Improving Predictions of Prosocial Behavior Using Models of Person Perception

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Using psychological models of person perception, we significantly improved the predictive power of standard choice models of other-regarding preferences in social dilemma games. Across multiple games and sample populations, models incorporating person perception explained nearly twice the variation in prosocial behavior compared to a baseline model without such information.

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EXTENDED ABSTRACT
Humans are remarkably prosocial toward other individuals. People adopt orphaned children, donate blood and organs to strangers, and collectively give billions of dollars to charity each year. Indeed, human prosociality has been shown to occur in ways that go beyond kin selection (Hamilton 1964), reciprocity considerations (Trivers 1971), or direct consequences for oneself. These results have been instrumental in the development of so-called models of “other-regarding preferences”, where, in contrast to standard assumptions of self-interested agents, people are assumed to have preferences over other people’s outcomes.

Since their development, these models have been found to have substantial explanatory power across numerous laboratory and field studies. At the same time, however, they struggle to explain some basic features of prosocial behavior, such as the widespread observation that people are not uniformly prosocial across circumstances. In laboratory experiments, for example, individuals donate more money to similar than dissimilar others (Emswiller, Deaux, and Willits 1971) two types (Hippie and Straight) and are more willing to rescue close than distant others from painful situations (Kruger 2003; Madsen et al. 2007) consider indirect evidence that biological kinship plays an important role in altruistic behaviour. All previous reports of the influence of kin selection on human altruism have, however, used correlational (rather than experimental. In field data, individuals from certain groups have been found to be discriminated against in labor markets (Bertrand et al. 2005).

Not surprisingly, owing to the importance of person perception to questions of attribution, impression formation, and stereotyping, social cognition researchers have long sought to characterize the set of cognitive dimensions underlying attributions of traits to other people (Cuddy, Fiske, and Glick 2007; Fiske, Cuddy, and Glick 2007). Although the specific details differ across frameworks, these studies have repeatedly converged on the idea that there exist fundamental dimensions, for example warmth and competence, capturing how people evaluate groups and individuals (Fig. 1A).

Accompanying the possibility that these core dimensions can be used to improve explanatory power of existing models of other-regarding preferences, specifically, instead of a random anonymous counterpart, subjects were told a single trait about their counterpart (Fig. 1A). We selected 20 single-attribute descriptions of people that were expected, based on past research, to elicit perceptions spanning a two-dimensional space of warmth/morality and sensitivity to disadvantageous inequity. We confirmed these placements by recruiting an independent set of 340 participants to rate the targets on these dimensions.

We investigated how trait information affects behavior in a set of social dilemma games that capture different aspects of prosocial behavior (Fig. 1B). In a dictator game, 320 participants had the opportunity to split a sum of money with the counterpart however they wished. In the proposer role of the ultimatum game, 300 participants had the opportunity to offer some or all of the starting endowment to the counterpart, who would then choose to accept the offer or reject it. In the recipient role of the ultimatum game, 300 participants viewed offers from the counterparts and decided whether to accept or reject. For all games, on each trial participants viewed a target, identified by one piece of information, e.g., “Occupation: Nurse”, a starting endowment (always “10.00”), and multipliers on the amounts to be allocated to self and other. In all cases, each participant made 20 decisions (with targets and exchange rates chosen randomly).

We found that allocations in the dictator game were significantly affected by target identity, $F(19, 5975) = 36.29, p < 10^{-15}$, such that some counterparts consistently received more than others. To model other-regarding preferences, we used an inequity-aversion utility function from the economic literature, in which the subjective value of an outcome is modulated by self-interest, sensitivity to advantageous inequity (the participant getting more than the counterpart), and sensitivity to disadvantageous inequity (the counterpart getting more than the participant).

We next considered two possible ways in which dimensions of person perception can influence other-regarding preferences. The first considered the possibility that person perception information additively affects attitude toward advantageous and disadvantageous inequity. This would correspond to the idea that individuals who are perceived as higher on warmth (or competence) would receive some fixed “bonus” or “penalty” compared to those who are perceived as being lower. In addition, we included the possibility that person perception information interacted multiplicatively with outcome values, for example by modulating the degree of inequity aversion. This captures the idea of a proportional “bonus” or “penalty”, such that individuals perceived as higher on warmth (or competence) would receive some fixed proportion more (less) than those perceived as lower.

Across all games including dictator game, ultimatum game sender and receiver roles, we found that the model with social perception information dramatically outperformed the baseline model, explaining nearly twice as much variance in behavior (likelihood ratio test $p < 10^{-15}$ in all cases, Figure 1C-E). Strikingly, we found that almost the entire improvement in fit in all three datasets can be attributed to the multiplicative model in which inequity aversion was directly modulated by person perception dimensions. Specifically, whereas the full model significantly improved fit of a model containing additive parameters (likelihood ratio test $p < 10^{-6}$), it did not significantly improve fit of a model only containing multiplicative parameters (likelihood ratio test $p > 0.5$).

Any realistic account of human social behavior must account for the fact that individuals flexibly adapt their behavior to different social contexts, including different interaction partners, as they navigate the social world. By providing a quantitative measure of social context that reduces a large number of factors into two core dimensions, measures of person perception provide a parsimonious and tractable way to explain such variation.

REFERENCES
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