Competition when cooperation is the means to success: Understanding context and recognizing mutually beneficial situations

Larry Katz¹*, Lisa Finestone² and David M. Paskevich¹

**Abstract:** Choosing to cooperate or to compete is a regular and important social decision. Certain scenarios call for one over the other, but people do not always behave logically. The present study describes trends to irrationally compete when cooperation is the means to success. A paradigm similar to the Kagan and Madsen (1971) checkers-style game was used in which cooperation resulted in mutual benefit and competition resulted in nothing. The participants in this 25-year observational study were adult university students and coaches, and though they are presumed to be rational thinkers, the large majority of them contradictorily competed. In the rare cases of cooperation during these games, at least one person in the pair tended to come from a rural or community-oriented background; this is a phenomenon worth acknowledging. To be successful, it is essential to understand the full context of a situation in order to recognize mutually beneficial situations. It is necessary to understand cooperative and competitive behaviors to meaningfully advance societal activities as well as maximizing individual benefits.

**Subjects:** Social Psychology; Social Cognition; Sport Psychology

**Keywords:** competition; cooperation; collectivism; individualism

---

**ABOUT THE AUTHOR**

Larry Katz is a professor in Kinesiology at the University of Calgary and is the Director of Sport Technology Research Laboratory. He is interested in how people perform and how they use technology and innovation to improve their performance.

Lisa Finestone holds a BSc (honours) in Psychology from the University of Calgary, and a MPH from McMaster University. She is currently a medical student at the University of Alberta.

David Paskevich is the Associate Dean (Academic) in the Faculty of Kinesiology at the University of Calgary and holds a PhD in Kinesiology from the University of Waterloo. His research interests include the integration of the science-practitioner model, bringing the science of sport psychology into practical/applied settings.

**PUBLIC INTEREST STATEMENT**

Choosing to cooperate or to compete is an important social decision that people regularly make. Certain scenarios favour one over the other, but people do not always recognize the context of a situation and behave logically. Using a game paradigm, the present study explores behavioral trends among adult university students and coaches to irrationally compete when cooperation lead to mutual success. In the rare instances of cooperation during these games, at least one person in the pair usually came from a community-oriented background. The study further examines several factors that may explain this phenomenon including cultural differences between individualism and collectivism, sources of motivation and trust levels. When competitive tendencies impair rational thinking, people are unable to read situations where cooperation can lead to positive outcomes. It is therefore important to understand cooperative and competitive behaviors to promote good decision-making in individuals and by extension, in society at large.
Cooperation and competition are interactions between two or more people towards a goal with interdependent results (Pepitone, 1985). Competitive behavior occurs when there is a goal that not all participants can achieve equally, and cooperative behavior occurs with a shared goal by all participants, ideally enhancing the efforts of those involved (Deutsch, 2006). In Deutsch's social-psychological theory of cooperation and competition (1949), he proposed that what encourages one form of behavior over the other is largely based on how individuals believe their goals are related. It follows that competition occurs with the belief of negative goal correlation, whereby a goal can be achieved only if others do not achieve it. Conversely, cooperation occurs with the belief in positive goal correlation: the accomplishment of a goal only if everyone achieves the goal (Johnson et al., 1981).

Darwinian thinkers describe competition as necessary for human evolution, regarding it as an unconscious way of life (Montagu, 1952). However, competition is not always logical for success as cooperation is often necessary for positive progress, though it is somewhat of a mystery to evolutionary biologists due to its apparent contradiction to natural selection (Chapin et al., 2017; Nowak, 2012). While many species cooperate, for example, when hunting in packs, it is considered a uniquely human trait to minimize selfishness for the sake of development with others (Puurtinen & Mappes, 2009; Saney & Gong, 2017). Nonetheless, individuals may choose to compete when cooperation is the logical and advantageous strategy for mutual success.

1. Competition & cooperation: significance
Deciding whether to compete or to cooperate is an important social choice that humans face every day. Competition can be essential for motivating progress in all societal domains, but cooperation is necessary for cohesive growth and development (Bacaria, 2007; Quintana-Garcia & Benavides-Velasco, 2004). Individuals need to recognize when to choose one over the other, and organizations and institutions should effectively encourage the appropriate behavior for economic, societal, and individual benefit (Newlands, 2003).

Cooperation has been shown to improve group productivity, psychological health, and relationships (Tjosvol & Johnson, 2000). Businesses with group projects can be negatively impacted by people working for themselves rather than to better the group. In a meta-analysis of 122 studies by Johnson et al. (1981), it was found that both (1) cooperation and (2) cooperation with intergroup competition were more effective than interpersonal competition and individualistic efforts for achieving goals. This result was supported by Puurtinen and Mappes (2009) finding that intergroup competition effectively improved group cooperation.

When approached effectively, competition can teach social, physical, and cognitive skills (Choi et al., 2014; Kew, 1978). However, in any workplace—healthcare, retail, government, school, sports—competition may dominate when cooperation would most benefit patients, business, teams, and clients (Balser & Winkler, 2012; Barmby et al., 2016; Westra et al., 2017).

Culture. Competition is emphasized more by individualist cultures than collectivist cultures (Triandis et al., 1990), while cooperation is more likely to be chosen by those from collective communities over individualist communities (Allison, 1982; Doucleff, 2014; Friedman et al., 1995; Kagan & Madsen, 1971; Madsen, 1967; Parks & Vu, 1994). In contrast to those raised in a rural setting, urban populations tend to be more individualistic (Barnes, 2000; Triandis, 1995) but these populations are not simply a homogenous group, as individuals from working class backgrounds
may have stronger interpersonal skills and perform better in cooperation-oriented tasks than their middle-class counterparts (Dittmann et al., 2020).

Nonetheless, in individualistic cultures (e.g. Western large urban centers), people are compelled to take care of themselves and immediate family, reducing cooperation in the workplace; whereas in collectivist cultures (e.g. rural), the group and whole community is where the loyalty lies, facilitating cooperation with those in one’s working community (van Hoorn, 2015). Triandis (1995) says that in individualistic cultures, personal goals take priority over group goals, and the reverse is true in collective cultures, thereby emphasizing individual competition over cooperation in individualistic cultures. Recognizing mutually beneficial situations is not as easy as it may sound, and instances that call for cooperation as the appropriate response are often not seen as such. Though successful cooperation is important, it is often avoided to prevent “being taken advantage of” (Sanfey & Gong, 2017). Teamwork is essential in the workplace, but incentives to promote cooperation are uncommon (Bandiera et al., 2013). Efforts should be made within businesses, communities, and political and educational systems to promote cooperation and cooperative instincts, especially in cultures where individualistic ideals and competitive nature prevails. For the sake of individual and societal progress, it is necessary to understand individual tendencies to compete and cooperate, as well as how to recognize which behavior is most beneficial.

2. Experimental games

Experimental games can be used to study cooperation and competition. These include the Prisoner’s Dilemma Game (Kuhn, 2017; Tucker, 1983), the Ultimatum Game (Güth et al., 1982; Van Damme et al., 2014), the string-pull activity (Madsen, 1967), and, as in the present study, a checker-style game (Kagan & Madsen, 1971).

The Prisoner’s Dilemma Game. This game is the most precise cooperative dilemma (Nowak, 2012), framed by Merril Flood and Melvin Drescher in 1950 and formalized by Albert Tucker (Kuhn, 2017). According to Tucker (1983), the dilemma is set up with two individuals charged with a crime and held in separate rooms. They are each told that they can either confess or remain silent and are made aware of the following three scenarios that can result: 1) if one confesses and the other remains silent, the former earns an award and the latter is fined double, 2) if both confess, they each are fined once, 3) if both remain silent, both are set free. No matter what the other chooses, silence will always help the other and confession will always help oneself. Therefore, for both individuals to be set free, and thereby achieving mutual success, they must cooperate by remaining silent and avoid the desire to serve their self-interest by confessing.

The Ultimatum Game. This game was introduced by Güth and colleagues in the 1980s to test selfishness and rationalization (Güth et al., 1982; Van Damme et al., 2014). Two people play, one “proposer” and one “responder”. The proposer is given money ($10) to split any possible way with the responder. The responder can accept or reject the offer, and the decision ends the game. It is logical for the responder to accept any amount of money because if he/she rejects, he/she gets nothing, but with less fair divisions ($8/$2, $9/$1), responders are less likely to accept. Conversely, if the proposer offers a fairer division ($6/$4, $5/$5), then the responder is more likely to accept the offer. Cooperation between the two people leads to mutual benefit with both receiving some money, while competitive behaviors enabled by selfishness leads to a zero-sum approach with no prizes awarded.

String-pull. This game was used in Madsen’s (1967) study with children. She presented a string-pull game to children aged five to ten, with eight opportunities to win a reward contingent upon cooperation. To play the game, pairs of children sit at opposite ends of a table and hold onto a string attached to a marble holder. To receive a reward, the string must be pulled to make the
marble fall into a hole at either end of the table. If both children are competitive and pull on the string simultaneously, the holder splits in two, so neither child can win a reward. Pairs need to cooperate to obtain a reward: while one child pulls, the other one should not, so that the holder does not split and the marble falls into one of the two holes. It was found that pairs of children tended to compete rather than cooperate and thus acquired only 25% of the possible rewards (Madsen, 1967).

**Checker-style.** This game was utilized in Madsen and Kagan’s 1971 experiment with children using a 7 × 7 board (Figure 1). There is a moveable marker in the center and pairs take turns moving it along the lines to any adjacent circle. The goal of the checker-style game is to get the marker from one side of the board to the other. Participants can engage in cooperative play by helping each other move the marker to one side then the other, allowing both individuals to earn a reward after multiple games. Alternatively, pairs can compete by moving the marker only towards their side, resulting in the marker staying relatively in the center of the board at the end of the game. This competitive approach therefore leads to no winners.

On the whole, individuals from Western cultures reveal an irrational tendency for competitive over cooperative behavior (Kagan & Madsen, 1971; Madsen, 1967). This tendency is called irrational because in the conditions under discussion, competition is defeatist while cooperation yields rewards. In Kagan and Madsen (1971) research, there were five groups of participants: (1) four to five year-old Anglo-Americans, (2) four to five year-old Mexican Americans, (3) seven to nine year-old Anglo-Americans, (4) seven to nine year-old Mexican Americans, and (5) seven to nine year-old Mexicans. In general, the older children were found to be more competitive than the younger children. Within the older children, it was found that the Mexican children were the most cooperative and Anglo-American children were the most competitive. The differences in competitive behavior were said to come from cultural tendencies to compete (Kagan & Madsen, 1971).

The present study uses a similar paradigm to the Kagan and Madsen (1971) checkers-style game to examine competitive versus cooperative behavior. As presented, much research on cooperation and competition has already been done with children (Friedman et al., 1995; Green & Rechis, 2006;
Kagan & Madsen, 1972; Madsen, 1967). For this reason, and because they are presumed to think more rationally than children, participants in the present observational study were adults. Three different formats were utilized (standard, computer simulation, and mind simulation) to try to eliminate as much bias as possible towards competition intrinsic in a checkers game.

3. Method

3.1. Participants

Participants came from undergraduate and graduate courses in the faculties of Kinesiology and Education at the University of Calgary, as well as coaches from various sports earning further coaching certification. Participation was voluntary and activity performance was unrelated to course grading. Group sizes were anywhere from 10 to 120 participants, depending on the class or certification program. In some sessions of the game, participants chose their partners who sat near them in class, while in other instances, pairs were randomly assigned, or imagined as described in Format C below. The same instructor led the activity every time.

4. Materials

Materials for the checker-style game differed slightly between formats and included small standard checkerboards, computers with Microsoft PowerPoint, and prizes (Table 1). Small raisin boxes were used as prizes for all three formats.

5. Procedure

Over a 25-year span, three different checker-style game formats were used in different university and coaching classes.

Rules. Rules were presented as follows: “This is a game that you will play with your partner. We will play the game two times and there are two prizes. Please place the disc in the middle of the board. Take turns moving the disc one space in any direction (forwards, backwards, left, right, diagonal). If the disc goes to the right side of the board, the person on the right side gets a prize. If the disc goes to the left side of the board, the person on the left side gets a prize. The game should take about one minute. Are there any questions? Please begin.” After one minute of play, the instructor continued: “Okay, time is up. Please place the disc in the middle of the board and begin again.” At the end of the second minute: “Okay, time is up. Does anyone get a prize?” To avoid as little competitive bias as possible, there was no overt mention of winning, losing, or competing, but that only two prizes would be awarded through two rounds of play. Similarly, references to “checkers” or “chess” board were avoided to prevent the attribution of competition to the activity.

Each class played only one format. The formats differed in the following ways.

| Table 1. Materials used for the three formats of the checker-style game to examine cooperative and competitive behavior |
|---------------------------------------------------------------|
| **Format** | **Name** | **Materials, per pair** |
| A | Standard | One small standard checkerboard, prizes |
| B | Computer simulation | Computer with Microsoft PowerPoint, prizes |
| C | Mind simulation | Prizes |
**Format A: Standard.** Two students faced each other across the board. The disc is placed in the middle.

**Format B: Computer simulation (Figure 2).** A computer simulation version was created. Students were partnered and given additional instructions: “Together with your partner, open Microsoft PowerPoint. As a pair, draw eight vertical and horizontal lines so the page looks like a $7 \times 7$ grid. Create a moveable disc to be placed in the middle of the grid. Agree on a color for the disc with your partner.” After creating the board and disc, the rules were described as previously presented.

**Format C: Mind simulation.** A mind simulation was initiated. Students were told to select an imaginary partner and draw a seven by seven grid in their minds with a disc in the middle. Rules were slightly modified from the ones previously explained: participants were told that only one round of play would occur. Since participants were told to play with their imaginary partner, it was assumed that the same outcome would occur twice.

With the exception of Format C, two rounds were played each time the game was played. If a disc reached a participant’s side of the board, he/she received a small box of raisins as a prize. After each session, a discussion would ensue: participants were asked if anyone should receive a prize and about their background (where they grew up, family values, community setting, rural or urban).

**6. Results**
Results were gathered by observing behavior over 25 years. Since this was not initiated as a study, but rather as a series of observations of cooperation and competition, ethics permission was not obtained. Consequently, no specific participant data is included and observations are predominantly presented qualitatively, with a nominal quantitative report.

Over the course of the study, it was observed that approximately 70% of the participants were male and 30% were female. Additionally, it was further observed that the student participants were roughly 18 to 30 in age, while the coaches were 18 to 50 in age.
Over 25 years of observation, in all but one trial out of over 35 sessions, more than 90% of participants competed. Competition negated success, as the majority of participants competed rather than cooperated in all formats (A, B, and C). The frequency at which each format was used differed, however, as Format A was used most frequently, approximately 75% of all sessions, while Format B and C were used for about 20% and 5% of all games, respectively. In the debriefing, it was found that cooperative pairs usually included someone from a community-oriented environment such as a rural background or Indigenous Peoples. These individuals indicated that they recognized the cooperative nature of the task and communicated this to their partner, thus enabling both to earn a prize.

On one occasion, a student stated aloud that if everyone cooperated, everyone would win a prize. Several surrounding pairs of students overheard the comment and consequently cooperated. This statement led to approximately 50% of the class cooperating; the highest observed cooperation over the 25-year process.

There were no rules surrounding what kind of communication was permissible prior to and during the game. It was observed that the majority of participants simply settled down and played the game in a quiet and concentrated fashion; this was likely due to the one-minute time constraint of each round of play.

7. Discussion
The present study demonstrates that the “irrational competitiveness” (Kagan & Madsen, 1971, p. 10) observed in children by Madsen and Kagan is not outgrown, and that their observation that older children were more competitive than younger remains consistent (Kagan & Madsen, 1971). As a person transitions into adulthood, competitiveness appears as a natural instinct. This phenomenon demonstrates a deeply rooted disposition to compete regardless of the mutual benefit that cooperation can yield. The competitive behavior observed in the present study may be the result of several factors: a prize as a stimulus; the competitive orientation of urban North American society; the competitive nature of university classes in which the students participated, or the nature of most sporting events where coaches aim to win; the degree of trust between the participants; and an inability to recognize the full context of a situation.

Since checkers is a game with two competitors, a checker-type board may influence individuals to compete instead of cooperate. Participants may be influenced by the fact that it is a “game”, immediately entering the challenge without thinking about the full context. This phenomenon is referred to as goal priming (Prentice & Sheldon, 2015).

With Format B, instructions were given to create a sense of teamwork and reduce competitive goal priming from the board (Prentice & Sheldon, 2015). It was thought that more cooperation would ensue than in Format A due to the teamwork required to set up the game; however, this was not the case. Prevalence of competition was observably the same as in Format A, and just as few prizes were awarded. The same was true for Format C. Even in one’s own mind, with an imaginary partner, the prevalence of competition was more than 90%. Congruent with Deutsch’s theory of cooperation and competition (Deutsch, 1949, 2006) as previously discussed, very few participants seemed to realize that their goals could be positively correlated even though the instructions for Formats A and B indicated that there would be two rounds—“we will play the game two times”—and thus, two opportunities to earn prizes, one for each participant.

Results of the present study support past findings that people from collectivist cultures favor cooperation while those from individualistic cultures favor competition (Allison, 1982; Doucelf, 2014; Friedman et al., 1995; Kagan & Madsen, 1972; Madsen, 1967; Parks & Vu, 1994; Triandis, 1995; Triandis et al., 1990). Interestingly, it was reported that collectivist cultures tend to focus
more on the context of situations while individualist cultures focus more on content (Triandis, 2001, emphasis added).

8. Recognizing the context of a situation
The difficulty of recognizing the context of a situation by the majority of students and coaches, and the missed opportunities for mutual benefit is worthy of further research and debate. Identifying mutually beneficial situations may have long-term benefits for adherents, as they can take advantage of opportunities such as career advancement rather than stifle them.

Kahneman (2011) describes two systems of thinking involved in judgments and decision-making: System 1 proceeds automatically and quickly, while System 2 demands higher attention and focus to process more complex components. System 1 is used for simple tasks such as detecting the distances of objects, recognizing emotion in a facial expression, understanding simple sentences, and adding \( 2 + 2 \). System 2 is used for more complicated tasks such as driving in confusing and busy roads, validating a multi-level argument, subtracting 178 from 2435, monitoring a social situation, and trying to remember the details of an old event. According to Kahneman (2011), System 2 can influence the function of System 1, and humans subconsciously balance the use of the two systems to maximize the efficiency of decision-making. With these terms, most participants of the present study may have overused System 1 by instinctively competing, and underused System 2 since they may not have considered the context of the activity. Contemplating all angles from which to play the checker-style game (with System 2) would allow participants to see the potential for mutual benefit rather than reacting with System 1’s competitive instincts. Contrary to the finding of the present study, Kahneman (2011) further postulates that humans are in fact rational, but sometimes need policies and institutions to help guide decision-making.

It has been empirically demonstrated that people can be trained to appreciate the advantages of cooperation over competition (Lindskold & Han, 1988) and utilize these advantages long-term (Sheldon, 1999). There is no unanimous agreement on when organizations should favor cooperation versus competition (Balser & Winkler, 2012; Beersma et al., 2003). The proper strategy for one circumstance may differ with different group dynamics; however, understanding how to balance the two behaviors is necessary for maximum success (Gneezy et al., 2015; Kahneman, 2011; Newlands, 2003; Wisman, 2010).

9. Understanding competition and cooperation: correlations
Kagan and Knight (1979) found a noteworthy cultural correlation between competition/cooperation and self-esteem. They found that cooperativeness and self-esteem were positively correlated amongst those with a cooperative cultural norm (Mexican-Americans) while competition and self-esteem were positively correlated amongst those with a competitive cultural norm (Anglo-Americans) (Kagan & Knight, 1979). For third generation Mexican-American children, there was no correlation with self-esteem and competition or cooperation. They hypothesized that the extent to which children follow cultural norms predicts self-esteem (Kagan & Knight, 1979).

Motivation & Orientations. A person’s source of motivation, which can be described as value orientation, may impact one’s inclination to compete or cooperate. High relative intrinsic-to-extrinsic value orientation (RIEVO) means an individual is motivated more by personal growth and intrinsic goals rather than physical appearance, social status, and financial gain (Kasser & Ryan, 1996). Individuals with high RIEVO are more likely to cooperate than those with low RIEVO (Prentice & Sheldon, 2015).

RIEVO is related to theories of goal orientation (Ma & Monsma, 2016; Nicholls, 1989) and self-determination (Deci & Ryan, 2008; Sheldon et al., 2003; Wehner, 2015) theories. According to goal
orientation theory, people are motivated by one of two orientations: task or ego. Individuals with a task orientation pursue mastery of a task or skill and measure improvement self-referentially (Liukkonen & Leskinen, 1999; Roberts & Ommundsen, 1996). Individuals with an ego orientation measure ability relative to others (Liukkonen & Leskinen, 1999; Roberts & Ommundsen, 1996). Similarly, self-determination theory describes motivation with a continuum from intrinsic to extrinsic (Deci & Ryan, 2008; Wehner, 2015), respectively associated with task- and ego-orientations (Chin et al., 2012). Self-determination theory states that human motivation differs between cultures and environments (Deci & Ryan, 2008).

Individuals with higher ego-orientation were found to be more competitive in sport, motivated with high skill, and satisfied from feelings of superiority relative to others (Roberts & Ommundsen, 1996). Individualistic cultures may be more ego-orientated, with extrinsic value orientation and low RIEVO, and collectivist cultures are more task-orientated, with internal value orientation and high RIEVO. However, cultural comparisons of ego and task orientations cannot yet be made fairly because measuring tools are inconsistent (Lochbaum et al., 2016), as are measurements of different groups’ individualism versus collectivism (Barnes, 2000; Triandis, 1995). Further investigation is required for accurate between-culture comparisons of ego- and task-orientations, as well as RIEVO measures and sources of motivation.

It was found that motivation sourced from self-improvement (autonomous motivation), rather than sourced from outside approval (controlled motivation), is better for psychological health and long-term healthy behaviors (Deci & Ryan, 2008). Thus, it would be valuable to understand sources of motivation to encourage healthy minds in addition to promoting cooperation and mutual benefit.

**Trust.** The degree to which a person is trusting is related to their cooperativeness and competitiveness (Parks et al., 1996; Ross et al., 2003; Tadesse & Kassie, 2017). Those who tend to see others as trustworthy are more cooperative in nature (Ross et al., 2003). Using a prisoner’s dilemma game, it was found that low-trusting and high-trusting individuals reacted in opposite ways to competitive or cooperative messages from opponents (Parks et al., 1996). Low-trusting individuals were more likely to compete after receiving a competitive message but not more likely to cooperate after a cooperative message. The reverse was true of high-trust individuals: they reacted to cooperative messages by behaving more cooperatively and were unaffected by competitive messages.

Trust level is associated with a person’s willingness to cooperate (van Hoorn, 2015). An ingroup is a group to which a person affiliates, and individuals are more likely to trust (and cooperate with) an ingroup versus an outgroup (van Hoorn, 2015). The ingroup size is referred to as “radius of trust”—a larger ingroup meaning a larger radius of trust. Though collectivist communities have larger radii of trust, and are generally more cooperative, they may actually be less inclined to cooperate with outgroup individuals than those from individualist societies (Triandis et al., 1988; van Hoorn, 2015). This result is consistent with Tadesse and Kassie (2017) findings from rural Ethiopia that trust rooted in community membership drives commitment to cooperation, and with Wilczewski et al.’s (2017) findings that people with collectivist attitudes were less inclined to cooperate with those from other cultures at work. While individuals from collectivist communities—the ingroup—may be more reluctant to trust and cooperate with outgroup individuals, this study suggests that despite the background differences, the rural or Indigenous participants may have extended their “radius of trust” to their game partner because they recognized them as a peer of the larger university community.

While much of the existing literature on trust has explored what makes someone trusting, recent research on trustworthiness indicates that guilt-proneness is a more effective predictor of the trait than the Big Five of the Five-Factor Model of Personality, which describes personality as
different combinations of openness, conscientiousness, extraversion, agreeableness, and neuroticism (Digman, 1990; Levine et al., 2018). Specifically, in comparison to individuals low in guilt-proneness, high guilt-prone individuals are equipped with a stronger sense of interpersonal responsibility and thus, are less likely to betray others’ trust (Levine et al., 2018). Individuals with high levels of guilt-proneness are therefore more likely to reciprocate a favor in situations where they are entrusted by others (Levine et al., 2018).

**Future Research.** A deeper understanding of systemic competitiveness would help institutions of all kinds promote cooperative behavior when warranted. What it is that encourages collectivism over individualism is not clearly understood, and the individualistic instincts to oversee mutual benefit should be known. Individualistic cultures may generate individuals who are more ego-orientated, with extrinsic value orientation, and collectivist cultures generate individuals who are more task-orientated, with internal value orientation. Testing goal-orientation before measuring cooperativeness/competitiveness could provide insight into sources of motivation to either cooperate or compete.

Other factors including the cultural differences between the participants merit further consideration. While the study involved university adult students and coaches living in a large Western urban center (or near one), future studies should investigate the demographics of the participants including their gender, age, and ethnicity to examine how these differences may affect competitive or cooperative orientations. By doing so, these studies may build on this paper’s findings of how individualistic and collectivist cultures promote competition, cooperation, and trust.

Additionally, literature relating to personality has shown that social responsiveness and personality differences can influence the degree to which a person is cooperative (Wolf & Krause, 2014). Type A individuals, external locus of control, and low tendencies for sensation seeking were found to be associated with competitive behavior in university students (Boone et al., 1999). From the Big Five of the Five-Factor Model of Personality (Digman, 1990), agreeableness was correlated most strongly with cooperation and negatively correlated with hyper-competition, or the need to win no matter the cost (Ross et al., 2003). While the existing literature has explored what personality traits may make one more cooperative or competitive, future research should further consider how personality traits are developed in individualistic and collectivist cultures that foster competitive or cooperative behaviors.

Given that the structure of the experiment in the present study encompasses two rounds and thus, two opportunities for prizes, it would be interesting to see how a trustee would react if one participant was primed to display trust by being vulnerable (a willingness to cooperate by letting the other obtain a prize first). Levine et al.’s (2018) study would suggest that they are more likely to cooperate (reciprocate the favor) if they had high levels of guilt-proneness.

Dittmann et al.’s (2020) study mentions that achievement, particularly in educational systems, is focused on individual achievements rather than group ones. It is worth examining if children are primed to be competitive through, for example, the educational systems, and thereby questioning how much of a “natural instinct” is competition rather than a product of institutional cultural priming.

**10. Final considerations**

The first Canadian to walk in space, Chris Hadfield, said, “The common thread of success is: number one, an advanced education [. . .], also to be in good physical health [. . .], and the third is the ability to make good decisions.” (NASA, 12:12). Good decision-making, however, becomes increasingly complicated as circles of influence expand from individuals to institutions, to society and on to inter-regional interactions (Civitelli & Gruere, 2016). The present study is unique because of the extensive 25-year period of observation and because an activity previously only done with children was examined with
adults. As such, it exposes irrational competitive decision-making within today’s Western society. Adults favored competition in a situation that required cooperation for success.

If people only work for themselves rather than for the betterment of the group, society becomes less functional. Untapped potential remains if individuals are irrationally pitted against each other rather than united towards progress. Using Kahneman’s (2011) terminology, System 1’s competitiveness requires System 2 to override irrationality, to realize the context of a situation, and to take advantage of an opportunity for mutual benefit. More attention should be paid to making good decisions, a concept that requires understanding the context and recognizing mutually beneficial situations.

Funding
The authors received no direct funding for this research.

Author details
Larry Katz1
E-mail: katz@ucalgary.ca
Lisa Finestone1
David M. Paskevich2
1 Faculty of Kinesiology, University of Calgary, 2500 University Drive NW, Calgary Canada, AB T2N 1N4.

Data availability statement
Due to the nature of this research, participants of this study did not agree for their data to be shared publicly, so supporting data is not available.

Citation information
Cite this article as: Competition when cooperation is the means to success: Understanding context and recognizing mutually beneficial situations, Larry Katz, Lisa Finestone & David M. Paskevich, Cogent Psychology (2021), 8: 1878984.

References
Allison, M. T. (1982). Sport, ethnicity, and assimilation. Quest, 34(2), 165–175. https://doi.org/10.1080/00336297.1982.10483775
Baccaria, J. (2007). Competition and cooperation among jurisdictions: The case of regional cooperation in science and technology in Europe. European Planning Studies, 23(3), 287–302. https://doi.org/10.1080/09654319408720269
Bolsø, D. B., & Winkler, A. E. (2012). Worker behavior on the job: A multi-methods study of labor cooperation with management. Journal of Labor Research, 33(3), 388–413. https://doi.org/10.1007/s12122-012-9133-1
Bandiera, O., Rasul, I., & Banerjee, A. (2013). Team incentives: Evidence from a firm level experiment. Journal of the European Economic Association, 11(5), 1079–1114. https://doi.org/10.1111/jeea.12028
Bartsch, T., Sessions, J. G., & Zangelidis, A. (2016). Looking after number two? competition, cooperation, and workplace interaction. Journal of Economic Behavior & Organization, 131, 166–182. https://doi.org/10.1016/j.jebo.2016.08.001. Part A.
Barnett, S. X. D. (2000). Individualism-collectivism and ego development: A study of the Chinese culture. [Publication No. 9985008] (University of Pittsburgh). ProQuest Dissertations Publishing.
Beersma, B., Hollebeek, J. R., Humphrey, S. E., Moon, H., Conlon, D. E., & Ilgen, D. R. (2003). Cooperation, competition, and team performance: Toward a contingency approach. Academy of Management Journal, 46(5), 572–590. https://doi.org/10.5465/3004650
Boone, C., De Brabander, B., & van Witteloostuijn, A. (1999). Locus of control and strategic behavior in a prisoners dilemma game. Personality and Individual Differences, 27(4), 695–706. https://doi.org/10.1016/S0191-8869(98)00269-4
Chapin, K. J., Nonacs, P., & Hayes, L. D. (2017). Evaluating an open-exam approach to engaging students in evaluatory paradoxes: Cheating to learn. The American Biology Teacher, 79(2), 144–148. https://doi.org/10.1525/abt.2017.79.2.144
Chin, N. S., Khoo, S., & Low, W. Y. (2012). Self-determination and goal orientation in track and field. Journal of Human Kinetics, 33(1), 151–161. https://doi.org/10.2478/v10078-012-0054-0
Choi, H. S., Johnson, B., & Kim, Y. K. (2014). Children’s development through sports competition: derivative, adaptive, generative, and maladaptive approaches. Quest, 66(2), 191–202. https://doi.org/10.1080/00336297.2013.861757
Civitelli, F., & Gruere, G. (2016). Policy options for promoting urban-rural cooperation in water management: A review. International Journal of Water Resources Development, 32(6), 852–867. https://doi.org/10.1080/07900627.2016.1230050
Deci, E. L., & Ryan, R. M. (2008). Self-determination theory: A macrotheory of human motivation, development, and health. Canadian Psychology/Psychologie Canadienne, 49(3), 183. https://doi.org/10.1037/00012801
Deutsch, M. (1949). A theory of cooperation and competition. Human Relations, 2(2), 129–152. https://doi.org/10.1177/001872674900200204
Deutsch, M. (2006). Cooperation and competition. In M. Deutsch, P. T. Coleman, & E. C. Marcus (Eds.), The handbook of conflict resolution: Theory and practice (2nd ed., pp. 23–42). Jossey-Bass.
Diggman, J. M. (1990). Personality structure: Emergence of the five-factor model. Annual Review of Psychology, 41(1), 417–440. 00664308 https://doi.org/10.1146/annurev.psy.41.020190.002221
Dittmann, A. G., Stephens, N. M., & Townsend, S. S. M. (2020). Achievement is not class-neutral: Working together benefits people from working-class contexts. Journal of Personality and Social Psychology, 119(3), 517–539. https://doi.org/10.1037/pspa0000194
Doucier, M. (2014). Rice theory: Why eastern cultures are more cooperative. The Salt: What’s on Your Plate. NPR. https://www.npr.org/sections/thatstheon/2014/05/08/310477497/rice-theory-why-eastern-cultures-are-more-cooperative
Friedman, A., Todd, J., & Kariuk, P. W. (1995). Cooperative and competitive behavior of urban and rural children in Kenya. Journal of Cross-cultural Psychology, 26(4), 376–383. https://doi.org/10.1177/0022022195264003

Gneezy, U., Leibbrandt, A., & List, J. A. (2015). Ode to the sea: Workplace organizations and norms of cooperation. The Economic Journal, 126(595), 1856–1883. https://doi.org/10.1111/ejoc.12209

Green, V. A., & Rechis, R. (2008). Children's cooperative and competitive interactions in limited resource situations: A literature review. Journal of Applied Developmental Psychology, 27(1), 42–59. https://doi.org/10.1016/j.appdev.2005.12.002

Guth, W., Schmittberger, R., & Schwarze, B. (1982). An experimental analysis of ultimatum bargaining. Journal of Economic Behavior & Organization, 3(4), 367–388. https://doi.org/10.1016/0167-2681(82)90011-7

Johnson, D. W., Maruyama, G., Johnson, R., Nelson, D., & Skon, L. (1981). Effects of cooperative, competitive, and individualistic goal structures on achievement: A meta-analysis. Psychological Bulletin, 89(1), 47–62. https://doi.org/10.1037/0033-2909.89.1.47

Kagan, S., & Knight, G. P. (1979). Cooperation-competition and self-esteem. Journal of Cross-cultural Psychology, 10(4), 457–467. https://doi.org/10.1177/002202210901000402

Kagan, S., & Madsen, M. C. (1971). Cooperation and competition of Mexican, Mexican-American, and Anglo-American children of two ages under four instructional sets. Developmental Psychology, 5(1), 32–39. https://doi.org/10.1037/00031080

Kagan, S., & Madsen, M. C. (1972). Experimental analyses of cooperation and competition of Anglo-American and Mexican children. Developmental Psychology, 6(1), 49–59. https://doi.org/10.1037/00032219

Kahneman, D. (2011). Thinking, Fast and Slow (1st ed.). Straus and Giroux.

Kasser, T., & Ryan, R. M. (1996). Further examining the American dream: Differential correlates of intrinsic and extrinsic goals. Personality & Social Psychology Bulletin, 22(3), 280–287. https://doi.org/10.1177/014616709623006

Kew, F. C. (1978). Values in competitive games. Quest, 29(1), 103–112. https://doi.org/10.1007/100336297.1978.10519914

Kuhn, S. (2017). Prisoner’s dilemma. E. N. Zalta Ed., The Stanford Encyclopedia of Philosophy(Spring 2017 ed.). Stanford University. https://plato.stanford.edu/entries/prisoner-dilemma/#Bib

Levine, E. E., Bitterly, T. B., Cohen, T. R., & Schweitzer, M. E. (2018). Who is trustworthy? predicting trustworthy intentions and behavior. Journal of Personality and Social Psychology, 115(3), 468–494. https://doi.org/10.1037/pspi0000136

Lindskold, S., & Han, G. (1988). GRIT as a foundation for integrative bargaining. Personality & Social Psychology Bulletin, 14(2), 335–345. https://doi.org/10.1177/0146167288140211

Liu, J., & Leskinen, E. (1999). The reliability and validity of scores from the children’s versions of the perception of success questionnaire. Educational and Psychological Measurement, 59(4), 651–664. https://doi.org/10.1177/00131649921970080

Lochbaum, M., Cetinkalp, Z. K., Graham, K. A., Wright, T., & Zazo, R. (2016). Task and ego goal orientations in competitive sport: A quantitative review of the literature from 1989 to 2016. Kinesiology, 48(1), 3–29. 1331-1441 https://doi.org/10.26582/k.48.1.14

Ma, C., & Monsma, E. (2016). Testing cross-cultural generalizability of the task and ego orientation in sport questionnaire across American and Chinese samples. Plos ONE, 11(7). https://doi.org/10.1371/journal.pone.0158953 https://doi.org/10.1080/0965431030363649

Nicholls, J. G. (1989). The competitive ethos and democratic education. Harvard University Press.

Nowok, A. (2012). Evolving cooperation. Journal of Theoretical Biology, 299(21), 1–8. https://doi.org/10.1016/j.jtbi.2012.01.014

Parks, C. D., Henager, R. F., & Scamahorn, S. D. (1996). Trust and reactions to messages of social intent in social dilemmas. Journal of Conflict Resolution, 40(1), 134–151. https://doi.org/10.1177/002200219604001007

Parks, C. D., & Vu, A. D. (1994). Social dilemma behavior of individuals from highly individualist and collectivist cultures. Journal of Conflict Resolution, 38(4), 708–718. https://doi.org/10.1177/0022002194038004006

Pepe, E. A. (1985). Children in cooperation and competition. In R. Slavin, S. Sharan, S. Kagan, & R. Hertz-Lazarowitz (Eds.), Learning to cooperate, cooperating to learn (pp. 17–65). Springer.

Prentice, M., & Sheldon, K. M. (2015). Priming effects on cooperative behavior in social dilemmas: Considering the prime and the person. The Journal of Social Psychology, 155(2), 1–19. https://doi.org/10.1080/00224565.2014.977763

Puurtinen, M., & Mappes, T. (2009). Between-group competition and human cooperation. Proceedings of the Royal Society B: Biological Sciences, 276 (1655), 355–360. https://doi.org/10.1098/rspb.2008.1060

Quintana-Garcia, C., & Benovides-Velasco, C. A. (2004). Cooperation, competition, and innovative capability: A panel data of European dedicated biotechnology firms. Technovation, 24(12), 927–938. https://doi.org/10.1016/j.technovation.2004.07.006

Roberts, G. C., & Ommundsen, Y. (1996). Effect of goal orientation on achievement beliefs, cognition and strategies in team sport. Scandinavian Journal of Medicine & Science in Sports, 6(1), 46–56. https://doi.org/10.1111/1600-0838.1996.tb00060-9

Ross, S. R., Rausch, M. K., & Canada, K. E. (2003). Competition and cooperation in the five-factor model: Individual differences in achievement orientation. The Journal of Psychology, 137(4), 323–337. https://doi.org/10.1080/00223980309600617

Sanfey, A. G., & Gong, X. (2017). Social rank and social cooperation: Impact of social comparison processes on cooperative decision-making. PLoS One, 12(4), e0175472. https://doi.org/10.1371/journal.pone.0175472
Sheldon, K. M. (1999). Learning the lessons of tit-for-tat: Even competitors can get the message. *Journal of Personality and Social Psychology, 77*(6), 1245–1253. https://doi.org/10.1037/0022-3514.77.6.1245

Sheldon, K. M., Williams, G., & Joiner, T. (2003). Self-determination theory in the clinic: motivating physical and mental health. Yale University Press.

Tadesse, G., & Kassie, G. T. (2017). Measuring trust and commitment in collective actions: Evidence from farmers’ marketing organizations in rural ethiopia. *International Journal of Social Economics, 44*(7), 980–996. https://doi.org/10.1108/IJSE-09-2015-0253

Tjosvol, D., & Johnson, D. (2000). Deutsch’s Theory of Cooperation and Competition. In M. M. Beyrleine (Ed.), *Work teams: Past, present and future* (pp. 131-155). Kluwer Academic Publishers.

Triandis, H. C. (1999). *Individualism and collectivism*. Westview Press.

Triandis, H. C. (2001). Individualism-collectivism and personality. *Journal of Personality*, 69(6), 907–924. https://doi.org/10.1111/1467-6494.696169

Triandis, H. C., Bontempo, R., Villareal, M. J., Asai, M., & Lucca, N. (1988). Individualism and collectivism: Cross-cultural perspectives on self-ingroup relations. *Journal of Personality and Social Psychology, 54*(2), 323–338. https://doi.org/10.1037/0022-3514.54.2.323

Triandis, H. C., McCusker, C., & Hui, C. H. (1990). Multimethod probes of individualism and collectivism. *Journal of Personality and Social Psychology, 59*(5), 1006–1020. https://doi.org/10.1037/0022-3514.59.5.1006

Tucker, A. J. (1983). The mathematics of tucker: A sampler. *The Two-Year College Mathematics Journal, 14*(3), 228–232. https://doi.org/10.2307/3027092

van Damme, E., Binmore,K.G., Roth, A. E., Samuelson, L., Winter, E., Bolton, G. E., ...Kliemt, H., Selten, R., Nogel, R., & Azar, O.H. (2014). How werner guth's ultimatum game shaped our understanding of social behavior. *Journal of Economic Behavior & Organization, 108*, 292–318. https://doi.org/10.1016/j.jebo.2014.10.014

van Hoorn, A. (2015). Individualist-collectivist culture and trust radius. *Journal of Cross-cultural Psychology, 46*(2), 269–276. https://doi.org/10.1177/002202214551053

Wehner, K. (2015). An examination of competitiveness between gender, race, and school classification of millennial students: An exploratory study [Undergraduate thesis, Georgia Southern University]. University Honors Program Theses. https://digitalcommons.georgia southern.edu/honors-theses/90

Westra, D., Angeli, F., Corree, M., & Ruwaard, D. (2017). Cooperation in healthcare: A multi-level analysis of its individual and organizational determinants. *Social Science & Medicine, 186*, 43–51. https://doi.org/10.1016/j.socscimed.2017.05.051

Wilczewski, M., Gut, A., & Gorbaniuk, O. (2017). The impact of individualism-collectivism orientation and communal orientation on employees’ attitudes toward intercultural communication: The case of chinese employees in an MNC. *Journal of Intercultural Communication*, (45). https://www.immi.se/intercultural/nr45/wilczewski.html1404-1634

Wisman, J. D. (2010). Competition, cooperation, and the future of work. *Peace Review, 12*(2), 197–203. https://doi.org/10.1080/1040265050057834

Wolf, M., & Krause, J. (2014). Why personality differences matter for social functioning and social structure. *Trends in Ecology & Evolution, 29*(6), 306–308. https://doi.org/10.1016/j.tree.2014.03.008
