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Cooperation of Authority

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MONTCLAIR STATE UNIVERSITY

Cooperation of Authority

By

Nathan Kemper

A Master's Thesis Submitted to the Faculty of

Montclair State University

In Partial Fulfillment of the Requirements

For the Degree of

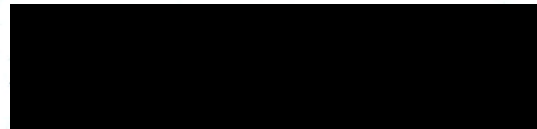
Master of Arts

May 2015

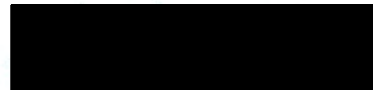
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Abstract

What is the place of authority and what effects does it have on the behavior of individuals? This has historically been a question addressed in social psychology literature (see Milgram, 1963; Zimbardo, 1974; 2007). Traditionally researchers in this paradigm focus on the situational effects of assigned authority on underlying positions in asymmetric power structure settings (e.g. the “teacher” and “learner” in Milgram, 1963). The current study sought to place focus on the individual in the authority role while engaged in a cooperative pay-off game. Thirty-eight students ($N = 38$) were recruited to participate in two trials of the Prisoner’s Dilemma Game (PDG) consisting of 20 rounds each for a total of 40 rounds. In between the two trials, participants completed three models in a Lego construction communication task. There were two conditions for the Lego task – a cooperative and non-cooperative condition. In the cooperative condition, participants were instructed to cooperate with their partner to complete the task; in the non-cooperative condition, participants were told to dictate instructions to the builder . Participants competed in the PDG and worked on the Lego task with a confederate posing as a naïve participant. It was hypothesized that those in the cooperative condition would show a decrease in defecting in the PDG from Trial 1 to Trial 2, whereas the non-cooperative condition would show an increase in defecting. The results did not support this hypothesis, but there was a significant increase in overall defecting from Trial 1 to Trial 2 of the PDG. Possible reasons for this increase are discussed.

COOPERATION OF AUTHORITY

A THESIS

Submitted in partial fulfillment of the requirements

For the degree of Master of Arts in Psychology

by

NATHAN KEMPER

Montclair State University

Montclair, NJ

2015

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ACKNOWLEDGMENTS

My gratitude goes to Dr. Meredyth Appelbaum for making this thesis possible through her guidance and support. Additionally, my deepest thanks go to Candace Moses and Felicia Apito for serving as outstanding research assistants and confederates. Without all of these people this research would not have been possible.

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Cooperation of Authority

Over the past half-century, the concepts of authority and cooperation have intensely interested social psychologists, whether studied independently or together. Authority, and response to authority (either defiance or obedience), is a staple of any kind of society (Milgram, 1963). In many cases, authorities may be considered representative of a greater group, making them representatives of collective wellbeing (de Cremer & Tyler, 2007). Milgram (1963), however, showed the darker side of authority and cooperation, effectively demonstrating the coercive effect of the presence of an authority figure (see Burger (2009) for replication). These findings make sense in a broader societal context, as the goal of authority is often to motivate citizens to both comply and cooperate (Tyler & Jackson, 2014). It is of note, however, that Haslam and Reicher (2012) do contest that the case for blind obedience in the Milgram study has been overstated. Shedding light on this claim, Burger *et al.* (2011) has suggested, through post-interview analyses following the Milgram study replication that the degree to which one accepts responsibility affects the degree of obedience. In other words, a sense of personal responsibility may be the main mediating factor in reducing destructive obedience in individuals. The current study seeks to elucidate this phenomenon of authority even further by viewing it from a completely different perspective – from that of the authority figure.

Authority, as discussed here, can either be dispositional or situational in nature. Viewed in the dispositional light, Authoritarian Personality (Adorno *et al.*, 1950) provides another view of how authority functions. Those people that possess an Authoritarian Personality are more likely to support and bring to power any kind of

strong figure as a leader. This is done for fear of outgroups and as an existential mechanism to avoid freedom (Kornyeveva & Boehnke, 2013). Li *et al.* (2012), working within the context of Chinese power structures, discuss how previously sampled public servants are more likely to possess an Authoritarian Personality, lending them a more rigid view of rules and morality. This theoretical framework of personality seeks to explain the rise of tyrannical rule in varying social strata.

Additionally, there is a situational aspect of authority aside from the dispositional dimension. As Zimbardo (1974; 2007) has researched and discussed, situational and vocational factors often precipitate authoritative actions of aggression. Viewed in this light, authority can theoretically be “switched on” by mere cues (for instance, an assigned role of prison guard in Zimbardo’s case). The situational type of authority is the main interest of the current study for three reasons: first, researchers can contrive and manipulate situational authority with greater ease than dispositional, lending itself to experimentation; second, the effect of interest, barring any moderating variables, should affect most people the same way; third, as explained by Zimbardo (2007), it is the situational aspect of authority that can be the most stealthy and nefarious in a global sense (e.g. Abu Ghraib). Thus, the situational construct is easier to consistently study, applicable to everyday situations, and of real world importance for its implications.

Though ostensibly a tool for tyrannical abuse when viewed under the paradigms detailed above, cooperation has a good side as well. For example, it expedites many tasks and makes them more enjoyable (de Cremer & Tyler, 2007). Cooperation can be studied on many levels, ranging from social games to psycholinguistic tasks where grounding, or establishing gradual mutual understanding between two people occurs (Clark & Krych,

2004). As stated by Pothos *et al.* (2011), cooperation to the degree witnessed in the human species is an anomaly in nature; most other organisms do not engage in the costly (and sometimes endangering) cooperative behavior that humans display on a regular basis.

For the purposes of quantifying and examining cooperation in a dyadic setting, the Prisoner's Dilemma Game (PDG) offers a testable avenue of research. First developed within the discipline of economic game theory (Flood, 1958), the PDG is a simulated setting to examine a person's cooperative/prosocial behavior in a zero-sum game setting. Two people play in the game with a pre-determined number of rounds. Every round, each player has two choices: cooperate or defect. If both players cooperate, they split the earnings; if one defects and the other cooperates, the defecting party takes all; and if both defect, both gain nothing.

Several factors that influence strategy in the PDG have been researched in the literature on cooperation and competition. Ingram and Berger (1977) discuss how gender may affect how individuals engage in strategy in a zero-sum game. They discuss the surprising finding across some studies that female pairs tend to be more competitive and show higher rates of defecting. The authors theorize that male strategy tends to focus on maximizing gains, whereas female strategy tends to focus on defensive playing. Thus, as the game moves along, women seem more likely to become deadlocked in defecting, a phenomenon known as Nash Equilibrium (Khadjavi & Lange, 2013). Recently, however, Balliet *et al.* (2011) performed a meta-analysis of social game research over the past half-century, focusing on effect sizes in gender difference findings. Across 272 effect sizes from 203 articles using social dilemma games (most utilizing the PDG), the authors

found essentially no difference between men and women in cooperation, though small effects were found indicating that men tend to cooperate more in same-gender dyads and women more in mixed-gender dyads.

Certain individual difference components may also influence cooperative strategy within the PDG. For example, Pothos *et al.* (2011) analyzed personality components related to the Behavioral Approach System and Behavioral Inhibition system and altered payoff matrices of the PDG to incentivize either cooperation or defecting; they found a strong predicting factor in the Behavioral Approach System to be the Reward Responsiveness trait, defined as the extent to which one gleans pleasure from positive rewards (Taubitz *et al.*, 2015). Participants high on this trait were more likely to defect when it was incentivized and they were privy to the moves of a dummy opponent. Despite predictions of cooperation bias, the researchers found that defecting was just as easy to incentivize as cooperation with varying payoff matrices. This indicates participants were not as willing to cooperate at the outset of the game as thought previously.

Another interesting characteristic that can influence strategy in social games is Machiavellianism, or the extent to which one is willing to use others as a means to some desirable end (Bereczkei & Czibor, 2014). Using the Public Good Game (another social game wherein participants determine how much money to put into a public account when playing with others) and Mach-IV personality index, the researchers found that high Machiavellian participants donated less money to the group and ended the game with higher gains due in large part to lack of cooperative tendencies. Findings such as these demonstrate the manner in which key personality traits (e.g. Reward Responsiveness and

Machiavellianism) can influence the strategies individuals choose to use in experimental games.

The paradigm up until now, as discussed earlier, has been to focus how one cooperates *with* an authority figure, or obeys. This should be differentiated from equal cooperation, which is a prosocial contribution of energy/resources or helping behavior dedicated to bettering a group (de Cremer & Tyler, 2007). Interestingly enough, little work has been conducted examining cooperative behaviors on the part of the authoritative figure herself. The current study seeks to flip the role of interest around from the underling to the authority figure. This, of course, alters the operational definitions regarding the behavior of interest. Defined as a subject complying with an authority figure (Coleman, 2009), obedience is typically studied under the authority paradigm; however, by making the authority figure the subject of interest and by using the PDG, the current investigation instead seeks to study dyadic cooperation in which equal give and take must facilitate the task.

Just as Milgram (1963) cast participants into the role of a participant as a “Teacher” and the confederate as a “Learner,” the current study will cast the participant in the role of a “Director” alongside a confederate “Builder” and examine behaviors in an experimental setting where cooperative strategies are highly incentivized. However, based on the literature on authority, the prediction is that individuals with assigned authority will play the cooperative game (i.e. the PDG) more aggressively or defensively due to felt superiority and privilege compared to their partner. To test this, changes as a result of a cooperative or non-cooperative task in the amount of defecting in a pre-post PDG design will be assessed. It is hypothesized that participants in the cooperative

condition will display more cooperative behavior (as measured by “cooperate” choice in PDG) in Trial 2 of the PDG than Trial 1; conversely, those in the non-cooperative condition will display higher rates of defecting from pre to post. Additionally, it is hypothesized that perceived legitimacy of authority and frustration with one’s partner will mediate the amount of defecting.

Methods

Participants

Thirty-eight Montclair State University students (N=38) were recruited from introductory psychology courses via SONA systems for class credit. The sample was 73.70% female with a mean age of 21.24. Additionally, two confederates were utilized for the protocol, both of whom were college-aged females. Both were given the same standard lines and key scripted behaviors for the procedure.

Procedure

The participants were first given informed consent to read and sign. During this time the confederate sat in the same room filling out a dummy informed consent form. After informed consent, both the participant and the confederate were guided to a back room with a partitioned table and taping equipment set up to record the session for future analysis. Here both parties competed in 20 rounds of the PDG for the first trial. For the PDG, participants sat facing away from each other across the partitioned table and lifted cards that read either “Cooperate” or “Defect” behind the partition to indicate their decisions; the researcher stood in the room and recorded participants’ moves. The payoff matrix used in both Trial 1 and Trial 2 was as follows: if both parties cooperated (CC), then both received one point; if one defected and the other cooperated (DC/CD), then the

defector gained two points and the cooperator received nothing; if both defected (DD), then neither received any points for that round. Nickels were used to represent points as a convenient token; use of money or points as a reinforcer in the game does not impact how people play it on average (Podd, Marcia, & Rubin, 1970).

After these initial 20 rounds in Trial 1, participants completed three simplified models of the Lego Task (Clark & Krych, 2004). In this task, the participant and the confederate sat across from each other at the partitioned table; the participant was given completed Lego models and the confederate given a box of Lego blocks. The goal of the game was for the confederate with the Lego blocks to successfully build a replication of the models the participant possessed. The confederate was not allowed to see the models nor was the participant allowed to see what the confederate was constructing, thus forcing both to rely solely on verbal communication. In the cooperative, or control, condition this game was framed as a cooperative task in the instructions and the labels “one” and “two” were applied to the one giving directions and the one building the model, respectively. In the non-cooperative, or experimental condition, labels of “director” and “builder” were assigned to the participants and the instructions for the task emphasized the “authority” and epistemological privilege of the director in holding the Lego models and dictating instructions (for both sets of instructions, see Appendix A).

The live participant was always assigned the “one” or “director” role in a false randomized assignment. Both conditions completed three Lego models on a partitioned table before continuing to Trial 2 of the PDG consisting of 20 rounds as well. The confederate’s moves were randomly pre-programmed to display an overall cooperation rate of 60% for both blocks of 20 with never more than three “defects” or “cooperates” in

a row (Ingram & Berger, 1977). This programmed strategy was adopted to avoid eliciting defecting behavior merely by the plays of confederate and to avoid Nash Equilibrium as well, as this would create a statistical ceiling effect.

After the final 20 PDG rounds, points were counted and participants were given an end survey (completed in a separate room from the confederate) asking if they felt they were in a place of authority, especially legitimate authority, if they wanted to cooperate, if they had a clear strategy in mind among other task evaluation questions, all rated on a 5 point Likert scale (see Appendix B). After this, participants were given a manipulation check, debriefed and given class credit.

Use of Confederate

Across both conditions the participant in the “two” or “builder” position was, as stated above, a confederate. Though the possible risks to validity posed by using a confederate in a dialogue setting are acknowledged (see Kuhlen & Brennan, 2013), there are three main reasons a confederate was used for this design as opposed to a live partner. First, the subject of interest for the purposes of the current study is the behavior of the participant in the instructing, or “director,” role. Thus, standardizing the behavior of the other member of the dyad could reduce unnecessary statistical noise in the behavior of the subject of interest. Another reason to use the confederate is to avoid Nash Equilibrium, a phenomenon that, as mentioned earlier, occurs when both parties become locked in a defecting deadlock (Khadjavi & Lange, 2013). This would produce a ceiling effect for the dependent variable (in this case, number of defects), thus skewing the normalcy of the data. Finally, two live participants in a pair create issues for independence of observations, thus limiting the use of traditional statistical analyses.

Using a confederate, and thus eliminating analysis of one member of the pair, avoids this problem as the behavior of the confederate can be treated as a constant.

Results

Confirmatory Analyses

A Paired-Samples T Test was conducted on the percentage of defects in Trial 1 ($M = 56.71\%$) and in Trial 2 ($M = 62.76\%$), regardless of condition. There was a significant increase in mean percentage of defects from Trial 1 to Trial 2 of the PDG (mean difference = -6.05 , $t(37) = -3.59$, $p = 0.001$, $CI = -9.47 - -2.63$). The effect size was medium ($d = 0.59$) and 0.94 power was achieved. For a visual representation see Figure 1. A Repeated Measures ANOVA revealed no difference between the control and experimental conditions ($p = 0.28$). See Figure 2 for a visual representation. Thus, in this study, the assigned authority condition manipulation had no effect on defecting behavior.

Exploratory Analyses

A series of analyses were completed in order to investigate any predictive power the End of Study Survey displayed for how people played the PDG. For an outcome variable, the difference between the final point score in the PDG (as measured in Nickels during the experiment) of the confederate and participant was computed. This score difference served as a proxy measurement of cooperation in the PDG across both trials – the higher the score difference between the confederate and participant, the more the participant defected. A Pearson Correlation confirmed this logic, with the total percentage of defects across both PDG trials being perfectly correlated with the PDG score difference ($r = 1.00$, $p < 0.001$). Given the poor Cronbach's Alpha the End of Study Survey displayed ($\alpha = -0.38$), the items were treated separately in the following analyses.

A Pearson Correlation was run on all eight items of the survey plus the computed PDG score difference. Of all eight items, only Item 5 ($r = 0.51, p = 0.001$), Item 7 ($r = -0.33$), and Item 8 ($r = -0.57, p < 0.001$) were significantly correlated with PDG score difference. See Table 1 for correlation matrix.

An Independent-Samples T Test showed no significant differences between men and women on any of the dependent variables. A Stepwise Multiple Regression was then run using all eight items of the end survey as predictor variables and the PDG score difference as an outcome variable to determine if any of the participants' attitudes about the tasks or the confederate predicted cooperation levels. Two models, the first consisting of one item and next adding one more item, were derived from the Stepwise Multiple Regression. The first model found Item 8 on the survey, which stated "I wanted to cooperate with my in the Prisoner's Dilemma Game," as a significant predictor ($R^2 = 0.32, R^2 \text{ change} = 0.32, F(1, 36) \text{ change} = 17.10, p < 0.001$) of the score difference. The second model added Item 5, which states "I had a clear strategy in mind when playing the Prisoner's Dilemma Game" ($R^2 = 0.47, R^2 \text{ change} = 0.15, F(1, 35) \text{ change} = 9.71, p = 0.004$). In the second model, the regression equation for Item 8 was $y = -3.91x + 14.70$, indicating that those who disagreed with the item were more likely to defect; the regression equation for Item 5 was $y = 3.54x + 14.70$, indicating that those who agreed with the item were more likely to defect. See Figures 3-5 for a depiction of the linear model.

Both of the primary analyses were run again with the removal of outliers (either "extreme cooperators" or "extreme defectors") from Trial 2, leaving a sample of 33. The criterion used was to remove those cases that, after viewing the histogram, were

disconnected from the rest of the distribution at either tail. The overall increase in defecting from Trial 1 ($M = 56.06\%$) to Trial 2 ($M = 61.52\%$) remained intact (mean difference = -5.45 , $t(32) = -3.95$, $p < 0.001$, $CI = -8.27 - -2.64$). Given these new values with outliers removed, both effect size ($d = 0.69$) and achieved power ($1 - \beta = 0.97$) increased. The Repeated Measures ANOVA measuring the effect of the condition across both trials remained non-significant ($p = 0.30$).

As an additional precaution, an Independent-Samples T Test was run using the two confederates as an independent variable and percentage of Trial 1 defects, percentage of Trial 2 defects, and score difference as dependent variables. At first, a significant difference was found between the two confederates on percentage of Trial 2 defects ($t(36) = -3.20$, $p < 0.01$) and score difference ($t(36) = -2.19$, $p < 0.05$). However, when the same outliers as described above were removed, the effect disappeared for both percentage of Trial 2 defects ($p = 0.07$) and score difference ($p = 0.52$). Thus, we can conclude that, most likely, the initial effect was due to random chance that one of the confederates happened to be paired with the extreme defectors rather than due to any systematic difference between the two confederates.

Discussion

The purpose of the present research was to show the effect of experimentally induced situational authority on a dyadic game in which one could either cooperate or compete with the given partner. Ultimately, the study was conducted to further elucidate the social-cognitive ramifications of situational authority and to generalize it to real-life power structure scenarios (e.g. the police force, political structures, etc.). The findings did not show any impact on the number of defects in the second trial from assigning

authority. Simply put, it seems participants behaved uniformly in the PDG on average whether or not they were given a place of authority in the Lego task. The lack of effect even held with the removal of outliers, removing the possibility that the tests were contaminated by skewed data. It is interesting that the overall increase in defecting from Trial 1 to Trial 2 held consistent, however. There are several possible explanations for this finding.

It could be that dispositional factors overrode the situational manipulation; in other words, personality factors were more salient in PDG and the Lego task manipulation was simply too weak to produce a detectable effect (at least with the given sample size). In line with the meta-analytic finding of Balliet *et al.* (2011), we can rule out gender as an impactful variable as all gender t tests were not significant and both confederates used were female, preserving some level of consistency in the gender dyad composition. However, as discussed earlier, personality dimensions such as Reward Responsiveness (Pothos *et al.*, 2011) and Machiavellianism (Bereczkei & Czibor, 2014) might have impacted strategies participants used in the PDG. Though these personality constructs were not directly measured, we can postulate how they might have impacted strategy of participants' based on the end of study survey.

Namely, it is interesting that, despite predictions, no survey items asking about role saliency (i.e. felt legitimacy of authority) or view of the confederate predicted PDG outcomes; rather, in a much more straightforward result, only the items asking about strategy and cooperation predicted the outcome. It is not surprising, though, that of these items, it was Item 8 inquiring about cooperation desires that displayed the greatest predictive power. Simply put, it seems that those participants who did not want to

cooperate with their partner indeed did not and vice versa. Adding Item 5, which inquired whether the participant had a strategy or not, increased the predictive strength of the model but was not as predictive of score difference on its own compared to Item 8. Again, this makes sense, as the item did not inquire what the content of the strategy was; thus, the strategy may not have necessarily been to defect more uniformly across all participants, though the results of the regression seem to indicate that high-defecting was indeed a popular strategy. Interestingly enough, though negative as would be predicted ($r = -0.25$), the Pearson Correlation between Item 5 and Item 8 was not significant, thus limiting the amount of conclusions we can draw about participants' attitudes toward cooperation and strategies utilized.

Back to the broader scope of the study, why is it that some participants did not want to cooperate with their partner and why did some claim to be using a clear strategy while others did not? As mentioned before, dispositional characteristics such as Reward Responsiveness and Machiavellianism might account for these individual differences. Pothos *et al.* (2011) discuss how, as they supported in their results, Reward Responsiveness as a disposition would motivate individuals to seek larger payoffs from a game such as the PDG. It could be that, due to the structure of the payoff matrix, certain participants came to rely on the defect option more as there were no negative consequences *per se* for defecting – worst case scenario, from the participant's point of view, she would simply not win anything for that round. From this perspective, the defect option is simply an easy default strategy that, in the case of this study, presents a random interval reinforcement of two points as opposed to one point each time the partner (confederate) cooperates. Thus, if there were people in the sample higher on Reward

Responsiveness this could explain some of the increase in defecting from Trial 1 to Trial 2 as these participants would become more aware of the reward structure of the game.

Machiavellianism could have influenced game strategy in a very similar manner. If there were participants who were more Machiavellian by nature, they would have been more likely to implement a clear strategy and cooperate only conditionally. In their study on the topic, Bereczkei and Czibor (2014) did indeed uncover a negative relationship between Machiavellianism and a personality measure of cooperativeness, which helps elucidate some of the strategic mechanisms at work for such individuals. It could be that any individuals with Machiavellian tendencies in the sample became aware, explicitly or implicitly, that their partner was (almost naively) cooperating more often than not and “seized the opportunity” as it were.

On the other hand, the greater influencing factor could have been the setting and structure of the game across the board on individuals. The programmed order of the confederate’s moves may have had large impact on the way participants played the game. Namely, though the confederate cooperated 60% of the time for both trials following Ingram and Berger’s (1977) program schema, more of the defecting moves were in the beginning of the trial for Trial 2 as opposed to Trial 1 merely due to the results of the move randomization. In fact, the confederate’s first three moves at the beginning of Trial 2 were defects. These moves may have appeared aggressive or very competitive to participants, especially after having just finished a joint communication game like the Lego task (Clark & Krych, 2004). This may have motivated many participants to adopt a more defensive strategy in Trial 2. This is supported by the fact that averaged across all 40 rounds participants defected at a 59.74% rate, thus inverting the confederate’s

programmed move ratio (60% cooperative/40% defecting). The participants may have, when encountering any defecting from the confederate, defensively overestimated the competitive nature of the confederate, especially in Trial 2 where participant defecting increased.

This aforementioned setting and structure could have activated certain unanticipated heuristics from participants playing the game. Jones and Zhang (2004) discuss how in multiple iteration games (such as the PDG) players must restrict their domain of information in order to make rational calculations of what they term sub-game perfect equilibria. This may mean the player is basing her decision off the most recent moves of the opponent. Using a computational modeling method the researchers demonstrate that this can be a functional strategy assuming the opponent is subject to the same limitations. In the case of the present study, it could be that participants were trying to optimize their decision-making processes by basing their calculations and predictions off the most recent moves of the opponent. In their study, Yamagishi *et al.* (2007) further catalogue heuristic strategies participants will activate during the PDG such as the matching heuristic, where participants will simply try to play tit-for-tat in order to reach an equilibrium of reciprocity. The above heuristics could explain the increase of defects from Trial 1 to 2 given the random change in move set distribution of the confederate.

Perhaps some artifact within the PDG not particular to this study can account for some of these findings. Pruitt and Kimmel (1977) discuss how researchers have historically had a difficult time generalizing results from the PDG, partly due to external validity issues with the PDG (e.g. partners not being able to communicate during the rounds) and partly due to limitations or unwillingness on the part of the researchers

themselves to theorize beyond the lab setting. The PDG may unfortunately, though, have inherent issues with external validity and ecological validity. That is to say, how often do people find themselves engaging in perfectly constructed zero-sum games with readily known payoff matrices out in the real world? Pruitt and Kimmel counter this point, however, by claiming that this artificial nature of the PDG thrusts participants into an “unfamiliar strategic environment,” giving us a window into *de novo* rational processing stripped of everyday heuristics of the game players. Only further, theory-directed confirmatory research will reveal whether the constructed nature of the PDG (and other social games as well) are to its benefit or its detriment.

Limitations

There are limitations to this study that reduce the conclusions we can make from the results. First and foremost, the sample size of 38 was quite small due to time limitations. The small sample could explain why no effect was found from the authority manipulation. This could also be an explanation for the medium effect size found for defect moves increasing from Trial 1 to Trial 2 if statistical noise was introduced into the analysis. The achieved power was good (0.94), but this is an *ad hoc* computed power so it can only be taken as an estimation.

Additionally, since both confederates were female, we gained no data on male vs. male dyads in the PDG, thus limiting the conclusions we can draw about gender effects. It must also be mentioned that both confederates, after going through several sessions of the experiment, began to memorize the Lego models. Both confederates were instructed to play the game as if they had never been exposed to it or the models before; however, it was unavoidable that they would become more skilled at the task over time, thus

making the task easier for the participant. This may have reduced the effectiveness of the authority manipulation by simply making the Lego task too easy.

Future Directions

This topic warrants further research, though certain changes should be made in the design. First of all, future researchers using an experimental design similar to the present study should re-conceptualize the authority manipulation to make it more salient to participants. Possibly a different type of task, such a mock-learning game with assigned roles could elicit a stronger behavioral response from participants. Investigating the possible effect using other social games, such as the Public Good Game, could also be fruitful to the research as this game might remove some the defensive and competitive baggage that accompanies the PDG. Finally, relevant personality measures should be utilized, such as the Mach-IV, as certain personality measures may play a strong role in mediating how susceptible individuals are to the trappings of authority.

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Appendix A

Cooperative Condition

The two of you will now engage in a cooperative building task for three rounds. You have both been randomly assigned to your positions for this game beforehand using random number generator and your SONA numbers. [*Point to participant*] you are “1” and you [*point to confederate*] are “2.” The two of you will have to cooperate to complete this task [*bring models to participant and box of Legos to confederate*]. Participant “1” will guide participant “2” in assembling the three models. Participant “1” may not show participant “2” the model, nor may participant “1” see the workspace of participant “2.” You need to work together to ensure that you have the same understanding. You may ask each other questions and interrupt as you would in any conversation. Once you believe you have a model finished say ‘finished’ and I will enter the room to check to see that both models are indeed identical. The model must be identical in color, shape, and orientation. There are three models total to complete. Are there any questions?

Non-cooperative Condition

The two of you will now engage in a building task for three rounds. You have both been randomly assigned to your positions for this game beforehand using random number generator and your SONA numbers. [*Point to participant*] you are the ‘Director’ and you [*point to confederate*] are the ‘Builder.’ The builder will have to listen to the director to complete this task [*bring models to participant and box of Legos to confederate*]. The director will dictate to the builder how to assemble the three models. The director may not show the builder the model, nor may the director see the workspace of the builder. The builder may ask questions for clarification, but the main role is simply to listen to the directions of the director. Once you believe you have a model finished say “finished” and I will check to see that both models are indeed identical. The model must be identical in color, shape, and orientation. There are three models total to complete. Are there any questions?

Appendix B

End of Study Survey

Respond to each question by **circling the number** that corresponds best with your response. Please **do not** indicate fractions/decimals for your answer by circling on the line.

1. I was well suited for my role for the Lego task.

1 ————— 2 ————— 3 ————— 4 ————— 5
Strongly disagree Disagree Neutral Agree Strongly agree

2. I communicated well with my partner during the Lego task.

1 ————— 2 ————— 3 ————— 4 ————— 5
Strongly disagree Disagree Neutral Agree Strongly agree

3. I feel I performed better than my partner in the Lego task.

1 ————— 2 ————— 3 ————— 4 ————— 5
Strongly disagree Disagree Neutral Agree Strongly agree

4. My partner frustrated me when trying to complete the Lego task.

1 ————— 2 ————— 3 ————— 4 ————— 5
Strongly disagree Disagree Neutral Agree Strongly agree

5. I had a clear strategy in mind when playing the Prisoner's Dilemma Game.

1 ————— 2 ————— 3 ————— 4 ————— 5
Strongly disagree Disagree Neutral Agree Strongly agree

6. My partner was not courteous in the way he/she played the game.

1 ————— 2 ————— 3 ————— 4 ————— 5
Strongly disagree Disagree Neutral Agree Strongly agree

7. The Prisoner's Dilemma Game confused me a little bit.

1 ————— 2 ————— 3 ————— 4 ————— 5
Strongly disagree Disagree Neutral Agree Strongly agree

8. I wanted to cooperate with my partner in the Prisoner's Dilemma Game.

1 ————— 2 ————— 3 ————— 4 ————— 5
Strongly disagree Disagree Neutral Agree Strongly agree

Figures

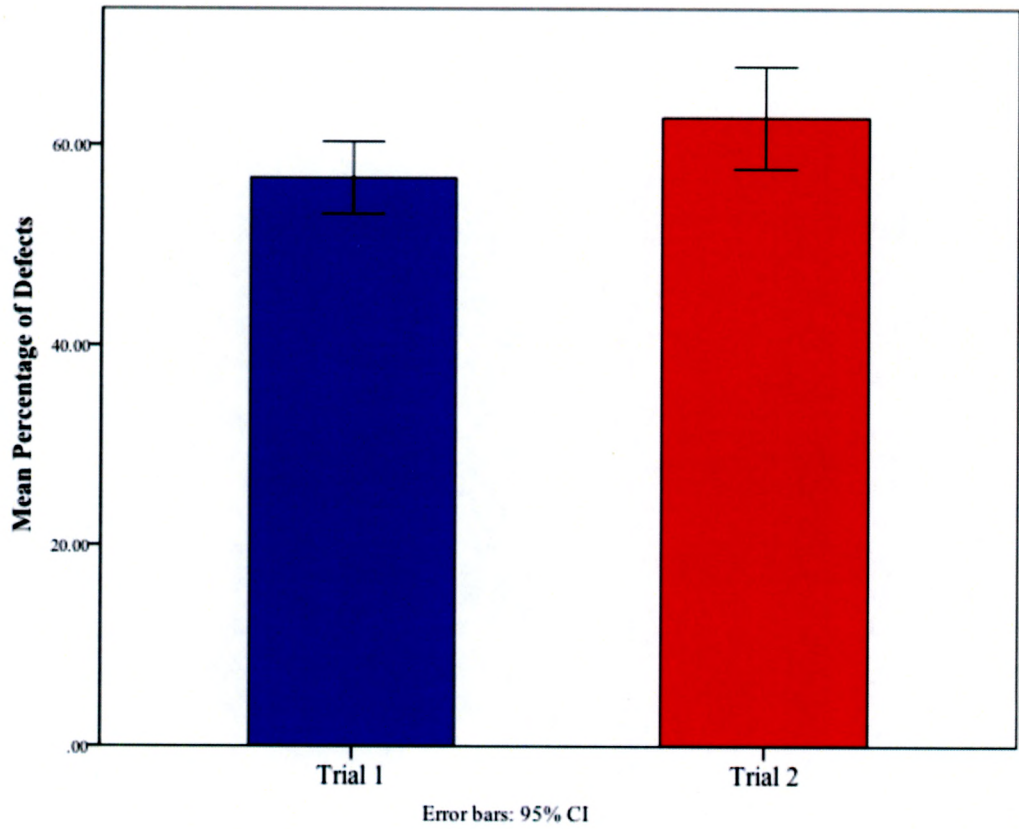


Figure 1. Comparison of mean percentage of defects for Trial 1 and Trial 2 of PDG.

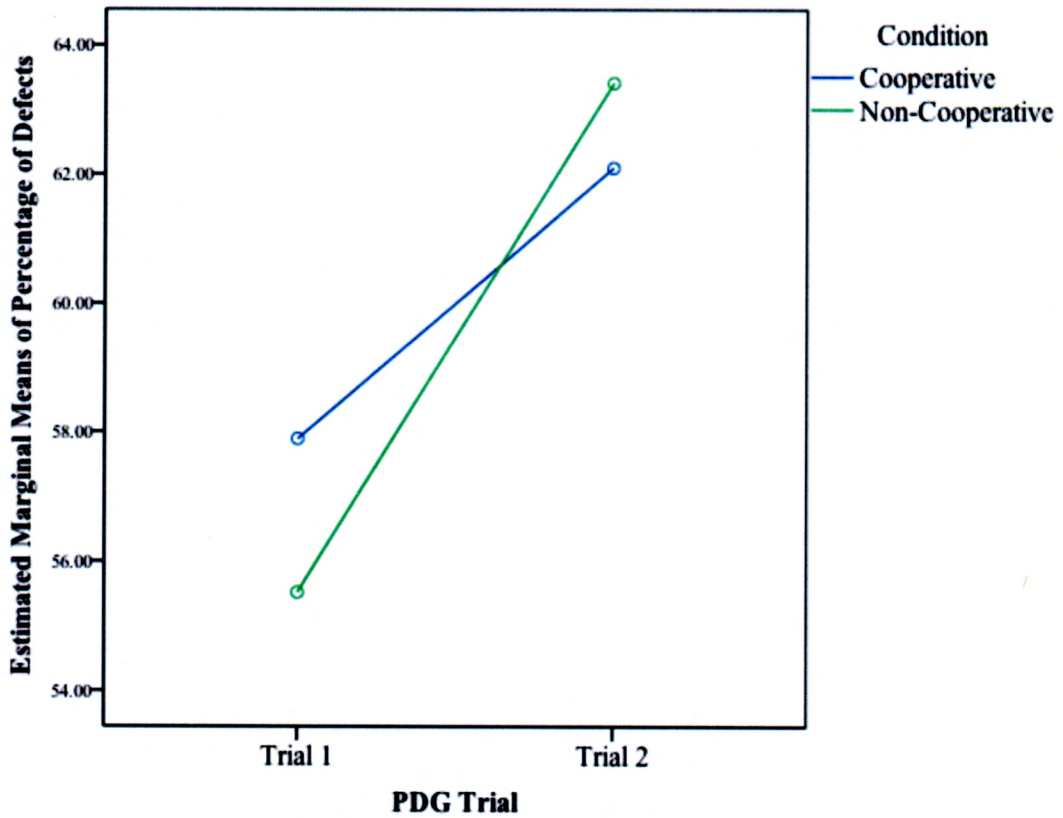


Figure 2. Plot of interaction between Cooperative and Non-Cooperative conditions across both trials of the PDG on mean percentage of defects (non-significant interaction).

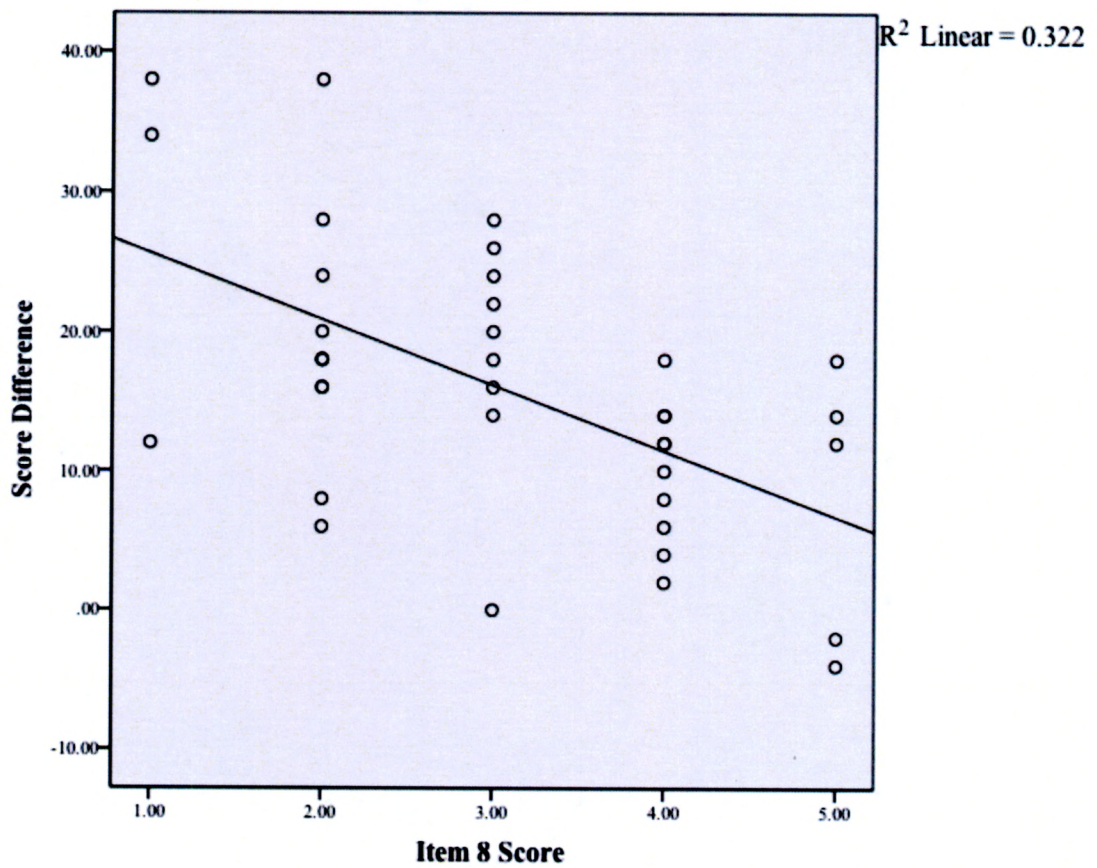


Figure 3. scatterplot with line of best fit between PDG score difference and responses on Item 8 (“I wanted to cooperate with my partner in the Prisoner’s Dilemma Game”) from End of Study Survey.

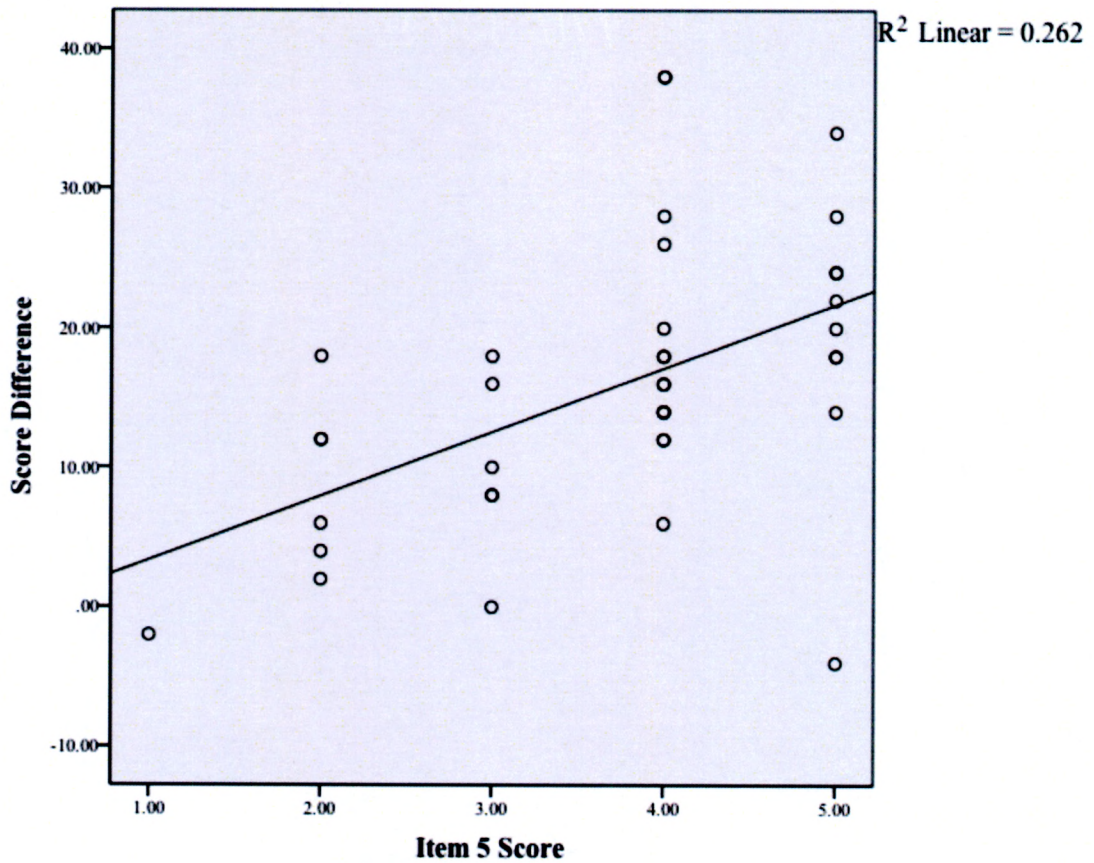


Figure 4. Scatterplot with line of best fit between PDG score difference and responses on Item 5 (“I had a clear strategy in mind when playing the Prisoner’s Dilemma Game”) from End of Study Survey.

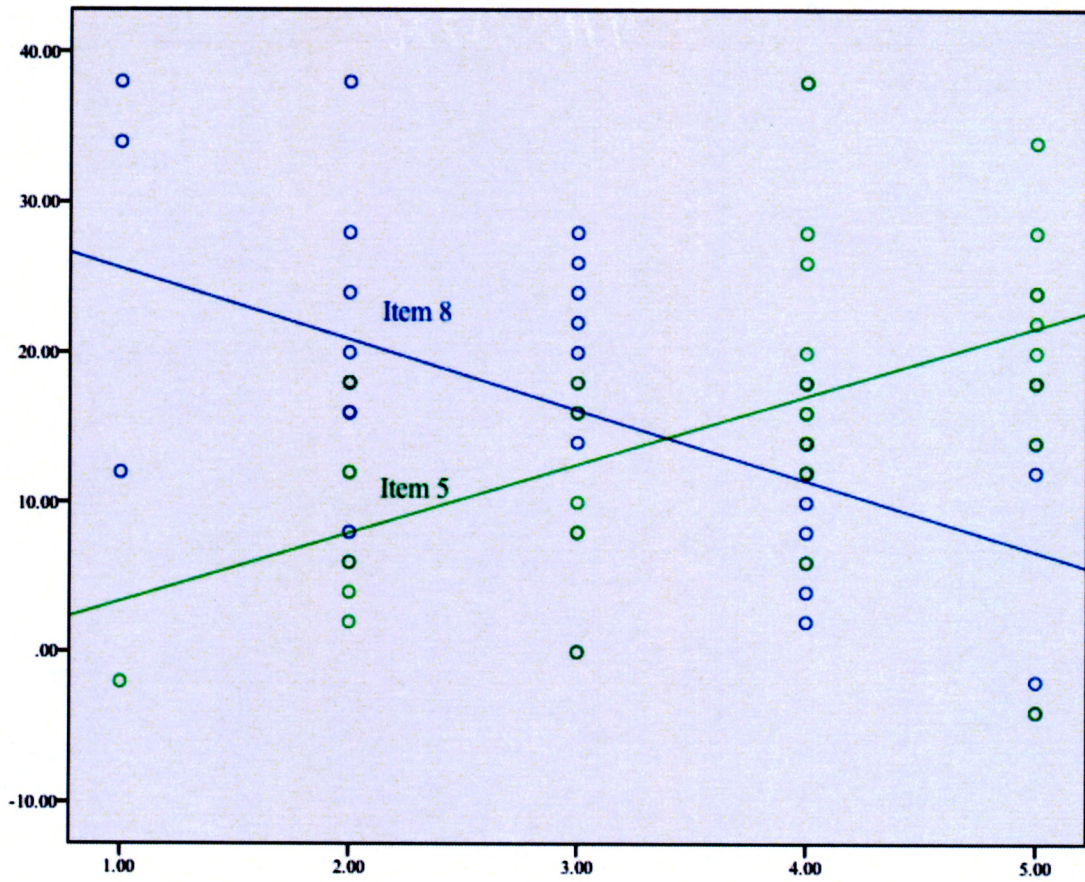


Figure 5. Combined graphs depicting linear relationship between both Item 8 & Item 5 and the PDG score difference.

Linked

End of Study Survey Item Correlations

		Item 1	Item 2	Item 3	Item 4	Item 5	Item 6	Item 7	Item 8	Score Difference
Item 1	Pearson Correlation	1	.705**	-.373*	-.56**	.040	.067	.096	.132	.024
	Sig. (2-tailed)		.000	.021	.000	.813	.691	.567	.428	.888
	N	38	38	38	38	38	38	38	38	38
Item 2	Pearson Correlation	.705**	1	-.243	-.65**	.146	-.040	.021	.154	.123
	Sig. (2-tailed)	.000		.142	.000	.382	.813	.900	.356	.460
	N	38	38	38	38	38	38	38	38	38
Item 3	Pearson Correlation	-.373*	-.243	1	.112	.034	-.132	-.289	-.46**	.177
	Sig. (2-tailed)	.021	.142		.503	.839	.428	.079	.004	.287
	N	38	38	38	38	38	38	38	38	38
Item 4	Pearson Correlation	-.56**	-.65**	.112	1	-.052	.173	.170	-.176	-.027
	Sig. (2-tailed)	.000	.000	.503		.757	.299	.308	.290	.872
	N	38	38	38	38	38	38	38	38	38
Item 5	Pearson Correlation	.040	.146	.034	-.052	1	-.189	-.249	-.247	.512**
	Sig. (2-tailed)	.813	.382	.839	.757		.257	.131	.135	.001
	N	38	38	38	38	38	38	38	38	38
Item 6	Pearson Correlation	.067	-.040	-.132	.173	-.189	1	.113	-.091	-.233
	Sig. (2-tailed)	.691	.813	.428	.299	.257		.499	.586	.159
	N	38	38	38	38	38	38	38	38	38
Item 7	Pearson Correlation	.096	.021	-.289	.170	-.249	.113	1	.320	-.334*
	Sig. (2-tailed)	.567	.900	.079	.308	.131	.499		.050	.041
	N	38	38	38	38	38	38	38	38	38
Item 8	Pearson Correlation	.132	.154	-.46**	-.176	-.247	-.091	.320	1	-.567**
	Sig. (2-tailed)	.428	.356	.004	.290	.135	.586	.050		.000
	N	38	38	38	38	38	38	38	38	38
Score Difference	Pearson Correlation	.024	.123	.177	-.027	.512**	-.233	-.334*	-.57**	1
	Sig. (2-tailed)	.888	.460	.287	.872	.001	.159	.041	.000	
	N	38	38	38	38	38	38	38	38	38

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

Table 1: Correlation matrix for End of Study Survey items and the PDG score difference