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Proportional reasoning, framing effects, and affirmative action: Is six of one really half a dozen of another in university admissions?

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Abstract

People often reason proportionally, perceiving fixed outcomes as larger or smaller depending upon the reference condition. Thus, for policies affecting individuals, presenting data as percentages rather than frequencies can alter perceived effects on high versus low base rate group members, even though identical numbers of individuals in each group are affected. Such numerical framing effects were explored through a case analysis of public debates over race-conscious selection policies and through experimental manipulations employing a race-conscious university admissions scenario. Undergraduates ($N = 193$) received data reporting the expected impact on black and white student enrollment resulting from a university shift to race-neutral admissions. Compared to those encountering percentages or proportions, participants receiving identical information expressed as frequencies revealed a predicted greater preference for race-neutral or "race blind" admissions. Structural equation analysis supported a model in which perceived impact and fairness mediated the relationship between format and endorsement of race-neutral admissions.

Keywords: Proportional reasoning; Risk perception; Relative frequency; Psychophysical numbing; University admissions; Framing; Affirmative action; Fairness; Attitude change

"In any admissions process where applicants greatly outnumber admittees, and where white applicants greatly outnumber minority applicants, substantial preferences for minority applicants will not significantly diminish the odds of admission facing white applicants." (Lui, 2002, p. 1049).

"But it is not true that, because the group from whom the benefits are taken is large, the burden of preference is diluted or rendered insignificant." (Cohen, 2003, p. 34).

Psychology has a long tradition in assessing perceived magnitude, with roots in the earliest studies of psychophysics (Fechner, 1860) and broader, more recent applications in the context of Prospect Theory and related work (Kahneman & Tversky, 1979; Kahneman, 2003). One of the central tenets of magnitude estimation in psychophysics is that people are generally sensitive to proportional rather than absolute changes in a stimulus. Whereas a one-pound increase in a 10-pound weight might seem quite noticeable, an equivalent one-pound increase in a 100-pound weight might be imperceptible. This general responsiveness to proportional rather than absolute change has an extensive research history across a wide range of judgments and behaviors, including sensory discrimination (Krueger, 1989), risk perception (Weber, Shafir, & Blais, 2004), and financial/consumer decision making (Thaler, 1980, 1999). Yet the notion that magnitudes are judged proportionally carries profound implications when extended to people's broader social perceptions.

The central role of proportional change in magnitude estimation suggests that people's perceptions of harms and benefits to individuals and groups might be highly

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sensitive to how such "impact information" is numerically framed. For example, as noted in the first of the opening epigraphs, one way of representing the impact of a race-conscious admissions policy is in terms of proportions admitted or probabilities of acceptance. Yet the magnitude of any resulting figure varies dramatically depending upon the size of the reference group against which an applicant's chances are computed. As an alternative, one could easily imagine representing the impact instead as an absolute count or frequency—reporting the actual number of individuals affected. The perceived harm and benefit associated with an organizational or social policy might well be subject to percentage-versus-frequency framing effects, with judgments of fairness and overall support shifting substantially based upon the numerical representation.

In this paper, we explore numerical framing hypotheses in the context of support for race-conscious versus race-neutral university admissions. We begin by reviewing the recent literature on proportional reasoning and risk perception, followed by a consideration of perceived justice and fairness issues that might mediate framing effects in the area of race-conscious selection. We then empirically test our causal and mediational hypotheses through the manipulation of proportional versus frequency framings of admissions data, and follow that with a case analysis of proportional argumentation as it appears in public debate over selection policies.

Thinking proportionally about impact

Thaler and others (Chatterjee, Heath, Milberg, & France, 2000; Christenson, 1989; Darke & Freedman, 1993; Darke, Freedman, & Chaiken, 1995; Heath, Chatterjee, & France, 1995; Thaler, 1980, 1999) have provided vivid illustrations of the role proportional thinking can play in consumer choice. In one classic problem (Kahneman & Tversky, 1984; Thaler, 1980), people are confronted with plans to purchase both an inexpensive ($15) and a relatively more expensive ($125) item and are informed that one of the items is available a 20 min drive away for $10 off. When told that the discount is on the cheaper item, people report being relatively more likely to make the trip than when the discount is on the more expensive one. Although the underlying choice in the two situations is the same—whether or not it is worth a 20 min drive for an absolute savings of $10—the amount looks substantial as a fraction (67%) of the cheaper item's cost but more modest (8%) with respect to the expensive item's price. Although people do not appear to be completely insensitive to the absolute magnitude of financial outcomes, proportional assessments play a significant role in their evaluations and behaviors.

Of course, financial decisions lend themselves readily to such absolute and proportional benefit calculations. In the context of social policies such as those governing university admissions, however, the metric of value tends to shift and may reflect a more general assessment of the consequences for the lives and opportunities of individuals and their social groups. Despite such differences, recent research on support for lifesaving interventions suggests that people rely on similar proportional reasoning strategies in social policy contexts to assess benefit and to make determinations about the value of human lives.

A perplexing concern in the realm of lifesaving interventions is people's seeming willingness to intervene on behalf of personalized "identifiable victims" while failing to aid "statistical victims" (Jenni & Loewenstein, 1997). People's sensitivity to proportional change provides a powerful explanation for such effects. For example, saving 100 lives out of 200 at risk is a sizeable portion of a "problem" to have remedied. In contrast, saving 100 lives out of 10,000 seems hardly noticeable, despite the fact that precisely the same number of lives has been saved. In the case of individually identifiable victims, the person him or herself becomes the reference group, with any intervention thus aiding 100% of those in need—an account of the identifiable victim effect for which Jenni and Loewenstein (1997) found considerable support.

Nevertheless, the choice of reference group and thus the perceived magnitude of a crisis or intervention can be somewhat arbitrary (Jenni & Loewenstein, 1997; Ubel, Baron, & Asch, 2001). Consider, for example, a costly treatment that could save 100 lives out of 200 people with a rare form of malignant cancer versus saving *the very same 100 lives* out of 10,000 people with malignant cancer of any form. Viewed proportionally, the former is likely to be seen as a great benefit worth pursuing; the latter would, by comparison, seem hardly noticeable—affecting a virtual "drop in the bucket" of cancer patients generally and altering each patient's seeming "chances" of a cure by a tiny amount. The dilemma, of course, is that the value thus placed on saving a given individual's life changes arbitrarily with the size of the reference group.

Fetherstonhaugh, Slovic, Johnson, and Friedrich (1997) documented this potential for diminished sensitivity to the value of life—an effect they term "psychophysical numbing"—by evaluating people's willingness to fund various lifesaving medical treatments. In a within-subject design involving a hypothetical grant funding agency, nearly two-thirds of the respondents raised their minimum benefit requirements to warrant funding when there was a larger at-risk population, with a median value of 9000 lives needing to be saved when 15,000 were at risk, compared to a median of 100,000 lives to be saved out of 290,000 at risk. By implication, respondents saw saving 9000 lives in the "smaller"