Psychopathic personality traits, empathy, and prosocial behavior

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Abstract

Altruism is defined as voluntary behavior to assist others without the expectation of any personal reward or gain. Some researchers have indicated a strong relationship between empathy and subsequent altruistic or prosocial behavior. Studies have shown that fear, as an indicator of helplessness, tends to elicit prosocial behavior in others. Its recognition is widespread throughout the human population; however not all individuals respond in the same manner in response to fear. Psychopathy, a disorder characterized by reduced empathy and remorse, has been shown to effect individual’s responses to others’ emotions, specifically various studies have shown that psychopaths have a deficit in recognizing, processing, and responding appropriately to fear. Using a flavor-distribution paradigm featuring commercially sold “BeanBoozled Jelly Beans,” the present research aims to examine the relationship between psychopathic personality traits, fear verbal cues, and prosocial behavior. Twenty-eight adult participants who varied in psychopathic personality traits, as measured by the PPI-R, participated in this study. Statements expressing happiness, fear, anger, and disgust at the prospect of eating various jelly bean flavors were paired with the various flavors. Participants were told they would be participating with a partner and were told they would have to choose between sampling an appealing or unappealing flavor and their partner, in reality a confederate, would be given the other flavor. No prior study has examined actual behavior and how psychopathy relates to how people respond to these emotional cues. Results showed that individuals with higher psychopathy scores were negatively correlated with prosocial behavior in response to another individual’s fear verbal cues but not with other emotional cues. These results support and extend past research indicating that
psychopathy is associated with impaired processing and responding to fear cues and suggest that a greater understanding of emotional processing in psychopaths could lead to a deeper understanding of the disorder and is a step towards improving the prognosis of the disorder.
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Empathy is defined as an emotional reaction to another’s emotional state or condition (Eisenberg et al., 1989). Research has shown that empathic concern promotes altruistic behavior to alleviate another’s distress as signaled by distress cues, such as fear and sadness (Batson, 1987; Dovidio, Allen, and Schroeder, 1990). Fear is a type of distress cue that is commonly accepted as signaling anxiety, apprehensive worry, or mental suffering. Signals that convey fear are universally recognized throughout the human population and have been shown to elicit prosocial behavior and inhibit aggression in healthy individuals (Blair, 2001; Batson, Fultz, and Schoenrade, 1987; Batson, Duncan, Ackerman, Buckley, & Birch, 1981). However, not all individuals are equally adept at recognizing, processing, and responding to the fear distress cue.

Psychopathy is a developmental disorder characterized by shallow affect and reduced empathy and remorse (Hare, 1993). People with high psychopathic personality traits are specifically impervious to fear cues as shown by various studies (Birbaumer et al., 2005; Blair, Jones, Clark, & Smith, 1997). In a recent study using emotionally evocative statements, results showed that psychopathic personality traits were correlated with deficiencies in recognition of fear-evoking statements but not for other emotions (Marsh and Cardinale, 2012). The converging research has demonstrated a relationship between the ability to process the fear distress cue and subsequent prosocial behavior, specifically that psychopaths have a diminished ability to recognize fear and thus fail to respond prosocially (Blair, 1999).

While research on psychopathy and prosocial behavior strongly supports the hypothesis that the ability to recognize fear predicts individual differences in prosocial behavior, there is limited research measuring actual behavior as a function of psychopathy. Aggression is a
difficult emotion to measure in an experimental setting; however, flavor distribution paradigms are a well-validated means of assessing interpersonal behaviors related to empathy (Lieberman, Solomon, Greenberg, & McGregor, 1999; McDermott et al., 2009). In these studies, participants are asked to distribute some amount of hot sauce high in capsaicin to a study confederate. Prior to the present research, no study has assessed the effects of expressing different kinds of emotional feedback on a participant’s behavior or how psychopathic personality traits affects one’s responses to another’s distress cues. The present research employs a flavor distribution paradigm using commercially available candy called “Beanboozled” to approximate social behavior in response to various emotional cues. The emotions conveyed at the prospect of tasting various jelly bean flavors included happiness, fear, anger, and disgust. Using pairs of appealing and unappealing jelly bean flavors, prosocial behavior was measured in terms of when the participant was willing to sacrifice self-benefit by selecting the unappealing jelly bean for himself and giving the other participant the appealing jelly bean. Our study will thereby assess the relationship between participants’ emotion perception from verbal statements and their empathically relevant social behaviors. Based on the well-established relationship between psychopathy, deficits in fear recognition, and prosocial behavior, we hypothesized that we would observe a negative correlation between scores on the Psychopathic Personality Inventory (PPI-R) and prosocial behavior in response to verbal fear cues but not in response to other emotional cues. The benefits of this study include that it measures the extent to which people are willing to sacrifice self-benefit for another person in relation to psychopathic personality traits. Because empathy is a fundamental component of altruism, discovering correlates and predictors of empathy is a logical path to study the individual differences in altruistic tendencies. Individuals
differ dramatically in their tendencies to help others at a personal cost, and by studying correlates of empathy, research may help researchers determine the crucial factors that influence altruism.

**Methods**

**Participants**

Twenty-eight adult volunteers (21 females, 7 males, $M$ age = 19.76 years, SD = 1.43 years, range = 18 - 22 years) were recruited from the Georgetown University undergraduate and graduate community. The demographics of the sample included 20 (71%) who identified as Caucasian, 1 (4%) as African American, 5 (18%) as Asian, and 2 (7%) as Latino. One participant reported a psychiatric diagnosis of Major Depressive Disorder and Generalized Anxiety Disorder and was receiving treatment for the conditions at the time of the study. The study was approved by the Institutional Review Board at Georgetown University, and all participants provided informed written consent.

**Measurement of Psychopathy**

Psychopathy was measured using the Psychopathic Personality Inventory - Revised (PPI-R; Lilienfeld & Widows, 2005). The PPI-R is a 154 item self-report measure of both global psychopathy and eight component traits of psychopathy. It measures the continuum of psychopathic personality traits present in individuals using items supporting Cleckley’s dimensional characterization of psychopathy (Lykken, 1995). The original and revised PPI have been validated for use on both community and offender samples (Lilienfeld & Andrews, 1996; Berardino et al., 2005; Patrick et al., 2006).
Participants answer items based on how accurately it applies to themselves using a 4-Point Likert scale (1 = false, 2 = mostly false, 3 = mostly true, and 4 = true). The PPI-R strongly correlates to the Psychopathic Checklist-Revised (PCL-R), which is an additional well-validated measure of psychopathy (Hare, 2003).

Stimuli

The stimuli used in this study were images of various flavored jelly beans, presented in pairs (Figure 1). Each condition contained one standard standard-flavored jelly bean (e.g., peach, coconut) and one unappealing flavor (e.g., barf, skunk spray). The pairs were determined based on the appearance of the jelly beans, as the flavors in each pair looked identical (e.g. the pear and the booger flavors were both green (Figure 1). In addition to the visual stimuli, sixty emotional statements were generated to convey basic emotions - happiness, anger, disgust, or fear - at the prospect of tasting the various jelly bean flavors. The order in which the jelly bean pairs were presented was randomized for each participant as were the sixty statements conveying the various emotions. Statements expressing happiness were always paired with an appealing jelly bean; however, the statements expressing fear, anger, and disgust were randomized for the unappealing flavors to ensure that there was not a confounding effect of specific flavors being paired with specific statements. For instance, a specific statement expressing disgust such as “Ewww” varied as to the unappealing flavor with which it was presented. In order to pilot the stimuli, a list of the statements was given to participants, and they were told to circle the emotion they thought each statement conveyed - happiness, fear, anger, or disgust. The statements were analyzed using a binomial distribution with $p=.5$ to ensure participants would clearly identify
each one with the emotion it intended to convey. In order to obtain 30 happiness, 10 fear, 10 anger, and 10 disgust statements that were accurately identified, there were three different handouts piloted with at least fifteen participants who responded to each statement. The binomial distribution analysis took the number of participants who responded into account to ensure each emotion conveyed was accurate.

Procedure

Participants entered the laboratory and were told they would be participating with another student, who was already present but in reality, was a confederate. The confederates used were always female but varied between four different research assistants. The experimenter gave the participants instructions regarding the task, informing them that the study was examining how control and choice affect sensory perception. The experimenter showed the participants a box of the commercially available “Beanboozled Jelly Beans.” The participants were told that they would be asked to type their impression at the prospect of tasting each flavor. The experimenter then informed the participants that one of them would be in the “choice” condition and will have the choice as to which flavor he wants to sample. The other participant would be in the “no choice” condition and required to sample the other flavor. For instance, if the choices presented are pear and vomit and the participant in the “choice” condition selects pear, the participant in the “no choice condition will be given the vomit flavored jelly bean. Upon their arrival, the experimenter told the participants that a coin flip would determine which condition each person was in. While the experimenter did actually flip a coin in front of the participants to ensure the believability of the deception, regardless of the results of the coin toss, the subject was always told he would be in the “choice” condition and the confederate in the “no choice” condition. In
addition, participants were told that the jelly beans would be distributed based on the responses at the end of the study.

Once the participants completed this computer task, they were given the PPI-R, a demographic form, a psychological screening form, and a perception questionnaire to ensure the deception used in the study was successful. Upon completion, the participants were debriefed regarding the study’s intent and informed that the “other participant” was a confederate and no one was required to eat any of the jelly beans. Participants received an unopened box of “BeanBoozled” jelly beans in addition to their compensation for participating in the study.

Results

Our hypothesis was that the effect of fear on prosocial behavior would be negatively correlated with scores on the Psychopathic Personality Inventory - Revised (PPI-R). In other words, those with higher scores on the PPI-R would exhibit less prosocial behavior in response to fear verbal cues. Responses from all 28 participants were included in the final analysis. Removal of data from two subjects who expressed disbelief minimally affected data. PPI-R scores ranged from 193 to 299 with a mean of 262.93 (SD=23.82). Linear correlations using PPI-R scores and the frequency of prosocial behavior were computed for the three emotional cues - fear, anger, and disgust. As shown in Figure 1, the correlations indicated that fear was the only emotion that had a statistically significant impact on prosocial behavior in relation to PPI-R scores, r(26)=−.36, p<.05. As shown in Figures 2 and 3, statistically significant correlations were not found for anger r(26)=−.26, p>.05, and disgust r(26)=−.24, p>.05. The mean rates of giving the unappealing jelly bean for each emotion were as follows: M(fear) = 3.21, M(anger) = 3.36, and M(disgust) = 2.93. Overall, out of the 30 trials, the mean of participants choosing the
unappealing jelly bean was 9.5, which translates to 32% of the time. While the mean for participants selecting the unappealing jelly bean for themselves was higher than that for fear, the linear correlation in relation to PPI-R scores was not significant for anger or disgust but was for fear.

When analyzed by gender for the seven male participants, statistically significant correlations were not found for fear $r(5) = -0.63$, $p > 0.05$, anger $r(5) = -0.59$, $p > 0.05$, or disgust $r(5) = -0.21$, $p > 0.05$; however, the strongest correlation was with fear. The mean for males choosing the unappealing jelly bean was 12.71 or 42% of the trials. For females, the correlations with PPI-R scores were calculated for each emotion. The results were not significant for fear, $r(19) = -0.28$, $p > 0.05$, for anger, $r(19) = -0.19$, $p > 0.05$, or for disgust, $r(19) = -0.34$, $p > 0.05$. The mean for females choosing the unappealing jelly bean was 8.43 or 28% of the trials. The gender differences in the mean of selecting the unappealing jelly beans could be a result of the fact that females were used as confederates in the study.

To ensure the deception was successful, participants were asked their impression of “the other participant” after the study. Some examples of comments indicating the deception was believed included, “She seemed pretty normal. Standard taste in jelly beans;” and “Her responses were similar to mine though she tried to impose her perceptions on me to give her the better tasting jelly beans.” Of the participants who completed the study, two reported some awareness of deception when they filled out the perception questionnaire at the end of the study; however, removal of these two subjects who indicated disbelief minimally affected the data. Therefore, the results indicate that the hypothesis was correct. Psychopathy scores predicted prosocial behavior in response to fear verbal cues.
Discussion

This study examined the relationship between psychopathic personality traits and prosocial behavior in response to various emotions (happiness, fear, anger, and disgust). To our knowledge, no study to date has assessed the impact of others’ fear on actual behavior as a function of psychopathy. As hypothesized, results showed that psychopathic traits were negatively correlated with prosocial behavior in response to another individual’s fear verbal cues but not with other emotional cues. The hypothesis was tested using verbal stimuli that were piloted to ensure the intended emotion was conveyed to participants. These results support and extend previous findings that suggest that psychopathy is related to impairment in processing social cues, specifically fear. This study provides more insight into the causes behind antisocial behaviors that are characteristic of psychopaths.

There have been numerous converging studies, including neuroimaging studies establishing a strong relationship between psychopathic personality traits and impairment in fear recognition (Marsh, Finger, & Mitchell, 2008; Marsh & Blair, 2008; Jones et al., 2009). Psychopaths are especially poor at recognizing, processing, and responding appropriately to fear, where an appropriate response would be to assist the frightened person. One criminal who scored very high on the Psychopathy Checklist said, “‘They are frightened, right? But, you see, I don’t really understand it. I’ve been scared myself, and it wasn’t unpleasant’” (Hare, 1993, 44). Studies have shown that the problem in fear recognition is isolated, as they do not have difficulty recognizing happiness, disgust, or anger expressions. This deficiency in fear recognition is associated with reduced amygdala function and suggests this may be the cause of the antisocial
behavioral tendencies exhibited by psychopaths - behavior that breaks social norms and violates the rights of others.

A recent study conducted by Marsh and Ambady demonstrated that the ability to detect fearful faces is correlated with prosocial behavior in an unrelated task, the present study measured the effect of another’s fear on prosocial behavior towards that individual (Marsh & Ambady, 2007). The results are consistent with the theory that the more adept one is at identifying fear expressions, the greater the tendency for subsequent prosocial behaviors. This is compatible with Cleckley’s construct of psychopathy that certain aspects of emotional response are idiosyncratic (Cleckley, 1976). This research along with past studies indicates that the fear expression plays a very important role in inhibiting antisocial behavior (Marsh, Ambady, & Kleck, 2005). Impairment in recognition seems to interfere with the normal aversive response to fear, which is a universal expression that serves as a distress cue.

The present study aimed to expand previous findings by directly measuring prosocial behavior in response to verbal fear cues using a novel stimulus set of statements. The use of verbal fear cues that are commonly used on a daily basis provides insight into behavioral tendencies that those with psychopathic personality traits may exhibit in interpersonal interactions. The results of this study indicate that individuals with more psychopathic traits do not respond appropriately to the verbal fear cues conveyed to them by another individual. Therefore, this study supports the theory that the deficits in processing fear may explain the lack of empathic behaviors and instead the maladaptive behavioral tendencies of individuals with callous and unemotional traits and psychopaths (Blair, 2006). The induction of empathy using
distress cues, particularly fear, is thought to increase the importance of the aversive stimulus expressed by the victim, in this study represented by the confederate’s emotions.

There are some limitations of the study that must be taken into account. Since this study was conducted using a healthy population, regarding the psychopathy scores, there was a limited range and scores did not exceed 300 on the PPI-R, indicating there were not very many high-psychopathy scores in the sample. There is an ongoing debate as to whether psychopathy is a categorical or dimensional condition. That is to say, there are arguments for psychopathy as a continuous disorder, in which there are different levels of psychopathic traits one possesses (Skeem et al., 2011). However, there are also researchers who believe psychopaths are a discrete group of individuals from the rest of humanity (Harris, Skilling, & Rice, 2001).

A limitation that can be easily eliminated was that the sample size was limited to the Georgetown community. It would be beneficial to recruit additional participants from elsewhere to allow the results to be extrapolated to a larger population. Another limitation was the absence of a manipulation check regarding what emotion the participant was feeling each time he made a decision between the two jelly bean flavors. A manipulation check would have ensured that the participant actually factored in the various emotions expressed by the confederate when selecting whether to give her the unappealing jelly bean.

In terms of future directions for this study, it is important to note that the present research used a limited amount of deception to measure participants’ prosocial behavior towards others. The actions measured were not actually performed while physically in the presence of the other individual but instead were indicated through computer responses. While subjects believed their responses would be converted into actions, this research could be extended by designing a study
in which participants see the consequences of their actions while performing the task. In addition, an fMRI study that involves measuring prosocial behavior in response to others’ fear would provide additional support for the concept that impairment in fear recognition results in less prosocial behavior. Although these experiments would not be able to present opportunities to simulate extreme psychopathic behaviors, they would still provide an accurate measure of antisocial tendencies, such as bullying and violence.

Conclusion

As research regarding psychopathy, impairment in fear recognition, and its effect on prosocial behavior is relatively new, this study employed a flavor-distribution paradigm to measure actual behavior in response to others’ fear. The results of this study support past research that indicates psychopathy is characterized by deficits in emotional processing, especially fear, and empathic responses to fear cues. Using a novel measure of prosocial behavior, the implications of this study are profound as they demonstrate a direct impact of others’ fear on prosocial behavior associated with psychopathic personality traits. By demonstrating a correlation between verbal fear cues and reduced prosocial behavior in individuals with greater psychopathic personality traits, this research provides insight into social interactions involving antisocial behavior and may explain why psychopaths do not hesitate to perform these maladaptive behaviors. Future research should aim to expand upon these results to further explore actual behavior in response to fear cues. This would increase the understanding of the reduced empathic reaction in individuals with psychopathic tendencies and hopefully lead to a means to improve the prognosis of the disorder.
References


Figure 1:
*Presentation of Flavor Options*
Figure 2:
Jelly Bean Flavor Pairings

<table>
<thead>
<tr>
<th>Left Flavor</th>
<th>Right Flavor</th>
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<td>Moldy Cheese</td>
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<td>Pineapple</td>
<td>Sulfur</td>
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<td>Cod</td>
<td>Tangerine</td>
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<tr>
<td>Asphalt</td>
<td>Plum</td>
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<td>Buttered Popcorn</td>
<td>Rotten Egg</td>
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<td>Raspberry</td>
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<td>Canned Dog Food</td>
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<td>Vinegar</td>
<td>Peppermint</td>
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<td>Coconut</td>
<td>Baby Wipes</td>
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<tr>
<td>Barf</td>
<td>Peach</td>
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<tr>
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<td>Salmon</td>
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<tr>
<td>Sand</td>
<td>Toasted Marshmallow</td>
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<tr>
<td>Copper</td>
<td>Root Beer</td>
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<tr>
<td>Cappuccino</td>
<td>Dirt</td>
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<td>Pear</td>
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Figure 3:  
*Effect of Fear Verbal Cues on Prosocial Behavior*

Figure 4:  
*Effect of Anger Verbal Cues on Prosocial Behavior*
Figure 4:  
*Effect of Disgust Verbal Cues on Prosocial Behavior*