CREATING THE INTERINDIVIDUAL-INTERGROUP DISCONTINUITY EFFECT THROUGH CAMPBELL'S INDICES OF ENTITATIVITY

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ABSTRACT

ANDREW REA: Creating the Interindividual-Intergroup Discontinuity Effect Through Campbell's Indices of Entitativity
(Under the direction of Dr. Chester Insko)

This study seeks to apply indices of entitativity taken from Campbell's ideas concerning the status of social aggregates (1958) to the interindividual-intergroup discontinuity effect. Common fate, similarity, and proximity were manipulated as participants play a prisoner's dilemma game. Entitativity was considered to be behaviorally evidenced when participants made higher proportions of competitive choices. Increased competition was found for both individuals interacting with groups and groups interacting with individuals in the presence of common fate consistent with the body of literature. A two-way interaction for groups interacting with individuals was found in which proximity accentuated the effect of common fate. Perceived entitativity was not found to significantly mediate any of these effects.

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CHAPTER I

INTRODUCTION

A continuing area of interest in social psychology relates to the tendency of interactions between groups to involve more conflict than interactions between individuals. This tendency has been termed the interindividual-intergroup discontinuity effect and has been demonstrated many times in laboratory settings (see Wildschut, Pinter, Vevea, Insko, & Schopler, 2003 for a meta-analysis of these studies). Although several studies in this area have examined the conditions necessary for group entitativity or "groupness" (Insko, Pinkley, Herring, Holton, Hong, Krams, Hoyle, & Thibaut, 1987; Insko, Pinkley, Hong, Slim, Dalton, Lin, Ruffin, Dardis, Bernthal, & Schopler, 1988), no discontinuity study thus far has addressed the combined effects of proximity, similarity, and common fate. These factors, including an additional factor named "pregnance", were put forth by Wertheimer (1923) as the factors leading to the perception of discrete elements as a single figure. Campbell (1958) applied these factors to the determination of the entitativity of social aggregates (although he did not apply Wertheimer's concept of pregnance). Campbell (1958) indicated that common fate and similarity might be more important than proximity when determining entitativity, and common fate may be more central to the diagnosis of entitativity than similarity. The present research focuses on applying these principles to the creation of discontinuity in a laboratory setting.

The first explicit test of the discontinuity effect was conducted by McCallum, Harring, Gilmore, Drenan, Chase, Insko, and Thibaut (1985). However, the problem of

group actions has been mentioned in the writings of numerous philosophers and social scientists throughout history (Plato, 1997; Le Bon, 1895; McDougall, 1920; Brown, 1954; Allport, 1962). Plato in *The Republic* is generally skeptical of democratic group rule. Similarly, Le Bon (1895) writes of cultivated men becoming barbaric in crowds. This view is echoed by both McDougall (1920) and Brown (1954) (from whom we get the term "discontinuity.")

The Prisoner's Dilemma Game

The discontinuity effect has been actively studied ever since McCallum et al.'s (1985) study. The majority of research centers on the use of the prisoner's dilemma game (PDG). In a basic PDG game, two individuals or groups are each given a choice between two options which will be referred to as "X" and "Y." Outcomes for the different combinations of choices for each of the sides are represented in Figure 1. If both entities playing choose "X," both will receive a moderately high outcome. If both choose "Y," both will receive a moderately low outcome. In cases where participants make different choices, the participant choosing "Y" will achieve the highest possible outcome while the participant choosing "X" will receive the lowest possible outcome. If one picks "Y" one can never "lose" the PDG. However, if everyone picks "Y" no one can "win." Such is the dilemma.

One goal the interaction partners might pursue is the maximization of joint outcomes. This only works if one's interaction partner is also willing to forego the allure of choosing "Y" when one chooses "X." These characteristics of the PDG produce a conflict of interest, or noncorrespondence of outcomes, which is thought to be necessary for observing the interindividual-intergroup discontinuity effect (Kelley & Thibaut, 1978; Schopler & Insko, 1992; Schopler, Insko, Wieselquist, Pemberton, Witcher, Kozar, Roddenberry, & Wildschut,

2001). Discontinuity is observed in PDG setting when groups pick "Y" more often than individuals. While it is possible to observe discontinuity in non-matrix contexts that have conflicts of interest as shown by Insko, Schopler, Graetz, Drigotas, Currey, Smith, Brazil, & Bornstein (1994), the PDG format is still eminently useful for this type of research.

Fear and Greed

Two major factors have been advanced as explanations for the greater competitiveness shown by groups as compared to individuals. One of these is greed (Insko , Schopler, Hoyle, Dardis, & Graetz, 1990; Schopler & Insko, 1992; Schopler, Insko, Graetz, Drigotas, Smith, & Dahl, 1993; Wildschut et al., 2003). It is not the case that individuals cannot be greedy. The greed hypothesis states that there exists a "social support for shared self-interest (Schopler & Insko, 1992)." Groups may assume that they will be able to exploit their interaction partners who they assume will choose "X." Groups provide a mutual support for pursuing a selfish maximization of short-term outcomes. Individuals have no support for pursuing a strategy of exploitation.

Discontinuity has also been explained in terms of increased fear (Insko et al., 1990, Schopler & Insko, 1992; Schopler, et al., 1993; Wildschut et al., 2003). This fear is said to be a result of a negative outgroup schema (Schopler & Insko, 1992). Before interaction begins, participants will assume more competition from their interaction partners. Communication between groups is then seen as less trustworthy and is less effective in producing cooperation (Insko, Schopler, Drigotas, Graetz, Kennedy, Cox, & Bornstein, 1993).

Communication

Most experiments in this area have involved unconstrained communication between interaction partners whether groups or individuals. A setting such as this creates the largest magnitude of the interindividual-intergroup discontinuity effect (Insko et al., 1993; Wildschut et al., 2003). For some experimental manipulations, it is not advantageous to have unconstrained communication. Discontinuity studies have also been performed in the absence of communication and have been found to yield a smaller magnitude of effect (Wildschut et al., 2003). Intermediate effects are obtained when constrained cooperative communication is used (Wildschut et al., 2003). Lodewijkx, Wildschut, Syroit, Visser, and Rabbie (1999) had participants write notes to exchange with one another. Experimenters substituted notes containing cooperative messages for the participants' notes. Even though this sort of procedure decreases the magnitude of the effect, it has the added benefit of increasing the number of independent units of analysis in each session.

Procedural Interdependence

One factor that is particularly important for generating discontinuity is procedural interdependence (Wildschut, Lodewijkx, & Insko, 2001). Generally, discontinuity experiments create procedural interdependence by requiring groups to make a collective decision and follow a consensus rule. Wildschut et al.'s (2003) discontinuity meta-analysis finds that the discontinuity effect is larger in cases where procedural interdependence is present. Directly related to this issue, Insko et al. (1988) find that consensus is necessary for the creation of entitativity. In their study, Insko et al. (1988) had five different conditions. In one condition, participants on one side possessed outcome interdependence. With outcome interdependence participants shared their earnings. An individuals condition was not

included because previous research had found it did not differ from the outcome interdependence conditions (Insko, Pinkley, Hoyle, Dalton, Hong, Slim, Landry, Holton, Ruffin, & Thibaut, 1987). The second condition (contact) placed participants in the same room, but did not allow discussion within the room. The third condition required discussion. The fourth required consensus. Finally, there was a condition where all the participants interacted collectively as groups (group-all). Lower amounts of cooperativeness were found for participants in the group-all and consensus conditions relative to the other conditions. This was the most direct assessment of entitativity in a discontinuity context. If a case can be made that procedural interdependence in the form of consensus is analogous to common fate, we may be able to draw a parallel between Insko et al.'s (1988) findings for discontinuity and Campbell's reasoning regarding entitativity.

Entitativity

Entitativity research itself has not lain dormant even though it has gone by names such as "groupness" and "perceived unity." Hamilton and Sherman (1996) provide a good review of research into differences in the outcomes of impressions formed of individuals and group targets. Relatively recently, research has sought to bring together the areas of social cognition and intergroup processes (Abelson, Dasgupta, Park, & Banaji, 1998; Hamilton & Sherman, 1996; Sedikides, Schopler, & Insko, 1998; Dasgupta, Banaji, & Abelson, 1999). McConnell, Sherman and Hamilton (1994) found that social information is processed differently for group and individual targets. These same authors, in a later study, manipulated similarity to affect target entitativity in both groups and individuals (McConnell et al., 1997). Yzerbyt, Rogier, & Fiske (1998) in their study on social attribution manipulated entitativity by providing information about which colleges participants attended.

Most recently, Spencer-Rodgers, Hamilton, and Sherman (2007) found that entitativity predicted stereotyping of social categories and making stereotype-like judgments about task groups.

Nearly all of these recent studies in entitativity make mention of Campbell's (1958) paper on indices of entitativity. Common fate, proximity, and similarity are still variables that are relevant to entitativity research. Some papers, such as Yzerbyt et al. (1998) have used one of the variables alone (similarity) in their experiments. Abelson et al. (1998) manipulated similarity and proximity in one of their experiments involving perceptions of novel stimuli (humanoid creatures). Increased entitativity resulting from similarity and proximity exacerbated participants' beliefs of how threatening groups of humanoid creatures were. Physical similarity can lead to a perception of psychological similarity which Campbell (1958) originally conceptualized as being pertinent to determining entitativity in social aggregates (Abelson et al., 1998; Dasgupta et al., 1999).

For the current experiment, we use common fate, proximity, and similarity in an attempt to produce the discontinuity effect. Common fate was originally conceptualized as relating to objects moving in the same direction, but is generalized by Campbell to relate to any common change over time. According to Campbell: "The essence of the common fate coefficient is co-variability in time, and other variable parameters such as activity level, temperature, reflected light, morale, hedonic tone, nutritional status, etc. could be employed (Campbell, 1958, p. 21)" Using a majority vote to ensure change from individual preference to group decision thus can be seen as a manifestation of common fate.

Proximity has also been addressed in the "contact" condition of Insko et al.'s (1988) study on the role of consensus rule. Although Insko et al. (1988) did not find discontinuity

occurring in the contact condition, Campbell (1958) indicates that proximity can create perceived similarity and that similarity is often linked to common fate. Proximity can thus be diagnostic of common fate. Thus, the relationship between proximity and entitativity may be complex.

Insko et al. (1987) found that mere categorization is not enough to create entitativity sufficient for increased competition. Their study used a procedure similar to Tajfel's (1969) minimal groups paradigm with participants being categorized as either preferring the art of Klee or Kandinsky. They find categorization will only produce increased competition in cases where inter-category competition is conveyed as appropriate by an assumed social consensus (i.e. when participants knew their fellow category members had been competitive they were also competitive). We can look to this study as an example of similarity in a discontinuity context because the categorization involved similar preferences in art. It is apparent that Campbell (1958) thought of these indices as interconnected. Campbell (1958) states:

> While in general, common fate may be found to be more central to the diagnosis of entities than similarity, there is often in practical diagnostic procedures an iteration between similarity and common fate criteria in which an observed similarity dimension may provide a hypothesized grouping which is then tested for intragroup homogeneity on various dimensions of common fate. (p. 21)

Why is common fate more central to a diagnosis of entitativity? For objects, common fate would be a more reliable predictor of whether particles make up a whole. Particles of a rock could be similar and close together, but movement in different directions would preclude a diagnosis of entitativity. In social interaction, common fate may be more important because

it will often describe if people will *act* as a group. Of the three indices, it is the only one that involves change over time. It would make sense for people to pay attention to such a dynamic factor for self-defense reasons. Common fate may stimulate the fear that leads to the discontinuity effect.

It is possible that both proximity and similarity may make common fate more salient and lead to a greater degree of competition. While proximity and similarity themselves do not seem to create the entitativity needed to produce the discontinuity effect, it is possible they may interact to produce greater competition relative to individuals. In any case, it seems that common fate is central to a diagnosis of entitativity. The other factors may increase entitativity in the presence of common fate by acting as cues that increase the salience of common fate.

In our study we manipulated the variables in a 2 Common fate X 2 Proximity X 2 Similarity design. Similarity was manipulated by using a modified Klee-Kandinsky task similar to that used by Insko et al. (1987). Proximity was manipulated as it was in Insko et al.'s (1988) experiment by having participants located in the same room. There was only one trial. As stated before, the constrained communication tends to lead to a smaller discontinuity effect (Wildschut et al., 2003). We attempted to maximize the discontinuity effect by having participants expect only one trial (Insko, Schopler, Gaertner, Wildschut, Kozar, Pinter, Finkel, Brazil, Cecil, & Montoya, 2001). With this approach we manipulated the entitativity of only one side with the other side remaining individuals. For the rest of this paper we will refer to the side of those whose entitativity we manipulated as the "observed participants." The other side will be known as the "observers" The artistic preferences from the modified Klee-Kandinsky task of those on the observed side were manipulated to

alter the perceived similarity of those on that side to each other. Those on the observed side were either in individual rooms or a single room. Participants on the observed side were either subject to majority vote or made individual decisions as did the observers. Each observer "interacted" with one observed participant who either was or was not constrained by a majority vote, was or was not in a common room, and did or did not share an artistic preference.

This approach of individuals interacting with groups is not without precedent. Winquist and Larson (2004) studied groups interacting with individuals in addition to the standard group-group and individual-individual interaction in the discontinuity literature. They found that individuals interacting with groups were more competitive than individuals interacting with individuals. It was also found that groups were more competitive than individuals. Wildschut, Insko and Pinter (in press) have also used this approach and likewise found that groups interacting with individuals compete more than individuals interacting with individuals.

Hypotheses

We hypothesized a main effect for level of common fate on both choice and entitativity. The variables should also produce significant two-way interactions where each variable will have a greater effect in the presence of one of the others. There are several alternatives to our primary hypotheses. It is possible that any one factor is sufficient to produce maximum levels of entitativity. It is also possible that they will interact, but common fate will not be superior to the others. Any of these outcomes are possibilities.

CHAPTER II

METHOD

Participants

One hundred and seventy-four female undergraduates from an introductory psychology course at the University of North Carolina at Chapel Hill participated in this research. Participants earned between $0.55 and $2.05 during their participation.

Units of Analysis

The participants in the experiment did not actually interact with each other. Also, any written communications exchanged or artistic preferences given were falsified. Therefore, the six participants in each session were counted as separate units of analysis. The data from the observers and the observed side were analyzed separately. Participants who reported having experience with the PDG or similar social dilemmas were excluded from analysis. This left one hundred and forty-four participants (seventy-two on each side).

Independent Variables

This study used a 2 Common Fate X 2 Proximity X 2 Similarity between-subjects design. Common fate was manipulated by telling participants that one side would have their responses determined by a majority vote. To avoid confounding, this vote was not discussed among the participants. Participants simply gave their responses with the knowledge that the majority choice would be taken as the response for all people on that side.

The layout of the experimental suite allowed for the manipulation of proximity. The suite had a main area with seven rooms opening into it. There were two sets of three rooms

on two opposite sides of the suite separated by the main area. A third side had only one room, which the experimenter occupied. The fourth side was the door of the suite. The experimenter gave instructions from the main area. Proximity was manipulated by placing the observed participants in three separate rooms on a given side or in the same room on a given side. The observers on the opposite side were always in three separate rooms. Thus, half of the conditions had participants in six separate rooms while half had three in one room and three in separate rooms. In all conditions each observer only "interacted" with the person immediately across from him or her.

Similarity was manipulated by a modified version of the Klee-Kandinsky task used by Insko et al. (1987) and adapted from Tajfel's (1969) minimal groups paradigm. Instead of using two artists, three were used. The third artist was Franz Marc. However, the only paintings used were those of Klee and Kandinsky. Participants could also be told that they had no strong preference for any of the three artists. In half of the conditions, participants on the observed side were told that they had the same artistic preference, and in half were told that they each preferred a different artist. The participants on the observers' side were always informed that they had "no strong preference." Participants on the observed side knew the preferences of everyone in the suite. Participants on the observers' side knew only their own preference and the preferences of those on the observed side. The instructions were intended to avoid creating a sense of similarity between the "interacting" pairs of participants. The participants on the observed side may have thought of those on the observers' side as possessing a degree of similarity because they all were represented as having no strong preference. No participants were aware of the differential knowledge of the two sides.

Procedure

Participants entered the suite, were seated in the main area, and instructed to refrain from speaking to one another. Instructions were read to the participants from a script. Care was taken to avoid mentioning the word "group" overtly while instructing the participants. Informed consent forms were given to the participants and they were asked to read and sign them if they agreed to participate in the experiment. After signing the consent forms, participants drew numbered cards. The numbers were used to keep materials together and to assign rooms. After drawing the cards, the experimenter informed participants that they would be tested for their artistic preferences.

The lights were dimmed and participants viewed five pairs of slides that were paintings of two of the artists in question. They circled "left" or "right" on a sheet to indicate their preferences. The experimenter collected these sheets and took them to the experimenter room where he pretended to tally the preferences. After this, he re-entered the main area and placed participants into rooms by telling them "please take your things and move to the room I assign you." The experimenter then used the numbers that participants had drawn to assign them to rooms corresponding to those numbers. In proximity conditions, the three participants on the observed side were put in the same room, and were instructed not to talk to one another. They were given a simple PDG matrix (Figure 1.) and the outcomes on it were explained to them. In half the conditions, participants were told that one side's responses would be determined by majority vote.

Next, as a rationale for indicating supposed artistic preferences, it was explained to the participants that people were often more comfortable interacting when they knew something about one another. Participants were then given a card displaying a rough

blueprint of the experimental suite with indicated artistic preferences. For the observers, the card indicated own preference (no strong preference) and the preferences of the three on the opposite side of the suite (either three different artists or all the same artist). For the observed participants, the card indicated the preferences of all six participants. The preferences of the three on the opposite side of the observed participants were all indicated as "no strong preference" in all conditions. In conditions of similarity, their own preferences matched those of the other people on their side. In conditions of no similarity, the preferences on their side were all different from one another. The participants were shown which preference was theirs and which preferences were those of the other side. Observed participants were shown the preferences of all three participants on the other side to prevent questions regarding those preferences. After the distribution of the preferences, participants were given an opportunity to practice using the PDG by filling out worksheets.

Participants were then told that there would only be one trial in which they would decide between "X" and "Y." They were also given a short period to compose a note to give to the person across from them. The communications that participants on the observers' side received were switched with notes that expressed a desire to cooperate. The communications received by those on the observed side were switched with three slightly different communications that all communicated a preference for "X." The purpose of this deception was to ensure experimental control and to avoid participants saying anything that would disrupt the similarity manipulation. The reason that the communications received by the observed side were slightly different is that it may have been possible for the observed participants to see the communications of the other participants on that side when all observed participants were in the same room. After receiving the communications

participants believed were from the person directly across from them, all participants made a choice.

Participants were finally asked to fill out a packet of dependent variables, debriefed, and dismissed. Included in the dependent variable packet were questions about perceived entitativity. Participants were asked to rate to what degree they felt participants on the opposite side were one group. This rating was made on a scale from one to seven with one being "not at all" and seven being "very much." Also, participants were asked to rate the degree to which they felt those on the other side were individuals. Participants were also asked to rate the degree to which they felt the participants on their own side were one group and to the degree to which they felt the participants on their own side were individuals. The ratings of individuality were subtracted from the ratings of the degree to which the side was a group to get a differential entitativity rating. This was done in order to create a scale from individuality to groupness. Participants were also asked: "To what extent did you feel the three people on [the side of the observed participants] were similar to each other?" In addition, we asked participants about the motives for their choices. There were 10 items assessing five possible motives (two for each). These were combined into five individual scales. Included among these questions were two items assessing distrust (or fear) and two items assessing the extent to which they wanted to maximize their own outcomes. The other motives assessed were: the desire to have outcomes better than the others (max rel), the desire to maximize the outcomes of both sides (max joint), and the desire to minimize the difference between the outcomes of the parties (min diff). Prior to the close-ended questions, participants were asked open-ended questions assessing motives for decisions.

CHAPTER III

RESULTS

Observers' Perceptions of Similarity of Observed Participants

Participants in the observer role were asked to what degree they thought participants on the opposite side were similar. These results were analyzed with a 2 Common Fate X 2 Proximity X 2 Similarity univariate analysis of variance (ANOVA). In conditions of high manipulated similarity of the observed, the participants in the observer role perceived those on the opposite side to be more similar ($M = 3.17$ vs. $M = 4.49$), $F(1, 63) = 12.35$, $p = .001$, partial $\eta^2 = .16$. No interactions affecting perceived similarity were found. No other main effects or interactions were found.

Observed Participants' Perceptions of Similarity among Own Side

Participants in the observed role were asked to what degree they thought those on their own side were similar to each other and also to themselves. The results were each analyzed with a 2 Common Fate X 2 Proximity X 2 Similarity univariate analysis of variance (ANOVA). There was no main effect for manipulated similarity on either measure. There were no other significant main effects or interactions. This indicates that the similarity manipulation may have not been effective for the observed side.

Observers' Perceptions of Entitativity of Observed Participants

Differential entitativity ratings were calculated by subtraction of ratings of individuality from ratings of the degree to which a side was perceived as a group. The ratings of the differential entitativity of the observed participants' entitativity by the

observers were analyzed with a 2 Common Fate X 2 Proximity X 2 Similarity univariate ANOVA. All three main effects as well as qualifying interactions were found. Common fate level was significantly related to ratings of entitativity, $F(1, 60) = 19.83$, $p < .001$, partial $\eta^2 = .248$. The presence of common fate was related to higher entitativity ($M = -2.22$ vs. $M = 0.53$). There was a significant main effect for proximity level, $F(1, 60) = 5.61$, $p = .021$, partial $\eta^2 = .085$. High proximity was related to high ratings of entitativity ($M = -2.44$ vs. $M = 0.42$). A significant main effect for similarity was also observed where in which the presence of similarity led to higher differential entitativity ratings ($M = -1.50$ vs. $M = -0.28$), $F(1, 60) = 4.72$, $p = .034$, partial $\eta^2 = .073$.

A significant interaction between proximity and similarity was found, $F(1, 60) = 4.31$, $p = .042$, partial $\eta^2 = .067$. Simple effects analysis of this interaction indicated that high proximity was associated with increased differential entitativity in the absence of similarity ($F(1, 60) = 11.97$, $p = .001$), but not in its presence (see Table 1). Similarity was associated with increased differential entitativity in the absence of high proximity ($F(1, 60) = 7.65$, $p = .008$), but not in its presence. The factors exerted their effects in the absence of each another.

Finally, there was a three-way interaction among common fate, proximity, and similarity, $F(1, 60) = 4.26$, $p = .043$, partial $\eta^2 = .066$ (see Table 2). This three-way interaction was probed by breaking it into component two-way interactions. The two-way interaction of proximity and similarity was significant with common fate ($F(1, 60) = 7.23$, $p = .009$), but not without it. Simple effects analysis of the significant component two-way found that proximity led to higher ratings of differential entitativity in the absence of similarity ($F(1, 60) = 9.58$, $p = .003$), but not in its presence. Likewise, similarity was

associated with increased differential entitativity ratings in the absence of proximity ($F(1, 60) = 9.42$, $p = .003$), but not in its presence.

The two scales making up the differential entitativity scale were also analyzed separately. They were each analyzed using a 2 Common Fate X 2 Proximity X 2 Similarity univariate ANOVA. The pattern of results for the group perception subscale mirrored that of the combined measure. There were significant main effects for common fate ($M = 2.97$ vs. $M = 4.34$), proximity ($M = 2.75$ vs. $M = 4.39$), and similarity ($M = 3.31$ vs. $M = 3.97$) [Respectively: $F(1, 60) = 23.00$, $p < .001$, partial $\eta^2 = .28$; $F(1, 60) = 7.54$, $p = .008$, partial $\eta^2 = .112$; and $F(1, 60) = 6.11$, $p = .016$, partial $\eta^2 = .092$]. The directions of these main effects mirrored those for the differential scale exactly.

As observed for the differential scale, there was one significant two-way interaction between proximity and similarity, $F(1, 60) = 7.30$, $p = .009$, partial $\eta^2 = .109$ (see Table 3). Probing this two-way interaction with simple effects analysis reveals the same pattern of results as obtained from the differential entitativity measure. Proximity led to increased ratings of groupness in the absence of similarity ($F(1, 60) = 18.01$, $p < .001$), but not in its presence. Similarity led to increased ratings of groupness when proximity was absent ($F(1, 60) = 11.36$, $p = .001$), but not in its presence. The three-way interaction was also significant, $F(1, 60) = 8.54$, $p = .005$, partial $\eta^2 = .125$.

The pattern of the three-way interaction was similar, but not exactly the same, as that of the differential scale (see Table 4). As with the differential measure, the Proximity X Similarity interaction was significant when common fate was present ($F(1, 60) = 7.23$, $p = .009$), but not in its absence. Simple effects analysis revealed that high proximity was significantly related to higher ratings of groupness in the absence of similarity ($F(1, 60) =$

15.36, $p < .001$), and marginal in the presence of similarity ($F(1, 60) = 2.91$, $p = .093$). The marginal effect is the only aspect of the pattern of the subscale interaction that differed from the pattern observed for the differential scale. Similarity led to higher ratings of groupness when proximity was absent ($F(1, 60) = 14.50$, $p < .001$), but not when it was present.

The pattern of results for the individuality subscale did not mirror the overall results exactly. There were no significant interactions, similarity did not show a main effect, and the main effect of proximity was marginal ($F(1, 60) = 3.14$, $p = .082$, partial $\eta^2 = .050$. Common fate led to significantly lower ratings of individuality ($M = 5.19$ vs. $M = 3.81$), $F(1, 60) = 13.26$, $p = .001$, partial $\eta^2 = .181$.

Observed Participants' Perceptions of Entitativity of their Own Side

Univariate ANOVA results revealed two significant main effects for differential entitativity. Participants on the observed side reported significantly more entitativity with common fate ($M = -2.45$ vs. $M = -0.14$), $F(1, 61) = 5.98$, $p = .017$, partial $\eta^2 = .089$. They also reported more entitativity with proximity ($M = -2.50$ vs. $M = -0.36$), $F(1, 61) = 7.92$, $p = .007$, partial $\eta^2 = .115$. One two-way interaction was also significant—Common Fate X Proximity, $F(1, 61) = 4.77$, $p = .033$, partial $\eta^2 = .073$ (see Table 5). The Common Fate X Proximity interaction was probed with simple effects analysis. It was found that common fate led to greater ratings of differential entitativity with high proximity ($F(1, 61) = 10.74$, $p = .002$), but not with low proximity. Proximity led to increased ratings of differential entitativity with common fate ($F(1, 61) = 10.75$, $p = .002$), but not without it. In this case, the factors exerted their effects in the presence of one another. Finally, there was a marginal interaction among all three of the independent variables, $F(1, 61) = 3.68$, $p = .060$, partial $\eta^2 = .057$. Means for this marginal interaction are presented in Table 6. There was a non-

significant tendency for the effect of common fate on differential entitativity to be the largest in the presence of similarity and high proximity.

Results for both subscales mirrored the pattern of the overall measure's results. For the measure of groupness, we found a significant main effect for level of common fate (M = 2.90 vs. M = 3.93) [$F(1, 61) = 4.54$, $p = .037$, partial $\eta^2 = .069$], level of proximity (M = 2.81 vs. M = 3.91) [$F(1, 61) = 7.89$, $p = .007$, partial $\eta^2 = .115$], and a marginal three-way interaction ($F(1, 61) = 3.31$, $p = .074$, partial $\eta^2 = .051$). However, the two-way interaction between common fate and proximity was marginal, $F(1, 61) = 3.15$, $p = .081$, partial $\eta^2 = .049$. For the measure of individuality, we found a significant main effect for level of common fate (M = 5.35 vs. M = 4.07) [$F(1, 61) = 6.03$, $p = .017$, partial $\eta^2 = .090$], level of proximity (M = 5.31 vs. M = 4.27) [$F(1, 61) = 6.26$, $p = .015$, partial $\eta^2 = .093$], a significant two-way interaction between common fate level and proximity level ($F(1, 61) = 5.34$, $p = .024$, partial $\eta^2 = .080$), and a marginal three-way interaction ($F(1, 61) = 3.21$, $p = .078$, partial $\eta^2 = .050$). Examining the simple effects for the two-way interaction revealed a similar pattern of results to the differential measure. Common fate only led to lower ratings of individuality when proximity was high ($F(1, 61) = 11.39$, $p = .001$), and proximity only led to lower ratings of individuality with common fate—
$F(1, 61) = 9.96$, $p = .002$ (see Table 7).

Choice Results for Observers

The data for presence or absence of competition of the observers were analyzed with a stepwise multinomial logistic regression. First, the main effects were entered into the model simultaneously. Examining the likelihood ratio tests for the main effects revealed a statistically significant effect of common fate of the observed participants leading to a greater

proportion of competitive choices when common fate was present (0.19 vs. 0.42), χ^2(N=72) = 4.36, p =.037. We did not find any two-way interactions to be significant after entering them into the model. The three-way interaction was unable to be tested due to a quasi-complete separation in the data leading to a situation where the model could not converge and model fit was uncertain. Though far from ideal, it is possible to test a dichotomous response variable in the general linear model (GLM). For purposes of exploration, we examined the results of a factorial combination of our independent variables with choice as a dependent variable in a GLM analysis. The three-way interaction was not significant[1].

Choice Results for Observed Participants

The data for competition of the observed participants were also analyzed with a stepwise multinomial logistic regression. When the main effects were entered into the model simultaneously, we uncovered one significant main effect. The likelihood ratio tests for the main effects revealed a statistically significant effect of common fate of the observed participants leading to a greater proportion of competitive choices (0.10 vs. 0.28), χ^2(N=72) = 4.09, p =.043. Next, the two-way interactions were entered into the regression. The two-way interaction between common fate level and proximity was significant, χ^2(N=72) = 5.80, p =.016 (see Table 8). However, the validity of the model fit was uncertain due to several cells containing only cooperative responses. Analyzing the results with GLM revealed a marginal interaction between the two variables, $F(1, 64) = 3.58$, $p = .063$, partial $\eta^2 = .053$. Examining

[1] The effect of common fate in the GLM was marginal, $F(1, 64) = 3.85$, $p = .054$.

the cell means reveals that common fate had a larger effect in the presence of high proximity than in the presence of low proximity[2]. The three-way interaction did not reach significance.

Reasons for Choices of Observers

The ten items assessing the five different reasons for PDG choice were combined into five variables. Split-half reliabilities were calculated for these variables. The Spearman-Brown reliability coefficient of the items making up the distrust variable was .84. The items making up the max own variable had a Spearman-Brown reliability of .84. Reliabilities for the max rel, max joint, and min diff variables were .89, .90, and .60 respectively. The open-ended assessments were scored for the presence or absence of the five reasons by two observers. The Spearman-Brown reliability coefficient for these open-ended assessments was .97 for the distrust motive. It was .95 for max own. Max rel's coefficient was .76. Max joint and Min diff had coefficients of .75 and .91, respectively. These ratings were averaged across the two observers. The open-ended and close-ended reason assessments were converted to standard scores and averaged. The reliability coefficients were calculated according to Nunnally and Bernstein's (1994) method for computing reliabilities of summed standard scores. The coefficients obtained were: .63 for distrust, .64 for max own, .50 for max rel, .61 for max joint, and .57 for min diff. Reasons for choices were analyzed with a series of 2 Common fate X 2 Proximity X 2 Similarity univariate ANOVAs.

No significant effects for any reason other that distrust were found. A significant main effect of common fate was found in which the presence of common fate led to higher reported distrust (M = -.31 vs. M = .32), $F(1, 63) = 8.58$, $p = .005$, partial $\eta^2 = .12$[3].

[2] Simple effects analysis of the marginal interaction shows that in the presence of high proximity, common fate led to greater competition ($F(1, 64) = 7.175$, $p = .009$), but it did not when proximity was low.

Reasons for Choices of Observed Participants

The ten items assessing the five different reasons for PDG choices of observed participants were also combined into five variables. The Spearman-Brown split-half reliability coefficient of the items making up the distrust variable was .64. The items making up the max own, max rel, max joint, and min diff variables had reliabilities of .84, .82, .75, and .58 respectively. The open-ended items for assessing reasons were treated the same as they were for observers. The inter-rater reliability was calculated using the Spearman-Brown corrected correlation. The coefficient for distrust was .41. Max own had a coefficient of .86. Max rel had a coefficient of .45. The coefficient of max joint was .69. Min diff had a coefficient of .71. The open-ended and close-ended reason assessments were converted to standard scores and averaged as they were for the observers. The reliability coefficients for the observed participants' open and close-ended responses were: .65 for distrust, .89 for max own, .64 for max rel, .76 for max joint, and .76 for min diff (Nunnally & Bernstein, 1994). These reasons were analyzed with a series of 2 Common fate X 2 Proximity X 2 Similarity univariate ANOVAs.

There were no significant effects on distrust. There were several notable results for max own. Similarity led to a significant main effect where participants reported higher max own (M = -.18 vs. M = .16), $F(1,64) = 4.67$, $p = .035$, partial $\eta^2 = .068$. We found a

[3] One marginal interaction was found for distrust. The three-way interaction of common fate, proximity, and similarity affecting distrust was marginal ($F(1,63) = 3.02$, $p = .087$, partial $\eta^2 = .046$). Means for this marginal interaction are displayed in Table 9. There was a non-significant tendency for the effect of common fate on distrust to be smallest when proximity was high and similarity was low. For the variable of max own, common fate showed a marginal main effect in which common fate lead to increased reporting of max own motivations (M = -.17 vs. M = .17), $F(1,63) = 2.93$, $p = .092$, partial $\eta^2 = .044$. There were no significant or marginal main effects or interactions for any of the independent variables on the response variables of max rel and min diff. There was one marginal interaction involving the max joint variable. The three-way interaction of common fate, proximity, and similarity affecting max joint was marginal ($F(1,63) = 3.06$, $p = .085$, partial $\eta^2 = .046$). Means for this marginal interaction are displayed in Table 10. There was a non-significant tendency for common fate to reduce max joint reporting in the presence of similarity and high proximity, but for this effect was descriptively reversed when similarity was absent and proximity was low.

significant two-way interaction between common fate and proximity level for max own $F(1,64) = 5.56$, $p = .021$, partial $\eta^2 = .080$ (see Table 11). Simple effects analysis revealed a significant increase in max own for common fate in the presence of high proximity ($F(1, 64) = 6.05$, $p = .017$), but not in its absence. Proximity was associated with marginally higher reported max own with common fate ($F(1, 64) = 3.70$, $p = .059$), but not without common fate. We also found a significant two-way interaction between common fate and similarity for max own, $F(1,64) = 5.06$, $p = .028$, partial $\eta^2 = .073$ (see Table 12). Simple effects analysis revealed a significant increase in max own for common fate in the presence of similarity ($F(1, 64) = 6.62$, $p = .012$), but not in its absence. Similarity was associated with significantly higher max own with common fate ($F(1, 64) = 8.89$, $p = .004$), but not without it. One significant effect for max rel was found. Max rel was greater in the presence of similarity ($M = -.20$ vs. $M = .18$), $F(1,64) = 5.93$, $p = .018$, partial $\eta^2 = .085$[4].

There was a significant two-way interaction between common fate and proximity for max joint, $F(1,64) = 10.97$, $p = .002$, partial $\eta^2 = .146$ (see Table 13). Simple effects analysis revealed a significant decrease in max joint for common fate with high proximity ($F(1, 64) = 9.06$, $p = .004$), but not with low proximity. High proximity led to a significant decrease in max joint with common fate ($F(1, 64) = 7.69$, $p = .007$), but this effect was marginally reversed without common fate, $F(1, 64) = 3.51$, $p = .061$[5].

[4] There was a marginal effect for common fate to be associated with higher max rel ($M = -.13$ vs. $M = .16$), $F(1,64) = 2.85$, $p = .097$, partial $\eta^2 = .043$.

[5] There was also a marginal effect of similarity on max joint such that the presence of similarity led to lower max joint, ($M = .19$ vs. $M = -.17$), $F(1,64) = 3.64$, $p = .061$, partial $\eta^2 = .054$. Finally, there was a marginal effect of similarity on min diff such that the presence of similarity led to less min diff ($M = .17$ vs. $M = -.16$), $F(1,64) = 3.05$, $p = .086$, partial $\eta^2 = .045$.

Mediational Analyses of Entitativity and Choice

We were interested in several possible mediators of choice in the data. The first of these was the possibility that entitativity might mediate choice. We first analyzed the observers' data for the possibility of mediation first. Specifically, we were interested on testing whether common fate exerts its effects on choice through entitativity. We tested the differential entitativity measure and both subscales for heterogeneity of regression by entering the interactions of common fate and those variables sequentially in a logistic regression. No significant heterogeneity of regression was found for any measure of entitativity. We then entered the entitativity variables as covariates in a series of logistic regressions. No significant effects on choice were found for the differential entitativity measure (χ^2(N=72) = .181, p =.67), the groupness subscale, (χ^2(N=72) = 0.053, p =.82), or the individuality subscale (χ^2(N=72) = 0.294, p =.59[6].

Our next step was to analyze the data of the observed participants for the possibility of mediation by entitativity. No heterogeneity of regression was found for the differential entitativity measure or either subscale. When entered as a covariate in a logistic regression with the main effects of our three predictors, differential entitativity was not significantly related to choice, χ^2(N=72) = 0.711, p =.40[7]. This was also true of the groupness (χ^2(N=72) = 0.93, p =.34) and individuality (χ^2(N=72) = 0.44, p =.50) subscales.

Mediational Analyses of Reasons and Choice

We wished to test for the possibility of mediation of common fate level's effects on choice by any of the reasons. We started with the data for observers. As previously stated, distrust was significantly related to common fate level and common fate level was

[6] The correlation between choice and differential entitativity for observers was r(68) = .102, p = .41.

[7] The correlation between choice and differential entitativity for observed participants was r(69) = .17, p = .15.

significantly related to choice. No significant heterogeneity of regression was found for distrust with common fate level. Entering distrust as a covariate in a multinomial logistic regression with the main effects of common fate, similarity, and proximity revealed that distrust was significantly related to choice, $\chi^2(N=72) = 27.40$, $p < .001$. Additionally, the effect of common fate was no longer significant, $\chi^2(N=72) = .002$, $p = .96$. The indirect effect of common fate on choice through distrust was significant, $z' = 2.18$, $p < .01$[8] (MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002). Our results are consistent with the possibility of mediation of common fate's effects on choice by distrust. Next, we examined the data for observed participants. No reasons were significantly associated with common fate level. Therefore, we did not further test for mediation.

[8] The z' statistic was calculated using values from ANOVA-type regression consistent with Wildschut, Insko, and Gaertner (2002). As this is not ideal for dichotomous variables, results must be interpreted with caution.

CHAPTER IV

DISCUSSION

Perceptions of Similarity of Observed Participants

The similarity ratings showed that in the conditions where similarity was supposed to be high, observers did indeed perceive those on the opposite side as similar to each other. The manipulation seemed to have been effective. Unexpectedly, the participants on the observed side did not perceive more similarity among themselves when they had the same as opposed to different artistic preferences. The manipulation of similarity failed for the observed participants. It is interesting that the similarity manipulation had no significant effect on the observed participants view of themselves even though the manipulation did affect the observers' view of the observed participants. Perhaps this difference is an indication that our views of ourselves are more resistant to change than are our views of others.

Observers' Perceptions of Entitativity of Observed and Observers' Choices

The results revealed that common fate, proximity, and similarity had significant main effects on ratings of perceived entitativity in addition there being several qualifying interactions. If the pattern of results had been mirrored in the choice results it would be simple to conclude that both were strong indicators of entitativity. However, the choice results did not mirror the results for perceived entitativity (See Table 14 for a summary of significant choice and differential entitativity effects for both observers and observed participants). In fact, common fate was the only significant predictor of choice. Why is it

that the supposed "behavioral confirmation" of the effect of entitativity showed a different pattern of results than a direct measure of perceived entitativity?

One possible explanation may be that participants have several conceptions of the word "group." We did not supply a definition for the word group, but simply asked participants to what degree the participants on one side were seen as more of a group and less as individuals. In common parlance the word group can mean many things. Several individuals standing on a street corner can be seen as a group even though they might not know each other or talk to one another. In social psychology, a "real" group is often thought of as two or more people who may interact with one another and possess a degree of interdependence (Cartwright & Zander, 1968; Lewin, 1948). In this sense, the groups in this experiment were only real groups when there was common fate. This is because the majority decision rule created a situation in which participants' outcomes were partially determined by the decisions of the two others on their side. This finding for common fate supports prior research (Insko et al., 1988) which found that a consensus rule was necessary for increased competition. However, the study in which this finding was reported involved groups interacting with groups. Our findings extend this result to individuals observing groups and groups observing just themselves.

Observed Participants' Perceptions of Entitativity of Own side and Choices

The observed participants followed a slightly different pattern. Common fate increased competition. This tracks the results of Insko et al. (1988). The two-way interaction between proximity and common fate in this study further indicated that proximity boosted the effect of common fate. Proximity by itself was not effective in creating competition in either this study or the study of Insko et al. (1988).

Observed participants perceived greater entitativity with common fate. Proximity also increased entitativity. The interaction of proximity and common fate revealed that common fate exerted its effects most strongly when proximity was high. Taken together, the results for entitativity and choice reveal that proximity moderates the effects of common fate across different response variables. The discontinuity results for observed participants provide partial support for our hypothesis that proximity and similarity would enhance the effect of common fate.

It was expected that the entitativity results would mirror the discontinuity results for all participants. This was clearly not the case for observers. The results for observed participants were similar, though not exactly the same. Past research by Insko and colleagues (1988) studied proximity and common fate jointly, but not in a factorial design and thus could not differentiate the independent and interactive effects on entitativity and choice. Also, older research did not test for mediation, but the parallel effects of groups versus individuals on both entitativity and choice suggested that entitativity might mediate the discontinuity effect. Despite some similarity in the pattern of results (Table 14), the present results do no significantly indicate that entitativity was a mediator of choice.

Distrust

Mirroring previous discontinuity research, this study finds that distrust (or fear) functions as a mediator for the discontinuity effects shown for observers. The results did not hold for the observed side. These results are partially at odds with Winquist and Larson's (2004) findings. Winquist and Larson found that distrust mediated effects for both individuals interacting with groups and groups interacting with individuals. We found mediation by distrust for individuals interacting with groups (consistent with the concept of

outgroup schema-based distrust), but not groups interacting with individuals. However, Winquist and Larson used a different procedure in their study. It is not precisely clear, but it can be inferred that participants in groups came to a consensus through discussion. The observed participants, even those in the same room, did not talk to one another during our study.

It seems that discussion and consensus make for a very powerful manipulation. However, they are not necessary to produce discontinuity effects. What then could explain the enhanced competition/reduced cooperation observed for those participants in a group who did not experience distrust? One possibility is max rel, but we were unable to test it due to the marginality of the finding. We can only speculate as to possible mediators of the relationship between common fate and competition. It is possible that there may be a variable that mediates this relationship in addition to being a more complete mediator of the discontinuity results for the observers. So, we are looking for a variable that would be associated with the indices of entitativity and that could lead to competition. Entitativity itself has been revealed as a poor candidate, but it may be productive to approach the problem from a different angle than is standard in discontinuity research. Perhaps we should be looking for a variable that mediates cooperation in individual conditions rather than a variable that mediates competition in group conditions. Campbell's indices of entitativity may create competition through disrupting or circumventing a normal process that leads to cooperation. The tendency to cooperate, whether learned or innate, may not generalize to group situations. Cooperation may be mediated by some sort of personal connection or presence felt by one person for another. When one realizes that one is interacting with a person, the primary objective may be to treat that person in a humane fashion. Otherwise,

one might treat a PDG situation as if it were a game to be won (i.e. a max rel intent). Whether it is referred to as chemistry, bonding, humanization, personal connection, or any of a host of other names, it may be that this elusive variable is the mediator that we seek. It may be that discontinuity effects arise not from a perception of others as a group, but a lack of some humanizing quality that is reduced by the variables that increase entitativity.

Future research will investigate other possible mediators of the discontinuity effect. Also, we wish to investigate the factorial combination of entitativity indicators in a group-on-group interaction. Wildschut, Insko, and Pinter (2007) find the discontinuity effect to be a joint function of interacting with a group and interacting as a group.

Considerations

Though our similarity manipulation led to perceived similarity among observers, the lack of perceived similarity main effects among observed participants indicates that our manipulation may not be as strong as we would like. It appears to be difficult to manipulate peoples' perceptions of their own similarity to others when they can see those others. However, it is possible that an alternative manipulation might do so. Another concern is the strength of the common fate manipulation. Majority vote is quite different from consensus reached through discussion.

Conclusions

Increased competition was found for both individuals interacting with groups and groups interacting with individuals in the presence of common fate consistent with the body of literature. A two-way interaction for groups interacting with individuals was found in which proximity accentuated the effect of common fate. Perceived entitativity was not found to significantly mediate any of these effects.

Table 1

Mean observer ratings of the differential entitativity of observed participants as a function of similarity and proximity

Similarity	High Proximity	Low Proximity
High	0.45	-1.50
Low	0.38	-3.00

Table 2

Mean observer ratings of the differential entitativity of observed participants as a function of similarity, proximity, and common fate

Fate	High Proximity	Low Proximity
	Common Fate	
Similarity		
High	1.50	3.67
Low	2.00	-2.27
	No Common Fate	
Similarity		
High	-0.60	-3.22
Low	-1.25	-3.89

Table 3

Mean observer ratings of the groupness of observed participants as a function of similarity and proximity

Similarity	High Proximity	Low Proximity
High	4.35	3.33
Low	4.44	2.40

Table 4

Mean observer ratings of the groupness of observed participants as a function of similarity, proximity, and common fate

Fate	High Proximity	Low Proximity
	Common Fate	
Similarity		
High	4.70	6.33
Low	5.38	2.73
	No Common Fate	
Similarity		
High	4.00	2.33
Low	3.50	2.00

Table 5

Mean ratings of observed participants of the differential entitativity of own side as a function of proximity and common fate

Fate	High Proximity	Low Proximity
Common Fate	1.56	-2.23
No Common Fate	-2.18	-2.65

Table 6

Mean ratings of observed participants of the differential entitativity of own side as a function of similarity, proximity, and common fate

Fate	High Proximity	Low Proximity
	Common Fate	
Similarity		
High	2.44	-3.20
Low	0.43	-1.63
	No Common Fate	
Similarity		
High	-2.40	-1.73
Low	-1.86	-3.50

Table 7

Mean ratings of observed participants of the individuality of own side as a function of proximity and common fate

Fate	High Proximity	Low Proximity
Common Fate	3.19	5.29
No Common Fate	5.15	5.39

Table 8

Proportion of non-cooperative choices of observed participants as a function of proximity and common fate

Fate	High Proximity	Low Proximity
Ensured Common	.38	.19
Self-Determined	.00	.17

Table 9

Mean distrust z scores as a function of similarity, proximity, and common fate for observers

Fate	High Proximity	Low Proximity
	Common Fate	
Similarity		
High	.48	.024
Low	.024	.54
	No Common Fate	
Similarity		
High	-.36	-.30
Low	-.12	-.43

Table 10

Mean max joint z scores as a function of similarity, proximity, and common fate for observers

Fate	High Proximity	Low Proximity
	Common Fate	
Similarity		
High	-.12	.029
Low	-.026	.091
	No Common Fate	
Similarity		
High	.63	-.59
Low	-.13	.027

Table 11

Mean max own z scores as a function of proximity and common fate for observed participants

Fate	High Proximity	Low Proximity
Common Fate	.44	-.17
No Common Fate	-.31	.039

Table 12

Mean max own z scores as a function of similarity and common fate for observed participants

Fate	High Similarity	Low Similarity
Common Fate	.53	-.31
No Common Fate	-.14	-.078

Table 13

Mean max joint z scores as a function of proximity and common fate for observed participants

Fate	High Proximity	Low Proximity
Common Fate	-.49	.28
No Common Fate	.34	-.10

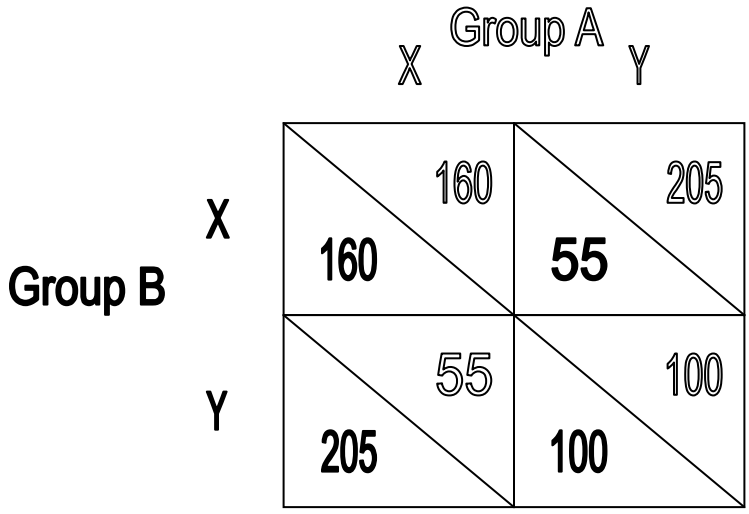
Table 14

A summary table giving significant effects for differential entitativity and competition

Observers		Observed	
Entitativity	Choice	Entitativity	Choice
Common Fate*	Common Fate*	Common Fate*	Common Fate*
Proximity*		Proximity*	
Similarity*			
Proximity X Similarity		Common Fate X Proximity[ab]	Common Fate X Proximity[a]
Common Fate X Proximity X Similarity			

Note. * indicates positive association between factor and response variable of interest. Superscript [a] indicates common fate led to significant effect in presence of high proximity. Superscript [b] indicates proximity led to significant effect in presence of ensured common fate.

Figure 1. An example of a matrix used in the prisoner's dilemma game.



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