Journal of Behavioral and Experimental Economics 57 (2015) 37–44

Contents lists available at ScienceDirect

Journal of Behavioral and Experimental Economics

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

Competitive behavior, impact on others, and the number of competitors[☆]

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ARTICLE INFO

Article history:
Received 7 January 2014
Revised 22 April 2015
Accepted 23 April 2015
Available online 28 April 2015

Keywords:
Competitive behavior
Number of competitors
Fairness in competition
Norms

ABSTRACT

This paper investigates changes in competitive behavior that follow from changes in: (1) the impact of competitive behavior on others; and (2) the size of the competitive reference group. Using a 2 × 3 between-subjects design, we asked participants whether they would work more hours (i.e., “compete”) in return for an increase in pay, varying: (1) group size – small ($n = 4$) or large ($n = 40$); (2) whether there is impact on others or not; and (3) given impact on others, whether there is future interaction or not. We find that when competitive behavior has no impact on coworkers (i.e., the baseline), the size of the competitive reference group does not influence the level of competitive behavior. If we allow the competitive choice to reduce the earnings of coworkers: (1) the level of competitive behavior falls relative to the baseline; and (2) increases in the size of the competitive reference group increase the level of competitive behavior. The level of competitive behavior falls further when respondents also anticipate future interactions with the reference group.

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1. Introduction

In many decision contexts, agents compete by supplying varying amounts of effort to gain both financial and non-financial rewards. For instance, individuals compete for salary, promotions, status, and recognition while firms compete for market share and profits. However, effort is costly and the unequal outcomes that typically occur in competitive environments often conflict with other social norms. As such, norms may constrain competitive behavior. Therefore, to understand variations in competitive behavior, it is important to determine the process through which norms constrain that behavior.

Understanding this process is not always straightforward. People can follow norms without being able to articulate them, and the norm employed in a given situation may not be the product of deliberate human design but rather may emerge from cultural and biological evolutionary processes (e.g., Smith, 2003). Fershtman, Gneezy, and List (2012) explain, “The properties of the situation determine the relevant set of social norms, which define the set of socially accepted choices.” They note that people like to be selfish when it is acceptable. Thus, individuals will expend effort to reallocate resources in their favor when social norms allow such reallocation.

Consider the typical ultimatum bargaining game. Player A’s proposed division may reflect a desire to conform to norms of fairness as much as (or rather than) an explicit calculation of welfare to Players A and B for various divisions of the sum. Indeed, Smith (2005) notes that ultimatum game offers to Player B fall dramatically when experimenters frame the task as a market exchange or employ a pre-game exercise to award the first-mover position. Thus, a simple desire to increase the welfare of others may not fully explain deviations from selfish behavior. Instead, these deviations may be the product of a desire to conform to social norms, as sharing norms are different in markets than in interactions between friends.

Similarly, Smith (2005) notes that models that assume participants will maximize personal monetary payoffs generally predict outcomes in laboratory experiments on “impersonal exchange” (e.g., double-auction markets) but not “personal exchange” (e.g., ultimatum games). This suggests that norms differ for personal and impersonal exchange and norms permit behavior that is more selfish in impersonal exchange. Because context determines the relevant set of norms, differences in context across personal and impersonal exchange may account for the differences in outcomes.

Key contextual differences between personal and impersonal exchange include the number of participants and the impact of actions on other participants. Personal exchange experiments typically include just two participants while impersonal market exchange experiments typically include eight or more. Moreover, outcomes in personal exchange experiments are interdependent; actions that increase personal monetary payoffs have a clear adverse impact on the payoffs to the other participants. Because participants in personal

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[☆] The authors would like to thank the participants at the August 2013 Meeting for Behavioral and Experimental Economists of the Mid-Atlantic (BEEMA), Haverford PA, the editor of this journal, and two anonymous referees for helpful comments.

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http://dx.doi.org/10.1016/j.socec.2015.04.008
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exchange experiments take less than the maximum, they raise the return to other participants.

Thus, changes in the number of competitors may alter the norms that govern competitive behavior, and interactions that include a lower number of competitors may show lower levels of competitive behavior (i.e., less selfish behavior). The direct relation between the number of competitors and the level of competitive behavior occurs because competitors are less likely to adhere to an impersonal market exchange norm and more likely to place weight on the adverse impact that follows from their competitive behavior.

However, a series of papers show an inverse (rather than a direct) relation between the level of competitive behavior and the number of competitors (Ku, Malhotra, and Murnighan, 2005, Garcia and Tor, 2009; Tor and Garcia, 2010). These authors argue that smaller groups are more competitive than larger groups because of competitive arousal or the desire for social comparisons. Ku, Malhotra, and Murnighan (2005) analyze data from live and internet auctions as well as a laboratory experiment and measure competitive behavior as the rate and degree to which auction participants exceed their bidding limits.

In the live auctions, participants were more likely to exceed their bidding limits when the number of bidders was low and near the end of the auction (i.e., time pressure). Moreover, time pressure and a small number of bidders interacted to further increase the probability that participants exceeded their bidding limits. In the lab experiment, undergraduates responded to questions based on a script that varied the number of bidders (one other bidder versus eight other bidders) and sunk costs (amount of time spent researching the auction item). The results of the lab experiment show that a small number of other bidders and high sunk costs raise the probability of a high bid (i.e., more aggressive competitive behavior). They contend that such behavior is the result of competitive arousal and that the arousal follows from rivalry, time pressure, social facilitation (e.g., presence of an audience), and the uniqueness of being first. With fewer other bidders, there is more competitive action and participants report feeling more “excited” and “anxious” (Ku, Malhotra, and Murnighan, 2005).

While Garcia and Tor (2009) and Tor and Garcia (2010) contend that a decrease in the size of the competitive group causes an increase in competitive behavior, they argue that the relation follows from the desire for social comparisons (rather than from competitive arousal). Using data from test takers, they show that smaller groups have higher performance, even after controlling for differences in ethnicity, income level, and quality of education. Furthermore, this so-called *n*-effect persists even when rewards are proportional to the number of competitors (e.g., the top 20% would receive an award regardless of the number of competitors). Therefore, the effect is not the result of any change in expected returns. In their words, “Mere knowledge of the number of competitors can independently affect competitive motivation even when the chances of success remain constant” (Garcia and Tor, 2009, p. 871).

Tor and Garcia (2010) argue that the n-effect is strongest among people high in social-comparison orientation. In a competitive setting, actors can compare their performance with that of other competitors, fueling the motivation to compete (Festinger, 1954). This active comparison is stronger with fewer others, because increases in the size of the group make social comparisons less viable. Indeed, the authors find that competitive motivation diminishes as social comparisons diminish.

Because of the apparent conflict between the norm-based view and the social comparison (or competitive arousal) view of the relation between group size and competitive behavior, this paper examines whether decreases in the size of the competitive reference group increase or decrease competitive behavior. We also test whether future interactions with the reference group will reduce competitive behavior because of fear of retaliation, concern for social image, or the desire to have good relationships with peers.

We find that when competitive behavior has no impact on peers, the size of the competitive reference group does not influence the level of competitive behavior. However, if we allow the competitive choice to reduce the earnings of coworkers: (1) the level of competitive behavior falls relative to the baseline; and (2) increases in the size of the competitive reference group increase the level of competitive behavior. Because total harm to others does not vary with group size, we conclude that respondents would rather impose a small amount of harm on a large number of peers than a large amount of harm on a small number of peers. These results contradict the predictions of competitive arousal and social comparison theories of competitive behavior and support the view that norms cause important variations in competitive behavior. In particular, larger competitive reference groups suggest a market-based norm governs the interaction.

2. Data and methods

To analyze competitive behavior, we designed an online survey to test whether respondents would work more hours in return for an increase in pay (i.e. the “competitive” route). Across six conditions (2 × 3 between-subjects design), we varied: (1) group size - small ($n = 4$) or large ($n = 40$); (2) whether there is impact on others or not; and 3) given impact on others, whether there is future interaction or not. This generates six conditions: (1) small group/no impact; (2) large group/no impact; (3) small group/impact; (4) large group/impact; (5) small group/impact and future interaction; and (6) large group/impact and future interaction. We employ a survey design rather than a laboratory experiment to capture better the contextual features of a typical workplace interaction.

All undergraduate students over age 18 at a mid-sized public university in the northeast U.S. received a link through Qualtrics software on Monday, March 18, 2013.[1] After agreeing to the informed consent statement, each respondent was randomly assigned to one of the six conditions. Across all conditions, participants were asked to imagine that they are full-time employees who have just finished a 15-week training course and are eligible for a bonus.[2] To measure competitive behavior, the survey presented participants with two options. Option A allowed them to split the bonus evenly with coworkers (i.e., their competitive reference group) while Option B offered them a chance to work three additional hours per week and receive a larger payment than in Option A.

In the baseline conditions (Conditions 1 and 2), participants were simply told that the employer has allocated “special funds” to pay these bonuses to the training group. To produce an outcome where competitive behavior lowers the returns to other members of the

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[1] The total applicant population was 6384 students with the following demographics: 56% female, 66% White, 6% Black, 9% Asian, 10% Hispanic/Latino, and 8% other or unknown. A follow-up email was sent automatically to all non-respondents 6 days after the initial invitation (March 24), and the survey was closed on March 25, one week after it was first made available. The survey received 2521 responses (39.47% response rate). However, 501 participants did not complete the full survey and did not provide information on gender and age. We dropped these observations from the analysis below because portions of the analysis require controls for gender and age. Thus, we analyze the remaining 2020 responses (31.64% response rate). Dropping these observations does not affect the basic results.

[2] We base our script on Vandegrift and Holaday (2012) with a series of important changes. First, we removed the variation for “proximity to a standard” by noting that all Option B choices would make the participant one of the top earners in their office. Second, we included language that describes the reference group as trainees in a course to allow for variation in future interactions. Third, we reduced the “small group” number to 4 (from 6) and reduced the additional work requirement in Option B to 3 h per week (from 5) to make this option more attractive to participants. We made the first change because the effect of proximity to a standard is not the focus here. The second change allowed us to vary the scripts across conditions so that in some conditions respondents were assigned to the same role and location as his/her coworkers while under other conditions they were not. The final change was aimed at inducing more overall competitive behavior under the baseline conditions because we suspected the remaining conditions would lower competitive behavior relative to the baseline.

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