Journal of Economic Psychology 33 (2012) 963–972

Contents lists available at SciVerse ScienceDirect

Journal of Economic Psychology

journal homepage: www.elsevier.com/locate/joep

How different are real and hypothetical decisions? Overestimation, contrast and assimilation in social interaction

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ARTICLE INFO

Article history:
Received 25 July 2011
Received in revised form 18 May 2012
Accepted 23 May 2012
Available online 1 June 2012

JEL classification:
A13
D03
D71
D83

PsycINFO classification:
2260
2340
3020
3040

Keywords:
Judgment
Decision making
Cooperation
Social interaction
Context effects
Cognitive biases

ABSTRACT

Decision researchers conduct laboratory experiments of choice between real rewards, but also often rely on asking people to provide hypothetical answers to fictitious situations. Applying results from such studies to real-world situations requires understanding how decision making in cases involving real rewards correspond to decisions with hypothetical rewards. This article reports two key differences between hypothetical and real decisions in social dilemmas. First, hypothetical and real decisions cause different cognitive biases in social dilemmas: hypothetical judgements and choices stem from perceptual processes and cause contrast effects; while judgements and actions in real interaction are biased by assimilation processes involved in action selection and learning. Second, without the corrective real social interaction, people overestimate theirs and others propensity to act cooperatively. However, individuals are more confident in their predictions during real interaction, which suggests that such metacognitive judgments can predict actual behaviour and also signal when respondents provide biased responses. Overall, our results call into question established methodologies that rely on hypothetical answers, and indicate that people should be observed and measured in real or incentivised social interactions.

1. Introduction

Many tests and methods in psychology, as well as in social and behavioural sciences, rely on measures asking people to make 'hypothetical' answers, judgments, choices, and statements of intent, as a response to fictitious situations or scenarios described in surveys, questionnaires or interviews (see Oppenheim, 2000). This practice is common in the literature on experimental gambles (Kühberger, Schulte-Mecklenbeck, & Perner, 2002) and also when hypothetical questions cannot be implemented for practical reasons, such as when in moral dilemmas or when using very controlled social events (Delgado, Frank, & Phelps, 2005; Greene, Sommerville, Nystrom, Darley, & Cohen, 2001; Takahashi et al., 2009). For example, respondents may need to state how likely it is that they are going to donate, approve, help, vote, or trust somebody in a specific social situation characterised by specific benefits and costs for each party involved. In other words, such hypothetical questions and answers are often in the context of some social behaviour.

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http://dx.doi.org/10.1016/j.joep.2012.05.005

However, what these methodologies often measure is what people think about when hypothetically thinking about such behaviours, but not what they think about when they are making actual choices. Previous research on differences between hypothetical and real decisions has focused on individual preferences, mostly in *contigent valuation* surveys used to measure the value of nontraded public goods; for example, for cost-benefit analyses of environmental protection, or to assess legal damages (Diamond & Hausman, 1994; Little & Berrens, 2004; Loomes, 2006; Murphy, Allen, Stevens, & Weatherhead, 2005). The only reliable difference between hypothetical and real responses in this research field is what is known as the *hypothetical bias*: people overstate hypothetical valuations (List & Gallet, 2001; Little & Berrens, 2004; Murphy et al., 2005) and plans (Ariely & Wertenbroch, 2002; Tanner & Carlson, 2009) compared with real choices. For example, polls typically overestimate intention to vote (Crespi, 1989), and responses to contingent valuation surveys often reflect imprecision and an upward bias (Diamond & Hausman, 1994; Mortimer & Segal, 2008).

In social psychology, researchers also sometimes rely on hypothetical measures, which might be affected by such biases. For example, measures of *social value orientation* ask hypothetical questions about the respondent's preferences how resources should be distributed between self and others (Van Vugt, Meertens, & Van Lange, 1995). Hypothetical surveys also assess preschool children's social strategies in hypothetical situations, for example in terms of their ability to predict social behaviour with peers and peer acceptance (Mize & Ladd, 1988).

In decision research, the issue about the difference between hypothetical and real (incentivised) decisions is very prominent too and the evidence is rather mixed. In experimental economics, subject payments usually bring about different responses in many of the research questions; for example, the hypothetical bias exists in value elicitation experiments (Harrison & Rutström, 2008). Recently, decision neuroscientists have also investigated whether the same processes are involved in hypothetical and real decisions, and found that activity in common reward areas in the brain – the orbitofrontal cortex and the ventral striatum – correlated with behavioural measures of the value of consumer goods in both hypothetical and real purchase decisions (Kang, Rangel, Camus, & Camerer, 2011). Behavioural studies have also found no difference between real and hypothetical rewards in delay discounting decision tasks (Johnson & Bickel, 2002; Madden, Begotka, Raiff, & Kastern, 2003) and risky gambles (Kühberger, Schulte-Mecklenbeck, & Perner, 2002).

In research focusing specifically on interactive decision making, reviews of game-theory and decision experiments have found that real monetary rewards are stronger incentives than hypothetical rewards of equal magnitude (Camerer & Hogarth, 1999; Hertwig & Ortmann, 2001). Other studies have found no difference between real and hypothetical interactive decisions. Locey, Jones, and Rachlin (2011) asked the participants to play temporal discounting version of the repeated Prisoner's Dilemma (PD) game, in which defection resulted in a small-immediate reward while cooperation resulted in a larger reward delayed until the following trial. Cooperation was significantly higher when the difference between larger and smaller hypothetical rewards was greater, but reward type (real or hypothetical) made no significant difference in cooperation on most measures. The authors also conducted a social discounting task where the decrease in value to the giver of a reward as social distance increases to the receiver of the reward, which found that discounting rates for real and hypothetical rewards did not significantly differ. The authors conclude that these results add to the evidence that results of experiments with hypothetical rewards validly apply in everyday life. Similar lack of difference between hypothetical and real play is observed in the dictator game (Fantino, Gaitan, Kennelly, & Stolarz-Fantino, 2007).

Whether or not hypothetical rewards have effects similar to those of real rewards is an important issue in interpreting laboratory studies of decision and choice. According to Locey et al. (2011, p. 553) 'if the effects of real and hypothetical rewards are similar then rewards in the laboratory may be varied over wide ranges, and limitations on number of participants will not be constrained by monetary considerations'. Therefore this issue is of crucial importance for behavioural and experimental economists. Locey et al.'s data suggest that behaviour in everyday-life situations (the primary interest to the experimenter) might be approached more closely in the laboratory by asking people to imagine what they would do in those situations, than by giving them real but lesser (narrower or different) rewards than those situations entail. This is especially the case in studies of social decision making, as in altruistic behaviour and cooperation, because hypothetical and real interaction could differentially encourages participants to maximise their monetary rewards, especially in real-money laboratory experiments (Locey et al., 2011), and hence could act more selfishly than they would in the real-world situations (where they might act more in line with hypothetical scenarios). Another very recent research in social dilemmas also suggests such systematic difference might exist between incentivised and hypothetical behaviour. For example, Lönnqvist, Verkasalo, and Walkowitz (2011) investigated decisions in an incentivized or hypothetical prisoner's dilemma game and observed that players were less generous in the incentivized game. Even more, the Big Five personality traits predicted decisions only in the incentivized game.

1.1. Cognitive biases in hypothetical and real decisions

None of the previous studies have investigated whether 'cognitive biases' known to drive behaviour during social decision making differ between hypothetical and real experiments. This article goes beyond previous research by investigating whether cognitive biases known to affect social decision making are equally prevalent across those two response modes. There are two major classes of cognitive processes known to influence decisions making: processes involved in perception and action respectively.

Recent evidence suggests that *perceptual processes* can bias responses to hypothetical survey questions: for example, the meaning of the descriptive labels on a rating scale can be altered by the numerical options attached to labels (Schwarz,