Group size and the framing effect: Threats to human beings and animals

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Past research provides conflicting evidence for the role of value in the appearance of framing effects. In this study, the effects of frame and group size were examined using scenarios about less valuable and more valuable groups (animal vs. human). In addition, two picture manipulations, intended to increase the value of the group, were presented. Choice patterns differed for the human and animal groups, with participants exhibiting greater risk seeking overall for the human scenario and showing a framing effect for humans but not animals when no pictures were presented. A small group size increased the proportion of risky choices for both the animal and human scenarios. Presenting pictures with names did lead to framing effects for animals, but providing pictures or pictures and names eliminated framing effects for the human scenario. These findings suggest that the relationship between value and framing effects is a matter of degree.

Generally, people prefer options with certain, determinate outcomes (i.e., they show risk aversion) when making decisions about gains, and they prefer options with risky, uncertain outcomes (i.e., they show risk seeking) when making decisions about losses (Markowitz, 1952). These effects extend past decisions involving actual gains and losses to outcomes that are merely “framed” to appear to be gains or losses. For instance, a person who anticipates owing \$1,500 in taxes can see an actual tax due of \$750 as a gain of \$750 (when compared with the foreseen loss of \$1,500), or simply as a loss of \$750. People generally demonstrate greater risk seeking for framed losses and greater risk aversion for framed gains, so preferences can be manipulated by altering the framing of the options (Tversky & Kahneman, 1981). This class of effects violates the *invariance* axiom of expected utility theories, which states that preferences should remain the same across situations where all outcomes are transformed in the same way (such as stating each outcome in terms of its negative points instead of its positive points); these effects are therefore considered irrational (Tversky & Kahneman, 1986).

The most famous demonstration of a framing effect was presented by Tversky and Kahneman (1981), using the Asian disease problem:

Imagine that the U.S. is preparing for the outbreak of an unusual Asian disease, which is expected to kill 600 people. Two alternative programs to combat the disease have been

proposed. Assume that the exact scientific estimate of the consequences are as follows:

Positive frame

If Program A is adopted, 200 people will be saved.

If Program B is adopted, there is $\frac{1}{3}$ probability that 600 people will be saved, and $\frac{2}{3}$ probability that no people will be saved.

Negative frame

If Program C is adopted, 400 people will die.

If Program D is adopted, there is $\frac{1}{3}$ probability that nobody will die and $\frac{2}{3}$ probability that 600 people will die.

All four options have the same *expected* value (derived from multiplying all outcomes by their probability of occurrence): 200 lives saved and 400 lives lost. Further, Program A and Program C are equivalent in terms of the probabilities associated with the possible outcomes, as are Program B and Program D. Despite this equivalence, participants responding to the positive frame chiefly chose Program A, or the certain option (72%); those responding to the negative frame predominantly chose Program D, or the risky option (78%).

Kahneman and Tversky (1979) explained the difference in risk preferences between decisions involving losses and those involving gains with prospect theory, which uses a value function to depict the relationship between risk attitudes and outcome domain (i.e., gains vs. losses; see Figure 1). The loss side of the function is convex, indicating that people will be risk seeking when considering losses, whereas the gain side of the function is concave, reflecting the risk aversion seen when people make choices involving gains. In addition, the loss side of the function is steeper, reflecting the idea that a given loss will be more painful than a gain of the same magnitude.

Although the label “framing effect” originally referred to the manipulation of outcome description used in the

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Figure 1. Prospect theory's value function for gains and losses. From "Prospect Theory: An Analysis of Decision Under Risk," by D. Kahneman & A. Tversky, 1979, *Econometrica*, 47, 279. Copyright 1979 by the Econometric Society. Adapted with permission.

Asian disease problem, other manipulations of frame have since been investigated. The framing manipulation associated with the Asian disease problem is referred to as *risky choice* framing; other types of framing manipulations include *attribute* framing and *goal* framing (Levin, Schneider, & Gaeth, 1998). For risky choice framing scenarios, other important differences may exist. Some scenarios use *risk manipulation by outcome salience*, which involves making the negative or positive aspects of a given alternative explicit (e.g., 90% chance of survival vs. 10% chance of death for a treatment option); others use *risk manipulation by reference to a risky event*, the manipulation used in the Asian disease problem (Kühberger, 1998). Levin et al. found differing amounts of evidence for risky choice, goal, and attribute framing effects, and Kühberger found that the size of the effect of frame was larger for scenarios that were more similar to the Asian disease problem. In light of this evidence, it is important to identify the type of framing effect under discussion when one is considering factors that affect the influence of frame. The discussion here will be limited to risky choice framing effects using risk manipulation by reference to a risky event (i.e., scenarios mapped closely after the Asian disease problem).

Significant framing effects have been found in many studies using the Asian disease or similar problems. Although the effects found are not typically as large as that found by Tversky and Kahneman (1981), frame generally has a moderately sized effect on choice when the scenarios are similar to the original problem (Kühberger, 1998). The standard framing effect involves more choices of the risky option in the negative frame, although reverse effects

have sometimes been found (Bloomfield, Sager, Bartels, & Medin, in press; Fagley & Miller, 1990). Framing has also produced null effects in numerous studies, several of which will be discussed below. It seems that, even when similar to the Asian disease problem, some scenarios are more likely to produce framing effects than others.

Type of Outcome and Framing Effects

Prospect theory explains framing effects through the value function, which predicts, due to *diminishing marginal utility*, that outcomes of greater value should occupy a portion of the value function that is more nonlinear (Kahneman & Tversky, 1979). Diminishing marginal utility occurs when each additional gain or loss has a subjectively smaller impact than do those that preceded it (e.g., a one-unit increase from 4 to 5 has greater subjective value than an increase from 499 to 500). This characteristic is believed to underlie the framing effect: Participants in the positive frame do not see the possible additional gain (offered by the risky option) as being worth the risk, and participants in the negative frame do not see the possible additional loss as fearful enough to drive them to accept a certain loss. Thus, in order for framing effects to appear, according to prospect theory, the value function for what is at stake must be nonlinear. Because less valuable outcomes have more linear value functions, having relatively high value for what is at stake should be necessary for a framing effect to appear, and framing effects should be stronger for outcomes that participants highly value (Fagley & Miller, 1997; Levin & Chapman, 1990).

Contrary to the idea that framing effects should be more extreme for more valuable outcomes, Fagley and Miller

(1997) found greater risk seeking for scenarios involving human life even in the positive frame (where prospect theory predicts greater risk aversion) than for scenarios involving money. Significant framing effects were found for two of the three money scenarios and only one of the three human life scenarios (and for women only in all cases; men showed no significant effects of frame). The greater preference for the risky option in the positive frame prevented the framing effect from being more extreme for human life. Jou, Shanteau, and Harris (1996) and Wang (1996b) also found greater risk seeking for human life across both frames than for other outcome arenas, such as precious metals or valuable artwork. In a meta-analysis of framing effect studies, Kühberger, Schulte-Mecklenbeck, and Perner (1999) found that more risky choices were made for human life scenarios than for money/property scenarios or scenarios involving other targets. Thus, it seems that framing effects could be smaller or nonexistent in these scenarios because participants show greater risk seeking in both frames when making choices regarding human life.

However, other studies have suggested that frame does indeed have a larger effect on decisions involving human life. Zickar and Highhouse (1998) performed an analysis based on item response theory (IRT), which takes into account preexisting risk preferences and other factors. Studying responses to four scenarios, only one of which involved human life (the Asian disease problem) and the others of which involved jobs, school dropout rates, and tax laws, they found that choice in the Asian disease problem was affected more by framing than was choice in the other three scenarios. The two frames of the Asian disease problem produced a greater disparity in choice of the risky option, and across a wider range of preexisting risk-taking levels, than did the other three scenarios. Also in support of this idea, a meta-analysis by Kühberger (1998) showed that scenarios that involved human life/health issues produced a higher mean effect size for frame than did scenarios that involved business, social, gambling, or other problem domains. These findings suggest that framing effects are stronger for scenarios involving human life, despite the propensity for greater risk seeking in these decisions.

There is also evidence that this relationship does not necessarily extend to other life forms. Wang, Simons, and Brédart (2001) found significant framing effects for human lives (36% choice of the risky option in the positive frame, 66% in the negative frame) but no difference in the preference for the risky option between frames for extraterrestrial lives (52% choice of the risky option in both frames). They suggested that participants lacked an aspiration for saving alien lives, as opposed to human lives, and that this led to near neutral choices in both frames. Schneider (1992) presented two scenarios involving animal lives and three scenarios involving human lives and found effects of frame for all three human scenarios but only one animal scenario. This again suggests that scenarios about human lives are more likely to produce framing effects than are scenarios involving other types of life.

Even within the domain of human life, qualities of the group at risk have been found to interact with the effect of frame. Levin and Chapman (1990) found that participants did not show reliable framing effects for AIDS victims when they were described as a "culpable" group (i.v. drug users), but did show the standard framing effect when the group was described as (presumably innocent) hemophiliacs (for i.v. drug users, 50% choice of the risky option in the positive frame, 39% in the negative frame; for hemophiliacs, 22% in the positive frame and 79% in the negative frame). They argued that participants were less likely to show a framing effect for a group that they devalued, and that this was the root of the lack of framing effects for the culpable AIDS patients. This premise is supported by an additional study in which the choice involved assigning the risky option to either Americans or Iranians and the certain option to the other group. In this situation, participants preferred to assign the certain option to Americans in the positive frame and the risky option to Iranians; the reverse was found in the negative frame. Again, this suggests that participants show the traditional framing effects pattern for a valued group (their in-group), but not for a devalued group.

Deep Thinking, Involvement, and Framing Effects

The argument that greater value for what is at stake encourages framing effects seems to fly in the face of arguments that these effects arise from a kind of mistake that could be overcome through more careful processing (see, e.g., Smith, 1985). Some empirical evidence supports this idea. Simon, Fagley, and Halleran (2004) reported no framing effect for participants who were high in both need for cognition (NFC) and self-reported math ability. They suggested that participants who are inclined to think more deeply and have proficiency in thinking logically are less likely to be swayed by the frame of the scenario. Furthermore, they found that when participants were asked to process the problem more deeply before responding (describing how they would explain the problem to a friend), participants with high NFC did not show framing effects, but participants with lower NFC still did. Again, this suggests that, although high NFC is not sufficient for eliminating framing effects, when it is combined with a deeper processing of the problem (either experimentally induced or, presumably, brought on by greater proficiency with math), the combination does seem to prevent an effect of frame (see, however, LeBoeuf & Shafir, 2003). Similarly, Miller and Fagley (1991) and Sieck and Yates (1997) found that participants who wrote explanations for their choices prior to making a choice were less likely to show framing effects than participants who did not write explanations.

A high degree of personal relevance or personal caring for the topic of a scenario has also been shown to diminish the effect of frame. Tanner and Medin (2004) found that participants who valued what was at stake very much (i.e., who had a "protected value" for what was at stake) failed to show framing effects, whereas participants who

did not care as much did show framing effects. McElroy and Seta (2003) found that college students showed framing effects for a scenario that had low personal relevance for them (a change in program requirements that would take effect 10 years in the future), but not for one that had high personal relevance (a change that would take place the following year).

Other work suggests that framing effects can be avoided by presenting scenarios that are more in line with people's natural decision-making abilities. Wang and Johnston (1995) found that for small human group sizes (60 or 6), participants did not show reliable framing effects and were instead predominantly risk seeking in both frames (68% and 64% choice of the risky option in the positive frame, 65% and 70% in the negative frame, respectively). Wang (1996a) argued that people do not show a framing effect for small group scenarios because a small group context is more ecologically valid (a small group context is what human beings evolved in), and people are therefore able to ignore the irrelevant cue of frame. He went on to suggest that people preferred the risky option in both frames because they valued each individual group member in a small group context higher than the individual group members in a large group context (because of a perceived interdependence between the small group members). Wang and Johnston's study provides additional evidence that more careful processing (in this case stimulated by the more valid decision context) can prevent framing effects.

The Present Study

Obviously, the relationship between having greater value for outcomes and framing effects is as yet unclear. Although studies such as Tanner and Medin's (2004) and McElroy and Seta's (2003) suggest that greater value for an outcome reduces the effect of frame, the findings of Wang et al. (2001) and Levin and Chapman (1990), as well as the predictions of prospect theory, suggest that value for what is at stake is also required for framing effects to appear in the first place. To address this issue, in the present study we explored framing effects by using groups that should be less valuable to the participants, as well as a human group, and we introduced a manipulation intended to increase the value of the group members for the participants.

In a pilot study, participants were asked to draw a line representing how much they cared about eight issues involving either animals or humans (e.g., otters exposed to toxins or nursing home residents losing their drug coverage). The average line drawn for human issues was nearly twice as long as that drawn for animal issues (10.06 vs. 5.67, in centimeters). Because the present study was performed with participants from the same population as that for the pilot study, it can be assumed that the participants in the present study cared less about animals than about humans too. Scenarios describing grizzly bears, turtles, and wolves at risk were presented, along with a scenario about humans. In addition, participants were presented with a manipulation to increase their value for the group at risk: pictures of the group victims. Hsee and Rotten-

streich (2004) employed pictures to increase the *affective-ness* of a scenario involving pandas and thus increased the extent to which participants relied on emotions to make decisions. Gunnthorsdottir (2001) found that providing attractive pictures of apes increased the hypothetical allocation of funds to the protection of that species of ape in comparison with presenting no pictures ($M = \$27.80$ for the attractive picture condition vs. $M = \$17.25$ for the no-picture condition). If having higher value for the group was necessary for framing effects, the presentation of attractive pictures of the group members should increase the likelihood that the participants would show framing effects for animals.

METHOD

Participants

One hundred eighty-two undergraduates participated for course credit. Two participants were excluded because they failed to follow instructions. One participant failed to respond to the human scenario, stating in her justification that she "couldn't choose." For this scenario, there were thus only 179 responses.

Materials

The scenarios presented in this study were modeled closely after the Asian disease scenario: In the positive frame, the certain option offered one third of the group members saved, and the risky option offered a $\frac{1}{3}$ chance that the entire group would be saved and a $\frac{2}{3}$ chance that none of the group would be saved. The scenarios were identically worded except for the label given to the victim group, and each participant responded to all four scenarios (grizzly bears, turtles, wolves, and humans). The identification of the risky and certain option in each scenario as Plan A or Plan B was randomized, and the scenarios were presented in one of five orderings.

The small group size condition grizzly bear scenario read (positive frame [negative frame]) as follows:

Imagine that 6 grizzly bears are infected by a fatal disease. Two alternative medical plans to treat the disease have been proposed. Assume that the exact scientific estimates of the consequences of the plans are as follows:

If Plan A is adopted, 2 bears will be saved [4 bears will die].

If Plan B is adopted, there is a one-third probability that all 6 bears will be saved [no bears will die], and a two-thirds probability that none of them will be saved [all 6 of the bears will die].

Which of the two plans would you favor?

After presentation of each scenario, the participants also responded to the prompt "Why?"

Frame was manipulated between participants: Half of the participants received the positively framed scenarios, and the other half received the negatively framed scenarios. The size of the groups discussed in the scenarios was also manipulated between participants: Half of participants responded to scenarios involving groups of 6 individuals (small group condition), and half responded to scenarios describing groups of 600 individuals (large group condition).

One third of the participants were shown pictures of the group members prior to reading the scenario and making their choice (*pictures* condition), one third were shown the same pictures accompanied by names of the victims (*pictures + names* condition), and one third were not shown pictures (*neutral* condition). The pictures were real photos of animals and people collected from different sites on the Internet, chosen to be appealing (e.g., no vicious-looking bears or wolves or people with unattractive facial expressions). The pictures of people were head shots, and the pictures of animals were cropped to focus attention on the "faces" of the animals, though

some included their bodies as well. The pictures of people were chosen to be diverse with respect to ethnicity, gender, and age. The names assigned to the photographs were found by accessing lists of baby names (humans) or pet names (animals) on the Internet, or were made up by the experimenter.

Design and Procedure

The participants were given a booklet containing the four scenarios, each on a separate page. The participants were instructed to not turn the pages of the booklet themselves, but to signal to the experimenter to turn the page when they were finished with a scenario. This allowed the participants in the pictures and pictures+names conditions to be presented with pictures of the group members prior to their reading the corresponding scenario. These participants were informed that they were being presented with “visual aids.” The participants in the large group condition saw packets containing 600 pictures, and those in the small group condition saw displays of 6 pictures. After a participant viewed the pictures for a few minutes, or was done viewing the pictures, the experimenter took the pictures away and instructed the participant to address the scenario.

RESULTS

Figures 2 and 3 show the proportion of risky choices by frame, group size, and picture condition for the human scenario and the animal scenarios, respectively. For simplicity's sake, the responses to the three animal scenarios are combined in Figure 3. The choice patterns were highly similar for the three animal scenarios.

For the human scenario, there was a general tendency for participants to be risk seeking in both group size conditions, although more so in the small group condition. To examine the effect of frame on choice, consider first the neutral/large group condition, which corresponds to the standard framing paradigm: In this case, framing effects were apparent, with 73% of participants choosing the risky option in the negative frame and 27% choosing it in the positive frame. There was also a smaller framing effect in the neutral/small group condition, with 80% choosing the risky option in the negative frame and 60% choosing the risky option in the positive frame. Framing

effects were not apparent in any of the other group size $\times$ picture condition cells, and participants tended to be risk seeking in both the positive and negative frames.

For the animal scenarios, there was a general trend toward risk aversion or risk neutrality in both group size conditions, although participants in the small group condition selected the risky option considerably more often. Framing effects were most apparent for participants in the pictures+names/small group condition, with more choices of the risky option in the negative frame than in the positive frame (71% and 33%, 79% and 13%, and 71% and 40% for bears, turtles, and wolves, respectively). Participants also showed a small framing effect in the pictures+names/large group condition (27% and 13%, 33% and 19%, and 33% and 7% for bears, turtles, and wolves, respectively). Participants were less risk seeking for the animal scenarios than for the human scenario, and, whereas framing effects were most apparent in the two neutral conditions for the human scenario, they were most apparent in the two pictures+names conditions for the animal scenarios.

A repeated measures ANOVA with scenario as the repeated measure and frame, group size, and picture condition as the between-subjects factors revealed significant main effects of frame and group size [$F(1,167) = 5.41$, $MS_e = 3.24$, $p < .05$, and $F(1,167) = 15.65$, $MS_e = 9.37$, $p < .001$, respectively]. Participants were more likely to choose the risky option in the negative frame than in the positive frame (50% vs. 37%) and in the small group condition than in the large group condition (55% vs. 32%). There was also a significant effect of scenario [$F(3,501) = 36.67$, $MS_e = 3.35$, $p < .001$]: The human scenario elicited a greater number of risky choices (64%) overall than did the animal scenarios (on average, 37%). Furthermore, there was a three-way interaction of scenario, frame, and picture condition [$F(6,501) = 3.685$, $MS_e = 0.337$, $p < .01$]. Separate ANOVAs were performed for each scenario in each picture condition separately to elucidate this in-

Figure 2. Effects of frame by group size and picture condition for the human life scenario.

Figure 3. Effects of frame by group size and picture condition for the animal life scenarios. Each bar represents the average proportion of risky choices made across the three animal scenarios.

teraction. As noted above, the human scenario produced significant framing effects only in the neutral condition [$F(1,58) = 7.59$, $MS_e = 1.67$, $p < .01$], and the animal scenarios produced framing effects only in the pictures + names condition [$F(1,58) = 11.66$, $MS_e = 2.28$, $p < .01$; $F(1,58) = 5.83$, $MS_e = 1.27$, $p < .05$; $F(1,58) = 4.53$, $MS_e = 0.989$, $p < .05$, for turtles, wolves, and bears, respectively].

As can be observed in Figures 2 and 3, the effects of frame were more apparent in the neutral/large group condition than in the neutral/small group condition for the human scenario, and in the pictures + names/small group condition than in the pictures + names/large group condition for the animal scenarios. However, the absence of a significant four-way interaction of scenario, frame, picture condition, and group size suggests that these differences may not be reliable. This is discussed further in the next section.

DISCUSSION

The results of this study provide further evidence that group size influences the effect of frame. In addition, the results demonstrate that value for the group, manipulated through the presentation of pictures, interacts with framing effects. The human scenario presented here (in the large group condition) was virtually identical to the original Asian disease problem and thus the neutral/large group condition represented the usual test of the framing effect. In the neutral condition, the typical framing effect was found, with more choices of the risky option in the negative frame than in the positive frame. This effect was visibly stronger for the large group condition than for the small group condition. However, the introduction of a picture manipulation (pictures or pictures and names) eradicated the framing effect for both the small and the large

group conditions. Increased value, owing to viewing the victims' pictures, led to participants in *both* frames being slightly risk seeking.

The findings presented here also provide further evidence that the type of group at risk influences framing effects. Almost no studies have looked at framing effects for scenarios involving animal life (but see Schneider, 1992, and Frisch, 1993). In the present study, animals were chosen specifically to represent less valued groups. The neutral/large group condition constitutes a replication of the Asian disease problem with animal life substituted for human life, and in this condition (and in the neutral/small group condition), there were no framing effects for any of the animal scenarios. These are the results predicted if participants must care about the group to show framing effects, as has been suggested by past studies (e.g., Levin & Chapman, 1990). However, a picture manipulation (pictures + names) intended to increase value led to significant framing effects for all three animal scenarios. These results indicate that participants will show framing effects for a less valued group if they are presented with a manipulation that increases the group's level of value, further supporting the idea that having value for the group at risk is a prerequisite for framing effects.

It is unclear why providing pictures alone did not produce framing effects for the animal scenarios (although this manipulation did eradicate framing effects for the human scenario). It is possible that the pictures of the animals failed to increase value because animals tend to "all look alike to us,"¹ and the addition of names may have helped to differentiate the photos from each other. The relationship between value and frame may involve not simply caring about the group as a group, but actually viewing each member of the group as individually valuable and important to save. Also, the names may have simply served as an additional manipulation of value, which,

combined with the pictures, made participants value the animals enough to show framing effects.

The present study also demonstrates that the group size effect found by Wang and Johnston (1995) partially extends to animal groups as well. Although no framing effect was evident in the neutral/small group condition for the animal scenarios, it cannot be argued that this resulted from the small group size's being a more ecologically valid decision context for the participants (the explanation given by Wang, 1996a); no framing effect was found for the neutral/large group condition, either. However, the increase in risky choices for the small group conditions as opposed to the large group conditions was significant for the animal scenarios as well as the human scenarios. Wang (1996a) suggested that participants feel that a small group cannot withstand a loss of two thirds of its members and so prefer the risky option. If participants interpreted the small groups of animals as being interdependent, perhaps not in the sense of relying on each other for survival but in terms of a necessary number of breeding pairs needed to continue the group, they might well have felt that the group's survival depended on all or most of the group members' survival. If this was the case, then the group size effect might be better described as an effect arising from how people think about small groups in general, as opposed to just small human groups.

That the picture manipulations did not have the same effect on the human scenario as they did on the animal scenarios is unsurprising, given that participants probably already saw the human group as made up of members who were valuable. Furthermore, if the increased value of the group members created by the small group context contributes to the lack of a framing effect and leads to a preference for the risky option in both frames for human scenarios (as argued by Wang, 1996a), it makes sense that increased value stimulated by the presentation of pictures would do the same. Although not significantly so, framing effects are notably weaker in the small group condition than in the large group condition, which accords with Wang and Johnston's (1995) findings. The similarity between responses to the neutral/small group condition and the pictures/large group and pictures+names/large group conditions is striking. Post hoc analyses revealed that there was no significant difference between participants' responses (across both frames) to the pictures/large group and the neutral/small group conditions, and no significant difference between responses to the neutral/small group and the pictures/small group conditions. If group size and the picture manipulations do not work by the same means, they do at least seem to have redundant effects for the human scenario in this task.

Although the four-way interaction of scenario, frame, picture condition, and group size was not significant, the effect of frame appears to be much smaller for the neutral/small group condition than for the neutral/large group condition (human scenario), and for the pictures+names/large group condition as opposed to the pictures+names/small group condition (animal scenarios). The most likely

explanation for the failure to find the corresponding interaction is that the present study, with its relatively small sample size, did not have enough power to detect it. In future studies, this interaction should be examined more closely, especially for less valued groups such as animals. It is possible that the pictures and names manipulation was not strong enough to increase participants' value for large groups of animals on its own, and only when it was combined with another value-increasing manipulation (smaller group size) did value increase enough for framing effects to appear. Small group size has been shown to increase the propensity for framing effects for commodities: Wang (1996b) found a framing effect for irreplaceable paintings when the group of paintings was small (60 or 6), but no effect for a group of 600 paintings, and a smaller effect for 6,000 paintings. These results suggest that a small group size may increase value for items less valuable than human life and thus encourage framing effects.

Although the effect of the picture manipulation in this study seems to provide evidence for a relationship between value and framing effects that is just as conflicting as what was previously known, combined with the results of past studies these findings suggest that the effect of value on frame may be a matter of degree. A low degree of value, like those for the animal scenarios in the neutral condition in this study, the alien condition of the Wang et al. (2001) study, and the culpable AIDS patients condition of the Levin and Chapman (1990) study, results in frame failing to affect choice, and in preferences near neutral or risk averse in both frames. This situation, as mentioned above, may be explained by the relationship between participants' value for the group at stake and the shape of the value function. When a manipulation to increase the value of the group (i.e., the pictures+names manipulation) was introduced, framing effects appeared for the animal scenarios in this study. The results for the human scenario in the pictures and pictures+names conditions (no framing effects and a preference for the risky option in both frames) suggest, like those of Wang and Johnston (1995) in their small group conditions, that a very high degree of value for what is at stake prevents framing effects. It seems that a certain degree of value is necessary for frame to affect choice, but that a very high degree of value can prevent frame from affecting choice.

Rothman and Salovey (1997) have suggested that framing effects are partially determined by the decision maker's first integrating the frame into a mental representation of the problem. I would suggest that value for what is at stake plays a role in whether frame is integrated into the problem representation. The framing manipulation of the Asian disease problem requires that decision makers interpret the negative frame in terms of losses, and the positive frame in terms of gains; if participants do not see the group members' dying as a loss, or their being saved as a gain, there is no reason for them to adopt a particular risk attitude. However, Wang (1996a, 1996b) has suggested that decision makers have other reasons for choosing one of the two options that supersede frame. The failure to find

framing effects with more involved participants, such as those of McElroy and Seta (2003), or those more predisposed to elaborate processing of problems, such as those of Simon et al. (2004), may arise from such participants' generating reasons for their decision that have nothing to do with frame.

Because no direct measure of value was obtained in the present study, the interpretation of the effects of the picture manipulations is open to question. However, Gunnthorsdottir (2001) demonstrated that the presentation of attractive pictures did increase a measure of value (funds allocated). Furthermore, although it is not definitive, the finding that the presentation of unattractive pictures in her study did not result in such an increase suggests that this is not simply an effect of vividness. Also, in ongoing work, presenting pictures in situations where they would not be expected to increase value for what is at stake (e.g., pictures of televisions at risk) has been found to have no effect on choices. In future studies, a measure of value should be obtained to pinpoint the effect (and the degree of the effect) of the presentation of pictures on value for a group. This would also be useful when researchers manipulate group size to evaluate whether participants' degree of value for the group members changes with the group size, as Wang (1996a) has suggested. Nonetheless, the findings presented here offer support for the idea that increasing value for a less valued group encourages framing effects and that increasing value for an already valued group can eradicate framing effects.

An anonymous reviewer raised another methodological concern with the present study, that participants in the neutral condition were not presented with any stand-in for viewing pictures. Viewing the pictures, especially the large groups of pictures, might have created a cognitive load for the participants in the pictures and pictures+names condition. In past studies, requiring participants to provide an explanation for their decisions, which could arguably introduce a cognitive load, eliminated the framing effect (Fagley & Miller, 1990; Sieck & Yates, 1997). However, the presentation of pictures and pictures and names had different effects on framing effects in the human and animal scenarios. If participants in the pictures and pictures+names conditions were hindered in their decision making, it is unclear why this would have affected choices differently for the animal and human scenarios. Furthermore, in ongoing related work, the neutral condition was altered to present participants with blocks of colored squares of the same size, configuration, and number as the picture displays; analogous differences between the pictures+names and the neutral conditions were found with this addition, suggesting that the presence of a visual display alone is not the source of the effects reported here.

CONCLUSION

In the present study, presenting pictures and names led to the appearance of framing effects for animal scenarios and to the disappearance of framing effects for a human scenario. This interaction appeared to be some-

what dependent on the size of the group at risk, supporting Wang's (1996a) idea that the group size effect documented by Wang and Johnston (1995) was the result of increased value for the group members in a small group context. These results also suggest that it is possible to create framing effects by manipulating degree of value, which supports the idea that having higher value for what is at stake leads to a nonlinear value function, as Levin and Chapman (1990) and Fagley and Miller (1997) have discussed.

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NOTE

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