Empathy-Altruism Hypothesis in Undergraduate Students: The Effects of Empathy and Relationship Type on Willingness to Help and Situational Interdependence

Shawna Larsen

Department of Psychological and Brain Sciences, University of California Santa Barbara

PSY 120L: Laboratory in Advanced Research Methods

Dr. Vanessa Woods

June 13, 2023

Abstract

For many years, altruistic behavior was thought to be self-serving. However, recent literature investigating the motivation behind altruistic and prosocial behavior in non-kin suggests empathy may be a non-egoistic motivator for helping behavior. Friendship has also been shown to predict helping and cooperation. In the current study, we seek to investigate the empathy-altruism hypothesis as opposed to social exchange theory, as well as the role that friendship plays in this relationship. The empathy-altruism hypothesis predicts that empathic concern (other-oriented emotions elicited by, and congruent with the perceived welfare of, someone in need) predicts altruistic behavior. The question we seek to answer is: How does empathy induction affect prosocial and altruistic behavior, and how does relationship type moderate this effect? The current study asked 105 participants to read a vignette about a student who had broken their legs in a car accident, and then measured participants' willingness to help and situational interdependence. We manipulated state-empathy and whether the vignette was about their friend or a stranger. Participants who were asked to imagine their friend in the vignette were more willing to help compared to those who read about a stranger. Our manipulation check revealed that our state-empathy manipulation was unsuccessful, and our empathy manipulation produced no significant differences in either dependent variable . However, self reported level of empathy towards the character in the vignette was significantly correlated with greater willingness to help and situational interdependence. These results support a significant relationship between friendship and willingness to help and call for further research into the effects of empathy on altruism and cooperation.

Empathy-Altruism Hypothesis in Undergraduate Students: The Effects of Empathy and Relationship Type on Willingness to Help and Situational Interdependence

Humans are a social species. They help others around them every day, often at a cost to themselves. Picking up a friend from the airport, buying dinner for a partner, helping a stranger in need, donating to charity: all behaviors performed regularly by people, but why? Understanding these mechanisms gives us valuable insight into the everyday social interactions between people, helping us predict when people are likely to help others. Psychologists have theorized several reasons why humans display altruistic behaviors.

Evolutionary psychologists explain helping behaviors among family members with Kin Selection Theory (W.D Hamilton, 1964). Under this theory, people have an evolutionary need to help their genes survive, thus providing help to family members even at cost to themselves. Note that we define altruism as benefiting another at a cost to one's self. However, this theory does not address why we act altruistically towards unrelated individuals.

An evolutionary perspective of altruism in non-kin is known as reciprocal altruism. This idea is somewhat interchangeable with social exchange theory, a longstanding theory of prosocial behavior in which people tend to choose whether to help others based on a cost-benefit analysis (Homans, 1958). For an example we have the Banker's Paradox (Tooby & Cosmides, 1996): A banker operating under a cost-benefit analysis method of helping is least likely to help the person who needs it most, because they are a 'bad investment.' If the costs of a given action or maintenance of a relationship are higher than the benefits, the person will not engage in said behavior. The theory has been supported experimentally (Cosmides, 1989). Under reciprocal

altruism, people only help others altruistically when they either have received or expect to receive a benefit in return. In a 1984 study, game theorists investigated the best strategy for the Prisoner's Dilemma game, in which two players can each decide whether to defect or cooperate without knowing the others' choice. If both players cooperate, they each receive 3 dollars. If they both defect, they each receive 1 dollar. If one defects and the other cooperates, the defector receives 5 dollars while the cooperator gets nothing. The trick of the Prisoner's Dilemma is that it is in each player's best interest to defect, but if they both defect they end up with less than they would have if they had both cooperated. The theorists found that a strategy of reciprocity, or 'tit for tat', was the best theory for this game (Axelrod, 1984). In this strategy, the player simply copies whatever choice their opponent made in the round before. This finding supports evolutionary theories suggesting that cooperation is an evolved mechanism for increased resources. The theory does not seem to adequately explain, however, why we act altruistically towards non-kin when they provide no benefit to us. Do we always require something in return to display prosocial behavior?

One place we do not see these rules of reciprocity occur is in communal relationships. Researchers Clark and Mills created the idea of communal and exchange relationships as a way to differentiate social norms between relationship types (Clark & Mills, 1979). As opposed to exchange relationships, in which each person expects compensation for any help given, communal relationships are more relaxed with giving and receiving. They do not expect immediate repayment from another, and in fact show negative feelings when the other tries to reciprocate (Batson, 1993). In a study of undergraduates, researchers found that receiving a benefit after benefiting the other increased attraction when an exchange relationship was expected, but decreased attraction when a communal relationship was expected (Clark & Mills,

1979). Communal tendencies are indicative of closer relationships, including friendships. In this way, friendship provides a solution to the Banker's Paradox: close friends tend to help each other, even when doing so would be considered a 'bad investment'. Still, there remains a distant expectation that this helping attitude is reciprocated in these relationships, and we are left without an explanation for altruism in non-kin, non-communal relationships.

This brings us to the empathy-altruism hypothesis, which states that empathy can facilitate altruistic behavior even at a negative cost-benefit evaluation (Batson et al., 1981). Empathy, or more specifically empathic concern, is an emotional response of compassion and concern caused by witnessing someone else in need. This theory, first introduced in 1981, is relatively new compared to those we have previously discussed. Experimentally, inducing empathy has been shown to increase both willingness to help and cooperation. A 2012 study found that participants who focused on the emotions of another person in distress were more willing to help compared to those who remained emotionally detached (Pavey, et al., 2012). Similarly, an all-female study using the Prisoner's Dilemma found that induced empathy increased cooperation (Batson & Moran, 1999). These results were replicated even when the participant was told that their opponent had defected (Batson & Ahmad, 2001).

In the current study, we aim to learn more about altruistic behaviors and how they are affected by empathy. We also wonder how these factors are different in friends compared to strangers.We are interested specifically in willingness to help and situational interdependence, which measures how a person thinks about their interdependence with others in a situation. In the situational interdependence scale, a higher score indicates more interdependence with the other in a given situation. The current study uses situational interdependence as an indirect measure of prosocial behavior and cooperation. A recent study found that situational interdependence

predicted prosocial behavior in a Prisoner's Dilemma game (Columbus et al., 2020). Our theoretical bases predict that despite the negative cost-benefit evaluation of helping another without reward, the addition of empathy and a close relationship will cause the participant to display altruism. Understanding the factors affecting altruistic behavior will help us better understand the social nature of humans and the function of social feelings.

We have discussed that previous literature has theorized that people generally operate under the rigid mechanisms of social exchange (Homans, 1958). This base model of social behavior theory, in which a person simply does what benefits him or her the most at the smallest cost, is our expectation of how people shall act when they have no empathic concern and are dealing with a stranger rather than a friend. Our main theoretical basis for predicting a different outcome with empathy present is the empathy-altruism hypothesis (Batson, 2017). As discussed previously, friendship provides a solution to the banker's paradox because we tend to help our friends without repayment expectations. Clark and Mills' theory of exchange versus communal relationships (Clark & Mills, 1979) states roughly the same idea; Close friends have communal relationships in which they help one another without expecting immediate repayment. Friendship has experimentally predicted increased cooperation in a Prisoner's Dilemma (Majolo et al., 2006) Additionally, it has been shown that people are more willing to help friends selflessly (Tooby & Cosmides, 1996). Because of these theories, we argue that when a friend, compared to a stranger, is in need, people will be more willing to help. We also predict that people will be more willing to help when they feel empathy for the other. We are specifically interested in the interaction between these ideas. There is a gap in the literature testing the empathy-altruism hypothesis on close relationships. The current study aims to fill this gap. In communal relationships, people share resources without expecting anything in return. Since close

friendships tend to be more communal than exchange relationships, we predict that people already tend to act altruistically to their friends, and that people will be willing to help friends regardless of empathy. Thus, the presence of empathy should have a stronger effect for strangers than for friends. To investigate these ideas, the current study involves a manipulation of state-empathy, consisting of induced and not induced, and a manipulation of relationship type, consisting of friend or stranger. Two dependent variables, willingness to help and situational interdependence are measured.

Hypotheses

Hypothesis 1: Main Effect of empathy: People will report more situational interdependence and willingness to help towards the other when empathy is induced as compared to when empathy is not induced.

Hypothesis 2: Main Effect of relationship type: Individuals will report more situational interdependence and willingness to help towards their friend as compared to a stranger.

Hypothesis 3: Interaction Effect: When empathy is induced, people will exhibit more SIS and helpfulness compared to when empathy is not induced. This effect will be the strongest towards a stranger in comparison to a friend.

Methods

Design

The current research study used a 2 (empathy: induced vs not induced) x 2 (relationship type: friend vs stranger) between-subjects experimental design to examine the effects of empathy

and relationship type on the dependent variables, willingness to help and situational interdependence. The first independent variable, empathy, was the instruction on how to read the vignette. To manipulate empathy, participants were randomly assigned to receive instructions to either imagine how they would feel in the upcoming situation or to objectively read about the upcoming situation. The second independent variable was relationship type, or who the participants imagined the vignette was about. This was operationalized by having participants either think of a close friend and imagine the vignette was referring to this friend, or they were told that the vignette was about a UCSB student named Carol. We examined how relationship type affects the relationship between empathy and the dependent variables. The first dependent variable we measured was willingness to help, and this was measured with a 1-10 scale asking participants how willing they were to help the person in the vignette. The second dependent variable we measured was situational interdependence, which was measured using the Situational Interdependence scale (Gerpott et al., 2018).

Participants

The study had a total of N = 105 people, in which 69.5% were female, 28.6% were male, 1.9% were other. The ages of participants ranged from 19 to 81 (omitting an entry of 220), with a mean age of 26.25, SD = 22.75. The participants were recruited from the undergraduate PSY 120L Advanced Research Methods course at UC Santa Barbara as well as through personal contacts of the researchers. The students recruited from PSY 120L received class credit for participating. This study is covered under an educational IRB and Dr. Woods, the instructor of the course, approved of all studies.

Measures

Situational Interdependence Scale

To measure situational interdependence, we used the Situational Interdependence Scale (Gerpott et al., 2018). It is 30 items and is scored with a likert scale (Sample Question: "The outcome of this situation does not affect my future interactions with the other"). It has subscales of mutual dependence, power, conflict, future independence, and information uncertainty. The scale measures how people think about their interdependence with another in a situation (1= completely disagree, 5=completely agree)The last six questions measure the power subscale and the response scale is different (1= definitely the other, 5 = definitely myself). It has been validated in prior research and shows reliability ($\chi 2/df = 3.08$, $\alpha > .80$).

Our empathy IV is being manipulated by having participants either imagine how the other feels, or objectively listen while reading an interview of a student who had gotten injured in a car crash and needs notes. Our relationship type IV is being manipulated by participants imagining that the interview is with a stranger or one of their close friends. Willingness to help was scored with a single question scale.

Vignette

Participants were asked to read a vignette: "In the following section, you will be asked to read a brief news excerpt from the Daily Nexus. Please click the blue arrow to continue." Empathy manipulation instructions followed (see procedure). Participants in the stranger condition were shown the following vignette:

> *I (Interviewer): On average, there are 6 million passenger car accidents per year in the United States. These statistics continue to grow each year. But the tragic impact of automobile accidents is often lost in the cold facts of statistics — two were killed, four*

injured, one is in critical condition. The reality of the tragedy implicit in such statements was brought home recently for Carol Marcy. A University of California, Santa Barbara junior from Ventura, CA, Carol was riding in the car with her parents as they were returning home, to visit friends. Recently, I talked with Carol about what happened next.

C (Carol): Well, you know, it was really awful. I was riding in the front seat, and Mom was in the back. I can still see that car coming toward us. It all seemed to happen so slowly. The car crossed over into our lane, and Dad tried to turn to avoid it. I remember the look on the other driver's face—like he couldn't believe what was happening either. Anyhow, he hit us on my side. It drove the engine right back into the front seat and smashed both my legs. My legs are in casts and I'm still in a wheelchair. But the doctors say I should be fine in another few months. I guess I got really lucky. The breaks could have been a lot worse—and if I hadn't been wearing my seatbelt, they say it would have been all over. Fortunately, both Mom and Dad escaped with just cuts and bruises.

I: I'm glad to see you're getting better. Still, I imagine all the time in the hospital, and all this time in the wheelchair, is really interfering with your studies.

C: Oh, yeah. I can't believe how far behind I am. I'm not sure I can ever catch up! Well, actually I've been able to keep up in most of the classes that I need, except for Psych 10A — you know, Research Methods in Psychology.

I: What's the problem?

C: Well, because of the accident I missed over a month of classes. And they told me that unless I found another student from Psych 10A to go over the class materials and notes with me, I'll have to drop the class. And so far, I haven't been able to find anybody.

I: You don't know anyone in the class? Or couldn't you take it again another semester?

C: Well — really — I don't know anyone else in the class. And I don't want to drop because Research Methods is one of the courses I'm supposed to take in my junior year if I'm going to get into the Psychological Brain Sciences program. That's what I want to do. But the courses you have to take for PBS are really structured. If I have to drop this class now, it'll set me back a whole year. And I really can't afford an extra year. The money I get from my work and my savings just isn't enough.

I: Carol, I hope something works out.

C: I hope so too. I really want to stay in the Psychological Brain Sciences program because, well, it's always been my dream to be a child psychologist. I really love kids, and I've always been able to—at least, I feel like I've always been able to—communicate with them really well. That's what I'd really like to do.

I: Thanks, Carol. This is just a look into the problems an accident can cause even after the pain is gone, as people try to put their lives back together. This is Gerard Stinston for the Daily Nexus.

Relationship Type Manipulation

Participants in the stranger condition were shown a vignette about a UCSB student named Carol (see above).

Those in the friend condition were told "In the following scenario, your close friend is being interviewed. Please answer the following questions accordingly." They were shown an identical vignette to the stranger condition with "Carol" being replaced by "your friend."

Willingness to help

To measure willingness to help, participants were asked "How willing are you to help this individual by helping them find someone to get notes from for PSY 10A?" The participants had options to choose from 0-10. They were then asked "If you are willing to help, how would you help this person?"

Empathy Manipulation

Participants who were assigned to the empathy condition were given the following instructions preceding the vignette:

> *While you are reading the excerpt, try to imagine how the person in the news feels. Try to take the perspective of the person who is being interviewed, imagining how they feel about what has happened and how it has affected their life. Try not to concern yourself with attending to all the information presented. Just concentrate on trying to imagine how the person interviewed in the broadcast feels.*

Participants assigned to the non-induced empathy condition were given the following instructions preceding the vignette:

> *While you are reading the excerpt, try to listen carefully to the information presented. Try to be as objective as possible, carefully attending to all the information presented about the situation and about the person who is being interviewed. Try not to concern yourself with how the person being interviewed feels about what has happened. Just concentrate on trying to listen objectively to the information presented in the broadcast.*

Manipulation Check

Participants were asked "How much empathy do you feel for the person in the story?" and given options of 1 = Very Little, 2 = Some, 3 = A Moderate Amount, 4 = A lot.

Procedure

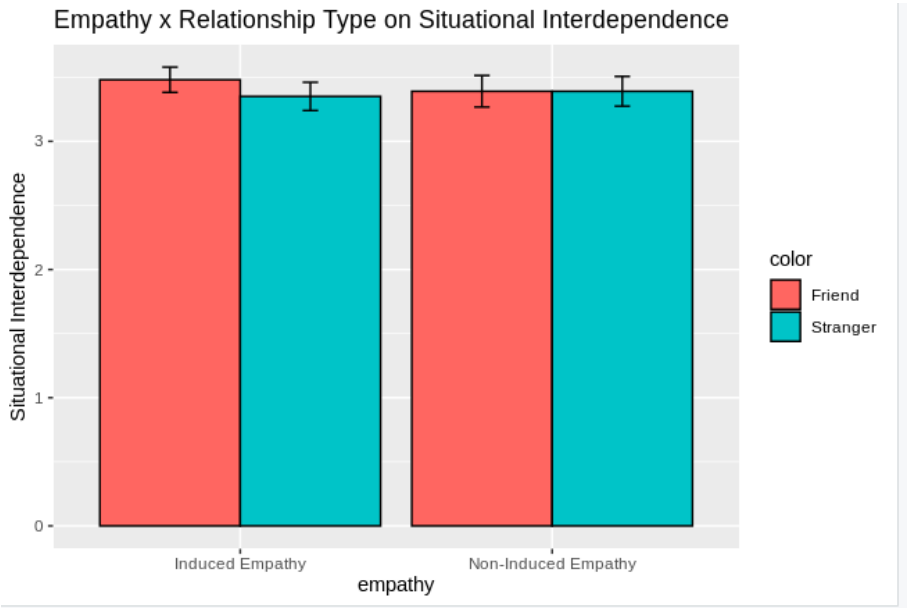
The survey was created using Qualtrics. Participants received an anonymous link to the qualtrics survey. Participants completed a consent form including a brief description of the survey. Participants who chose to continue with the study answered demographic questions about age and gender. On the next screen, participants were told that they would be reading a short passage. The researchers included a randomizer for each independent variable to create 4 conditions total. They were first separated into the empathy and non-empathy conditions, then friend and stranger conditions. They were given instructions on how to read the vignette (empathy manipulation). In the friend condition, participants gave the initials and gender of a close friend and were told to imagine that this friend is being interviewed. In the stranger condition, participants are told that Carol, a UCSB student, is being interviewed. The participants

were asked to read a vignette taken from a previous qualtrics survey (citation) in which Carol (in the friend condition, Carol was replaced with 'your friend') was being interviewed for the Daily Nexus about a car crash she had been in in which she had broken both of her legs. She spoke in the interview about falling behind academically as a result and how she needed notes for PSY 10A.

On the next screen, participants were asked to rate how willing they were to help the person in the story (1-10) and to describe how they would help. A manipulation check for empathy was given in which participants were asked how much empathy they felt for the person in the story(1 = very little, 4 = a lot). The participants were then given the 30-item Situational Interdependence Scale (SIS). Finally, participants were shown a debriefing form and thanked for their participation. Data was collected anonymously through qualtrics.

Results

To analyze the effects of empathy and relationship type on situational interdependence, we ran a 2(empathy: induced vs. not induced) x 2(relationship type: friend or stranger) between subjects ANOVA. We found no significant main effect of empathy $F[(1,74) = .188, p = .666, \eta 2 = 0.0049$, *M*s =3.415 vs. 3.39] such that the situational independence of participants in the empathy condition was no different from that of those in the non empathy condition. We found no significant main effect of relationship type $F[(1,74) = .262, p = .61, \eta 2 = 0.013$, *M*s =3.435 vs. 3.37] such that the situational independence of participants in the friend condition was no different from that of those in the stranger condition. We also found no significant interaction effect $F[(1,74) = 2.41, p = .625, \eta 2 = 0.00079]$.

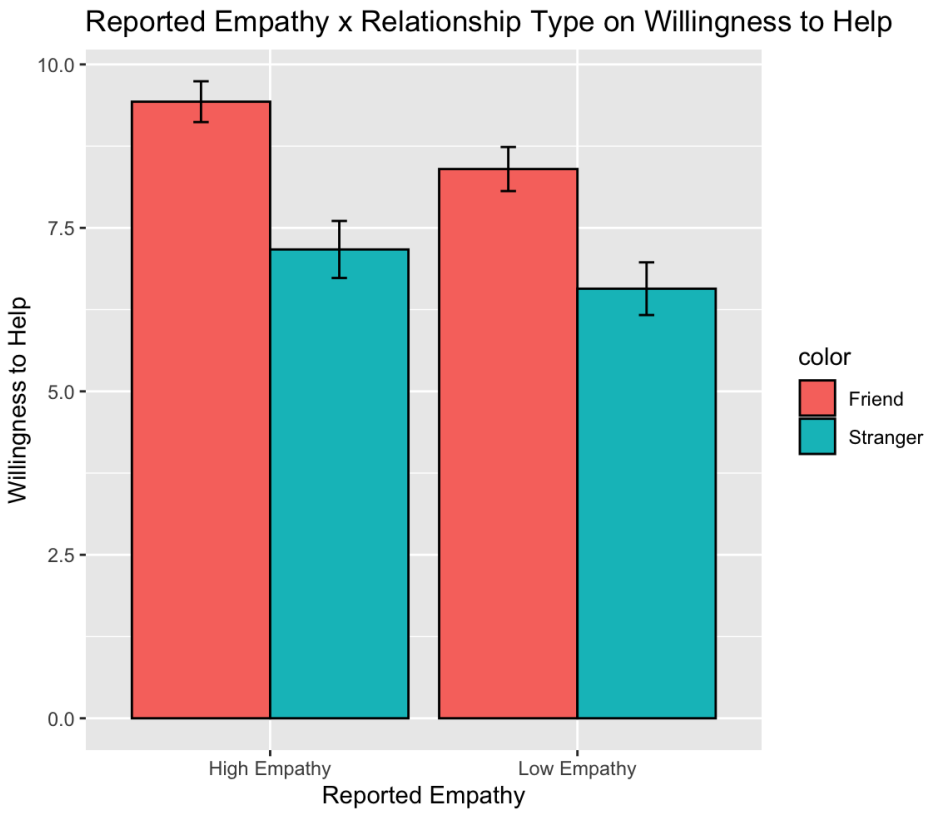


To analyze the effects of empathy and relationship type on willingness to help, we ran a 2(empathy: induced vs. not induced) x 2(relationship type: friend or stranger) between subjects ANOVA. We found no significant main effect of empathy $F[(1,99) = 1.254, p = .2655, \eta 2 = 0.00343, Ms = 8.21$ vs. $7.95]$ such that the willingness to help of participants in the empathy condition was no different from that of those in the non empathy condition. We found a significant main effect of relationship type $F[(1, 99) = 5.282, p = 0.0236, \eta 2 = 0.0486, Ms = 8.66$ vs. $7.65]$such that participants in the friend condition were more willing to help than those in the stranger condition. We also found no significant interaction effect $F[(1,99) = 2.067, p = .1537, \eta 2 = 0.019028446]$.

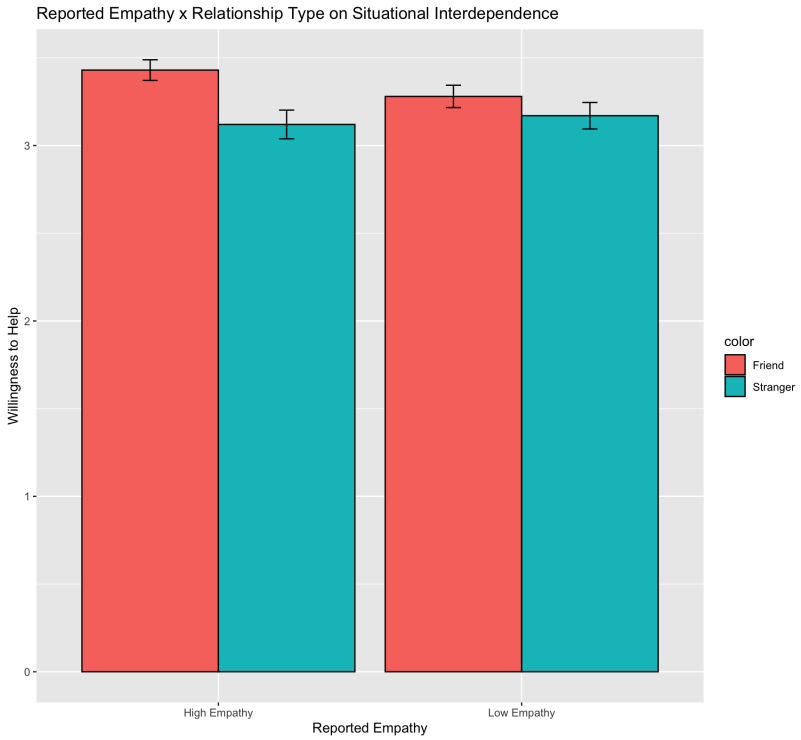
T-tests were conducted to examine whether willingness to help differed by relationship type (friend vs. stranger). Results showed a significant difference between the friend and stranger condition, [$t(92.714) = 2.464$, $p < .016$] such that people in the friend condition were more willing to help than people in the stranger condition (Ms = 8.66 vs. 7.65).

We included a manipulation check to see if empathy was manipulated successfully. Results of a T test [$t(102.65) = 0.30916$, $p = 0.76$] showed no significant difference in reported empathy between the induced empathy group (M =3.58) and the non-induced empathy group (M = 3.54).

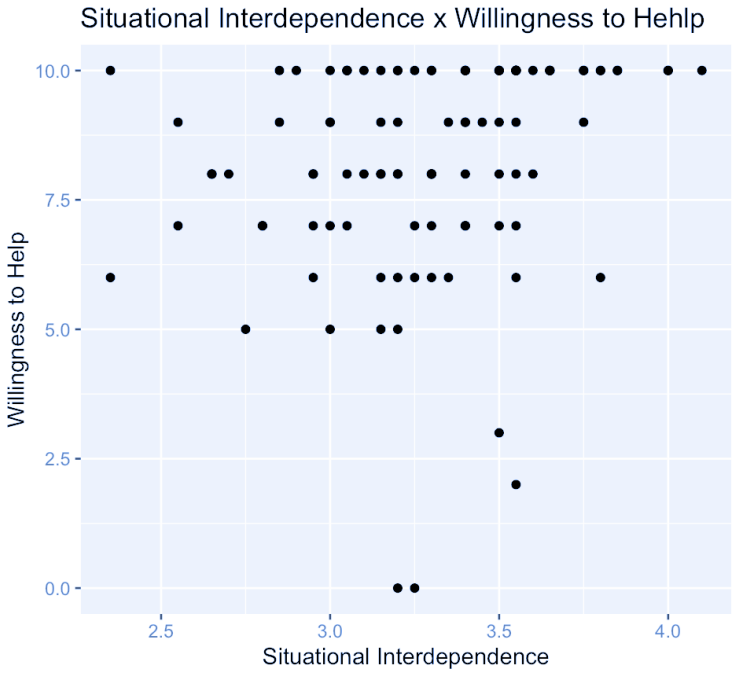
T-tests were conducted to examine whether willingness to help differed by high or low empathy (as reported in our manipulation check). Empathy was split into 4 = high (n=66) and 1,2,3 = low (n=39). Results showed a significant difference between high and low empathy, [$t(70.30) = 5.3051$, $p < .001$] such that participants who reported high empathy were more willing to help than participants who reported low empathy (Ms = 8.95 vs. 6.85).



T-tests were conducted to examine whether situational interdependence differed by high or low empathy (as reported in our manipulation check). Empathy was split into 4= high (n = 66) and 1,2,3 = low (n = 39). Results showed a significant difference between high and low empathy, [$t(83.958) = 3.1694$, $p = 0.0021$] such that participants who reported high empathy had higher situational interdependence than participants who reported low empathy (Ms = 3.36vs. 3.15).



We examined the relationship between our two dependent variables, willingness to help and situational interdependence, using a Pearson correlation. Results showed that the higher participant's willingness to help, the more situational interdependence they showed ($r(77) = 0.228$, $p = 0.043$).



Discussion

The researchers hypothesized that there would be 1) greater willingness to help and situational interdependence when empathy is induced compared to when it is not induced, 2) greater willingness to help and situational interdependence for a friend rather than a stranger, and 3) a greater effect of empathy on willingness to help and situational interdependence with a stranger compared to with a friend.

The first hypothesis was not supported by our empathy manipulation results, but we did find evidence in support of the relationship being investigated. We did not find a difference in willingness to help or situational interdependence based on our empathy manipulation. However, it is important to note that prior literature has supported an effect of empathy manipulation on

willingness to help and cooperation, which has been linked to situational interdependence. Although no effect of empathy induction was found, we believe that this is due to a failed manipulation. Our analysis of our manipulation check tells us that we did not effectively induce empathy as intended. It follows that logically we did not see a difference in these groups in our dependent variables. However, we believe that there still exists a relationship between empathy and our dependent variables. In fact, when looking at self-reported empathy for the person in the vignette, we found that higher empathy was significantly correlated with being more willing to help and showing higher situational interdependence. This finding supports our theoretical bases for our experiment, the empathy-altruism hypothesis. Note that we cannot make causal attributions based on this finding, but it is significant in the context of the current study and calls for an improved manipulation in future research.

The second hypothesis was partially supported. We found that people were more willing to help a friend compared to a stranger, which is consistent with prior literature regarding communal versus exchange relationships and our predictions. However, we found no main effect of relationship type on situational interdependence. The finding that participants did not show more interdependence with a friend compared to a stranger as we had predicted is inconsistent with prior literature connecting friendship to increased cooperation.

The third hypothesis was not supported. We did not find an interaction effect for either of our dependent variables. Furthermore, when we use reported empathy rather than our manipulation analyzed alongside relationship type, we still find no significant interaction even with both main effects present. This finding implies that the lack of interaction was not due to our failed manipulation. This may signify that the mechanisms involved in the empathy-altruism hypothesis and the social mechanisms of friendship are unrelated or mutually exclusive, aligning

with previous literature stating that there are multiple complex mechanisms involved in social exchange (Cosmides & Tooby, 1992). However, we cannot conclude this concretely.

Limitations

We believe that it was difficult to properly manipulate empathy in our study. Because the person in our vignette (Carol) was a UCSB student who needed notes for a psychology class, many participants likely empathized with Carol causing a ceiling effect for empathy in our study and a presence of empathy in the non-induced empathy conditions.

Additionally, since our act of altruism, helping someone get notes, was hypothetical, it is possible that participants claimed they were more willing to help than they actually would be in a real situation.

Our measure of situational interdependence stemmed from evidence that empathy and relationship type may affect cooperation. Ideally, the researchers would prefer a Prisoner's Dilemma game to measure cooperation, but we found it too difficult to carry out through qualtrics. The Situational Interdependence Scale is linked to cooperation (citation), but some of the items do not fit well within the context of the current study (i.e., "I don't think the other knows what I want.") Thus, situational interdependence was likely too distant a measure of cooperation in this context which may explain why we did not see significant results with the measure besides its correlation with reported empathy and willingness to help.

Future Research

To better manipulate and reduce the ceiling effect of empathy, we suggest that future researchers should give the vignette in a video or audio format to elicit emotion as done in (Pavey, et al., 2012) and use a character in the vignette who is less similar to the sample. Furthermore, we suggest that future researchers test these variables in relation to cooperation as prior research suggests there may be a significant effect of both empathy and relationship type on cooperation.

More broadly, the researchers believe it would be beneficial to the literature to test the empathy-altruism hypothesis in close friendships to further examine the lack of interaction found in this study.

Conclusion

We can conclude based on our findings that relationship type does seem to affect willingness to help, where people are more willing to help their friend than a stranger when they do not expect a reward.

We cannot conclusively state whether empathy affects willingness to help and situational interdependence due to our failed manipulation. However, the evidence suggests that correlationally, higher reported empathy is associated with more willingness to help and situational interdependence. We believe these results may be important in future evaluations of the cognition behind helping.

References

Axelrod (1984). The Evolution of Cooperation. *New York: Basic Books.* (No DOI found)

Batson, C. D. (1993). Communal and exchange relationships: What is the difference? Personality and Social Psychology Bulletin, 19(6), 677–683. https://doi.org/10.1177/0146167293196002

Batson, C. D. (2017). The empathy-altruism hypothesis: What and so what? In E. M. Seppälä, E. Simon-Thomas, S. L. Brown, M. C. Worline, C. D. Cameron & J. R. Doty (Eds.), *The Oxford handbook of compassion science; The Oxford handbook of compassion science* (pp. 27-40, Chapter xxii, 526 Pages). Oxford University Press. https://doi.org/10.1093/oxfordhb/9780190464684.001.0001

Batson, C. D., & Ahmad, N. (2001). Empathy-induced altruism in a prisoner's dilemma II: What if the target of empathy has defected? *European Journal of Social Psychology, 31*(1), 25-36. https://doi.org/10.1002/ejsp.26

Batson, C. D., Duncan, B. D., Ackerman, P., Buckley, T., & Birch, K. (1981). Is empathic emotion a source of altruistic motivation?. *Journal of personality and Social Psychology*, *40*(2), 290. https://doi.org/10.1037/0022-3514.40.2.290

Batson, C.D., & Moran, T. (1999), Empathy-induced altruism in a prisoner's dilemma. Eur. J. Soc. Psychol., 29: 909-924. https://doi.org/10.1002/(SICI)1099-0992(199911)29:7<909::AID-EJSP965>3.0.CO;2-L

Clark, M. S., & Mills, J. (1979). Interpersonal attraction in exchange and communal relationships. *Journal of personality and social psychology*, *37*(1), 12. https://doi.org/10.1037/0022-3514.37.1.12

Cosmides, L. (1989). The logic of social exchange: Has natural selection shaped how humans reason? Studies with the Wason selection task. *Cognition*, *31*(3), 187–276. https://doi.org/10.1016/0010-0277(89)90023-1

Cosmides, L., & Tooby, J. (1992). Cognitive adaptations for social exchange. *The Adapted Mind: Evolutionary Psychology and the Generation of Culture*, *163*, 163–228. (No DOI found)

Gerpott, F. H., Balliet, D., Columbus, S., Molho, C., & de Vries, R. E. (2018). How do people think about interdependence? A multidimensional model of subjective outcome interdependence. *Journal of personality and social psychology*, *115*(4), 716–742. https://doi.org/10.1037/pspp0000166000166

Hamilton, W. D. (1964). The genetical evolution of social behaviour. II. *Journal of theoretical biology*, *7*(1), 17-52. https://doi.org/10.1016/0022-5193(64)90039-6

Homans, G. C. (1958). Social behavior as exchange. *American journal of sociology*, *63*(6), 597-606 (No DOI found)

Majolo, B., Ames, K., Brumpton, R., Garratt, R., Hall, K., & Wilson, N. (2006). Human friendship favours cooperation in the Iterated Prisoner's Dilemma, *Behaviour*, *143*(11), 1383-1395. https://doi.org/10.1163/156853906778987506

Pavey, L., Greitemeyer, T., & Sparks, P. (2012). "I help because I want to, not because you tell me to": empathy increases autonomously motivated helping. *Personality & social psychology bulletin*, *38*(5), 681–689. https://doi.org/10.1177/0146167211435940

Tooby, J., & Cosmides, L. (1996). Friendship and the Banker's Paradox: Other pathways to the evolution of adaptations for altruism. *Joint Discussion Meeting of the Royal Society and the British Academy*, *88*, 119–143. (No DOI found)