Effects of Auditory Stimuli on Empathic Emotion

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Individuals are exposed to a variety of stimuli that elicit empathy. However, it is unclear whether the sensory mode (i.e., auditory or visual) through which a stimulus is perceived influences empathic responses. The present study experimentally examined the differences between audiovisual communication channels in their ability to elicit empathic reactions from undergraduate students. Participants completed the Balanced Emotional Empathy Scale (BEES: Mehrabian, 2000) in order to determine one's emotional empathy trait prior to visually, aurally, or audio-visually viewing a short video clip of an infant child in a state of distress. Subsequently, the participants rated their emotional reactions to the video clip based on subjective level of distress, how upset participants felt, and participants' desire to help the infant. There were no statistically significant effects of the presentation style of the video on participants' upset reactions or participants' desire to help. However, the effect of the stimuli presentation on participants' level of distress was statistically significant, particularly among participants with "very below average" or "below average" empathy traits. The findings of the present study suggest that empathic responses are greatest when an individual can see and hear another individual in distress, as he or she cannot misinterpret the incoming information.

Empathy is an affective state that mirrors another person's affective state. In other words, empathic responses are induced through the observation (imaginarily or in vivo) of the other person's affective state (De Vigemont & Singer, 2006). A last crucial part of the definition of empathy is that the person is aware that the other person is functioning as the source of his or her own affective state (Batson & Shaw, 2001; De Vigemont & Singer, 2006; Van Lange, 2008; Westbury & Neumann, 2008). Though the neuropsychological processes of observation and imagination differ, both processes are capable of independently activating an empathic state (Han, Fan, & Mao, 2008; Staub & Vollhardt, 2008; Van Lange, 2008; Westbury & Neumann, 2008)

Researchers have long wondered why people empathize. Some researchers, for instance, have proposed that empathy functions as an intermediary between one's cognitive and social domains during role-taking processes (Iannotti, 1978; Knafo, Van Hulle, Zahn-Waxler, & Robinson, 2008). The suggested association between empathy and role-taking does not, however, connote inclusive similarities; rather, empathy drastically differs from role-taking (or emotional contagion) as it is capable of holding aspects of both cognition and emotion, resulting in a multidimensional construct (Massi-Lindsey, Yun, & Hill, 2007; Seitz, Nickel, & Azari, 2006). The cognitive aspect of empathy brings about the capability to comprehend a distressing situation, distinguish another person's emotions, and assume his or her perspective. The

affective aspect, on the other hand, requires an individual to "experience an indirect emotional response to others' expressed emotions" (Knafo et al., 2008, p. 737).

Recent evidence has emerged which suggests that during the observation of another person's actions, specific regions within one's own brain are affected (Seitz et al., 2006). Given that these specific regions have been shown to be involved in the preparation of one's own actions, one can conclude that observing another's pain involves brain activity similar to experiencing his or her own pain (Jackson, Brunet, Meltzoff, & Decety, 2005; Seitz et al., 2006; Staub & Vollhardt, 2008; Van Lange, 2008). It is believed that the neurological activity is due to a "large-scale cortical network of nodes of convergence" (Seitz et al., 2006, p. 743), linking information from various regions of the brain. Through the use of fMRI, Jackson et al. (2005) confirmed this statement, demonstrating that the activation of the same pain-related neural network is indeed brought about when imagining oneself in a painful situation and when imagining another person in a painful situation. Specific regions that are involved in this process include the temporal lobe (which provides knowledge of past experiences), superior temporal sulcus (which provides information about observed behavior), and medial prefrontal cortex (which links cognitive information to basic emotions). Also, there is speculation related to the prefrontal cortex's role in linking one's actions with the emotional contexts associated with empathy because of the region's condensed "spatially distinct activation clusters" (Seitz et al., 2006, p. 745) which are related to thoughts and emotions (Jackson et al., 2005; Seitz et al., 2006). Clusters similar to those found in the previously mentioned regions of the brain were also present in the superior frontal gyrus and on the border of the cingulate gyrus. This finding suggests that one's ability to generate

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mental concepts and physical actions is integrally related to the prosocial behaviors that are associated with empathic emotion (Jackson et al., 2005; Seitz et al., 2006).

The interconnected regions within the brain emphasize the various effects that empathy can have on the individual. Empathy-related emotional responses affect the activity within the nervous system as well as the cognitive accuracy and emotional intensity particular to one's overt behavior (Jackson et al., 2005; Seitz et al., 2006; Westbury & Neumann, 2008). For instance, empathy and prosociality are considered essential components in the expression of compassion (Batson et al., 1995; Shaw, Batson, & Todd, 1994; Knafo et al., 2008), which can be defined as a "dimension of morality that emphasizes concern for the well-being of others in distress, as well as an important aspect of interpersonal responsibility and ethical behavior" (Knafo et al., 2008, p. 737). The tendency to help one individual over another, which is often generalized across species, has been found to lead to an increased helping behavior towards those who have a closer genetic relatedness or share more similarities with the individual (Allen et al., 2002; Batson, 1990; Bierhoff & Rohmann, 2004; Westbury & Neumann, 2008). Though prosocial acts result from empathic emotion, the manifestation of such acts as altruistic or egoistic behaviors remains in question (Batson, 1990; Batson & Shaw, 1991; Jackson et al., 2005; Van Lange, 2008). We present here several constructs which are closely related to empathy and which may be viewed as behavioral manifestations of empathy.

Altruism

Altruism is viewed as devotion to the welfare of others or an act in which an individual wants to help others at a significant cost to him or herself (Batson & Shaw, 1991; Van Lange, 2008). The activation of empathy—a point at which the individual becomes less self-interested—leads to an increase in altruistic motivation, which ultimately leads to helping behavior (Staub & Vollhardt, 2008; Van Lange, 2008). Van Lange (2008) explained the occurrence of this phenomenon in terms of over-exposure. When another person is in distress or in need, the primary attention of an individual is diverted from the self and captured by the distressed person. Therefore, through repeated experiences, empathy can become associated with not only benefiting others but also with specific costs to the self. With this in mind, it is important to note that empathy activates an increase in altruistic motivation, but does not significantly affect one's selfishness/selflessness or egalitarian motives (Batson et al., 1995; Van Lange, 2008). Empathy, therefore, is an emotional state that results in a unique desire to help others at a cost to the self but without necessarily affecting personal motives.

Egoism

Humans are social creatures in thought and in action. However, when motivated by internal or external desires, we can become capable of caring only for ourselves (Batson,

1990). In essence, the egoist theory assumes that humans are motivated by an ultimate goal of either maintaining or enhancing self-image, and are not interested in the welfare of others (Batson, 1990; Staub & Vollhardt, 2008). Therefore, according to the theory, an individual's ultimate goal is always a subtle form of self-benefit (Batson & Shaw, 1991). Maner and Gailliot (2007) explained that circumstances leading an onlooker to experience empathic concern for another also elicit emotional states that remain focused on the self. After all, pain-processing areas within the brain have been found to be more widespread when an individual imagines himself or herself in a painful situation versus another person in the same painful situation. This denotes a shift of focus away from another person's needs and onto one's own feelings of stress and discomfort, concentrating on reducing aversive empathic arousal (Batson, 1990; Jackson et al., 2005). Also, a sense of perceived similarity could account for actions that appear to be driven by empathic concern. The theory behind the idea of perceived similarity is that a self-focused emotional state arises from a feeling of shared-self with the individual in need. Nevertheless, according to the egoist theory, one cannot be viewed as acting entirely selflessly (i.e., altruistically) when helping the individual because they would, in a psychological sense, also be helping themselves—therefore, acting egoistically (Batson, Lishner, Cook, & Sawyer, 2005; Maner & Gailliot, 2007). Overall, a person's prosocial acts consist of definitive objectives that concern only the self and consequently are manifested through egotistic motives.

The Empathy-Altruism Hypothesis

The empathy-altruism hypothesis views empathic concern as a situation-specific response in which an affective focus remains on the person in distress instead of on oneself. Therefore, in contrast to the egoist theory, the desire to assist an individual through an attempt to diminish their suffering is viewed as a truly selfless motive as it increases or strengthens one's drive to alleviate the other person's need (Batson et al., 1995; Bierhoff & Rohmann, 2004; Maner & Gailliot, 2007). However, an individual can also deduce the value of another person's wellbeing and respond accordingly (Batson et al., 1995).

Much like any other hypothesis, the empathy-altruism hypothesis has been disputed on the grounds of its origins and motivational foundation. First, there remains a possibility that prosocial actions may be motivated by more egoistic/self-centered concerns rather than altruistic intentions (Maner & Gailliot, 2007). As previously mentioned, researchers have argued that a sense of shared-self can, in fact, account for actions that are outwardly driven by an empathic concern through the unconscious perception that another person is part of one's own self (Batson et al., 1995; Maner & Gailliot, 2007). According to Batson (1990), the presence of helping behaviors when empathy is low indicates the presence of underlying egoistic motives. Bierhoff and Rohmann (2004) predicted that prosocial behavior would most likely occur within conditions where empathic concern overrode all other

variables (free of situational constraints) or where personal distress predominated with difficulty to psychologically escape the condition. When situational constraints were present and an opportunity to psychologically escape was deemed complex, an inclusive helping behavior was positively correlated with empathy, and a sense of accountability and fluctuating self-esteem were primarily dominated by one's egoistic motivations (Bierhoff & Rohmann, 2004; Staub & Vollhardt, 2008). Bierhoff and Rohmann (2004) had also predicted that those who experienced a great deal of personal distress but who had the opportunity to exit the situation would exert a minor degree of help because the ease of dismissing the situation from the mind would allow for one's own distress to be alleviated. Nevertheless, if an individual is altruistically motivated, then the helping behavior would not decrease, signifying that empathy is a good indicator of altruistic motives (Bierhoff & Rohmann, 2004). The primary concept behind the empathy-altruism hypothesis is based upon situation-specific responses. It is within these conditions that an observer who witnesses another person's troubles may become motivated to behave in an altruistic manner with the sole intention of reducing the other person's suffering (Bierhoff & Rohmann, 2004).

The significance of the empathy-altruism hypothesis tends to coincide with various theoretical explanations of helping behavior as well, including shared genetics (Allen et al., 2002; Batson, 1990; Thibodeau, Jorgensen, & Jonovich, 2008; Westbury & Neumann, 2008), relationship status (Allen et al., 2002; Maner & Gailliot, 2007; Staub & Vollhardt, 2008; Westbury & Neumann, 2008), and preferential biases. However, there is still uncertainty as to why people are empathic. The answer to this may not be directly related to earlier renowned notions of human behavior, but rather, in one's ability to interact and communicate with others.

Whom We Choose to Help and Why

Relationships and closeness. In comparison to distant social relationships, relationships that are generally close are commonly characterized by elevated levels of empathic concern and sincere affection for another's wellbeing. These characterizations are evident in everyday conversations as people choose what type of personal information to discuss dependent on who they are talking to. A conversation between two strangers, for example, will consist of fairly selfish objectives in order to maximize one's benefits to their costs (Maner & Gailliot, 2007). However, when an observer witnesses a person in distress who is similar to himself or herself, increased signs of physiological arousal and distress are displayed (Allen et al., 2002; Westbury & Neumann, 2008).

There are implications that helping in close personal relationships may possibly be stimulated by empathic concern and an actual desire to improve the welfare of another person, though these motives seem to dissipate as the relationship becomes more distant (Maner & Gailliot, 2007; O'Gorman,

Wilson, & Miller, 2005). An empirical study conducted by Maner and Gailliot (2007) assessed the relation between empathy and willingness to help a family member and a stranger; their findings revealed that the strength of the empathy-helping link was dependent on relationship context. Though, these findings can also be used to clarify the differences in egoistic and altruistic factors. By showing that meaningful forms of prosocial acts are more likely to be directed by empathic concern when taking place within a close relationship—despite the lack of evidence regarding empathic concern as a predictor to the willingness to aid a stranger—it can be concluded that only egoistic factors can predict an individual's inclination to help. In other words, prosocial acts among strangers may look as if they are altruistically driven but they are in actuality driven by more self-centered concerns, while prosocial acts within a close relationship appear to be driven by genuine empathic regard (Maner & Gailliot, 2007; Staub & Vollhardt, 2008).

Empathy/prosocial behaviors and genetic closeness. Empathic responding is extended from human to human, often varying in intensity, and can be generalized towards other species as well (Westbury & Neumann, 2008). However, individuals who have a lower empathy trait may not experience stimuli in the same manner as individuals who contain a moderate or high empathy trait (Westbury & Neumann, 2008). This response is reflected in the empathy-altruism hypothesis, in which behavior serves as a function of emotional responsiveness (Batson et al., 1995). In this sense, the more empathy that an individual feels for another will largely predict the degree of altruistic motivation present within the given prosocial act. However, it is important to note that one's empathic concern does not denote a 'help' vs. 'not-help' state of mind, but rather refers to the extent to which motivation is considered altruistic or egoistic (Bierhoff & Rohmann, 2004).

Movement of the corrugator supercilii, a small muscle located near the middle of the eyebrow, is often regarded as the principal muscle in the expression of suffering and can be equated to one's level of empathic emotion (Westbury & Neumann, 2008). A distinguishing feature of this muscle is to lead observers to detect a direct relationship between acknowledgement of distress and genetic relatedness, such that we can correctly interpret the expressions of others who appear more similar to ourselves—solely based on another's movement of their corrugator supercilii muscle (Maner & Gailliot, 2007; O'Gorman et al., 2005).

Evolutionarily speaking, it is likely that species have either evolved to react empathically to distress calls or have evolved the distress calls that are effective at eliciting an empathetic response from others (Allen et al., 2002; Batson, 1990; Westbury & Neumann, 2008). Of all the communication channels that can be used to elicit an empathetic response, it would seem as if visual and auditory cues would be the most likely to be effective at a distance (Batson et al., 2005). However, if the latter were more accurate, an evolutionary push to develop auditory distress

calls over visual cues would exist. After all, those who are most likely to help and are in proximity of the individual in need would be more likely to hear a distress call than to see the distress cues. Yet, most research regarding empathy has been based on still pictures or silent video.

If an individual does experience an empathic response to non-verbal vocal communication with no corresponding visual stimuli, an indication toward one's capacity to interpret signals that help is needed overrides the genetic variable. In other words, the ability to interpret empathic emotion may be primarily due to another's ability to effectively communicate their distress to other individuals. It is hypothesized that the highest amount of empathy will be elicited when an individual can see and hear another individual in distress. However, when an individual can only hear the distress of another they will experience slightly less empathy, and when an individual can only see the distress of another they will experience the least amount of empathy.

Method

Participants

Data was collected from 81 undergraduate students (25 men, 56 women) attending the State University of New York (SUNY) at Potsdam. The current sample was chosen through a sign-up sheet that ascribed three time periods, each on different days, for participation in the experiment. Participation in the experiment was voluntary. All participants were students enrolled in a psychology course and were compensated for their participation through the award of extra credit in one psychology class. Participants ranged in age from 18 to 42 years ($M = 21.20$ years, $SD = 4.64$), and two participants (2.5%) reported having children of their own. It should be noted that a sample consisting of an equal number of parents and non-parents might be more likely to produce generalizable results because empathic reactions may be strongly related to one's personal experiences and the situation-specific components of the applied stimuli. According to the SUNY Potsdam class standings, the participants' year in school varied from freshmen status to senior status. Demographically, the sample was composed of 79 Caucasian students (97.5%) and two African American students (2.5%).

Measures

Each participant was given a demographic questionnaire that asked about age, gender, year in school, the major of the individual, and whether the participant had children of his or her own. Trait empathy was measured by using the Balanced Emotional Empathy Scale (BEES; Mehrabian, 2000). The BEES consists of a 30-item self-report scale of empathy wherein each item is be rated on a 9-point scale, ranging from –4 (very strong disagreement) to +4 (very strong agreement). Sample items include, "I cannot feel much sorrow for those who are responsible for their own misery" and "I am deeply moved when I observe strangers who are struggling to survive." The internal consistency of the BEES is .87 with a

coefficient alpha value of .85 and a test-retest reliability coefficient of .79. Furthermore, the high correlation (+.77) that the scale holds with the original Emotional Empathic Tendency Scale (EETS; Mehrabian & Epstein, 1972) suggests that the BEES is a valid measure of empathy. Further studies by Mehrabian, Young, and Sato (1988), as well as various literature reviews (e.g., Chlopan, McCain, Carbonell, & Hagen, 1985), have supported its validity and have identified various tendencies of high-empathy individuals compared to low-empathy individuals (e.g., Macaskill, Maltby, & Day, 2002; Mehrabian, 2000; Singer et al., 2004).

The empathy-eliciting stimuli consisted of one 28.6-second video clip of an infant child in a distressing situation (crying in a crib, unattended). Each group of participants viewed the same video clip. However, one group of participants was presented with the original video format (audio and visual); a second group of participants was presented with a black screen (they only heard the audio of the clip); and a third group was presented with a soundless version of the video clip. Likert scales, ranging from -4 (*very strong disagreement*) to +4 (*very strong agreement*), were used to measure the participants' emotional states—degree of distress, participants upset response, and willingness to help—following the stimuli presentation.

Procedure

The participants met in a specified classroom on the SUNY Potsdam campus. All participants completed a consent form and were provided with a packet of papers—they were instructed to complete the first three pages of the packet without going onto or looking at the fourth page. The first page of the packet was a brief questionnaire that consisted of demographic information; the second and third pages of the packet included the 30 statements of the BEES scale. Each participant's responses to the BEES provided the data used to interpret one's empathic trait level (see Mehrabian, 2000).

Upon completion of the BEES, each group was presented with the stimulus-type that corresponded with their designated group. The stimulus chosen for the present study was an infant child in distress. The characteristics of the child (e.g., age and gender, intensity of crying, facial/body mannerisms, etc.) and the child's immediate surroundings (e.g., no people, absence of aid/comfort, etc.) provided the assumption that he or she was upset and in a state of distress. However, a pilot study was not conducted to determine the accuracy of this statement. The first group of participants ($n = 29$) was presented with the original clip of an infant child in a distressing situation (audio/visual), the second group ($n = 28$) was presented with the audio-version of the infant, and the third group ($n = 24$) was presented with the visual footage (absence of sound) of the infant. Thus, the experiment utilized a between-group research design wherein participants were randomly assigned to different groups and exposed to different levels of audiovisual stimuli. Participants were exposed to the audiovisual stimuli in a group-setting format.

After each stimulus presentation, the participants were asked to turn to the last page of the packet and use the 9-point Likert-type scales to rate their present emotional state. Participants were debriefed after they completed the Likert-type scales.

Statistical Analysis

All statistical analyses were calculated using SPSS 20.0. The hypothesis tested whether participants' emotional states are affected by the quantity and quality of sensory information received from a stimulus. More precisely, the greatest emotional response was expected to come from the audiovisual presentation, followed by the audio presentation, and finally, the visual presentation. Given that the present study included male and female participants, additional statistical tests were conducted in order to account for potential gender-based differences. A chi-square test analyzed the relationship between gender and empathy level using a critical alpha value of .05.

Comparisons among gender, empathy level, and stimuli presentation were examined using a multivariate analysis of variance (MANOVA). The significant main effects were assessed using a two-way analysis of variance (ANOVA) on each dependent variable (level of distress, upset response to the stimuli and willingness to help); alpha values were set at .016 so as to control for family-wise error (see Benjamin & Hochberg, 1995). The simple main effects of empathy level and stimuli presentation were examined as well; alpha values were set at .010 and .016, respectively, to control for family-wise error (Benjamin & Hochberg, 1995). The analyses of simple main effects addressed the potential differences in response based on the empathic trait composition of each group as well as any differences based on the stimuli presentation for each empathy level. Pairwise comparisons were examined, with alpha set at .003, when the simple main effects were significant.

Results

A chi-square (χ^2) test was used to examine the relationship between gender and empathy level. Empathy levels, as measured by the BEES, were examined as categorical variables throughout the experiment. Results revealed an association between one's gender and empathy level, $\chi^2(4, N = 81) = 19.40$, $p = .001$. Specifically, 60% of the individuals who scored a "very below average" empathy level were male, while only 40% were female. Furthermore, 48% of the participants with "below average" empathy scores were male and 17.4% of the "above average" empathy scores were found in males. The "average" and "very above average" empathy levels were 100% female. The Cramer's V calculated a moderate effect size of .489.

A MANOVA was used to assess the effects of gender, stimuli presentation, and empathic trait level on participants' behavior (distress, upset, and helping responses). Using Wilks' criterion (λ) as the omnibus test statistic, the combined dependent variables resulted in significant main effects for empathy level, $F(12, 148) = 2.87$, $p = .001$, partial $\eta^2 = .168$. The main effects of stimuli presentation, $F(6, 112) = 1.97$, $p = .076$, partial $\eta^2 = .095$, and gender, $F(3, 56) = 0.26$, $p = .851$, partial $\eta^2 = .014$, were not significant. Furthermore, neither the interaction between empathy level and stimuli presentation, $F(24, 163) = 0.70$, $p = .848$, partial $\eta^2 = .090$; empathy level and gender, $F(6, 112) = 1.30$, $p = .262$, partial $\eta^2 = .065$; nor stimuli presentation and gender, $F(6, 112) = 0.55$, $p = .768$, partial $\eta^2 = .029$ were statistically significant. MANOVA results also failed to indicate a significant Empathy Level x Stimuli Presentation x Gender interaction effect, $F(9, 136) = 0.46$, $p = .898$, partial $\eta^2 = .024$.

For each of the statistically significantly multivariate effects, follow-up ANOVAs were conducted so as to further examine the univariate effects. Though the main effects of stimuli presentation were found to be nonsignificant, they are nevertheless important to the present study and therefore will be described in further detail. The only ANOVA that was relevant to the analysis was that which corresponded to the significant main effect of empathy level. The results indicated a significant main effect for empathy level on distress, $F(4, 58) = 5.28$, $p = .001$, partial $\eta^2 = .267$; upset response, $F(4, 58) = 5.37$, $p = .001$, partial $\eta^2 = .270$; and helping behaviors, $F(4, 58) = 8.50$, $p = .000$, partial $\eta^2 = .370$. The means and standard deviations of empathy level are shown in Table 1; the main effects of empathy level are shown in Figure 1. ANOVA results failed to indicate a
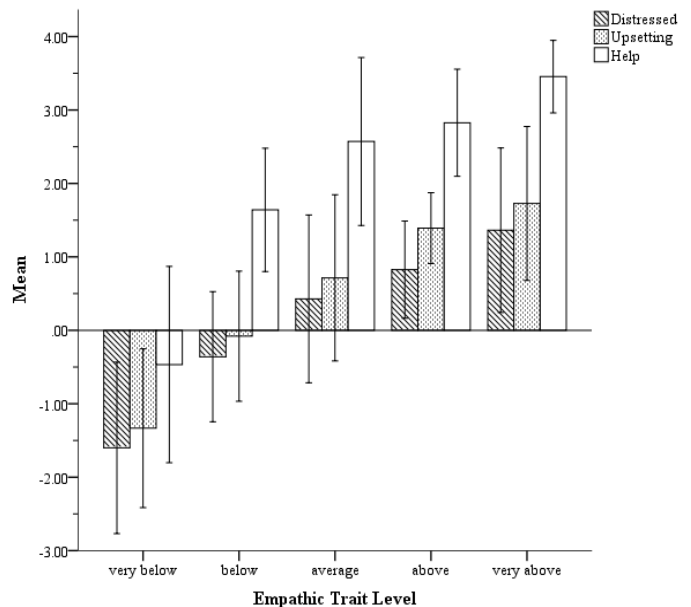

Figure 1. Mean proportional response of subjective distress, upset, and helping response as a function of empathic trait level. Error bars show the mean plus or minus two standard deviations, indicating diversity in response. Empathic Trait Levels are based on the "Percentile Scores and Z-Score Equivalents" in the *Manual for the Balanced Emotional Empathy Scale* (Mehrabian, 2000).

Table 1

Means, Standard Deviations, and ANOVA Results for Effects of Empathy Level on Behavior

	Empathy Level					$F(4, 76)$	Partial η^2
	Very Below Average	Below Average	Average	Above Average	Very Above Average		
Distress	-1.600_a (2.261)	-0.360_a (2.215)	0.429_a (1.512)	0.826_a (1.586)	1.364_a (1.859)	5.116*	.212
Upset	-1.333_a (2.093)	0.080_a (2.216)	0.714_a (1.496)	1.391_b (1.158)	1.727_b (1.737)	7.040**	.057
Helping	-0.467_a (2.588)	1.640_b (2.099)	2.571_b (1.512)	2.826_b (1.749)	3.455_b (0.820)	8.940**	.320

Note. Standard deviations appear in parentheses below means. Means with differing subscripts within rows are significantly different at the *p* < .05 based on Bonferroni's post hoc paired comparisons. Empathic Trait Levels are based on the "Percentile Scores and z Score Equivalents" in the *Manual for the Balanced Emotional Empathy Scale* (Mehrabian, 2000).
*p < .05** *p* < .001.

significant main effect of stimuli presentation on participants' distress, $F(2, 78) = 2.21$, $p = .116$, partial $\eta^2 = .054$; upset response, $F(2, 78) = 0.32$, $p = .725$, partial $\eta^2 = .008$; or helping reaction, $F(2, 78) = 0.07$ $p = .935$, partial $\eta^2 = .270$, partial $\eta^2 = .002$. The differences in participants' responses, based on stimuli presentation, are shown in Figure 2.

In addition, the simple main effects of empathy level and the simple main effects of stimuli presentation were assessed for each of the responses. An analysis of the differences among the five empathy levels at each level of stimuli presentation (audiovisual, audio, visual)—the simple main

effects of empathy—resulted in significant empathy effects for the audio and visual participants' distress reaction, $F(4, 66) = 2.86$, $p = .030$ and $F(4, 66) = 5.20$, $p = .001$, respectively. There were no empathy effects for the audiovisual group's distress reaction, $F(4, 66) = 0.96$, $p = .437$. There were also significant empathy effects for the participants in the audio and visual groups with regard to how upset they felt following the stimuli presentation, $F(4, 66) = 4.08$, $p = .005$ and $F(4, 66) = 3.54$, $p = .011$, and their willingness to help the distressed individual, $F(4, 66) = 5.60$, $p = .001$ and $F(4, 66) = 4.52$, $p = .003$, respectively. However, empathy effects were insignificant for the audiovisual group's upset response, $F(4, 66) = 1.22$, $p = .354$, and helping response, $F(4, 66) = 1.38$, $p = .251$.

Statistical measures were taken so as to control for family-wise error ($\alpha = .016$), which altered the significance of the audio group's distress levels. An analysis of the simple main effects of stimuli presentation at each empathy level also revealed significant differences within the participants' responses. For one, participants with "very below average" and "below average" empathy levels experienced greater distress reactions following the stimuli presentation, $F(2, 66) = 4.00$, $p = .023$ and $F(2, 66) = 3.83$, $p = .027$, respectively. However, there were no stimuli presentation effects for the "average," $F(2, 66) = 0.44$, $p = .645$, "very above average," $F(2, 66) = 0.93$, $p = .398$, or "very above average," $F(2, 66) = 0.27$, $p = .762$, participants' distress reaction. There was also a significant presentation effect for "very above average" participants' helping response, $F(2, 66) = 3.38$, $p = .040$; those rated as "below average," "average," "above average," and "very above average" were not affected. Lastly, regardless of one's empathy level, the stimuli presentation had no effect on participants' upset response. However, no simple main effects of stimuli presentation remained after controlling for family-wise error ($\alpha = .010$).
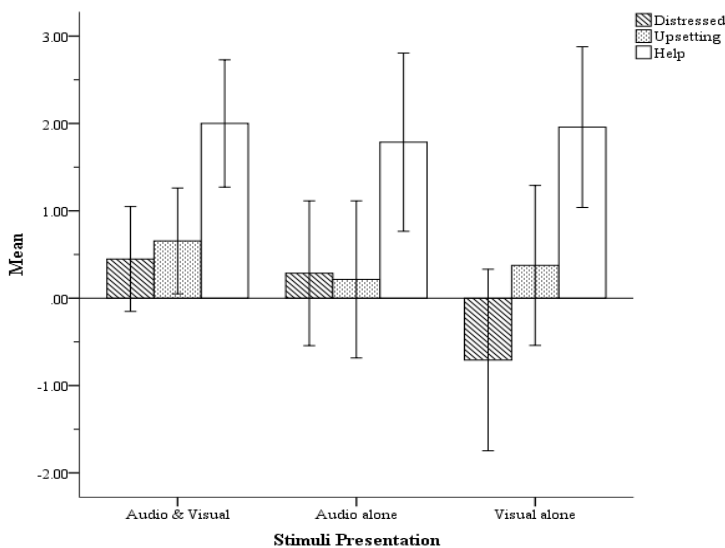

Figure 2. Mean proportional response of subjective distress, upset, and helping response as a function of stimuli presentation. Error bars represent +/- 2 SE.

Additional *posteriori* contrast analyses (i.e., pairwise comparisons) were used to further evaluate the differences in the response ratings based on the stimuli presentation and empathy levels. While no significant comparisons were yielded in the audiovisual group, many significant associations did appear regarding participants' empathy levels and their responses to the audio and visual presentations. The results indicated a direct relationship between response and empathy level; as expected, the greatest responses were typically from participants with "very above average" empathy scores and the weakest responses generally came from participants with "very below average" empathy scores (see Figure 3).
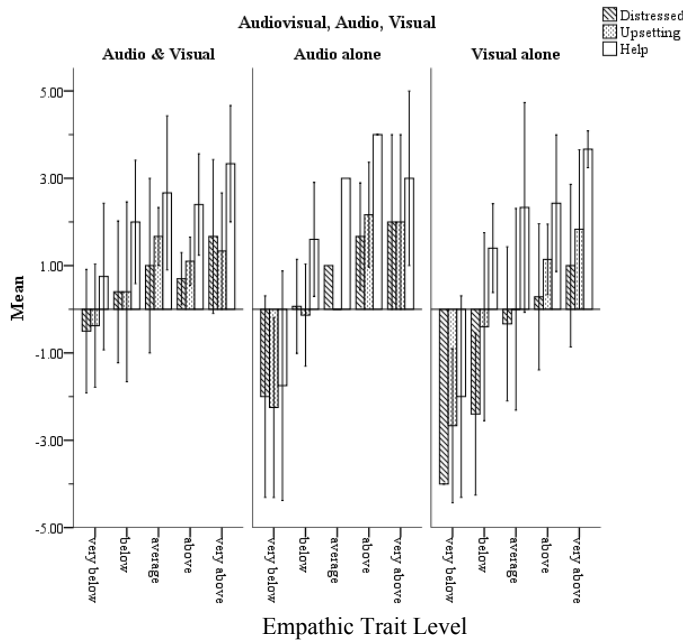

Figure 3. Mean proportional response of subjective distress, upset, and helping response as a function of empathic trait level and stimuli presentation. Error bars represent +/- 2 SE. Empathic Trait Levels are based on the "Percentile Scores and *z* Score Equivalents" in the *Manual for the Balanced Emotional Empathy Scale* (Mehrabian, 2000).

Discussion

The present study examined the role that the presentation of stimuli plays in an individual's empathic response and drew upon previous research (e.g., Batson, 2005; Van Lange, 2008) in an attempt to provide a stimulus presentation that would elicit an appropriate empathic emotion. Batson and colleagues (2005), for instance, acknowledged that only two conditions are crucial in evoking such concern: first, the target should be perceived as needing care and protection, and second, the empathizer should value the target's well-being. Based on a situation-specific response, empathic concern is affiliated with an emotional focus on an individual who is in distress rather than on oneself, endorsing a truly unselfish

desire to provide help (Bierhoff & Rohmann, 2004; Maner & Gailliot, 2007). According to Batson and colleagues (1995), the empathic response operates according to a 'motivation function,' either intensifying or amplifying one's motivation to alleviate another person's suffering. However, the desire to alleviate suffering is also related to one's perception of another's well-being, or the degree to which one values another person's welfare. The perception of well-being is, after all, influenced by the information that is available to the individual (Batson et al., 1995). However, Van Lange (2008) suggests that an individual's empathy level also influences the likelihood that he or she will assist a distressed individual. In other words, regardless of situational components that may reduce one's own stress and anxiety (i.e., exiting the situation), highly empathic people tend to report a greater need to help others who are in a state of distress. The current study addressed Batson et al.'s (1995) concepts of motivation and information availability in the production of empathic responses as well as Van Lange's (2008) notion wherein empathic level affects one's willingness to help.

As hypothesized, the greatest amount of empathy was elicited when an individual could see and hear another individual in distress, slightly less empathy was elicited when an individual could only hear another individual in distress, and the least amount of empathy was elicited when an individual could only see another individual in distress. Participant empathy was assessed through a composite of subjective levels of distress, how upset the participant felt, and the participant's willingness to help following the stimulus presentation. The compiled results suggest that the stimuli presentation significantly affected individuals' level of distress, but did not significantly affect how upset they felt after the presentation or their willingness to help. Participants' baseline empathy levels were, on the other hand, predictive of perceived distress, an upset response, and a willingness to help the distressed individual. Nevertheless, the interaction between stimuli presentation and empathy level remained insignificant regarding participants' reactions to the stimuli. However, it should be noted that a significant reaction to the stimuli presentation was received from the least empathic participants (those with baseline empathy levels rated as "very below average").

The present study showed that empathic responses are most viable when an individual can see and hear the eliciting target. When visual cues are the only source of information, an individual is left with an ambiguous and incomplete framework to interpret the situation; however, auditory cues contain a more definite and clear-cut outlook of the situation. However, individuals' empathic traits will also elicit different responses to distressing stimuli, regardless of stimuli presentation. Based on this line of reasoning, one would expect individuals with "very above average" and "very below average" empathy scores to have the strongest and weakest, respectively, reactions to stimuli. However, the greatest difference in response ratings, based on stimuli presentation, came from participants with "very below

average" or "below average" empathy scores—an unanticipated, yet noteworthy, finding.

There were a number of limitations to the current study. First and foremost, all of the participants were undergraduate college students at a public university. Second, the study was primarily composed of psychology students or, more specifically, students enrolled in a psychology course. These factors alone constrain the generalizability of results due to similarities in age, study, education level, and ethnic/cultural diversities. In addition, nearly all of the participants in the current study reported that they did not have any children of their own. The presence of children could have, in theory, altered an individual's response to the audio-visual stimuli by enhancing or decreasing their general affect. Based on these limitations, it is possible that the sample composition could have provided skewed results. Therefore, one could hypothesize that the empathic traits of the aforementioned subjects are not representative of those in the general population.

Lastly, neither the footage of the infant child used as empathy-eliciting stimuli nor the 7-point Likert scale used to measure the participants' willingness to help were empirically validated instruments. Pilot studies would have provided greater certainty in the stimuli's ability to bring about empathic responses while an empirically-based scale, with internal and external validities, would have provided greater certainty and confidence in participants' responses.

The current study could be extended in a variety of ways. Though the current study addressed the functions that could influence one's empathic response (see Allen et al., 2002; Batson et al., 2005; Westbury & Neumann, 2008), it did not test the differences in responses due to human-animal similarities. The results of the present study could be further generalized if participants were also subjected to videos of animals with varying degrees of relatedness to humans (e.g., apes, bears, and goats). This addition would help in concluding whether the genetic hypothesis plays a role in eliciting empathic emotions. One may also be able to interpret a relationship between genetic similarity and effective communication styles by continuing to subject the participants to the different presentation styles (audiovisual, audio, and visual).

Furthermore, studies have shown that some people will assist others in distress based on altruistic motivations while other people base their assistance on egoistic desires (Batson, 1990; Batson et al., 1995; Jackson et al., 2005; Van Lange, 2008). In other words, people help others in one of two ways: with an unselfish regard for one's own welfare, or with the intent to fulfill a self-beneficial goal. It would be interesting to determine whether individuals with "very below average" or "below average" empathy levels are more likely to help a distressed individual, based on egoistic means, than their counterparts. In relation, one wonders whether individuals with "very above average" or "above average" empathy levels would base their assistance on more altruistic motives. If this connection were made, evidence could be offered for both egoistic and altruistic motives, indicating differential

processing of information and situations based on one's empathic traits.

The existing research on empathy lacks information detailing the effects of stimuli presentation, leaving future research open to incorporate the effects of presentation modes and methods, among other variables, on an individual's reaction. The results of this study have therefore provided a preliminary look into the association between empathy level, information availability (based on audiovisual presentations), and elicited empathic responses. Scientific exploration into the unconscious motivators that significantly influence the individual will provide further insight into why and how humans react to particular situations.

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