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A group construal account of drop-in-the-bucket thinking in policy preference and moral judgment

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ABSTRACT

Decisions, both moral and mundane, about saving individuals or resources at risk are often influenced not only by numbers saved and lost, but also by proportions of groups saved and lost. Consider choosing between a program that saves 60 of 240 lives at risk and one that saves 50 of 100. The first option maximizes absolute number saved; the second, proportion saved. In two studies, we show that the influence of proportions on such decisions depends on how items at risk are mentally represented. In particular, we show that proportions have greater influence on people's decisions to the extent that the items at risk are construed as forming groups, as opposed to distinct individuals. Construal was manipulated by means of animated displays in which resources at risk moved either independently (promoting individual construal) or jointly (promoting group construal). Results support the hypothesis that (a) decision makers form mental representations which vary in the degree to which resources at risk are construed as groups versus individuals and (b) construal of resources as groups promotes the influence of proportions on decisions and moral judgments.

Choices can be described in both relative and absolute terms. For example, a deal on a stereo can be presented as a $50 discount or as "10% off." A government's budget cut can be spun as $100 million, which sounds large, or as a 4% reduction, which does not. A decision to send aid to a famine-struck country might be seen as saving the lives of 1000 people or as making but a tiny dent in the problem of hunger and malnutrition in the world.

Furthermore, our evaluative judgments often depend on whether outcomes are framed in absolute or relative terms. In one study, for example, participants evaluated a program that would save the lives of two pedestrians annually (Jenni & Loewenstein, 1997). For one group of participants, the pedestrians were described as 2 of 4 people who die at an intersection annually. For a second group, they were described as 2 of 1700 people who die in auto-related accidents in Pennsylvania annually. The first group evaluated the program more favorably. The program's consequences are identical in both cases, but relative considerations – the proportion of the reference group saved – make the first description more compelling. Other experiments employing similar between-participants designs have revealed similar effects (Baron, 1997; Fetherstonhaugh, Slovic, Johnson, & Friedrich, 1997; Friedrich et al., 1999).

More surprisingly, relative considerations often influence decisions even in cases where absolute and relative considerations are pitted against each other and where a strict focus on absolute numbers seems appropriate, or even morally obligatory (Kogut & Beyth-Marom, 2008; McDaniels, 1988). For example, participants in one study read that anthrax had been weaponized and released into the air above two cities (Bartels, 2006). They then chose between saving 225 of 300 people expected to die in one city versus saving 230 of 920 expected to die in another city. Nearly half of participants preferred the first option — saving a greater proportion, even though this meant saving fewer lives. This phenomenon has been termed *proportion dominance* (Slovic, Finucane, Peters, & MacGregor, 2002). In a subsequent task, participants were shown the conflict between saving a greater proportion and saving a greater absolute number, and they were asked to rate the importance of each. In this task, participants did *not* respond that saving a greater absolute number was maximally important. In other words, even upon deliberation, participants did not respond as if a strict focus on absolute numbers was the correct approach to every problem.

Previous research on proportion dominance has investigated policy preference, making little connection to research on moral reasoning and judgment. This could seem like an oversight, considering that the resources under consideration (e.g., human life, natural resources) are typically drawn from domains that are ascribed moral relevance by many people. As Baron (1997) first observed, proportion dominance, as studied in the context of judgment and decision making, is similar to a pattern in moral reasoning discussed in a prominent utilitarian ethical theory proposed by the philosopher Peter Unger (1996). Unger notes that people tend to regard saving lives as less morally obligatory when they are construed as a few among overwhelmingly many at risk, a tendency he calls "futility thinking" and that we will call "drop-in-the-bucket thinking." For example, most people judge that letting a child drown in a nearby pond is less permissible than letting a child die of

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malnutrition in a famine-struck country (Singer, 1972). Although there are many differences between the scenarios, Unger argues compellingly that one of the important differences is that in the latter case only a tiny proportion of those at risk can be saved, whereas in the former case *all* of those at risk (one person) can be saved.

In sum, we have multiple phenomena that involve an influence of relative considerations where a strict focus on absolute considerations might seem more "correct." In this paper, we propose a single cognitive account of these phenomena.

Ours is not the first attempt to explain the influence of proportions on decisions about resources at risk, but we believe it is the most comprehensive. Baron (1997) attributed proportion dominance to a general error in mathematical reasoning: a tendency to confuse relative and absolute quantities. Alternatively, Fetherstonhaugh et al. (1997) likened the diminished appreciation of loss of life when many are at risk to Weber's law of perception, which says that just-noticeable differences in stimulus intensity are greater at greater absolute intensities. They proposed that these phenomena in fact share a common underlying mechanism, a form of "psychophysical numbing" that is "ingrained in the workings of our cognitive and perceptual systems" (Fetherstonhaugh et al., 1997, p. 298; see also Slovic, 2007). Although the confusion and psychophysical numbing accounts explain some instances of proportion dominance, other instances are problematic for these accounts. The confusion account, for example, does not explain why proportion dominance remains when relative and absolute considerations are pitted against each other (making the conflict between absolute and relative transparent), nor why participants, when asked to reflect on the problem, don't consistently endorse a strict focus on absolute quantities.

Our account is explicitly cognitive; its explanatory constructs are mental representations. We posit that choices are based on mental representations of resources (lives, dollars, etc.) and that mental representations vary in the degree to which they emphasize resources as distinct individuals versus monolithic groups. In other words, representations of resources fall somewhere on a continuum whose endpoints are "individuals" and "group." Fifty sea otters can be construed as 50 individuals; as a single, deindividuated group; or anywhere in between. To the degree that they are construed as individuals, greater weight will be given to absolute considerations, and decisions will maximize the number of individuals saved. To the degree that resources are construed as a group (e.g., that 50 otters form a single raft), more weight will be given to relative considerations; decisions will tend toward maximizing the proportion of this group that is saved, as saving a large proportion of a whole unit is more satisfactory than saving a small proportion (cf. Geier, Rozin, & Doros, 2006). The greater the "groupness" of the representation, the greater the influence of relative considerations.

Our argument that individual versus group representation can influence thinking is well-founded theoretically. "Groupness" in mental representations has already met with success as an explanatory tool in social cognition, where "entitativity" – the degree to which a social group constitutes a single entity (Campbell, 1958) – influences how people explain traits (Haslam, Rothschild, & Ernst, 2000), behaviors, and intentions (Brewer, Ying-Li, & Qiong, 2004), among other things.

The studies in this paper accomplish two goals: (1) We manipulate the representation of resources as individuals versus groups and show that this difference accounts for the influence of absolute versus relative considerations on judgment. For experimental control, we manipulate construal in a way that is somewhat artificial. In the General Discussion, we consider factors that influence individual versus group construal in more natural settings. Study 1 finds that group construal promotes proportion dominance, and Study 2 finds that it promotes drop-in-the-bucket thinking. (2) In accounting for both proportion dominance and drop-in-the-bucket thinking, we bring together disparate literatures which, we believe, describe a single phenomenon from different perspectives.

Study 1

To manipulate construal, we adopted methods from studies that investigated conditions under which adults and children treat groups as single units. In a study by Bloom and Kelemen (1995), participants were shown a static display of 15 unfamiliar-looking objects arranged in three groups of five and were told, for example, "these are fendles." The question was what participants would take "fendle" to mean, and to answer this question, the researchers asked participants how many fendles there were. Participants in this condition interpreted the name as referring to the objects — when asked, they reported that there were 15 fendles. In another condition, the three groups moved as units, with each group following a distinct path across the display. In this condition, participants interpreted the novel name as referring to the groups, reporting that there were three fendles. In another study, participants saw groups of objects moving along distinct paths and interacting with one another. When asked to describe these animations, participants described the groups, not the objects, as agents with intentions to move in certain ways (Bloom & Veres, 1999). Joint motion, then, is a cue to "groupness."

We adapted this method to manipulate people's construal of resources at risk. In Study 1, participants saw resources (people, otters, etc.) depicted as arrays of objects. These objects appeared via computer-presented animations. In the *individuals* condition, objects emerged from different, randomly chosen off-screen locations and followed independent paths to their final locations in the array. In the *groups* condition, objects moved in concert. These animations were accompanied by verbal descriptions of the scenarios, in which absolute and relative considerations were pitted against each other, and participants rated their preference for one alternative or the other. We predicted that participants in the groups condition would show greater preference for maximizing proportion saved (at the expense of absolute number saved) than participants in the individuals condition.

Method

Participants

Thirty undergraduates participated for course credit.

Materials and Procedure

The experiment was administered by computer. After some initial instructions, participants advanced to a screen where they read a scenario posing a tradeoff between relative and absolute savings. The scenario involved some resources at risk, and two alternatives were described: one saving a larger number of individuals and another saving a larger proportion of an at-risk group. Revisiting our earlier example, participants were asked to decide whether to save 225 of 300 people expected to die of anthrax inhalation in one city versus saving 230 of 920 expected to die in another city. Participants then advanced to a screen where the manipulation took place. Elements appeared on this screen in the following sequence.

(1) On the left side of the screen, a frame labeled "Program A" appeared. Gray objects representing Program A's reference group appeared. For example, if Program A would save 14 of 17 people, then 17 stick figures appeared. In the individuals condition, these 17 figures followed distinct paths from locations around the edges of the frame (see Individuals A in Fig. 1) and assembled into a rows-and-columns array. In the groups condition, the individuals moved together into the frame, like an army marching in formation (see Groups A). The final rows-and-columns arrangement was the same in both conditions.
(2) A description appeared (e.g., "Program A saves 14 of 17"), followed by the text "To see this depicted, click on the figure above." Participants had to click for the task to proceed, and when