

These results suggest that low numerates' mental representation of the victim is sensitive to the presentation format. Specifically, they seem to be dependent on concrete representations in order to have concrete mental images. High numerate participants, on the other hand, do not show a difference due to identification and their representation of the victim is less influenced by identifying information[36].

While higher numeracy resulted in less concrete representations and lower victim-focused affect, the correlational results presented in *Table 24* further suggest that high numerate people may have donated more money than low numerate individuals. The direct effect of numeracy on participants' WTC was highlighted by separating numeracy scores into four quartiles and performing a linear trend analysis[37] with WTC as a dependent variable. Descriptive statistics for the quartile split are presented in *Table 25*.

Table 25: Descriptive Statistics for Quartile Split on Numeracy

	Lowest Numeracy	Low Numeracy	High Numeracy	Highest Numeracy
Numeracy score	4-10	11-12	13	14-15
N	37	52	44	35
WTC	1.81	2.62	3.22	3.77
Sympathy	5.54	5.21	4.93	4.66

Results of the trend analysis showed a significant linear trend, $F(1,164) = 4.9$, $p < .05$, $\eta_p = .03$, such that as numeracy increased participants donated more money. The differential impact of numeracy on WTC and victim-focused affect was demonstrated by a similar trend analysis with sympathy as the dependent variable. As expected, results showed that as participants' numeracy increased, sympathy for the victim decreased,

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[36] Similar factorial ANOVAs were run for "how clear a feeling" participants had for the victim, and also with variables measuring self- (e.g., anticipated regret and feeling better) vs. other-focused (e.g., sympathy and worry) affect. Results are presented in APPENDIX C, and suggest that self-focused affect does not depend on victim identifiability and participants' numeracy. However, other-focused affect is consistently lower for high numerates compared to low numerates, which supports the notion that high numerates engage less in System 1 processing and have a less concrete picture of the victim.

[37] Analyses that retain the continuous scale of numeracy are congruent with the results of the quartile split, and presented in APPENDIX C.

$F(1,163) = 6.8$, $p < .01$, $\eta_p = .04$, see *Figure 8*). A similar trend analysis with self-focused affect (anticipated regret and feeling better) as the dependent measure was not significant.
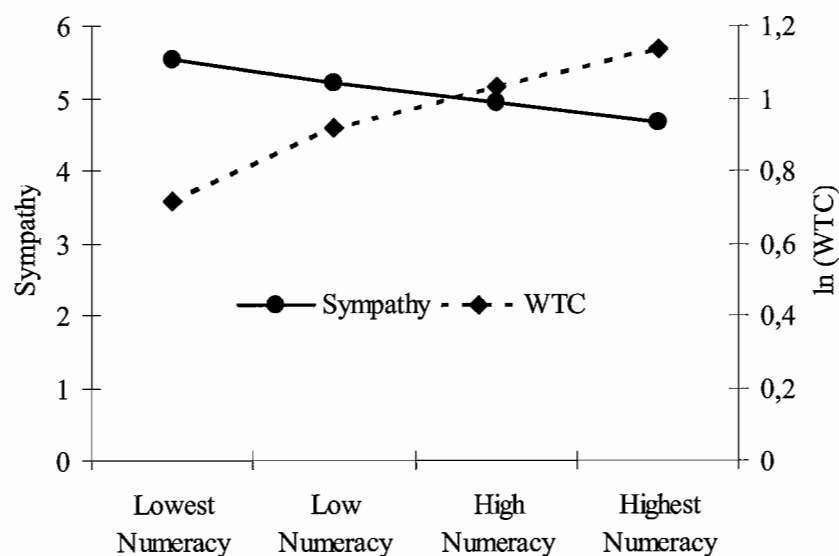
Figure 8: Sympathy and WTC by Numeracy

Discussion

    The main purpose of the present experiment was to test the effects of identifiability and background statistics on participants' use of self- vs. other-focused affect in the decision to donate money to a victim in need. Participants saw one of four conditions, in which a victim was either identified (or unidentified) and either presented by herself or as part of 20,000 other victims similar to her. Results suggest that while these (indirect) manipulations of processing mode had no direct effect on participants' WTC, it did affect participants' feelings focused on the victim. As expected, identifying a victim by name, age, and picture led to higher reported sympathy and worry about the victim. The background statistics manipulation had a significant effect on feelings focused on the self (i.e., anticipated regret and how much better participants felt about themselves if a donation was made), such that participants reported stronger self-focused feelings when the victim was presented alone and not as part of a group.

These results point to the possibility that feelings are more malleable than actual donations, but they also suggest that self- vs. other-focused affect is sensitive to different aspects of the presentation of the victims. While more sympathy is generated for identified victims, presenting a victim singly (as opposed to as part of a group) can evoke stronger feelings of anticipated regret if one doesn't help, and makes people feel better about themselves if they do. Participants also reported that they believed their donation would have a greater impact when the victim was presented by herself (vs. as part of 20,000). After controlling for the effects of how much impact a donation would have, the effect of adding background statistics on self-focused feelings disappeared. Thus, self-focused affect may be sensitive to background statistics due to the fact that these feelings are primarily a motivator to regulate one's own emotional state. If the donation is judged to have little impact, then self-focused feelings are probably not very motivating to help, as the donation is likely not changing how one feels.

The role of impact judgments can also potentially explain why participants did not feel better about themselves for donating to one out of many victims (i.e., to a larger problem). While there are self-focused emotions that can be associated with helping a larger group (e.g., pride), these feelings might be dependent on the donation actually having some impact. The current study found tentative support for the notion that adding background statistics reduced the judged impact of a donation and the associated emotion as well. If a donation is judged to have little impact then donating is unlikely to change one's negative emotional state. However, this also suggests that self-focused affect is not entirely self-focused, but also takes information about the victims and the impact of one's donation into account. Thus, it appears as that both other- and self-focused affect might be sensitive to the state and condition of the victims at least to some degree. As the correlational analyses revealed, self- and other-focused affect variables are usually positively correlated, and it is likely that these two types of feelings inform each other.

While feelings focused on the self depended on the presentation of background statistics, feelings focused on the victim were higher when the victim was identified. Other-focused feelings seem to be sensitive to how tangible and concretely the victim

was presented. An identified victim is more tangible and easier to affectively focus on compared to a nameless and unidentified one.

More central to the discussion of donations and dual information processing in the present experiment, an analysis of participants' decision to donate showed further support for a two-step model by which people decide whether to donate and then construct the donation amount. As found in Study 1 and 2, participants' self-focused affect was predictive of decisions to donate any money at all. After this initial decision, the donation amount was also dependent on victim-focused affect in the condition where information was presented in an affectively salient way. Specifically, victim-focused affect was predictive of donations only when the affective salience of the victim was enhanced by its identifiability and not diminished by adding statistics (i.e., information about a larger group of victims). Thus, the present results extend Small, Loewenstein, & Slovic's (2007) contention that adding statistics changes participants' reliance on feelings in the decision to donate. Results of the current experiment suggest that the type of feelings (self- vs. other-focused affect) is sensitive to different aspects of information processing changes. Other-focused affect (as measured by sympathy and compassion) was dependent on victim identifiability, suggesting presentation of an identified victim results in more affective (i.e., System 1) information processing. Self-focused affect, on the other hand, was sensitive to the addition of background statistics.

Finally, it was expected that people with lower numeric ability process information in a more concrete (and less abstract) way than those with high numeracy. Results confirmed this prediction and showed that low numerate persons had a more entitative perception (i.e., clearer feelings and more coherent picture) of the victim than highly numerate individuals. Moreover, this difference was only significant when the victim was identified, suggesting that high numerate people do not process concrete information in the same way that low numerate people do. It should be noted that while numeracy was negatively correlated with sympathy, it was also positively correlated with donations. Thus, even though individuals with high numeric skill had lower sympathy for the identified victim than people with low numerate skill, they still donated more.

The fact that high numeracy leads to higher donations in spite of the comparatively lower victim-focused affect suggests that high numerate people may not rely as much on this type of affective reaction to concrete stimuli when constructing their donation amount. Specifically, if highly numerate people process information more abstractly, then their System 1 processing may not generate the same emotional reactions for the victims.

An alternative explanation would take into account that high numerate participants are demographically different than low numerate participants. It is possible that prosocial behavior has been modeled by their (probably highly numerate and successful) parents, and that higher contributions from high numerates are a sign of learned behavior in this respect. However, since no data was collected on participants' income or the educational level of their parents, the current study cannot address these speculations.

CHAPTER VII

STUDY 4: SERIAL PRESENTATION

Rationale and Hypotheses

It is common practice by charity organizations to identify single victims in graphical forms (e.g., by pictures). Using this format, several victims are presented one at a time in serial fashion before the potential donor decides whether to make a financial contribution.

While research on donations has started to examine the effect of presenting several pictures of victims, the emphasis is usually on comparing one vs. a group of victims. Kogut and Ritov (2005a, 2005b) compared donations to one vs. a group of victims and found that higher donations and stronger affective reactions for a single picture compared to victims presented in a group picture. However, results do not uniformly support the notion that affective responses towards one target victim are always higher compared to several victims. Specifically, while Kogut & Ritov (2005a) found that a single identified child received higher donations, Hsee & Rottenstreich (2004) did not find a difference in donations for one vs. four pandas when presented as a picture. Furthermore, Studies 1 and 2 in this dissertation also did not find support for single victims receiving higher donations than groups of victims.

Recent research comparing the influence of serial presentation of victims (as opposed to presenting all at once) suggests that affective reactions are stronger for victims presented last in such a sequence (van Boven, SJDM 2007). People's attention seems to be drawn to more immediate information, while information about victims presented earlier might become less accessible over time. Van Boven found that participants displayed an affective 'immediacy bias' and judged a second crisis as more severe than a previously viewed crisis.

However, it is also possible that presenting several victims one at a time (opposed to a group picture) may have the unexpected effect of distracting from the eventual target victim. Small, Loewenstein, & Slovic (2007) found that adding statistical background (with information on a food crisis) to an identified victim reduced donations in comparison to identifying the victim without the added information. These authors speculate that additional (affect-poor) information leads to more System 2 processing and weaker affective responses to the target victim. Evaluation of the identified victim with additional statistical information may reduce caring because it requires analytic and deliberative thought. Study 3 in this dissertation found some support for the notion that affective reactions are dependent on how a victim is presented (e.g., as part of a larger group). The current study will address the question of whether presenting victims one at a time has a similar effect. Instead of adding background statistics, as was done in Study 3, several identified victims will be added prior to presenting a single target victim.

Furthermore, the present study also manipulates the identity of the target by either presenting different victims or presenting the target victim several times before a donation could be made. Keeping the target victim identical while manipulating both the dimension of the tragedy (i.e., number of victims) and the identity of these victims (similar to the victim vs. identical to the victim) un-confounds the effects of changes to the victim number (i.e., one vs. four vs. eight) and the effects of victim identity.

Additionally, the current study investigates whether perceptions of relevance are a critical factor in the decision to donate money. Loewenstein and Small (2007) suggest that donations, as well as emotional responses, are related to how similar victims are to the potential donor. Higher perceived similarity and higher personal relevance judgments are usually expected to lead to more caring about the victims.

The design and manipulation of the current study gave rise to the following considerations regarding hypotheses. The target victim was kept constant in all conditions for purposes of comparisons that are specific to a single victim with and without prior exposure to other victims. Since the target was always the same, it is possible that WTC will not be markedly different for each condition. Furthermore, affect

felt for the victims is also expected not to vary between conditions, as affect elicited by the victim should be the same for identical target victims[38].

However, the main hypothesis of interest for the current study did not concern mean level differences in feelings or donations, but primarily concerned the use of affect as a source of information when it comes to deciding how much to donate towards the target victim. It is hypothesized that affective vs. deliberative information processing depends on the number and identity of the victim. Seeing more victims in serial order might increase deliberative information processing because it allows for comparative evaluations while at the same time taking attention away from the target victim (see Loewenstein & Small, 2007; Slovic, 2007; Small, Loewenstein, & Slovic, 2007, Unger, 1995). Specifically, as found in Studies 1 through 3, it is expected that:

> *Hypothesis 1*: Willingness to contribute will depend on participants' affective responses.

Presenting more victims will lead to less reliance on affect (e.g., sympathy) towards the target victim. Since the target victim is the same in each condition affective reactions are not expected to differ substantially between conditions. However, viewing additional victims in serial order should reduce the impact of sympathy on donations because of a shift towards more deliberative processing. Feelings that are focused on the self, on the other hand, are thought to be more robust against changes in processing mode (e.g., Rossnagel, 2000). The moderating effect of information processing mode on the predictive strength of victim-focused affect on donations is hypothesized to produce the following result:

> *Hypothesis 2*: Affect towards the victim will be more predictive of donations in the single target condition compared to the conditions where additional victims are shown.

The last hypothesis concerns the effect of the identity of the additional victims. It is possible that an effect of presenting these additional victims may be due to their

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[38] It would be possible to expect differences in affect towards the target victim if a sufficient amount of distractor victims was shown to produce compassion fatigue or psychic numbing (Slovic 2007).

different identities. For example, different victims might give rise to comparative processes on affective dimensions. One way to keep the number of victims that are processed constant while manipulating the victim identity is to present the target victim several times before one can make a donation. Presenting the same target victim several times does not give rise to comparative evaluations to other victims, but it may reduce affective processing by increasing the time between forming an affective impression of the victim (when first seeing the target) and making a donation response (after seeing the last target picture). Furthermore, repeated exposure to the same victim may allow participants to become used to the victim and may reduce the use of immediate affective responses in the decision to donate. Additionally, presenting the target victim several times might induce deliberation by counting the number of times the victim appeared (Hsee & Rottenstreich, 2004).

> *Hypothesis 3*: Presenting participants with the target victim several times prior to the elicitation of a donation will decrease affective information processing and reduce the impact that affect towards the target victim has in determining participants' donations.

Method

> *Participants.* One-hundred and thirty-three undergraduate students at the University of Oregon took part in this study. The mean age was 22.7 years (SD = 1.8), and 54% of the participants were female.

> *Design.* In a between-subjects design, presentation frequency of victims was manipulated in four conditions (single picture, four different pictures, eight different pictures, and eight identical pictures). The main dependent variables of interest were willingness to contribute (WTC) a (hypothetical) financial donation to a victim in need, and several affect measures relating to the target victim (including sympathy, worry, how much donating would make the participant feel better, and how relevant the story of the victim was to the participant; see Appendix D for details).

Materials and Procedure. Participants were randomly assigned to one of four presentation frequency conditions (single picture, four different pictures, eight different pictures, and eight identical pictures). In the second and third condition (i.e., four and eight different pictures), participants saw the additional victims (3 or 7) before seeing the target picture. In the fourth condition (i.e., eight identical pictures), the target picture was presented 8 times. Pictures were shown on a computer screen viewed at approximately 70 cm distance and pictures size was 4.5° at 1024 x 768 pixel screen resolution. Pictures appeared at different locations on the screen and participants had to click on a button to view the next picture. The target picture was always the last picture shown and the same in all conditions. A graphical representation of the design is depicted in *Figure 9*.
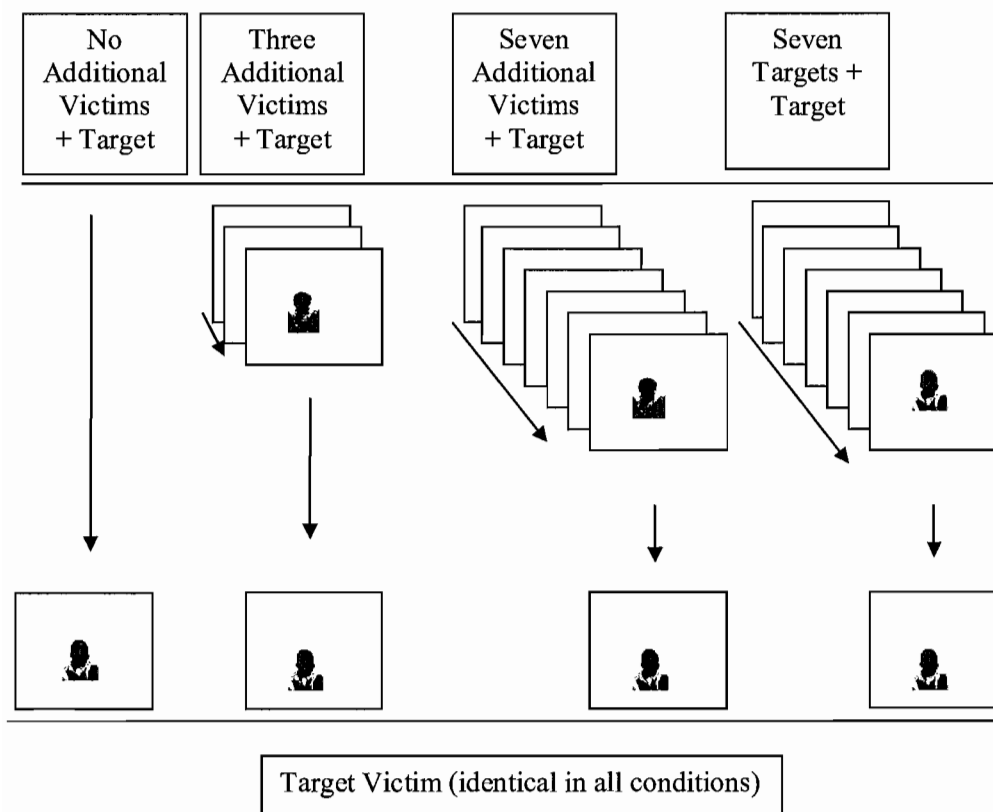

Figure 9: Serial Presentation Study Design of Study 4

To reduce carry-over and contrasts effects from the other victims to the target victim, the order of the additional victims was counterbalanced in the conditions where four and eight different victims were shown. The last condition (eight sequential presentations of the target) served as a control condition for the condition with seven additional victims, and was included to allow for separate conclusions about the impact of victim number and identity.

Before participants saw any of the pictures, they read a short cover story about living conditions of children in Mali, Africa, and were told that they might have the possibility to donate money towards one of these children:

> In Mali, Africa, severe rainfall deficits have resulted in a sharp drop in maize production for 2006. The resulting food shortage has especially impacted the quality of life for the children in Mali, who are facing the possibility of starvation. To alleviate the food shortage, the organization "Children in Africa" is pairing individual sponsors with specific children in need of help. Imagine that you have the possibility to contribute a donation to one of these children.

Participants in the conditions with four different pictures, eight different pictures, and eight identical pictures were further informed that they will now see "some children that are in need of contributions and that [they] may be able to contribute to one of them". Participants in the single target condition did not see this statement. The target picture appeared always last in all conditions (in the single target condition it was the only picture that appeared), and was accompanied by identifying information about the victim: "This is Moussa, a 5-year old boy from Mali. Any money that you donate will go directly to the effort to help feed Moussa." Participants were then asked whether they would be willing to donate money to help feed Moussa, and if so, to indicate the (hypothetical) amount. Finally, participants answered a series of affect-related questions about the target victim and his predicament on a 7-point Likert scale anchored by "not at all" and "very much". Specifically, these affect-related questions were (1) how much emotion they felt while reading Moussa's story, (2) how worried they were about Moussa, (3) how much sympathy and compassion they had towards Moussa, (4) how close they felt towards Moussa, (5) how much donating would make them feel better, (6)

how much donating would help, and (7) how relevant the story is to them (see Appendix D for details).

Results

    Descriptive and Preliminary Analyses. To test for possible order effects of the additional victims, a one-way ANOVA was conducted on WTC and affect ratings for the target victims. Results showed that victim order did not influence donations or affective ratings for the target victim (all $Fs < 2, ps > .1$). Therefore, WTC ratings were combined across the different presentation orders within each condition, and affect ratings as well. Willingness to contribute (WTC) ratings were significantly positively skewed, and were winsorized (less than 5% of the data) and then log-transformed.

    Affect Structure. Before testing the effect of serial presentation of additional victims on WTC, the underlying structure of the affect variables was investigated. Descriptive analyses revealed that two variables (how close participants felt toward the target victim and how relevant the victim's story is to the participants) were significantly positively skewed. This positive skew is at least partially the result of the majority of participants indicating that they did not feel close to the target victim and did not think the story was relevant to them ($M_{Close} = 1.07$ and $M_{Relevant} = 1.71$ on a 1-7 point Likert scale). These two variables were nonlinearly transformed (log-transformed and square-rooted for "closeness" and "relevance", respectively) to reduce skewness and all further analyses were performed with these transformed variables. Correlational analyses were then conducted to investigate the relationship between the different affect variables and WTC[39]. Results are presented in *Tables 26 and 27*.

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[39] For correlations between the individual affect questions and WTC by condition, please see Appendix D.

Table 26: Means and Standard Deviations of WTC and Affect Variables

	N	Mean	Standard Deviation
WTC	133	20.93	27.86
WTC[a]	133	2.05	1.66
Emotion intensity while reading victim's story?	132	2.87	1.55
Worry, upset, and sad	132	2.38	1.57
Sympathy and compassion	131	3.63	1.56
Feel better if donation is made	132	2.57	1.92
How much donation would help	132	2.64	1.70
Closeness to victim	131	1.07	1.29
Closeness to victim[a]	131	.56	.55
Relevance of story to self	131	1.72	1.50
Relevance of story to self[b]	131	1.11	.70

[a]Log-transformed variable [b]Square-rooted variable
Note: All variables except WTC were measured on a 1-7 point Likert scale.

Table 27: Correlations Between WTC and Other Variables

	WTC[a]	Emotion intensity	Worry	Sympathy	Feel better	Donation help	Closeness
WTC[a]	1						
Emotion intensity	.39**	1					
Worry	.39**	.72**	1				
Sympathy	.39**	.71**	.61**	1			
Feel better	.39**	.44**	.57**	.53**	1		
Donation help	.39**	.31**	.42**	.29**	.44**	1	
Closeness	.32**	.42**	.44**	.32**	.51**	.44**	1
Relevance	.25**	.36**	.44**	.38**	.43**	.22*	.53**

** $p<.01$ **$p<.05$ [a]Log-transformed variable
Variables in order: Willingness to contribute; Emotion intensity while reading victim's story?; Worry, upset, and sad; Sympathy and compassion; Feel better if donation is made; How much a donation would help; Closeness to victim[a]; Relevance of story to self[a]

Inspection of these correlations reveals that all affect variables, as expected, are positively correlated with WTC ($.25 < r < .39$). Closer examination reveals that some affect variables are differentially correlated with each other. Specifically, emotion intensity, worry, and sympathy are highly correlated amongst themselves ($.61 < r < .72$)

and to a somewhat lesser degree with the other affect variables ($.29 < r < .57$). To test whether self- vs. other-focused affect showed the same structure as in studies 1-3, a principal components analysis with varimax rotation was conducted. Specifically, using similar variables as in the previous studies, a principle components analysis with sympathy, worry, and how much better participants anticipated to feel after donating was conducted. A two-factor solution with eigenvalues above 1 revealed that the first rotated component (other-focused affect) accounted for 46% of the variance of these affect variables, while the second rotated component accounted for 41%. The component loadings (i.e., the proportion of each variable's variance that is accounted for by the principal components) are represented in *Table 28*, and suggest sympathy and worry about the target victim are best explained by a different affect component than judgments of how much better participants would feel. However, it should be noted that "worry" loads highly on both components, albeit stronger on the first. Based on these results sympathy and worry were combined into one variable measuring other-focused affect, and the extent to which participants anticipated to feel better after a donation was taken as an indication of self-focused affect.

Table 28: Component Loadings of Affect Variables on Other- and Self-Focused Affect Components

Affect Variables:	Other-focused Affect	Self-focused Affect
Sympathy	.927	.229
Worry	.675	.549
Feel better	.271	.938
Eigenvalue	1.4	1.2
Percentage of variance explained	46.1	41.1

Effects of Frequency Manipulation on WTC and Affect. Inspection of the number of participants who donated showed that the percentage of participants who chose to donate money was between 64.4%-70.4%. A goodness of fit χ^2 test of equal proportions revealed no effect of condition on the number of participants who contributed, $\chi^2(3, N = 133) = .46$, *ns*. To determine whether self- vs. other-focused affect towards the victim

predicted participants' initial decision to donate any money, a logistic regression was run for each of the four experimental conditions (see *Table 29*).

Table 29: Affective Predictors of Donation Decisions by Condition

Overall Model	Individual Predictors	*Exp(b)*	*Wald*	*p*
No Additional Victims + Target $\chi^2(2) = 13.1, p < .001$	Other-Focused Affect	1.951	3.86	.050
	Self-Focused Affect	1.430	.68	.411
Three Additional Victims + Target $\chi^2(2) = 18.2, p < .001$	Other-Focused Affect	1.448	1.51	.220
	Self-Focused Affect	2.263	3.98	.046
Seven Additional Victims + Target $\chi^2(2) = 1.7, p > .4$	Other-Focused Affect	1.047	.06	.802
	Self-Focused Affect	1.298	.90	.343
Seven Targets + Target $\chi^2(2) = 8.5, p < .05$	Other-Focused Affect	1.195	1.05	.305
	Self-Focused Affect	1.354	1.799	.180

While feelings focused on others are significantly predictive of participants' decision to donate in the condition where only a single target victim was presented, feelings focused on the self are predictive of the initial decision to donate when three additional victims were presented. In both conditions, stronger affective reactions led to higher likelihood of participants donating. In the conditions where eight pictures were shown (seven additional victims + target, and seven targets + target), neither self- nor other-focused affect predicts the choice to donate any money.

To see whether the donation amount was dependent on sequential presentation and number of victims, a one-way Analysis of Variance (ANOVA) was run on participants' responses in each of the four conditions. As expected, results indicated that WTC did not differ by frequency condition, $F(3,129) < 1$, *ns*. Inspection of the means

shows that participants' hypothetical contributions to the target victim are virtually the same in all conditions (see *Figure 10*).
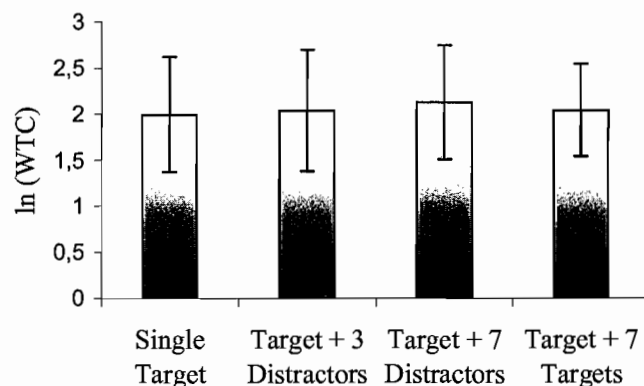
Figure 10: WTC by Serial Presentation Condition

To examine whether this pattern of results was mirrored by participants' affective responses, two univariate ANOVAs were run with affect focused on the self ("feel better") and on others (i.e., "sympathy" and "worry") as the dependent variables. Results show that neither of them was dependent on condition, $Fs < 1$, *ns*. Thus, both WTC and affect were not significantly different for each of the four frequency conditions. This is not particularly surprising given that the target victim was the same in all conditions. However, it was also hypothesized that as the frequency of additional victims increases, participants would process information more with System 2 and base their decisions less on System 1-dependent affective responses (i.e., sympathy).

To test this hypothesis, separate regression analyses were run with self-focused and other-focused affect as predictor variables and WTC as the dependent variable[40].

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[40] Another analysis strategy combines all the affect variables into three different, theoretically informed factors: (1) affect focused on others (sympathy and worry), (2) affect focused on the self (feeling better due to donation and how much a donation would help), and (2) personal relevance (relevance and closeness to victim). Results for this analysis are generally similar to the here presented findings regarding the effect of sympathy on donations, and are presented in Appendix D.

Results for the regression analysis are depicted in *Table 30* and zero-order correlations are presented in *Table 31*.

Table 30: Regression Analyses of Affect Predicting WTC by Condition

Overall Model	Predictors	β	t	p
Single Target $F(2,24) = 7.2, p<.01,$ $_{adj}R^2=.35$	Other-focused Affect	.66	3.6	.002
	Self-focused Affect	-.06	-.3	.76
Three additional victims + Target $F(2,26) = 17.7,$ $p<.001, _{adj}R^2=.55$	Other-focused Affect	.37	2.0	.059
	Self-focused Affect	.45	2.5	.021
Seven additional Pictures + Target $F(2,28) = 1.1, p>.3,$ $_{adj}R^2=.01$	Other-focused Affect	.09	.42	.677
	Self-focused Affect	.21	.97	.339
Eight Targets $F(2,36) = 2.9, p<.07,$ $_{adj}R^2=.08$	Other-focused Affect	.26	1.3	.195
	Self-focused Affect	.12	.6	.548

Table 31: Zero-Order Correlations Between WTC and Affect Components by Condition

	Single Target	Three Additional Victims + Target	Seven Additional Victims + Target	7 Targets + Target
Other-focused Affect	.63**	.69**	.21	.34*
Self-focused Affect	.28	.71**	.27*	.31*

** p<.01   **p<.05

Careful inspection of *Table 30* shows that the regression models differ in their predictiveness of donation amount. Self- and other-focused affect are better predictors of donation amount when the total number of victims did not succeed four, while the adjusted R^2-values are smaller for the conditions where a total of eight victims was shown. The regression results for the individual predictors (i.e., self- and other-focused

affect) support the hypothesis that affect focused on the victim is most predictive of WTC when only the target victim was presented to the participants. The predictive strength of victim-focused affect declines as more victims are shown prior to the target victim. This is in line with results from Study 3, which suggest that identified victims who are presented without statistics or additional (potentially competing) victims are more affectively processed, which increases the relationship between victim-focused affect and donations. However, it should be noted that victim-focused affect is not predictive of WTC when the target picture was shown a total of eight times. This is tentative evidence that the number of exposures to any victims (regardless of victim identity) prior to seeing a target victim can be distracting and have a detrimental effect on the degree to which victim-focused affect is related to participants' decisions to donate.

Discussion

The current study manipulated the number and identity of additional victims (i.e., pictures of victims who participants are not able to donate money to), and investigated participants' use of affect in the decision to make a hypothetical donation. Results showed that no main effects of the manipulation existed on either WTC or affective responses. This is not surprising as the target victim was kept constant across conditions and participants. It is likely that presenting other victims prior to the target victim was too subtle a manipulation to change participants' donations and affective reactions.

An investigation of whether affect was predictive of the decision to donate revealed that higher victim-focused affect increased participants' likelihood of donating when only the target was presented, while higher self-focused affect increased this likelihood only when a few additional victims were presented before the target victim. Studies 1 – 3 showed that self-focused affect was more important than other-focused affect in the initial decision to donate, and the current results only partially support this claim. It seems more likely that the decision to donate is dependent on how the victims are presented (i.e., with or without prior-shown victims).

As expected, participants' affective responses were differentially predictive in the different conditions. Specifically, sympathy and worry for the victim was predictive of donations when no additional victims were shown, and as the number of victims increased the relationship between victim-focused affect and donations decreased. Moreover, affect focused on the victim was also not predictive when the target picture was shown several times before participants were able to specify a donation. Thus, it appears as though presenting any picture a sufficient number of times prior to the victim can have this effect.

Conversely, affect focused on the self (i.e., how much a donation would make participants feel better) shows a different pattern: when controlling for victim-focused affect, it was only predictive of donations when a few additional victims were shown. An explanation of the differential predictive strength of victim-focused affect needs to take into account the differences in information processing in each condition. Specifically, when additional victims were shown, participants were able to engage in comparative evaluations, which are likely to induce more deliberative processing (e.g., Small, Loewenstein, & Slovic, 2007).

In contrast to the conditions with additional victims, no direct comparative evaluations were possible in the conditions where only the picture of the target victim was shown. When the target victim was shown only once, victim-focused affect was more predictive of donations than when the target victim was shown eight times. This difference can be explained by the fact that presenting the target victim several times might have induced less affective and more deliberative processing by causing participants to count the number of times the victim appeared (Hsee & Rottenstreich, 2004) and also increased the time between the first exposure to the victim to the time participants could make a donation. Increasing the time between first exposure and evaluation is likely to reduce reliance on affective reactions (e.g., Slovic, Finucane, Peters, & MacGregor, 2002, VanBoven, SJDM 2007). Additionally, the results showed that affect was less predictive of donations when several victims were shown, regardless

of the type of affect and the kind of victims (e.g., whether one target was preceded by seven additional victims or by seven targets).

In sum, the present study provides support for differential use of affect depending on the kind of information processing used in the decision to help a single victim in need. Results suggest that showing pictures of additional victims in serial order increases deliberative processing and reduces the impact of other-focused feelings on people's willingness to make a financial contribution to a single identified target. Together with Study 3, the current study suggests that indirect (and subtle) manipulations of information processing have a greater impact on the link between other-focused affect and donations than on mean-level changes of affect per se. Specifically, no main effects of victim number or identifiability manipulations were found in either study, but increased deliberation had a deleterious effect on the relationship between sympathy and donations.

An important limitation of the current study is that it is not clear how participants represented the additional victims shown prior to the target victim. The design of the study did not allow testing participants' perceptions of the additional victims, and it is quite possible that although they were presented serially they could be represented by a single average image or value. If this is the case, then substantial variations in sympathy judgments of the additional victims could influence perceptions of the target victim. It is likely that information about the other victims influences participants' ratings of the target, and contrast or carry-over effects are to be expected. However, the present design attempted to minimize these biasing effects by randomizing the order of the additional victims prior to the target victim.

CHAPTER VIII

STUDY 5: ATTENTIONAL MECHANISMS

Rationale and Hypotheses

Research shows that affective reactions towards identified victims are usually more intense and meaningful compared to unidentified victims or statistics (e.g., Small, Loewenstein, & Slovic, 2007; Kogut & Ritov, 2005a, 2005b). Information about the victim is processed more affectively when victims are shown in vivid and concrete form (e.g., with a picture). Furthermore, sometimes pictures of single individuals produce more intense affective responses (and higher donations) than pictures of several victims, and guide donation behavior.

As shown in studies 1 – 4, information processing mode can influence people's affective responses to identified and affectively vivid victims. Depending on the level of detail with which pictures are encoded, fewer pictures are arguably easier to process than several of them. Thus, it is likely that a single picture is less effortful to process (i.e., encode, retrieve, and judge) than a group picture, given that the level of detailed encoding remains constant.

Research on the perception of groups of stimuli suggests that we are quite able to estimate average quantities (such as average height or size), but not as good in recognizing individual members (Ariely, 2001). It is possible that the quantity of information about a group is compressed and transformed into an average across the group. Seminal research on abstraction of visual patterns into prototype formations suggests that people are efficient in learning about visual prototypes and able to abstract the visual information (Posner & Keele, 1968). However, when presented with a picture of a group of people in need, it is not clear what kind of visual information about the individual members is abstracted, and how it is used to form an affective impression of either the individuals or the entire group.

Hamilton and Sherman (1996) point out that individuals are often seen and processed as a coherent psychological unit, whereas groups are seen as more diverse and less unitary (i.e., entitative). They propose that different processes are involved in personality judgments that are made online (i.e., while a target is perceived) vs. those that are based on memory. Online impression formations are most likely to occur when the target is perceived to have high entitativity (Hastie & Park, 1986), which should lead to integrative encoding of the targets' characteristics (McConnell, Sherman, &Hamilton, 1997). Targets low in entitativity (such as a group), on the other hand, should lead to impression formations that are made based on memory retrieval of their social aspects (e.g., dispositions and behaviors). Support for this was found by McConnell et al. (1994) and Srull, Lichtenstein, and Rothbart (1985), who found better recall of behavioral aspects of individuals compared to group targets.

An additional mechanism that may play into these entitativity judgments may be whether people pay attention to the target (Slovic, 2007). Visually more complex stimuli (e.g., such as a picture of a group of victims) have more information and might require more cognitive resources to process than relatively simple stimuli (e.g., a picture of only one victim). The complexity of the stimuli might impact both entitativity judgments as well as affective reactions. It is of note that these affective reactions may occur at several different stages, even quite early in the information processing stream. For example, an affectively salient stimulus is able to direct people's attention even before conscious recognition, and then influence subsequent processing involved in the evaluation of the information (Vuilleumier, 2005).

Some evidence exists that that visual attention plays an important role in the generation of emotions for single and group targets. For example, Fenske and Raymond (2006) report that stimuli that are actively inhibited and not attended to are affectively devalued. Specifically, human faces that were outside the spatial focus and served as distractor stimuli to a target stimulus were judged to be less trustworthy compared to target stimuli. This suggests that a single target within the spatial focus is processed differently than distractor stimuli, and possibly differently when presented alone

compared to when it is presented next to other stimuli. The implications for research on donations is two-fold: First, it seems likely that presenting a group of victims in a picture makes it more difficult to focus on any single individual and that this lack of visual attention leads to lower sympathy. Second, while scanning a group picture it is possible that victims outside the spatial focus are devalued on an affective dimension.

In sum, research from several different lines of research suggests that information about groups vs. individuals seems to be processed differently on cognitive and emotional levels (e.g., Ariely, 2001; Hamilton & Sherman, 1996; Kogut & Ritov, 2005a, 2005b). Judgments about single targets are often made online and based on coherent and unitary individuating information. Judgments about group targets, on the other hand, seem to be based more on memory representations. Furthermore, targets presented among other, distractor stimuli are more difficult to focus on. This should result in less concrete, emotional (i.e., System 1) processing than when targets are presented by themselves. Based on this reasoning, the following hypotheses concerning affective processing towards visually presented victims were made:

> *Hypothesis 1a & 1b*: Visual distractors negatively influence the attention needed to generate sympathy towards the target victim. Sympathy is therefore expected to be higher for a single target victim presented alone compared to a target victim presented among other, distractor victims. The distracting effect of other victims is predicted to occur when participants are able to specifically focus on the target and form an online impression as well as when they are unable to focus and make sympathy judgments from memory.

> *Hypothesis 2*: Emotional reactions are hypothesized to be stronger when forming an online impression. This should particularly be the case when victims are flanked by other, distractor victims. Therefore, it is predicted that participants will report higher sympathy for individual victims when forming an online emotional impression compared to when forming the emotional impression from memory of the victim.

Hypothesis 3: Directly comparing emotional reactions for a single vs. a group of

victims should reflect the joint evaluation mode and reveal greater sympathy for

the group (Kogut & Ritov, 2005b).

Method

Participants. A total of 61 participants completed the experiment. The average

age was $M = 21.9$ ($SD = 4.5$) and were 79% female. All participants had normal or

corrected-to-normal vision.

Design and Materials. Two independent variables (cue type and number of

victims) were manipulated in a fully factorial within-subjects design. Cue type consisted

of three levels (seeing a spatial cue before presentation of the picture(s), seeing a spatial

cue after presentation of the picture(s), and presentation of the picture(s) without a spatial

cue). Number of victims was manipulated by showing one vs. eight pictures of the target

stimuli. The primary dependent variable was sympathy ratings for the target stimuli.

Reaction times for these sympathy ratings were also recorded. *Table 32* details the

conditions of the factorial design.

Table 32: Factorial Design for Study 5

	Cue Before Picture	Cue After Picture	No Cue
Single Picture	Cell 1	Cell 3	Cell 5
Eight Pictures	Cell 2	Cell 4	Cell 6

A total of eight victim pictures (four female children and four male children) were

used for this study (taken from Kogut & Ritov, 2005a, 2005b). The pictures were

presented so that participants saw each picture an equal number of times in each of the

cue conditions ("cue before pictures", "cue after pictures", and "no cue"). In the first two

cue conditions (i.e., "cue before picture" and "cue after picture"), pictures were either

presented by themselves (i.e., "single picture") or among seven other, distractor victims

(i.e., "eight pictures). For cells 2 and 4, it is important to note that although eight pictures

were shown on the screen, only one picture denoted by the cue was actually the target. In

cells 1 through 4, each of the eight possible pictures from Kogut and Ritov (2005a,

2005b) served as the target victim twice, resulting in 64 trials[41]. In the "no cue" condition, pictures were not preceded or followed by a cue. Cell 5 was identical to cells 1 and 3, with the exception that no cue was shown. When eight pictures were shown in the "no cue" condition (cell 6), all of them constituted the targets and sympathy was judged for all of them together. Thirty-two trials were run in the "no cue" condition, 16 in cell 5 and another 16 in cell 6, which resulted in 96 total trials for each participant. All 64 total trials in cells 1 – 4 were run before the 32 trials in cells 5 and 6.

The 96 total trials were split into 48 pairs of the same cue type ("cue before pictures", "cue after pictures", and "no cue"). These pairs consisted always of one picture presented alone and another picture flanked by the other seven pictures. The pairs were nested in each cue condition, so that if the first picture of a pair was presented after the spatial cue appeared, then the second picture of that trial was also presented after the spatial cue. Similarly, if the first trial of a pair was presented before a cue appeared, then the second picture was also presented in the same cue condition and presented before the cue. A schematic of a segment of the experiment (cells 1 and 2) is presented in *Figure 11*:
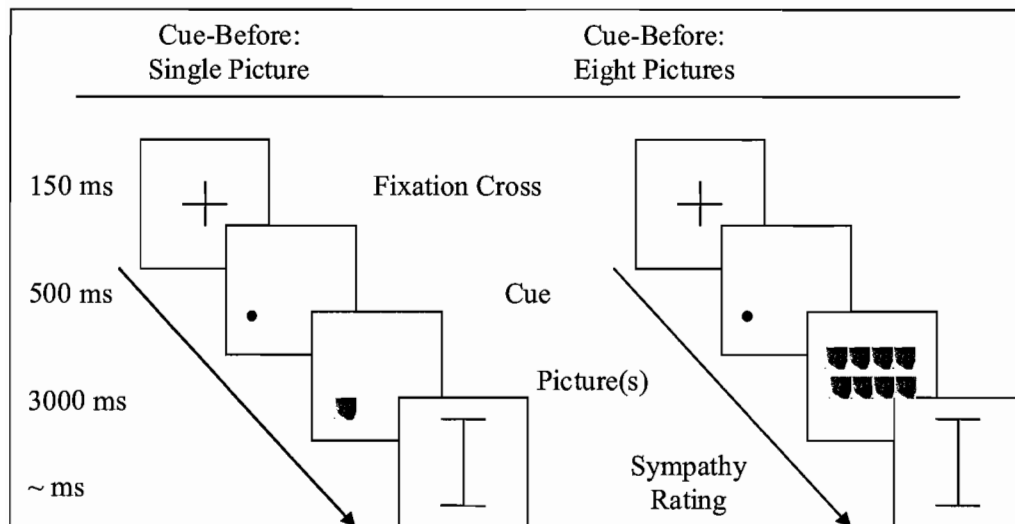

Figure 11: Design Schematic (Cue-Before Pair) for Attentional Mechanism Study

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[41] Eight pictures x two times the target x four cells = 64 trials.

After making their sympathy judgment for the first trial of each trial pair, participants' response was marked as an anchor on the sympathy scale during the second trial. This ordering of the trials and carrying participants' responses over to the second trail of each pair was designed so that differences between conditions would not be a chance product. Instead, finding differences in spite of the close proximity of the same cue type for each trial pair would be more likely due to the manipulations of number of victims (i.e., presence or absence of distractor victims). The experiment was designed so that the trials in the cue conditions (cue preceding or following the pictures) were presented prior to the no cue conditions..

Apparatus and Procedure. Participants were seated 65cm in front of a 17" computer screen (screen resolution = 1024 x 768). At the beginning participants were informed that they will see a number of children in need of a financial contribution due to a life-threatening disease at a local hospital. They were informed that they would see sometimes see an individual child and other times several children, and that they would see each child more than once. Participants were further informed that the child that elicited the highest average sympathy would possibly receive a donation from the experimenters on behalf of the participants. The experimenter explained the task to the participants and started the practice trials. The practice trials resembled the actual experimental trials except in two details: 1. instead of pictures of children the practice targets were squares and circles, and 2. instead of sympathy ratings participants had to judge how much they liked the target stimuli. After the practice trials the instructions for the experiment were presented on the computer screen and the experimenter made sure that the instructions were understood before starting the experiment. Either before or immediately after a picture of the child came onto the screen participants saw a red dot which denoted the spatial location to focus on in order to see the target picture on the screen. After seeing the target picture, participants rated how much sympathy they felt, using the mouse to indicate their sympathy on a sliding scale. Each trial started with a fixation cross which was presented for 150ms at the middle of the screen. Then participants either saw a red dot cue (size = .5°) or one or eight pictures (size = 4.5°).

There were eight locations on a vertical line in the middle of the screen, one for each picture. Each picture always appeared in the same space. The dot cues were always presented at the center of the space of the pictures. Dot cues were shown for 500ms, pictures for 3000ms, and between dots and pictures a 150ms blank screen was interleaved. After this blank screen participants saw a vertical sliding scale (300 pixels = 8.7°) with a vertically movable cursor on it, which responded to movement of the mouse. The vertical scale was anchored by "Very much sympathy" and "No sympathy at all", to indicate the level of sympathy felt by the participants. Once they moved the cursor and clicked on the mouse button to indicate their sympathy level, the next trial started. The presentation of the pictures followed the above described pattern of trial pairs nested in each condition. The actual order of pictures presented was determined with a Latin-square to ensure that any effect of picture order on sympathy would be counterbalanced. After 64 trials (2/3 of the experiment) participants saw another instruction screen informing them that now they would see the same children again but without cues. When only one picture was shown they were to rate their sympathy towards that single child, and when all eight were shown they were to rate their overall sympathy towards the group. They were further informed that these group ratings would go towards their average sympathy rating for each child. The experiment stopped after 96 trials and participants filled out a demographics sheet, were debriefed, and thanked for their participation.

Results

  Descriptive Analyses. A preliminary descriptive data analysis inspected each participants' reaction times for each trial. Three participants had unusually fast average reaction times (less than 1000ms) and were deleted from the data analysis. The data for the remaining 58 participants was split by cue type (cue before, cue after, and no cue) and by number of victims.

  Sympathy Ratings. Recall that the cue trials (cue before and cue after) consisted of pairs in which one trial featured a single victim and the other eight victims. For the

cue trials, participants always rated only one victim (because only one cue appears per trial). When only one victim was shown, sympathy ratings were specific to that victim. When eight victims were shown but either preceded or followed by a cue, then the victim that appeared in the location of the cue was the target and the others assumed a distractor role. Average sympathy ratings for the first four conditions (cells 1 – 4 in *Table 32*) are depicted in *Figure 12*. Sympathy ratings could range from "no sympathy at all" (Sympathy score = 0) to "very much sympathy" (Sympathy score = 300).
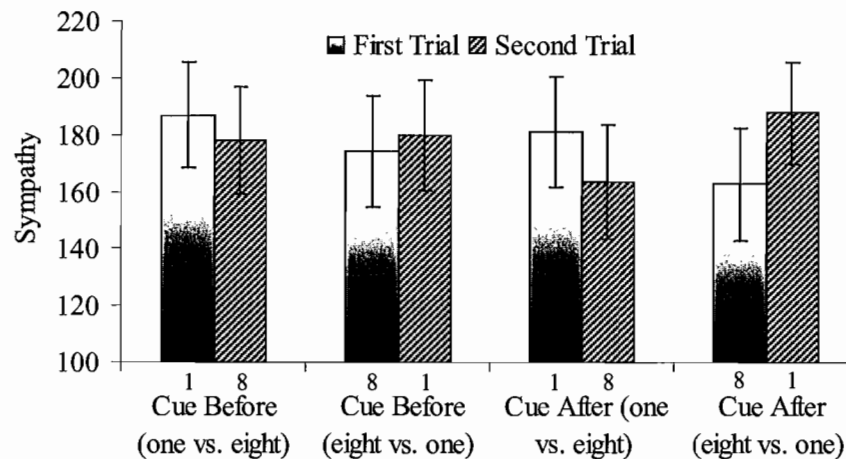
Note: Error bars denote 95% confidence intervals.

Figure 12: Mean Sympathy Ratings for Cue Conditions x Trial

Each pair of bars in *Figure 12* represents a specific trial pair type. There are two basic trial pairs possible from the employed design: Either the first trial is a single target picture presented by itself (e.g., bars 1, 4, 5, and 8 in *Figure 12* denote trials where a single victim was presented without distractors), or it is one target out of eight pictures (bars 2, 3, 6, and 7 in *Figure 12* denote trials where one victims was presented among seven distractor victims). For example, the first two bars depict the first and second trials in the "Cue-Before" condition that featured trial pairs which consisted of first showing one picture (single victim), and on the following trial showing a target as part of eight pictures. Inspection of this type of trial pair in *Figure 12* suggests that when cues

preceded the pictures, a single target received higher sympathy ratings than one out of eight targets. It is important to note that the order of the trials within each pair (i.e., whether the single picture was shown on the first trial or the second) did not make much difference in the direction of the effect. Sympathy for a target victim presented alone was higher compared to a target victim flanked by other victims regardless of trial order (i.e., in *Figure 12*, bars 1 and 4 are higher than bars 2 and 3, respectively). Similarly, when the cue was shown after the presentation of the pictures ("Cue-After" condition), this difference between trials was even more pronounced than in the conditions where cues were shown before the pictures.

Inspection of the no cue conditions (cells 5 and 6 in *Table 32*), which presented either one target victim or all eight targets at the same time shows that eight victims received higher sympathy ratings than single victims. This difference in sympathy did not appear to be trial-order specific, since ratings for eight victims are higher than ratings for single victims regardless of whether the eight victims were shown before (i.e., trial 1) or after (i.e., trial 2) the single target (see *Figure 13* for details).
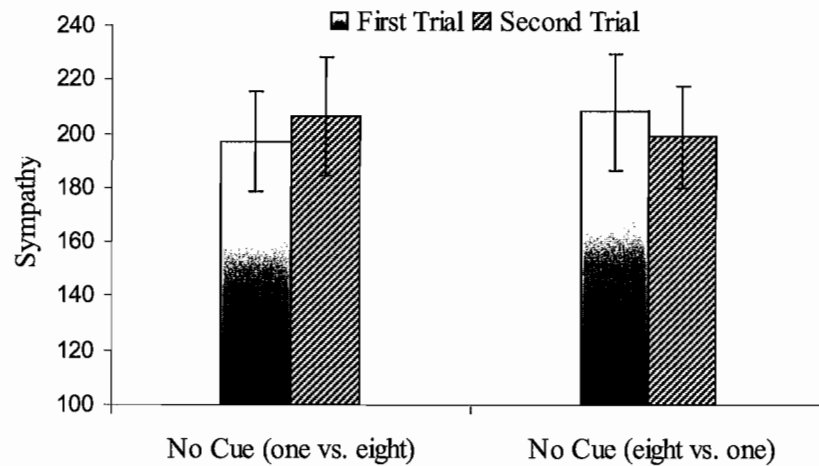
Note: Error bars denote 95% confidence intervals.

Figure 13: Mean Sympathy Ratings for No Cue Conditions x Trial

Given that the order of the trials did not appear to be of importance to participants' sympathy ratings, trials in the same condition were collapsed across order for the following analyses. Collapsing across order resulted in one measure of sympathy for each of the six different trial types (reported in *Table 32*). These data are presented in *Figures 14* and *15*. Note that the general pattern is similar to the data that was split for trial order (*Figures 12* and *13*).
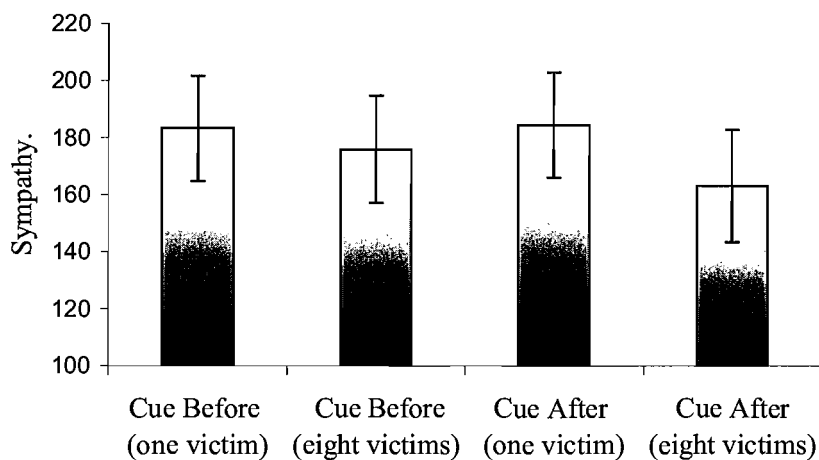
Note: Error bars denote 95% confidence intervals.

Figure 14: Mean Sympathy Ratings for Cue Conditions

The data presented in *Figure 14* suggest that regardless of whether the spatial cue preceded or followed the picture presentations, target victims received higher sympathy ratings when they were not flanked by distractor victims. Sympathy ratings were lowest when the target victim was presented with distractors and the spatial cue followed the picture presentation. To test *Hypothesis 1a* (a single target will receive higher sympathy ratings when it is preceded by a cue and presented alone vs. flanked by several distractor victims), a repeated measures t-test was conducted for the two conditions with cues preceding the presentation of the pictures (bars 1 and 2 in *Figure 14*). Results indicate that this comparison is marginally significant, $t(57) = 1.8, p < .08, r^2 = .05$. As predicted,

subjects expressed higher sympathy for single pictures ($M = 183$, $SD = 70$) compared to a single picture flanked by 7 others ($M = 176$, $SD = 71$).

Hypothesis 1b investigated the same difference between a single target presented alone vs. among a group of other victims when participants were unable to attend to the spatial location where the target victim was presented (bars 3 and 4 in *Figure 14*). Results support the prediction and corroborate findings from *Hypothesis 1a*, $t(57) = 3.8$, $p < .01$, $r^2 = .20$. As predicted, participants expressed higher sympathy for single targets ($M = 184$, $SD = 70$) compared to a targets picture flanked by others ($M = 163$, $SD = 75$).

Hypothesis 2 predicted sympathy responses to be stronger when forming an online impression compared to sympathy judgments based on memory. The lack of attention towards the single victim was expected to have a more negative effect on sympathy ratings when single victims were presented along distractor victims following the spatial cue (bar 4 in *Figure 14*) than when preceding it (bar 2 in *Figure 14*). In this condition (i.e., bar 4) participants had to process all eight presented victims and then wait for the cue to inform them which one of the victims was the designated target of their sympathy. Since the cue appeared only after the pictures had already disappeared, the sympathy judgment had to be made from memory. Results showed that sympathy ratings were significantly higher for single victims flanked by other victims when these pictures followed the spatial cue ($M = 176$, $SD = 71$) compared to when they preceded the cue ($M = 163$, $SD = 75$), $t(57) = 3.6$, $p < .05$ (Bonferroni correction), $r^2 = .19$. A similar comparison for targets that were presented alone showed no significant difference between sympathy ratings for targets following vs. preceding the spatial cue, $t(57) = 1.3$, $p > .18$. Comparing sympathy ratings for the condition without a spatial cue showed that participants' responses were slightly higher when judging eight target victims together than a single target (see *Figure 15*).
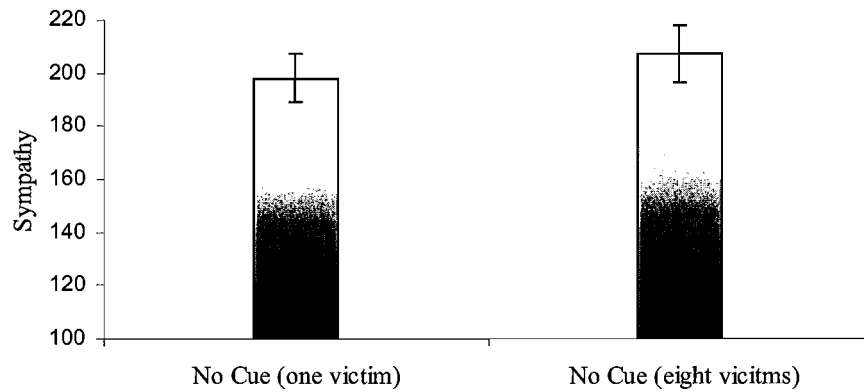
Figure 15: Mean Sympathy for No Cue Conditions

Hypothesis 3 addressed the difference between single targets vs. an entire group of targets. Results show that participants expressed more sympathy towards the group of victims ($M = 207$, $SD = 82$) compared to single victims ($M = 198$, $SD = 71$), but this result failed to reach significance, $t(57) = -1.2, p > .2, r^2 = .02$.

Reaction Time Analysis. Exploratory analyses for participants' reaction times were conducted on the average reaction times for sympathy judgments by condition. Averages are shown in *Figure 16*.
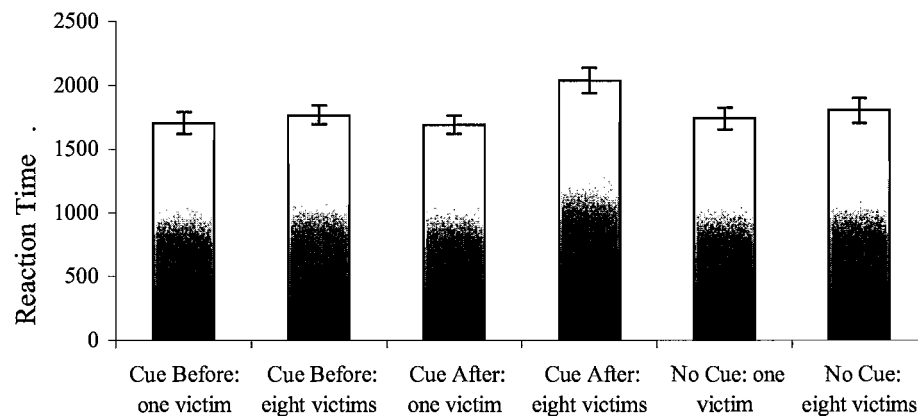
Figure 16: Mean Reaction Times for Each Cue Condition.

Inspection of *Figure 16* reveals that distinctly longer reaction times were observed when a single target was presented with a group of distractor victims preceding the spatial cue (i.e., "Cue After" condition). In this condition, participants could not make their sympathy judgments online but had to consult their memory to identify the target and then indicate their sympathy for the target victim. Recall that sympathy ratings were lowest in this condition, and it appears as though longer reaction times are associated with lower sympathy ratings. A repeated analysis of variance (ANOVA) found that reaction times varied significantly by condition, $F(5, 205) = 7.9$, $p < .01$. $\eta_p^2 = .12$. A contrast comparing reaction times for a single target with distractors in the "cue after" condition to a combination of all other conditions showed that participants took significantly longer to make their sympathy judgment in this condition, $F(1,57) = 29.8$, $p < .01$, $\eta_p^2 = .34$.

Correlational analyses show that in some conditions shorter reaction times are correlated with higher sympathy ratings, albeit not significantly so. These correlations suggest that shorter reaction times are related to higher sympathy ratings when participants were presented with only a single target (and no distractors). *Table 33* details the correlations between sympathy ratings and reaction time.

Table 33: Correlations Between Mean Reaction Time and Sympathy Across Trials

	Cue Before Picture	Cue After Picture	No Cue
Single Picture	-.19	-.12	-.12
Eight Pictures	-.10	.01	.01
N = 58			

Discussion

Study 5 was designed to investigate the effect of attending to a target victim on participants' sympathy ratings. Interpretations of the results need to take the specific design into account. Recall that the experiment was split into two different phases. In phase one (the cue conditions), participants saw a spatial cue either before or after being

presented with a target picture. In the second phase, participants did not see a cue and rated either one target or eight targets. This second phase (the "no cue" trials) always followed the first phase (the cue trials). This design ensured that participants would not be biased in their sympathy ratings during phase 1 by being able to rate all eight targets at once. However, a drawback to this design is that trials in phase 2 were potentially influenced by phase 1 trials. Furthermore, trial pairs consisted of always showing a single picture on the first trial and then eight pictures on the second trial (or vice versa). In the "no cue" conditions, this resulted in single targets being paired with eight targets in close temporal proximity and a potential carry-over effect of sympathy ratings from eight to one target.

It was hypothesized that visual distractors (i.e., other victims presented concurrently with the target) negatively influence the attention needed to generate sympathy towards the target victim. Results support the hypothesis that a single target victim evokes more sympathy when presented alone and not flanked by distractor victims. This effect is present when judgments are made online as well as from memory, however it seems to be especially pronounced when affect judgments are made based on people's memory. Online judgments are typically subject to more vivid images than judgments that rely on images stored in memory (Hamilton & Sherman, 1996). More vivid images can influence judgments by making affective characteristics more salient (Slovic, et al., 2002; Loewenstein et al., 2001), and evaluable (Hsee & Zhang, 2004).

Results further support the notion that attention is a factor in the generation of sympathy. In the trials that featured cues, sympathy ratings were higher in conditions where participants were able to discern the spatial location where the individual target victim would appear. It is noteworthy that this difference was most evident when participants rated one victim that was presented within a group (i.e., with distractors). These distractors have a negative impact on sympathy ratings, especially when judgments were based on memory.

The finding that presentations of victims with distractors can reduce affective ratings is an extension of Fenske and Raymond's (2006) distractor devaluation effect.

Fenske and Raymond found that distractors presented outside an attended visual area were emotionally devalued (i.e., less cheerful and less trustworthy) compared to an attended target. This devaluation was partly dependent on the distance between target and distractors, with smaller distance leading to more devaluation. While the present study did not specifically look at devaluations of victims presented next to the target, it demonstrates that affective ratings decrease as the ability to focus on the target decreases. Thus, distracting attention away from a target can lead to affective devaluations of the target.

Furthermore, it was hypothesized that in joint evaluations a group of victims would elicit more sympathy compared to an individual member of this group (Kogut & Ritov, 2005b). Even though mean levels were in the expected direction (i.e., a group of victims elicited higher sympathy than single victims), no statistical difference was found to support this hypothesis.

A limitation of the current study design was that it is not possible to compare the effects of cue vs. no cue without risking potentially biasing effects of the employed trial order. It is therefore not possible to conclude that spatial attention increases sympathy ratings per se. However, the effect of attending to visual information is visible when comparing participants' sympathy ratings for trials where they made online judgments vs. memory judgments.

In sum, Study 5 lends some support to the model proposed in *Figure 1*. Attentional mechanisms seem to be an important ingredient in the generation of sympathy. Inability to attend to a single victim leads to lower sympathy ratings. That is, our capacity to generate other-focused affect seems to depend on our giving specific attention to one victim at a time.

CHAPTER IX

GENERAL DISCUSSION

Research Questions and Methodology

The experiments in this dissertation were designed to investigate the role of affective vs. deliberative information processing in decisions related to prosocial behavior. Of specific interest was the effect that different modes of processing (i.e., System 1 vs. System 2) have on people's willingness to contribute financially to victims in need, the generation of affective reactions towards the victims (and their predicament), and the extent to which donations in this context were related to these affective reactions. A distinction was made between feelings that were predominantly focused on the self (i.e., anticipated regret if no donation was made, and how much better people felt if they made a donation) and those focused on other people (i.e., sympathy and compassion for the victim). Even though these two types of affect are not expected to be independent of each other, this distinction nonetheless gave insight into people's underlying motivation to help others in need. It further extended existing research on prosocial decision making (e.g., Batson, 1990; Kogut & Ritov, 2005a, 2005b; Loewenstein & Small, 2007; Small, Loewenstein, & Slovic, 2007; Slovic, 2007) by showing that self- vs. other-focused affect is differentially related to donations depending on what information processing mode people engage in. The moderating effect of System 1 vs. System 2 processing on self- vs. other-focused affect was explored by manipulating information processing directly in Studies 1 and 2, as well as indirectly by varying how victims were presented (Studies 3 and 4). Additionally, a fifth study investigated the role of attentional mechanisms in the generation of affective responses focused on the victims.

The experiments that directly manipulated information processing were designed to change participants' ability to deliberate, as well as the degree to which they focused on affective or deliberative processing. In Study 1, participants' deliberative capacity

their ability to engage in deliberative processing. According to dual process models (e.g., Kahneman 2003; Epstein, 1994), a reduction of deliberative processing results in System 1 being less influenced (and possibly interrupted) by System 2 processing (Shiv & Fedorikhin, 1999). To test the effect of augmenting System 1 processing directly, Study 2 used a priming manipulation to focus participants' towards either their feelings or deliberative aspects, and to engage them into affective or calculation-based valuation of the victims (Small, Loewenstein, & Slovic, 2007; Hsee & Rottenstreich, 2004).

Two additional experiments were designed to manipulate information processing indirectly via different presentation modes of the victims. In Study 3, the victim's identifiability (identified vs. unidentified) was varied along with whether she was part of a bigger group or not. Identifying a victim may lead to more affective processing (Small & Loewenstein, 2005; 2003), and presenting victim statistics may induce a comparative process[42] that increases System 2 processing (Small, Loewenstein, & Slovic, 2007). Both of these manipulations are subtle, and influence information processing not by preventing one processing route (i.e., either deliberative or affective), but instead entice people to pay attention to specific features of the victim and victim situation that increase the likelihood of one type of processing (Slovic et al., 2002). In addition to manipulating victim identifiability and number of victims, a fourth experiment manipulated presentation mode by showing several additional victims in sequence before the target victim (see Study 4). This manipulation was designed to elucidate the effect of increasing the dimension of the tragedy not by means of a number (as in Study 3), but by graphically presenting the victims in serial order. Increasing the number of victims was expected to decrease affective processing as it is more difficult to affectively process larger groups (Slovic, 2007).

Finally, to further investigate the role of victim-focused affect in donation decisions, a fifth experiment was designed to examine the extent to which attentional mechanisms are involved in the generation of sympathy. The ability to visually focus on

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[42] This comparative process is based on people's awareness of helping one individual victim while at the same time not helping (or not being able to help) a much bigger group of victims (e.g., Unger, 1995).

a target in order to feel sympathy is constrained when several victims are presented at the same time, which is the case in several research studies that use group pictures of victims in need (e.g., Kogut & Ritov, 2005a, 2005b). In the experiment reported in Study 5, victims were presented either by themselves or among distractor victims, and participants made sympathy judgments either online or from memory. As shown in Study 5 and related research (Fenske & Raymond, 2006), presentation of additional, potentially competing and distracting victims divides people's attention to the victim, thereby reducing affective reactions towards the victims. Based on these studies, it seems likely that the presentation of distractors has deleterious effects on affective processing because of a lack of visual attention. Moreover, a shift in processing modes from System 1 to System 2 is also possible due to the fact that distractor victims can provide a contrast that resembles a joint evaluation mode, which tends to increase comparative and deliberative processing (Loewenstein & Small, 2007). Thus, presenting a target victim with distractors is likely to decrease affect-related processing and increase deliberation[43].

Summary of General Findings

Effects of Information Processing Mode on Donations. Manipulating information processing mode by means of a cognitive load paradigm resulted in slightly, albeit not significantly higher donation amounts when participants were under a high memory load vs. low memory load. This result was significant when (hypothetical) donations were elicited for groups of victims. Apparently, reducing deliberative capacity may have a positive effect on donations when people are confronted with several victims. Conversely, being able to deliberate reduced donations, especially when the target of the donation is a group. From a theoretical perspective, it is possible that high cognitive load could negatively influence how much attention is paid to the victims. This should result

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[43] An increase in System 1 processing is not synonymous with a decrease in System 2 processing. These Systems have different mechanisms that govern their respective level of processing (e.g., Kahneman, 2003). However, it is also possible that a decrease in System 1 processing is accompanied by an increase in System 2 processing, which is likely to have an even greater impact on decision outcomes compared to when just one of these processing routes changes (i.e., increases or decreases processing).

in lower donations for higher cognitive load. However, results do not support this prediction. In Study 1, it is more likely that a high memory load decreased the disruptive influence that deliberation has on sympathy. For example, deliberations about the victims' situation, their deservedness of a donation, potential other uses of the money, and other deliberative processing was reduced by the cognitive load. A reduction in deliberative capacity should have reduced these kinds of thoughts while leaving affective reactions unchecked by System 2. However, since no explicit deliberations were measured in Study 1, it is impossible to identify the nature of participants' thoughts and this needs to be addressed by future research.

Results from Study 2 supported the notion that more deliberation reduced donations (see also Small, Loewenstein, & Slovic, 2007). Priming participants to evaluate the victims by calculations reduced donations compared to priming them to focus on their feelings. Thus, it seems as though direct attempts to manipulate information processing influence donations in a consistent direction. More deliberation (and calculation) leads to lower donations, compared to affective information processing. As feelings are an important motivating factor and ingredient in donation decisions (Slovic, 2007; Västfjäll, in preparation), it is not surprising that focusing on one's affective response increases donations.

The results of the direct information processing manipulations (i.e., Study 1 and 2) are contrasted by the effects of the indirect manipulations attempted in Studies 3 and 4. These indirect manipulations are more subtle and rely on the presentation format to change information processing. Varying the presentation mode of the victims revealed that donations were neither dependent on victim identifiability (Study 3) nor changes in number of victims (Studies 1, 2, 3, and 4). The specific manipulation of victim-number also had little impact on donations, as adding numeric background statistics about the size of the entire group (Study 3) was as ineffective in changing donations as was manipulating the size of the group by serial picture presentations of individual victims (Study 4). It is possible that the indirect manipulations were too subtle to cause a substantial shift in information processing to see changes in donations due to

identifiability and victim number manipulations. Hsee and Rottenstreich (2004) suggest that sensitivity to numbers of victims is a function of affective strength towards an object (or person). A subtle processing manipulation might not produce this sensitivity to changes in victim number with the highly emotional stimuli used in this dissertation. All of the employed stimuli represented suffering of real (and sometimes even identified) human beings, and this could explain the failure to produce sensitivity to numbers.

Additionally, the null effects of victim-number manipulations on donations could be explained by the fact that donations depend on several different factors (such as participants' socio-economic status, personal experience, prior donation behavior, moral reasoning, and judgment of deservingness, to name just a few) and affective reactions to the victim are just one (albeit central) piece of the prosocial behavior puzzle (Loewenstein & Small, 2007). Not surprisingly, the effect sizes for variables predicting donations are typically quite low throughout the reviewed literature (but see Västfjäll et al., in preparation, for an exception) and also in the studies presented in this dissertation. Nonetheless, the failure to replicate the singularity effect that Kogut and Ritov (2005a) found despite using similar stimuli suggests that further research is needed to understand the effects of victim numbers on donation amounts.

Finally, in addition to the direct and indirect information processing manipulations, Study 3 found support for donations being dependent on people's numeracy ability. Those skilled at numeric manipulations (i.e., high in numeracy) donated more money than those who were low in numeracy. It is possible to speculate that high numerate people were able to abstract the problem and make their donation decisions less dependent on an immediate affective reaction towards the victim. They might also have realized the bigger problem and reacted to that instead of the victim-focused affective responses that drove donations for low numerate people. Further research is needed to elucidate the role of numeracy in donations and specifically examine whether high numerate people process information related to donations more abstractly than low numerate people.

Effects of Information Processing Mode on Affective Reactions. Affective reactions were divided into self-focused and other-focused affect. The latter was primarily investigated by measures of sympathy and worry about the victim, while the former was assessed by participants' anticipated regret and indications of how much a donation would make them feel better. The distinction between self- and other-focused affect does not represent an empirical or theoretical independence of these two types of feelings, but reflecting different sources of motivations of helping (Batson, 1990). Of primary interest for the studies in this dissertation was the influence of information processing on self- vs. other-focused affect.

Across the different studies, results suggest that sympathy for the victim is dependent on information processing mode. Processing the victim under high cognitive load slightly increased sympathetic responses compared to a low load condition. The result that sympathy under low load was reduced indicated that sympathy is unlikely to spring solely from deliberative processes, as models of pure cognitive appraisal and higher-order affect would suggest (e.g., Berkowitz, 1993). More likely, sympathy and other-focused feelings in general are sensitive to how the victim information is affectively represented by the participants. This interpretation is supported by the fact that priming participants to evaluate the victims by means of calculation mechanisms led to lower sympathy compared to affective priming. Asking participants to affectively evaluate objects and people unrelated (and prior) to the donation task had the effect of increasing sympathetic responses to the victims, presumably because participants were cued to focus on the now more salient affective information from the victims.

In addition to the direct manipulations of processing modes, indirect attempts to alter information processing by varying the presentation mode of the victims revealed that more sympathy was expressed for identified victims compared to unidentified victims. Identifying victims by name, age, and picture resulted in more concrete mental representations that, in turn, made them affectively more salient. Thus, sympathy judgments seem to be responsive to the level of abstraction that victims are represented in. Unlike victim identifiability, changing the number of victims did not seem to have a

reliable effect on sympathy ratings for individual victims. When identified, groups elicited higher sympathy ratings compared to single victims. However, neither the addition of background statistics about a larger group of victims nor the serial presentation of pictures of additional victims seemed to affect sympathy for a single target victim. This gives tentative support for the notion that victim-focused affect is not as sensitive to changes in victim number as it is to how affectively salient and concrete the actual target victim is presented (i.e., identified vs. unidentified).

Further investigations of the origins of sympathy for victims in Study 5 showed that the ability to visually focus on a specific target victim may lead to higher sympathy ratings compared to situations where one is not able to focus. Thus, increasing the number of victims by introducing pictures of distractors concurrently with the target victim reduces sympathy ratings for that single target. Apparently, if people cannot (visually) attend to a victim, their sympathetic response is reduced. It is not clear whether this effect is specific to visual attention, but evidence from Study 2 suggests that attending to more deliberative aspects (like calculations) takes attention away from affective aspects, and thereby reduces sympathy.

Results for self-focused affect are also relatively consistent across the studies presented in this dissertation. Self-focused affect (as measured by anticipated regret and the extent to which people feel better about themselves when donating) was robust against most of the employed information processing manipulations. Unlike victim-focused affect, anticipated regret and how much better participants felt after a donation was not dependent on the ability to deliberate, nor was it influenced by priming participants to evaluate the victims by calculation or by feeling. Furthermore, unlike victim-focused affect, some evidence emerged that self-focused feelings are responsive to the number of victims. Adding background statistics that link a single victim to a larger group had the effect of making participants feel less good about themselves due to a donation in comparison with a condition without these background statistics. Self-focused affect functions as a motivator for donations to ameliorate one's negative feelings resulting from the victims' predicament (Batson, 1990). Thus, if the impetus is

to change how one feels about oneself then donating to a smaller group, where the impact of the donation is larger, seems to be more attractive to participants. In essence, this sheds new light on the drop in the bucket effect (e.g., Friedrich et al., 1999; Fetherstonhaugh et al. 1997), since it highlights the self-centered motivation behind donating (or, as in the case when the victim-referent group is too large, not donating).

Investigation of other affect-related variables (apart from self- and other-focused affect) gave insight into how the mental representations of the victims were influenced by information processing mode. Reducing cognitive resources had the somewhat counterintuitive effect of a more coherent mental representation of and clearer feelings about the victims. This was true especially for victim groups, which were seen as more entitative (e.g., unitary and coherent) when deliberative information processing was limited. Apparently, less deliberation can lead to more extreme judgments on group coherence because deliberative capacity may be needed to notice and process the differences between individual members. The result is a clearer affective image of the group that "glosses over" differences of the individual victims.

In addition to the effects of information processing on perceptions of victim groups, the data in Study 3 suggest that participants with higher numeracy had a less clear feeling and less coherent picture of a single target victim. This is further evidence that higher numeracy can lead to a more abstract representation of the victims, and result in lower affective responses towards one victim. However, the extent to which large masses of victims elicit differential affect from high vs. low numerate people needs to be addressed by future research.

Effects of Information Processing Mode on the Relationship Between Affect and Donations. The extent to which information processing mode moderated the relationship between affect and donations was explored in Studies 1 – 4. Affect was divided into self- vs. other-focused emotions, and the effects of one type of affect on donations were always explored while controlling for the effects of the other type.

Some evidence emerged from the data that participants decided to donate based on how they felt (or would feel) about themselves. To the extent that donation decisions

consist of a two-step process (e.g., Slovic & Lichtenstein, 1968), participants first had to decide whether they want to donate money and in a second step determine the donation amount. Throughout the studies on donations (i.e., Studies 1 – 4), participants' self focused affect seemed to be important in determining whether they wanted to donate money or not. It appears as though the initial decision to donate is related more to feelings that target the self than other people. As feelings focused on the self are thought to be less effortful and are possibly more quickly accessible than other-focused feelings (e.g., Rossnagel, 2000), it is possible that people first consult how negative they would feel about themselves if they do not help the victims to decide whether a donation is warranted.

An investigation of the actual donation amounts suggests that the relationship between other-focused affect and donations was moderated by processing mode. Specifically, in Study 1 participants' other-focused affect significantly predicted donation amounts when their deliberative processing resources were limited, but not when deliberation was possible (i.e., in the low load condition). The disruptive effect of deliberation on the relationship between other-focused affect and donations was supported by Study 2. Inducing participants to engage in mathematical calculations reduced the ability of sympathy and compassion to predict donations relative to an affective priming and control condition. It seems as though increasing deliberation not only negatively impacts overall victim-focused affect, it also reduces the extent to which victim-focused affect is related to donation decisions. Further evidence for the moderating effects of information processing mode on the relationship between victim-focused affect and donations comes from the studies that manipulated processing by varying the way victims were presented. Victim-focused affect predicted donations only when a single target victim was identified and presented alone (vs. part of a larger group). As the number of other victims presented before the target victim increased in number, sympathy for the victim was no longer predictive of donations for the target victim. The same effect occurred regardless of the presentation format of these other victims, as

increasing the number of victims by a large and abstract number (i.e., 20,000) had the same disruptive effect as showing pictures of several victims.

In contrast to victim-focused affect, self-focused affect was overall robust in its predictability of donations. Neither the manipulation of deliberative capacity nor affective vs. calculation priming had an impact on the relationship between self-focused affect and donations. In all conditions that manipulated information processing directly, higher self-focused affect always predicted higher donations. Furthermore, varying the presentation mode of a target victim showed that self-focused affect was predictive of donations regardless of whether the victim was identified or not. Somewhat mixed results were obtained for changing the number of victims. Whereas making a single victim part of a bigger group (i.e., 20,000) did not reduce the predictive power of self-focused affect on donations in Study 3, Study 4 showed that anticipated regret was only predictive of donations when a single target victim was preceded by pictures of a few other victims, but not when presented by itself. This points to the possibility that affect focused on the self can be a motivator to help victims in need when participants are sensitive to the victim context. If a donation is judged to have an impact on the victims, self-focused affect motivates people to help others because they would like to alleviate one's own bad feelings. However, if a donation is judged to be just a drop in the bucket, then self-focused feelings are not particularly motivating as they will not reduce the negative emotions (like anticipated regret). This social-egoism explanation of helping (Batson 1990) was largely supported in the present studies.

Towards a General Model of Dual Information Processing in Helping Behavior

The presented results offer tentative support for the general model of dual information processing proposed earlier (see *Figure 1*). A critical feature of this model is that affective reactions can be focused on the self and on others. These two types of affect are not independent of each other, but the underlying motivation for helping (i.e., altruistic vs. egoistic) is tied to what kind of affect-focus dominates in a given situation. For example, if affective reactions are focused on the self, then the likelihood of helping

(and the extent of that help) depends on whether one can actually improve one's negative affect by means of aiding the victim. Thus, social-egoistic motivations of helping appear to be related to mood management strategies to regulate behavior (e.g., Batson, 1990).

Affective reactions that are focused on the victim, on the other hand, seem to be governed by different mechanisms than self-focused affect. First, the generation of other-focused affect seems to be moderated by information processing mode. While affective (i.e., System 1) processing is conducive to higher sympathy for the victims, deliberative (System 2) processing can have deleterious effects. In Studies 1 and 2, deliberative processing (or the ability to deliberate) had negative consequences for sympathetic responses. Second, deliberative processing also disrupted the relationship between sympathy and donations. System 2 processing appears to not only reduce overall sympathy, but it can also reduces the motivational aspects of sympathy and other feelings that are focused on the victim. Further support for other-focused affect being less important as a determinant for donations comes from Study 3, which showed that higher numeracy can lead to lower sympathy yet higher donations. This suggests that not all forms of abstract processing necessarily reduce donations. In fact, in theory it should also be possible to increase sympathetic responses to victims if one can use this deliberation to attend to features of the victim that give rise to higher-order affect on top of sympathy generated through System 1. The experiments in this dissertation did not collect data on what participants were deliberating about, so it is not possible to pinpoint exactly what kinds of deliberations reduce sympathy and other-focused affect.

The mechanisms by which this disruption occurs need further investigation, but it is possible to speculate that deliberation focuses people on other aspects of the situation, possibly unrelated to the affective appeal of victims. For example, awareness of the bigger problem at hand, one's own moral obligations to other causes, and deservingness of the victims are examples of how increased deliberation can distract from the immediate affective response of sympathy and then lead to a decision to help based on other factors.

Implications

An interesting question raised by the results and model presented here is whether self-focused vs. other-focused affect is more important in (i.e., predictive of) helping? Which motivation for helping (i.e., egoistic vs. altruistic) leads to more consistent and effective helping behavior? While more empirical research is needed to answer these questions fully, the results presented here suggest that the type of motivation depends on several factors: If people are primarily concerned with regulating their own emotional state, then situations where they perceive that they can make a difference (and thereby alleviate their own negative emotions) should be more conducive to helping. While a large group of victims does not free us from a moral obligation to provide help to any one of them (Singer, 1972), self-focused affect motivates helping when the number of victims is small enough to be able to make a difference.

Another important consideration in the investigation of underlying motivations for helping is whether help is provided on a continuous basis or just once. Humanitarian aid organizations give donors the option to make a one-time donation or to donate a certain amount each month. If helping is motivated by the desire to alleviate one's own negative emotional reaction (such as anticipated regret), then it is more likely that a donation is only made once.

On the other hand, if people are motivated by sympathy for the victim, then it would be best if they are not distracted from that sympathy. The extent to which people differ in their empathic disposition (Davis, 1994) is, naturally, also an important ingredient in this equation. However, it seems more important to identify the situations in which any type of affect is predictive of donations. While it probably does not make much difference to a victim exactly where the motivation for helping him/her comes from, humanitarian aid organizations, funding agencies, and philanthropists should be concerned about the determinants of helping and how they can be manipulated. The presented model in this dissertation is an attempt to address these determinants, and identify ways in which we can protect and nurture "the fragile flower of caring" (Batson, 1990, p. 345).

Limitations

Interpretation of the present data needs to take into account the possibility that with the chosen designs it is not entirely clear whether affective reactions to the victims precede donation decisions. In Studies 1 - 4, participants were first asked to make a decision about donating, and then asked to answer related affect questions (such as sympathy and anticipated regret). It is possible that affective responses were influenced by each participant's donation decision, such that those participants who donated more money felt like they needed to also respond with greater affect. However, this is unlikely for the following reason. All affect variables should have been showing a high correlation to donations in all conditions if affect was cued by donations, which was not the case. Moreover, a mediation analysis of the effect of affect on donations in Study 2 suggested that only victim-focused affect (and not self-focused affect) was mediating the relationship between information processing and donations.

Another possible limitation is that throughout the different studies self-focused affect was measured by either anticipated regret or predictions of how much better one would feel after donating. Both of these measures are arguably not "pure" affect variables. Even though theorists distinctly categorize anticipated regret as an emotion (e.g., Miller and Taylor, 2002; Zeelenberg & Pieters, 2007), it has a cognitive component that sets it apart from many other emotions (including sympathy). Namely, it is a forecasted emotion and projects how one feels into future situations (e.g., through counterfactual thinking). However, this distinction is not a particular problem for the proposed model in this research, because anticipated emotions have anticipatory components to them that make them "felt" and influential at the time when decisions are made (Loewenstein et al., 2001). Moreover, anticipated regret and judgments of how much better one would feel about oneself are, as posited by the model, definitely focused on the self, whereas the same is not necessarily true for sympathy.

Finally, several of the presented studies have compared one vs. several victims in an attempt to manipulate the number of victims. Research on group perceptions suggests that if a group gets large and complex enough it will no longer be viewed as a collection

of individuals but rather a more abstract group average (e.g., Ariely, 2001; Asch, 1952, 1946). It is possible that participants did not see the victims as a group but rather an abstract average or prototype in the conditions where several victims were shown concurrently (Posner & Keele, 1968). This could explain the null effects of victim-number manipulations on donations in Studies 1 and 2, as it would suggest that participants treated the group of victims similarly as a single victim. Support for this interpretation comes from Study 1, where groups were seen as more entitative than individual victims, albeit not significantly so. While the current study designs do not allow for a more thorough investigation of the possibility of abstracting groups of victims, other research has found that individuals can be seen as more entitative (e.g., Hamilton & Sherman) and receive higher donations (Kogut & Ritov, 2005a) and affective reactions (Västfjäll, in preparation) than groups of victims.

Future Directions

Apart from examining the effects of victim group size, future research needs to address whether extremely large groups of victims can be made more affectively salient. If the number of victims becomes large enough, victims become statistics (Slovic, 2007), and we are only at the beginning in understanding how affect and deliberation play into helping behavior. These future endeavors need to take the motivational source of helping into account, and expand the present research on self- vs. other-focused affect.

Research on perspective-taking and self-other-overlap (e.g., Batson et al., 2007; Davis et al., 2004; VanBoven & Loewenstein, 2003) has begun to examine the antecedents of empathic concern, and research on donations should make use of similar methodologies to increase people's affective reaction and encourage donations towards victims. If perspective taking can increase empathic concern about victims in need, research should aim at identifying the specific conditions when increasing self-other overlap motivates people to provide help. If perspective taking is a skill, then maybe it can be taught and increase empathic and sympathetic responses to charity requests.

Another interesting topic for future research concerns people's numeric ability. Results from Study 3 suggested that numeracy might be an important individual difference involved in the perceptions of victim entitativity and, more importantly, donations. This leads to two (theoretical and applied) considerations. From a theoretical perspective, if high numeracy does indeed lead to less concrete and more abstract processing, this difference in processing mode should be visible in other domains as well (e.g., financial decision making). From a practical viewpoint, it should be possible to tailor charity requests to peoples' numeric ability. People with low numerical skill are more likely to base their donation on immediate affective responses to the victims, whereas high numeric people might not. Future research also needs to address the possibility that a given person will donate more when feeling more of an affective response to the victims, but that across people those who rely on affect may give less.

Future research also needs to address the possibility that an increase in deliberation might result in higher affective responses, donations, or both. While the studies in this dissertation have shown that deliberation can have a disruptive effect on the generation and use of other-focused affect, it also transpired that visually attending to a victim yields higher sympathy than not attending. Thus, it might be possible to find types of deliberation (e.g., perspective taking) that focus people on the victims and increase sympathetic responses.

Finally, it stands to reason that attention not only influences sympathy but also helping and possibly self-focused affect. The role of visual attention in the generation of feelings has only recently begun to draw researchers' interest, (e.g., Fenske & Raymond, 2006), and has potentially far-reaching consequences for research on affect and decision making. In the specific context of donation decisions, attention may increase emotional reactions in some situations (e.g., by making emotional reactions more salient), but decrease emotions in situations where it is too difficult (or even harmful) to emphasize (Batson, 1990; Hodges & Biswas-Diener, 2007). One mechanism for "down-regulating" (i.e., reducing) empathic responses is compassion fatigue, defined as traumatic stress that results from witnessing the suffering of others (Figley, 2002). It is likely that exposure to

too much suffering induces mechanisms that decrease empathic responses and donations. More research is needed to identify why and when people engage in empathic regulation and how it affects helping.

Conclusions

Regardless of whether we witness the suffering of millions or just one individual, from a philosophical perspective the moral obligation to provide help to others in need does not rest on how the suffering is portrayed (Singer, 1972). However, from a psychological perspective things look differently. We seem to be more motivated to help when affectively involved, and when we care about ourselves and others. This explanation might sound matter-of-fact or unemotional, but from a practical standpoint one could say that *any* motivation to help is a good one. Still, what is concerning about social-altruism is that helping might depend on how much we can focus on our (hopefully existing) immediate affective reactions on the victims. If we are either unable or disinclined to focus on those emotional reactions, helping may not occur. It would be nice if we could say that all we need to care about and help others is to "feel", but things do not seem to be that easy. For some, caring is the first step in actually providing help, but for others helping depends on factors unrelated to sympathy and compassion. The research in this dissertation was motivated by an attempt to contribute to our understanding of when we use our feelings as effective guides in the decision to help others, and it showed that these feelings depend, at least in part, on how we process information.

APPENDIX A

MATERIALS AND ADDITIONAL RESULTS FOR STUDY 1

Materials

Low Load Condition:

Below are some random alphabetical letters to memorize. Please take as much time as you would like to memorize these letters. At the end of this section, you will be asked to recall these letters as accurately as possible. After you memorize the letters below, you will be asked to make a series of choices. There are no right or wrong answers. We are interested in your opinion. Throughout these choices, try to rehearse the letters in your head.

        Letters to memorize: XD

High Load Condition:

Below are some random alphabetical letters to memorize. Please take as much time as you would like to memorize these letters. At the end of this section, you will be asked to recall these letters as accurately as possible. After you memorize the letters below, you will be asked to make a series of choices. There are no right or wrong answers. We are interested in your opinion. Throughout these choices, try to rehearse the letters in your head.

        Letters to memorize: DKZZVHTRKJ

Donation and Affect Questions for Single Victims (sample):

This is Emily, a two-year old child with a life threatening disease who is being treated through the American Cancer Society.

1) Would you be willing to donate money to help save Emily? __ Yes __No
2) If you answered yes to the previous question, how much money would you donate? Please type the value in the space below:

3)

	Not at all					Very much	
After reading Emily's story I felt worried, upset and sad.	1	2	3	4	5	6	7
I felt sympathy and compassion towards Emily.	1	2	3	4	5	6	7
How much would donating money make you feel better?	1	2	3	4	5	6	7
I would feel regret not donating money.	1	2	3	4	5	6	7
How much do you think your donation would help Emily?	1	2	3	4	5	6	7
How clear a feeling do you have about Emily?	1	2	3	4	5	6	7
To what extent do you have a clear and coherent picture of Emily?	1	2	3	4	5	6	7

5) Please enter the letters you memorized:

Donation and Affect Questions for Group Victims:

This is Emily, Jacob, Michael, Isabella, Hannah, Elizabeth, Joshua, and Daniel, a group of two-year old children with a life threatening disease who are being treated through the American Cancer Society.
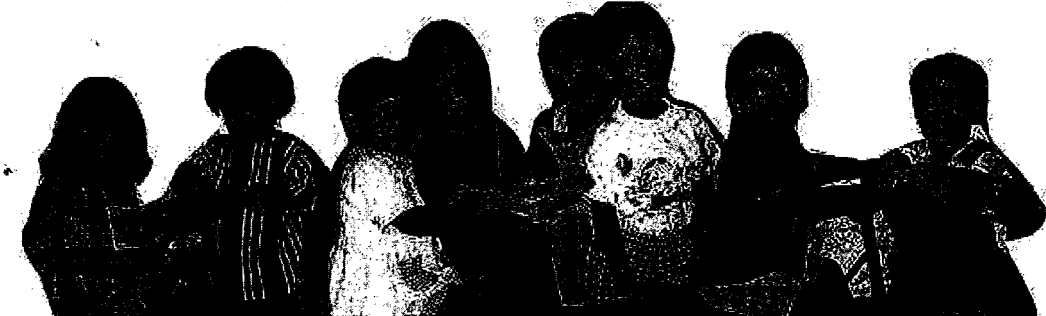
1) Would you be willing to donate money to help save these children? Yes   No
2) If you answered yes to the previous question, how much money would you donate? Please type the value in the space below:
3)

	Not at all					Very much	
After reading these children's story I felt worried, upset and sad.	1	2	3	4	5	6	7
I felt sympathy and compassion towards these children.	1	2	3	4	5	6	7
How much would donating money make you feel better?	1	2	3	4	5	6	7
I would feel regret not donating money.	1	2	3	4	5	6	7
How much do you think your donation would help	1	2	3	4	5	6	7

these children?

How clear a feeling do you have about these children?	1	2	3	4	5	6	7
To what extent do you have a clear and coherent picture of these children?	1	2	3	4	5	6	7

5) Please enter the letters you memorized:

Additional Results

Analyses including all Participants (including those who did not recall their number):

Table A1: Means and Standard Deviations of WTC and Affect Variables

	N	Mean	Standard Deviation
WTC	193	137.96	767.44
WTC[a]	193	2.61	1.88
Worry	192	3.11	1.64
Sympathy	192	4.20	1.49
Sympathy[b]	192	19.82	10.64
Feel better	192	2.73	1.54
Anticipated Regret	192	2.56	1.92
Donation help	192	2.32	1.64
Clear a feeling	192	2.59	1.62
Coherent a picture	190	2.57	1.63

Table A2: Non-Corrected Correlations Between WTC and Affect Variables

	WTC	Worry	Sympathy	Feel better	Regret	Donation help	Clear Feeling
WTC	1						
Worry	.18*	1					
Sympathy	.12	.66**	1				
Feel better	.03	.40**	.34**	1			
Anticipated Regret	-.01	.46**	.33**	.50**	1		
Donation help	.21**	.35**	.31**	.52**	.21**	1	
Clear feeling	.20**	.51**	.37**	.36**	.26**	.48**	1
Coherent picture	.20**	.43**	.38**	.36**	.30**	.39*	.70**

Table A3: Correlations Between WTC and Affect Variables

	WTC[a]	Worry	Sympathy	Feel better	Regret	Donation help	Clear Feeling
WTC[a]	1						
Worry	.42**	1					
Sympathy[b]	.31**	.63**	1				
Feel better	.40**	.40**	.29**	1			
Anticipated Regret	.43**	.46**	.30**	.50**	1		
Donation help	.39**	.35**	.28**	.52**	.21**	1	
Clear feeling	.37**	.51**	.42**	.36**	.26**	.48**	1
Coherent picture	.28**	.43**	.39**	.36**	.30**	.39*	.70**

Table A4: Component Loadings for Affect Variables

Affect Variables:	Affect Component
Sympathy	.771
Worry	.841
Feel better	.711
Anticipated Regret	.738
Eigenvalue	2.4
Percentage of Variance explained	57.8

Table A5: Component Loadings for Affect Variables on Other- and Self-Focused Affect

Affect Variables:	Other-focused Affect	Self-focused Affect
Sympathy	.917	.328
Worry	.843	.145
Feel better	.181	.850
Anticipated Regret	.241	.825
Eigenvalue	1.6	1.5
Percentage of Variance explained	41.1	38.3
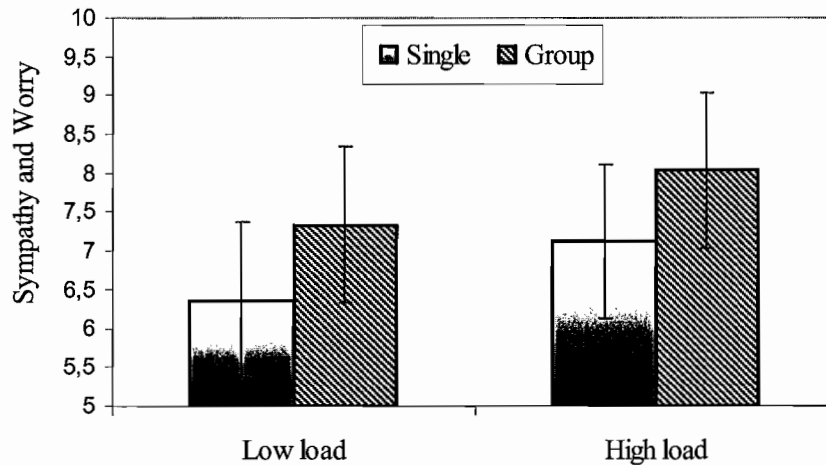
Figure A1: Other-focused Affect by Cognitive Load and Number of Victims

Other-focused affect is dependent on number of victims, such that groups of victims elicited higher affect ($M = 7.71$, $SD = 2.60$) than single victims ($M = 6.87$, $SD = 3.07$), $F(1,188) = 5.0$, $p < .05$, $\eta_p^2 = .03$. Additionally, participants reported slightly more other-focused affect under higher load ($M = 7.55$, $SD = 2.81$), $F(1,188) = 3.0$, $p < .09$, $\eta_p^2 = .02$. The interaction was not significant. Similar analyses with self-focused affect and impact judgments showed no significant main effects or interaction.

Table A6: Frequency Counts (and Percentages) of Respondents who Contributed

	Low Cognitive Load	High Cognitive Load	Totals
One victim	25 of 31 *(81%)*	47 of 60 *(78%)*	72 of 91 *(79%)*
Eight victims	34 of 48 *(71%)*	43 of 54 *(80%)*	77 of 102 *(75%)*
Totals	59 of 79 *(74%)*	90 of 114 *(79%)*	149 of 193 *(77%)*

Table A7: Logistic Regression Analyses by Cognitive Load Condition

Overall Model	Individual Predictors	*Exp(b)*	*Wald*	*p*
Low Cognitive Load $\chi^2(3) = 31.3, p < .001$	Other-Focused Affect	1.029	.05	.813
	Self-Focused Affect	1.587	9.34	.002
	Donation Help	2.338	5.98	.011
High Cognitive Load $\chi^2(3) = 41.3, p < .001$	Other-Focused Affect	1.125	1.36	.526
	Self-Focused Affect	1.839	17.83	.001
	Donation Help	1.030	.02	.882
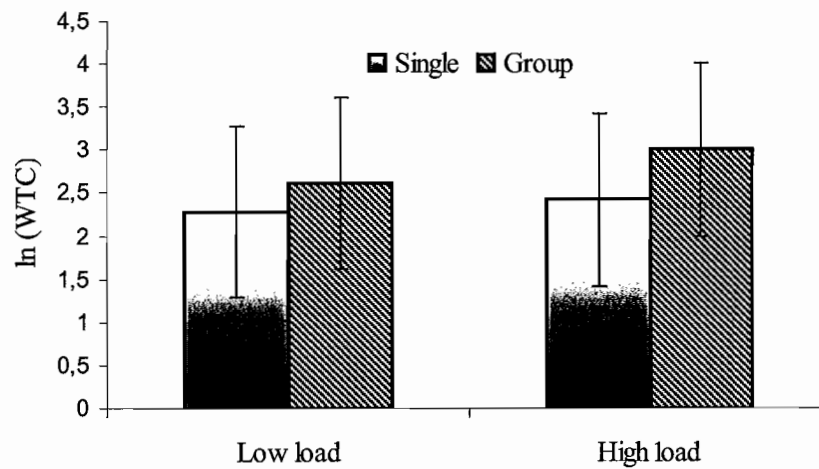
Figure A2: WTC for Cognitive Load by Number of Victims

Participants donated slightly more to a group ($M = 2,70$, $SD = 1.88$) than single victims ($M = 2.28$, $SD = 1.41$), $F(1,189) = 2.7$, $p = .1$, $\eta_p^2 = .01$. No other effects were significant.
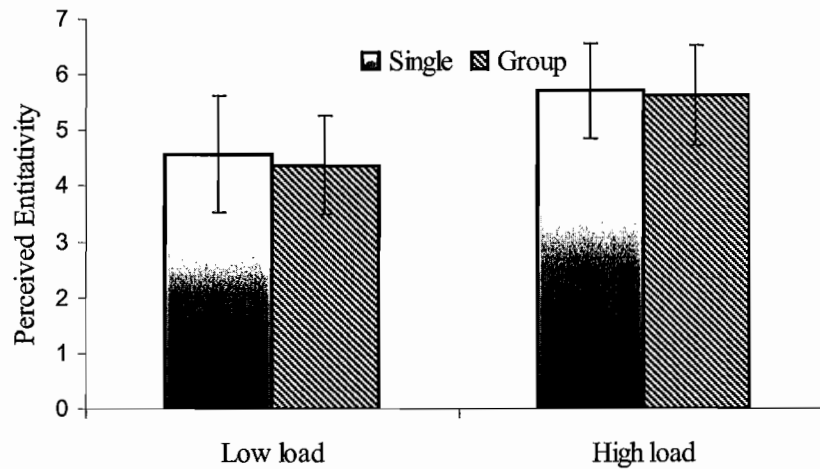
Figure A3: Perceived Entitativity for Cognitive Load by Number of Victims

Results indicate that in the high load condition judged the victims to be more entitative ($M = 5,66$, $SD = 2.83$) than single victims ($M = 4.45$, $SD = 3.07$), $F(1,186) = 7.2$, $p < .01$, $\eta_p^2 = .04$. A simple effects analysis showed that in the high load condition groups of victims ($M = 5.61$, $SD = 2.68$) were seen as more entitative than groups in the low load condition ($M = 4.37$, $SD = 2.92$, $t(98) = 2.2$, $p < .05$. No other effects were significant.

Table A8: Regression Analyses by Cognitive Load Condition

Overall Model	Individual Predictors	β	t	p
Low Cognitive Load $F(2,75)=10.5$, $p<.01$, adj$R^2=.20$	Affect focused on victims	.24	2.0	.054
	Affect focused on self	.28	2.3	.027
High Cognitive Load $F(2,111)=26.1$, $p<.01$, adj$R^2=.31$	Affect focused on victims	.23	2.7	.009
	Affect focused on self	.43	4.9	.000

Additional analyses that excluded the participants who did not recall their letter-sequence correctly (i.e., N = 152).

Table A9: Correlations Between WTC and Affect Variables (untransformed variables)

	WTC[a]	Worry	Sympathy	Feel better	Regret	Donation help	Clear Feeling
WTC	1						
Worry	.19*	1					
Sympathy	.10	.68**	1				
Feel better	.03	.42**	.38**	1			
Anticipated Regret	.24**	.48**	.38**	.50**	1		
Donation help	.12	.38**	.33**	.49**	.25**	1	
Clear feeling	.17*	.55**	.35**	.36**	.25**	.47**	1
Coherent picture	.17*	.45**	.35**	.42**	.35**	.41*	.64**

** $p<.01$ **$p<.05$ Variables in order: Willingness to contribute; Worry, upset, and sad; Sympathy and compassion; Feel better if donation is made; Regret if donation would not be made; How much a donation would help; How clear a feeling participants' had about the victim(s); How coherent a picture of the victim(s) participants had

Table A12: Regression Analyses of Victim-Number Conditions

Overall Model	Individual Predictors	β	t	p
One Victim $F(2,68)=8.1, p<.01,$ $adjR^2=.17$	Sympathy	.18	1.5	.147
	Anticipated Regret	.32	2.6	.011
Eight Victims $F(2,77)=14.4, p<.001,$ $adjR^2=.25$	Sympathy	.27	2.7	.009
	Anticipated Regret	.39	3.9	.000

Table A13: Regression Analyses of Victim Number by Cognitive Load Conditions

Overall Model	Individual Predictors	β	t	p
Low Load: One Victim $F(2,26)=6.4$, $p<.01$, $adjR^2=.28$	Sympathy	.24	1.2	.232
	Anticipated Regret	.40	2.1	.050
Low Load: Eight Victims $F(2,38)=5.3$, $p<.01$, $adjR^2=.18$	Sympathy	.07	.4	.659
	Anticipated Regret	.44	2.9	.006
High Load: One Victim $F(2,39)=3.1$, $p<.06$, $adjR^2=.09$	Sympathy	.14	.9	.382
	Anticipated Regret	.29	1.8	.083
High Load: Eight Victims $F(2,36)=10.7$, $p<.001$, $adjR^2=.34$	Sympathy	.45	3.3	.002
	Anticipated Regret	.35	2.6	.014

APPENDIX B

MATERIALS AND ADDITIONAL RESULTS FOR STUDY 2

Materials

Introduction:
Today you will be asked to make a series of choices. Please choose whatever you think is the best option in each one. There are no right or wrong answers. We are interested in your opinion.

Calculation Prime Condition:
Please answer the questions below. Type your answer in the space provided. You are not allowed to use a calculator.

2) If an object travels at five feet per minute, then by your calculations how many feet will it travel in 360 minutes?
3) If a student needs 30 hours to read 40 articles, on average, how many hours did the student need per article?
4) If a number is divided by 4 and then 3 is subtracted, the result is 0. By your calculation, what is the number?
5) If a plane flies at 35,000 feet and descends at a rate of 2500 feet per minute, how long will it take to reach 20,000 feet?
6) If team A scored twice as many points as team B, and team A scored 28 points, by your calculation how many points did team B score?
7) There are x number of boys in the class. This is three more than four times the number of girls. How many girls are in the class?

Affect Prime Condition:
Please answer the questions below. Type your answer in the space provided.

2) When you hear the name "George Bush", what do you feel? Please use one word to describe your predominant feeling.
3) When you hear the word "baby," what do you feel? Please use one word to describe your predominant feeling.
4) When you hear the word "music", what do you feel? Please use one word to describe your predominant feeling.
5) When you hear the word "disease", what do you feel? Please use one word to describe your predominant feeling.

6) When you hear the word "sunshine" what do you feel? Please use one word to describe your predominant feeling.

7) When you hear the word "Hurricane Katrina" what do you feel? Please use one word to describe your predominant feeling.

Donation and Affect Questions for Single Victims (sample):
This is Emily, a two-year old child with a life threatening disease who is being treated through the American Cancer Society.

1) Would you be willing to donate money to help save Emily? *(circle one)*

     Yes   No

2) If you answered yes to the previous question, how much money would you donate? Please write the value in the space below:

3)

	Not at all					Very much	
After reading Emily's story I felt worried, upset and sad.	1	2	3	4	5	6	7
I felt sympathy and compassion towards Emily.	1	2	3	4	5	6	7
I feel for Emily.	1	2	3	4	5	6	7
How much would donating money make you feel better?	1	2	3	4	5	6	7

Donation and Affect Questions for Group Victims:
This is Emily, Jacob, Michael, Isabella, Hannah, Elizabeth, Joshua, and Daniel, a group of two-year old children with a life threatening disease who are being treated through the American Cancer Society.

1) Would you be willing to donate money to help save these children? *(circle one)*
    Yes   No
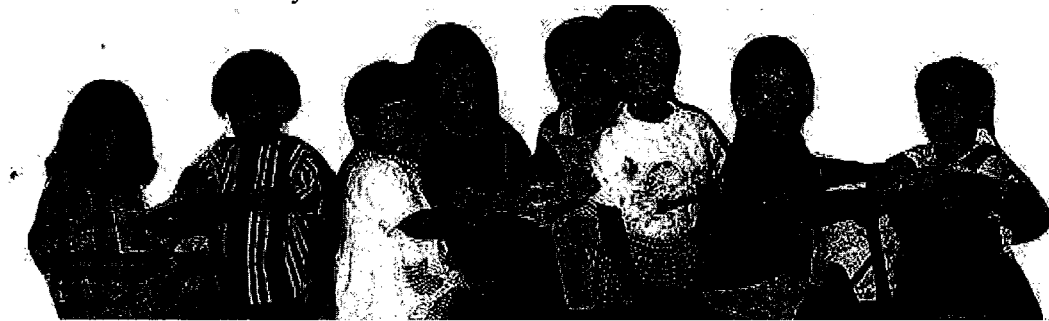2) If you answered yes to the previous question, how much money would you donate? Please type the value in the space below:

3)

	Not at all					Very much	
After reading these children's story I felt worried, upset and sad.	1	2	3	4	5	6	7
I felt sympathy and compassion towards these children.	1	2	3	4	5	6	7
I feel for these children.	1	2	3	4	5	6	7
How much would donating money make you feel better?	1	2	3	4	5	6	7

Additional Results

Table B1: Frequency Distribution of Calculation Answers

Number of correct answers	Frequency	Percent
0	2	2.3
1	0	0
2	9	10.3
3	10	11.5
4	37	42.5
5	27	31
6	2	2.3
Total	87	100

Table B2: Correlations of Correct Calculation Answers with Other Variables

	Correct answers	WTC^a	Other-focused affect	Self-focused affect
Correct answers	1			
WTC^a	-.07	1		
Other-focused affect	-.05	.32**	1	
Self-focused affect	.06	.48**	.55**	1

** p<.001; WTC^a = log-transformed variable

Table B3: Frequency Distribution of Affect Answers

	Number of Positive – Negative emotions	Frequency	Percent
Greater frequency of negative emotions	-3	2	2.3
	-2	7	8.0
	-1	13	14.9
Neutral	0	44	50.6
	1	11	12.6
	2	6	6.9
Greater frequency of positive emotions	3	2	2.3
	4	1	1.1
	5	1	1.1
Total		87	100

Table B4: Correlations of Correct Calculation Answers with Other Variables

	Number of Positive – Negative emotions	WTC^a	Other-focused affect	Self-focused affect
Number of Positive – Negative emotions	1			
WTC^a	-.05	1		
Other-focused affect	.01	.39**	1	
Self-focused affect	-.07	.47**	.40**	1

** p<.001; WTC^a = log-transformed variable

APPENDIX C

MATERIALS AND ADDITIONAL RESULTS FOR STUDY 3

Materials

Identified Victim:

You have the opportunity to donate any of your just-earned money to the humanitarian aid organization *Save the Children*. Any money that you donate will go toward relieving the severe food crisis in Southern Africa.

In particular, any money that you donate will go to Rokia, a 7-year old girl from Mali, Africa.

Rokia, 7 years old

Rokia is desperately poor, and faces a threat of severe hunger or even starvation. Her life will be changed for the better as a result of your financial gift. With your support, and the support of other caring sponsors, *Save the Children* will work with Rokia's family and other members of the community to help feed her and provide her with education, as well as basic medical care and hygiene.

Identified victim with Statistics:

In particular, any money that you donate will go to Rokia, a 7-year old girl from Mali, Africa.

Rokia, 7 years old

Rokia is one of about 20,000 needy children in the same region who are desperately poor, and face a threat of severe hunger or even starvation. Her life will be changed for the better as a result of your financial gift. With your support, and the support of other caring sponsors, *Save the Children* will work with Rokia's family and other members of the community to help feed her and provide her with education, as well as basic medical care and hygiene.

Unidentified Victim:

In particular, any money that you donate will go to a child from Mali, Africa.

The child is desperately poor, and faces a threat of severe hunger or even starvation. His or her life will be changed for the better as a result of your financial gift. With your support, and the support of other caring sponsors, *Save the Children* will work with the child's family and other members of the community to help feed the child and provide him or her with education, as well as basic medical care and hygiene.

Unidentified Victim with Statistics:

In particular, any money that you donate will go to a child from Mali, Africa.
This child is one of about 20,000 needy children in the same region who are desperately poor, and face a threat of severe hunger or even starvation. His or her life will be changed for the better as a result of your financial gift. With your support, and the support of other caring sponsors, *Save the Children* will work with the child's family and other members of the community to help feed the child and provide him or her with education, as well as basic medical care and hygiene.

Donation and Affect Questions for Identified (Unidentified) Conditions:

1. Would you be willing to donate money to help save Rokia (this child)? [Check one box.]

☐ Yes   ☐ No

2. If so, how much money would you be willing to donate?

[Circle one amount, or write in an amount of more than $6.]

$1 $2 $3 $4 $5 $6 $_____

For the questions below, please circle the appropriate number to indicate how you feel about Rokia (this child). [Circle one number for each item.]

	Not at all					Very much	
3. After reading Rokia's (this child) story, I felt worried, upset and sad.	1	2	3	4	5	6	7
4. I felt sympathy and compassion towards Rokia (this child).	1	2	3	4	5	6	7
5. How clear a feeling do you have about Rokia (this child)?	1	2	3	4	5	6	7
6. How much would donating money make you feel better?	1	2	3	4	5	6	7
7. How much would you regret not donating money?	1	2	3	4	5	6	7
9. How much of an impact would your donation have on Rokia's (this child) life?	1	2	3	4	5	6	7
10. Imagine Rokia (this child) among the other children in need. To what extent do you have a clear and coherent picture of Rokia (this child)?	1	2	3	4	5	6	7

Numeracy Scale:

1. Imagine that we roll a fair, six-sided die 1,000 times. Out of 1,000 rolls, how many times do you think the die would come up as an even number?
Answer:_____

2. In the BIG BUCKS LOTTERY, the chances of winning a $10.00 prize are 1%. What is your best guess about how many people would win a $10.00 prize if 1,000 people each buy a single ticket from BIG BUCKS?
Answer:_____ people

3. In the ACME PUBLISHING SWEEPSTAKES, the chance of winning a car is 1 in 1,000. What percent of tickets of ACME PUBLISHING SWEEPSTAKES win a car?
Answer:_____ %

4. Which of the following numbers represents the biggest risk of getting a disease?
___ 1 in 100   ___ 1 in 1000 ___ 1 in 10

5. Which of the following numbers represents the biggest risk of getting a disease?
___ 1%   ___ 10%   ___ 5%

6. If Person A's risk of getting a disease is 1% in ten years, and Person B's risk is double that of A's, what is B's risk?
Answer:_____% in _____ years

7. If Person A's chance of getting a disease is 1 in 100 in ten years, and person B's risk is double that of A, what is B's risk?
Answer:_____ in _____ years

8. If the chance of getting a disease is 10%, how many people would be expected to get the disease:
   A: Out of 100?   Answer:_____ people
   B: Out of 1000?   Answer:_____ people

9. If the chance of getting a disease is 20 out of 100, this would be the same as having a _____% chance of getting the disease.

10. The chance of getting a viral infection is .0005. Out of 10,000 people, about how many of them are expected to get infected?
Answer:_____ people

11. Which of the following numbers represents the biggest risk of getting a disease?
___ 1 chance in 12   ___ 1 chance in 37

12. Suppose you have a close friend who has a lump in her breast and must have a mammogram. Of 100 women like her, 10 of them actually have a malignant tumor and 90 of them do not. Of the 10 women who actually have a tumor, the mammogram indicates correctly that 9 of them have a tumor and indicates incorrectly that 1 of them does not have a tumor. Of the 90 women who do not have a tumor, the mammogram indicates correctly that 81 of them do not have a tumor and indicates incorrectly that 9 of them do have a tumor. The table below summarizes all of this information. Imagine that your friend tests positive (as if she had a tumor), what is the likelihood that she actually has a tumor?

	Tested positive	Tested negative	Totals
Actually has a tumor	9	1	10
Does not have a tumor	9	81	90
Totals	18	82	100

Answer: _____out of_____

13. Imagine that you are taking a class and your chances of being asked a question in class are 1% during the first week of class and double each week thereafter (i.e., you

would have a 2% chance in Week 2, a 4% chance in Week 3, an 8% chance in Week 4). What is the probability that you will be asked a question in class during Week 7? Answer: _____ %

14. Suppose that 1 out of every 10,000 doctors in a certain region is infected with the SARS virus; in the same region, 20 out of every 100 people in a particular at-risk population also are infected with the virus. A test for the virus gives a positive result in 99% of those who are infected and in 1% of those who are not infected. A randomly selected doctor and a randomly selected person in the at-risk population in this region both test positive for the disease. Who is more likely to actually have the disease?

___ They both tested positive for SARS and therefore are equally likely to have the disease

___ They both tested positive for SARS, and the doctor is more likely to have the disease

___ They both tested positive for SARS and the person in the at-risk population is more likely to have the disease.

Additional Results

Correlational Analyses for Variables by Condition:

Table C1: Correlations across conditions:

	WTC	Worry	Sympathy	Clear Feeling	Feel better	Regret	Impact	Coherent Picture
WTC	1							
Worry	.02	1						
Sympathy	.12	.66**	1					
Clear Feeling	.10	.56**	.59**	1				
Feel better	.31**	.31**	.23**	.28**	1			
Regret	.42**	.29**	.27**	.29**	.59**	1		
Impact	.27**	.34**	.34**	.42**	.46**	.33**	1	
Coherent Picture	.19*	.39**	.37**	.67**	.37**	.32**	.45**	1

$*$ = sig. at $p<.05$ $**$ = sig. at $p<.01$

Table C2: Correlations for Identified Single Victim Condition

	WTC	Worry	Sympathy	Clear Feeling	Feel better	Regret	Impact	Coherent Picture
WTC	1							
Worry	.18	1						
Sympathy	.39*	.68**	1					
Clear Feeling	.27	.42**	.45**	1				
Feel better	.45**	.27	.35*	.22	1			
Regret	.47**	.45**	.38*	.36*	.56**	1		
Impact	.36*	.22	.37*	.48**	.21	.31*	1	
Coherent Picture	.27	.33*	.43**	.65**	.24	.31*	.38*	1

* = sig. at p<.05 ** = sig. at p<.01

Table C3: Correlations for Identified Victim with Statistics Condition

	WTC	Worry	Sympathy	Clear Feeling	Feel better	Regret	Impact	Coherent Picture
WTC	1							
Worry	.01	1						
Sympathy	.14	.64**	1					
Clear Feeling	.00	.71**	.55**	1				
Feel better	.27	.34*	.18	.30*	1			
Regret	.45**	.16	.19	.16	.66**	1		
Impact	.25	.42**	.37*	.37*	.55**	.44**	1	
Coherent Picture	.12	.43**	.35*	.54**	.32*	.39*	.29	1

* = sig. at p<.05 ** = sig. at p<.01

Table C4: Correlations for Unidentified Single Victim Condition

	WTC	Worry	Sympathy	Clear Feeling	Feel better	Regret	Impact	Coherent Picture
WTC	1							
Worry	-.04	1						
Sympathy	-.01	.60**	1					
Clear Feeling	-.09	.53**	.62**	1				
Feel better	.15	.36*	.17	.27	1			
Regret	.30*	.35*	.28	.27	.54**	1		
Impact	.22	.39*	.30*	.35*	.54**	.40*	1	
Coherent Picture	.12	.52**	.38*	.78**	.39*	.39*	.51**	1

* = sig. at p<.05 ** = sig. at p<.01

Table C5: Correlations for Unidentified Victim with Statistics Condition

	WTC	Worry	Sympathy	Clear Feeling	Feel better	Regret	Impact	Coherent Picture
WTC	1							
Worry	.00	1						
Sympathy	.06	.71**	1					
Clear Feeling	.27	.57**	.70**	1				
Feel better	.35*	.31*	.31*	.39*	1			
Regret	.43**	.26	.32*	.41**	.58**	1		
Impact	.21	.35*	.40**	.50**	.55**	.18	1	
Coherent Picture	.26	.30*	.31*	.63**	.53**	.20	.59**	1

* = sig. at p<.05 ** = sig. at p<.01

Table C6: Means and Standard Deviations by Single Victim vs. Victim with Statistics

	Victim without statistics		Victim with statistics	
	Means (SD)		Means (SD)	
Numeracy[a]	23103	(11971)	23738	(13387)
WTC[a]	.99	(.87)	.91	(.81)
Worry	4.0	(1.6)	4.0	(1.7)
Sympathy[a]	27.5	(13.8)	29.4	(15.2)
Clear Feeling	3.5	(1.7)	3.5	(1.6)
Feel better	3.5	(1.8)	2.9	(1.7)
Anticipated Regret	3.9	(2.0)	3.5	(2.2)
Impact[a]	1.3	(.41)	1.2	(.38)
Coherent Picture[a]	1.7	(.53)	1.6	(.48)

[a]Non-linearly transformed variable; N = 82 in each condition

Table C7: Correlations of Numeracy for Single Victim vs. Victim with Statistics

	Victim without statistics	Victim with statistics
WTC[a]	.18	.20
Worry	-.10	-.17
Sympathy[a]	-.16	-.17
Clear Feeling	-.15	-.14
Feel better	.01	.12
Anticipated Regret	.03	.06
Impact[a]	-.17	-.10
Coherent Picture[a]	-.18	-.09

*   = sig. at p<.06 ** = sig. at p<.01; [a]Non-linearly transformed variable

Additional Effects of Numeracy:

Univariate ANOVAs with identifiability (identified vs. unidentified victim) and numeracy (high vs. low) as between-subject factors and affect variables as dependent variables revealed the following results:

Clear Feeling. Results show a significant main effect for identifiability, such that participants who saw the identified victim ($M = 3.7$, $SD = 1.6$) reported clearer feelings than those who did not ($M = 3.2$, $SD = 1.7$), $F(1,163) = 4.2$, $p< .05$, $\eta_p=.03$. Additionally, high numerate subjects ($M = 3.8$, $SD = 1.6$) reported less clear feelings toward the victim than low numerates ($M = 3.2$, $SD = 1.6$), $F(1,163) = 5.9$, $p< .05$, $\eta_p=.04$. The interaction

between numeracy and identifiability was marginally significant, $F(1,163) = 2.8, p< .1$, $\eta_p=.02$. As can bee seen in *Figure C1*, identified victims evoked clearer feelings for low numerates, whereas this difference disappeared when the victim was unidentified.
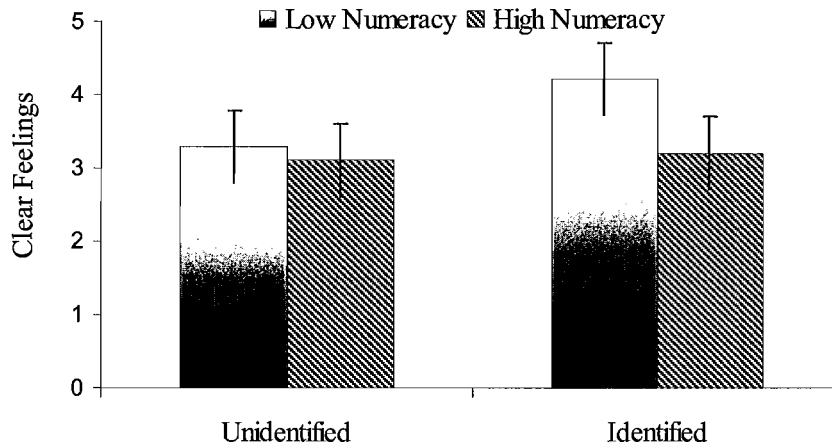

Figure C1: Clear Feeling by Identifiability and Numeracy

Sympathy. Results reveal a significant main effect for numeracy, such that high numerates ($M = 27.7, SD = 14$) reported lower sympathy than low numerates ($M = 30.9$, $SD = 14.5$), $F(1,163) = 4.5, p< .05, \eta_p=.03$. No other effects were significant.

Worry. Results indicate a marginally significant main effect for numeracy, such that high numerates ($M = 3.8, SD = 1.7$) reported lower sympathy than low numerates ($M = 4.2, SD = 1.6$), $F(1,162) = 3.0, p< .1, \eta_p=.02$. Additionally, a marginal interaction suggests that only in the identified condition were high numerates ($M = 3.6, SD = 1.8$) less worried about the victim than low numerates ($M = 4.5, SD = 1.4$), $F(1,162) = 2.8, p< .1, \eta_p=.02$. Conversely, high and low numerates did not differ in how much they worried when the victim was unidentified ($M = 3.9$ for both high and low numerates).

Regret and Feel Better. No significant main effects or interactions emerged from the ANOVAs with either regret or feeling better as dependent variables.

Relationship Between Numeracy, WTC, and Sympathy

While numeracy is positively correlated to WTC ($r = .19, p < .05$), it is negatively correlated with sympathy ($r = -.16, p < .06$). These relationships are more pronounced in the identified conditions ($r = .25, p < .05$ and $r = -.21, p < .07$ for WTC and sympathy, respectively), than for the unidentified conditions ($r = .13, p > .2$, and $r = -.1, p > .4$ for WTC and sympathy, respectively).

Effect of Numeracy on WTC and Sympathy. An analysis of the differential relationship between numeracy with WTC and sympathy that retains the continuous scaling of numeracy supports the notion that as numeracy increased, sympathy decreased and WTC increased. This becomes even more evident when inspecting only participants in the identified condition (*Figures C2, C3, and C4*).
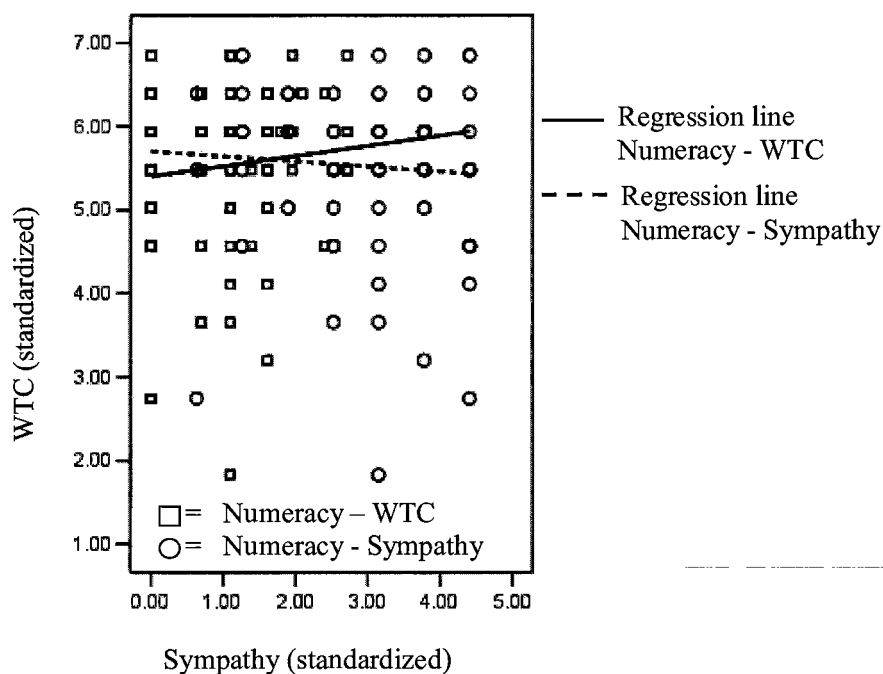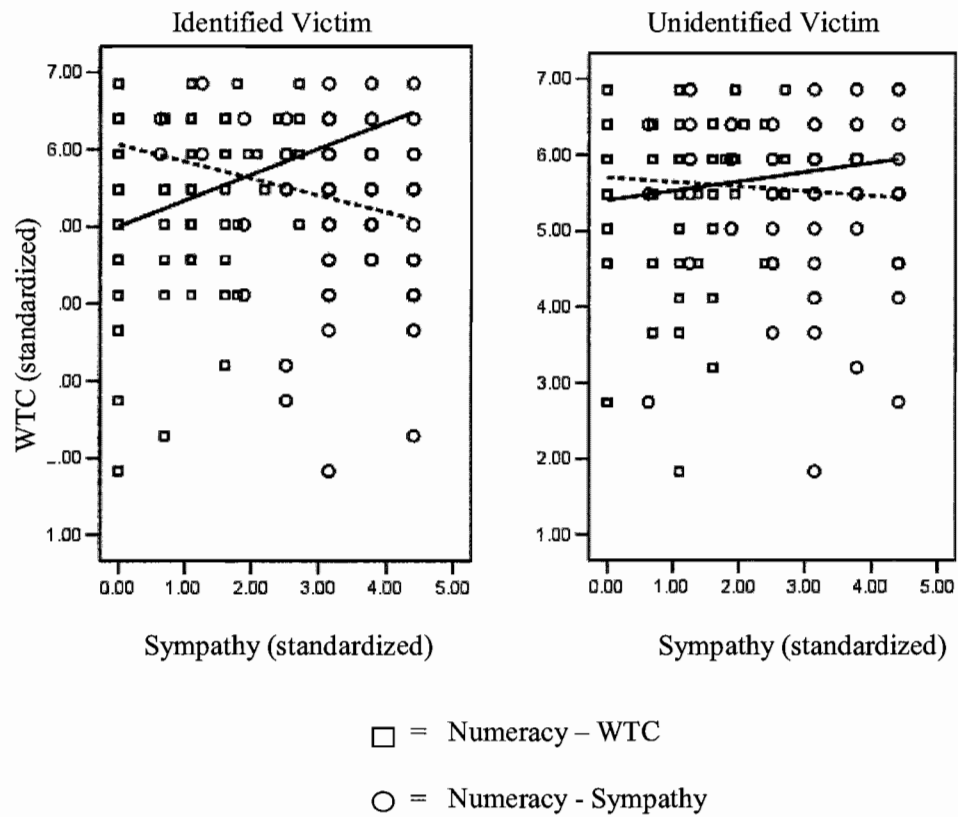

Figure C2: Scatterplot of Numeracy – WTC and Numeracy – Sympathy Relationships Across Conditions.

Figures C3 and C4: Scatterplot for Numeracy – WTC and Numeracy – Sympathy
Relationships for Identified vs. Unidentified Conditions.

APPENDIX D

MATERIALS AND ADDITIONAL RESULTS FOR STUDY 4

Material

Condition 1 (Single target, no additional victims):

In Mali, Africa, severe rainfall deficits have resulted in a sharp drop in maize production for 2006. The resulting food shortage has especially impacted the quality of life for the children in Mali, who are facing the possibility of starvation. To alleviate the food shortage, the organization "Children in Africa" is pairing individual sponsors with specific children in need of help. Imagine that you have the possibility to contribute a donation to one of these children.

This is Moussa, a 5-year old boy from Mali. Any money that you donate will go directly to the effort to help feed Moussa.


Conditions 2, 3, and 4: (three additional victims, seven additional victims, and seven targets)

In Mali, Africa, severe rainfall deficits have resulted in a sharp drop in maize production for 2006. The resulting food shortage has especially impacted the quality of life for the children in Mali, who are facing the possibility of starvation. To alleviate the food shortage, the organization "Children in Africa" is pairing individual sponsors with specific children in need of help. Imagine that you have the possibility to contribute a donation to one of these children.

You will now see some children that are in need of contributions and you may be able to contribute to one of them.

Additional pictures used in Study 4:
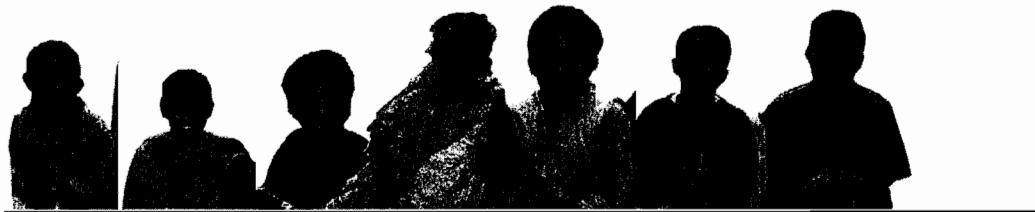
Donation and Affect Questions:

(1) Would you be willing to donate money to help Moussa?

        Yes   No

(2) If you answered yes to the previous question, how much money would you contribute?

        The amount I'd be willing to contribute is $_____

For the questions below, please circle the appropriate number to indicate how you feel.

Not at all						Very much
0	1	2	3	4	5	6

(3) How much emotion did you feel while you were reading the story about Moussa?
(4) After reading the story about Moussa, I felt worried, upset and sad.
(5) I felt sympathy and compassion towards Moussa.
(6) I feel close to Moussa.
(7) How much would donating money make you feel better?
(8) To what extent do you feel the story about this child is relevant to you?
(9) How much do you think your donation would help Moussa?

Additional Results

Effect of Frequency Conditions on Individual Variables:

      To test the effect of the frequency manipulation on individual variables, separate ANOVAs were conducted. No significant differences emerged due to frequency condition (all Fs <1) for all variables with the only exception for this being how relevant the target victim's story was to the participants, $F(3,127) = 2.88, p<.05, \eta=.06$. While no pair-wise comparison was significantly different, inspection of the means suggest that personal relevance decreases as the frequency of victims increases (see *Figure D1*). To

test this, polynomial contrasts analysis were run and found a significant linear trend, $F(1,127) = 4.4, p<.05, \eta_p = .04$. This suggests that as the number of sequentially presented victims is increasing, participants might feel that the victim's story had less personal relevance. Research has proposed that personal relevance is a key ingredient in the decision to help others (Loewenstein & Small, 2007), and the present result corroborates and extends this line or reasoning by suggesting that relevance is a function of number of victims.
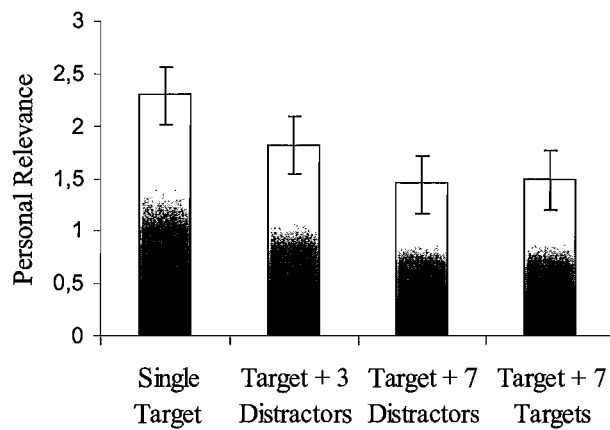

Figure D1: Personal Relevance of the Target Victim's Story

Correlations Between WTC and Affect by Condition

Table D1: Correlations Between WTC and Affective Responses by Condition

	No additional victims + Target (N=27)	3 additional victims + Target (N=30)	7 additional victims + Target (N=31)	Seven Targets + Target (N=44)
Emotion intensity	.58**	.59**	.39*	.13
Worry	.61**	.65**	.15	.27
Sympathy	.53**	.59**	.22	.29*
Feel better	.28	.72**	.27	.31*
Donation help	.43*	.64**	.15	.37*
Closeness	.35	.28	.58**	.16
Relevance	.62**	.33	.41*	-.13

* sig at p<.05; ** sig at p<.01

As is evident from *Table D1*, differential correlational patterns are visible for the different conditions. Whereas emotions such as distress and sympathy are highly correlated with WTC in the single picture and four different pictures conditions, these correlates are much lower when participants saw eight pictures. It is also of note that personal relevance is highly correlated to WTC in the single pictures condition, but only moderately so in the other conditions. This result is even more evident when combining worry about and sympathy for the victim, as well as feeling better due to a donation and how much a donation would help into two variables (see *Table D2*). Feelings seem to be less correlated with WTC in situations where different victims are displayed in greater frequency.

Table D2: Correlations Between WTC and Combined Responses by Condition

	No additional victims + Target (N=27)	3 additional victims + Target (N=30)	7 additional victims + Target (N=31)	Seven Targets + Target (N=44)
Worry and Sympathy	.63**	.69**	.21	.28*
Feel better and Help	.39*	.74**	.26	.42**

Regression with Theoretically Informed Combination of Individual Difference Variables.

Table D3: Regression Analyses of Donations by Priming Conditions

Overall Model	Predictors	β	t	p
Single Target $F(3,23) = 5.9$, $p<.01, adjR^2=.36$	Sympathy + Worry	.49	2.3	.029
	Feel better + Help	-.02	-.1	.915
	Relevance + Closeness	.25	1.2	.232
Three additional victims + Target $F(3,25) = 13.4$, $p<.001, adjR^2=.57$	Sympathy + Worry	.35	2.0	.055
	Feel better + Help	.56	3.0	.007
	Relevance + Closeness	-.12	-.8	.460
Seven additional victims + Target $F(3,27) = 3.8$, $p<.05, adjR^2=.22$	Sympathy + Worry	-.03	-.2	.862
	Feel better + Help	-.09	-.4	.675
	Relevance + Closeness	.61	2.9	.007
Eight Targets $F(3,39) = 6.7$, $p<.01, adjR^2=.25$	Sympathy + Worry	.29	1.5	.128
	Feel better + Help	.44	2.5	.015
	Relevance + Closeness	-.26	-1.68	.102

The results from *Table D3* show that the combination of sympathy and worry predict WTC best in the single victim condition, and this emotion towards the victim becomes less important in participants' determination of WTC as the total number of victims increases. Affect focused on the self, measured by how much better participants feel due to their donation and how much they think it will help the victim is only independently predictive of WTC when the target victim was preceded by a small number of additional victims. When the total number of victims shown increases, participants' perception of how relevant the victim's story is to them and how close they feel towards the victim becomes more important in the prediction of WTC. Higher personal relevance and closeness to the victim is predicting higher WTC. The pattern of results for participants who saw the target victim several times before they could make a donation suggests that self-focused affect is individually predictive when sympathy and personal relevance are controlled for. This suggests that being exposed to the target victim several times before making a donation entices participants to use self-focused feelings as a determinant for donation amount.

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