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Medical students' empathy positively predicts charitable donation behavior

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Abstract

Empathy is known to motivate prosocial behavior. This relationship, however is complex and influenced by the social context and the type of prosocial behavior. Additionally, empathy is a complex psychological capacity, making it important to examine how different components of empathy influence different prosocial behaviors. The current study uses a unique longitudinal sample to assess how changes in cognitive and affective components of empathy relate to charitable giving. Measures of empathy were collected from medical students in the fall and spring of students' first three years of medical school. After this time, students had the opportunity to donate to charity. Positive changes in students' cognitive empathy predicted their charitable giving, with students who demonstrated greater increases in cognitive empathy giving more money. This study points to an important role for cognitive empathy in certain prosocial behaviors, and suggests that long term changes in empathy influence individual differences in prosocial behavior.

Keywords

charitable giving; prosocial behavior; empathy; medical school

Introduction

The role of empathy, or the ability to perceive and understand the emotional states of others (Decety, 2015), in motivating a variety of prosocial behaviors is a question that has long been of interest in behavioral sciences (Batson & Powell, 2003) and more recently in behavioral neuroscience (Decety, Bartal, Uzevovsky, & Knafo-Noam, 2016). However, there is continued debate on whether empathy is important in motivating prosocial behaviors (Paulus, 2018; Zahavi & Rochat, 2015). Prosocial behaviors refer to a wide range of behaviors aimed at benefitting another, including helping, comforting, sharing, and cooperating (Batson & Powell, 2003; Davidov, Vaish, Knafo-Noam, & Hastings, 2016). There is solid empirical evidence demonstrating a critical role of empathy in motivating certain forms of prosocial behavior, in particular helping and comforting (Batson & Powell, 2003; Decety & Jackson, 2004; Eisenberg, Eggum, & Di Giunta, 2010). Indeed, empathy

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has been related prosocial behaviors in children (Decety, Meidenbauer, & Cowell, 2017) and adults (Sze, Gyurak, Goodkind, & Levenson, 2012), as well as in some non-human animals (Bartal et al., 2016). However, there is a growing literature suggesting that the relationship between empathy and prosocial behaviors is more complex than has previously been proposed, and that empathy does not necessarily lead to prosociality (Davidov et al., 2016; Paulus, 2018). Findings linking empathy to prosocial behaviors differ based on how empathy and prosocial behaviors are measured (Paulus, 2018), the context in which the relationship is assessed (Maner & Gailliot, 2007), as well as a variety of individual level factors, including gender (Mesch, Brown, Moore, & Hayat, 2011), early experiences with stress (Lim & DeSteno, 2016), and cognitive performance (Böckler, Tusche, & Singer, 2016).

One potential explanation for these varying findings is that the term prosocial behaviors represents a broad overarching category encompassing a wide range of different behaviors that are likely motivated by multiple and different proximate mechanisms (Davidov et al., 2016; Decety et al., 2016). Indeed, not all prosocial behaviors are related, with many demonstrating only weak or non-significant correlations, suggesting prosocial behavior should not be treated as a simple global construct (Cowell et al., 2017; Decety et al., 2016). Some forms of prosocial behavior are thought to be motivated by empathy (e.g. helping and comforting), while others are not necessarily associated with empathy (e.g. sharing) (Cowell & Decety, 2015). Additionally, even within subtypes of prosocial behavior often linked to empathy, such as helping or sharing, these behaviors are likely to be multiply motivated, and are not always the result of the same combination of psychological processes across individuals (Tomasello & Vaish, 2013). Indeed, generosity, a type of helping behavior that constitutes giving to others at a cost to oneself (Gray, Ward, & Norton, 2014), has been evidenced to be motivated by a variety of differing and competing processes, including guilt, preserving a positive image eliciting positive reciprocity, or avoiding potential punishment (for review see: Chierchia & Singer, 2017). Some researchers have gone as far to argue that empathy in of itself is not sufficient to motivate prosocial behaviors, including helping and comforting (Bekkers & Wiepking, 2011; Davidov et al., 2016). Overall, this suggests a need for continued research examining whether empathy motivates prosocial behaviors, and if it does, which types of prosocial behaviors and under what conditions.

One prosocial behavior that has been of interest to researchers is that of charitable giving (Bekkers & Ottoni-Wilhelm, 2016). Charitable giving is a form of generosity (Gray et al., 2014), and individual differences in empathy have been linked to variation in charitable giving (Sze et al., 2012; Verhaert & Van den Poel, 2011). However, other work has found little or no link between empathy and charitable giving (Bekkers, 2010; Davis, Hall, & Meyer, 2003; Einolf, 2008), or found that these relationships vary based on factors such as gender and guilt (Mesch et al., 2011; Roberts, Strayer, & Denham, 2014). Additionally there is conflicting research on which components of empathy are most important in motivating charitable giving (Kim & Kou, 2014; Marjanovic, Struthers, & Greenglass, 2012; Tusche, Bockler, Kanske, Trautwein, & Singer, 2016). Empathy is a multifaceted psychological construct, composed of a variety of interacting processes and representations, making it important to examine the unique effects of these component processes on individual's social behaviors (Decety, 2015). Empathy consists of both cognitive and affective components, with cognitive empathy primarily referring to an individual's ability to understand another's

emotions and affective empathy primarily referring to the sharing of others' emotions and caring for another's welfare (Decety, 2015). Affective empathy has been argued to primarily motivate prosocial behaviors, especially helping (Batson & Powell, 2003). However, there is still debate about the mechanisms through which affective empathy may motivate prosocial behaviors (Decety & Lamm, 2009). Some research has demonstrated an important role of affect sharing, or vicariously taking on and resonating with the emotional state of another (Decety & Svetlova, 2012; Zaki & Ochsner, 2012), in supporting prosocial behaviors (Hein, Lamm, Brodbeck, & Singer, 2011; Tomova et al., 2017), while other work suggests that it is the ability to feel concern for another's well-being, often referred to as empathic concern (Smith, Porges, Norman, Connelly, & Decety, 2014), rather than sharing of another's emotional state, that is important in producing giving behaviors (FeldmanHall, Dalgleish, Evans, & Mobbs, 2015; Shdo et al., 2016). Additionally, recent work examining the relationships of both aspects of cognitive and affective empathy in concert, suggest that cognitive empathy may also play a role in motivating charitable giving (Kim & Kou, 2014; Marjanovic et al., 2012; Tusche et al., 2016). These observed relationships are likely a result of the fact that, while the different components of empathy have somewhat separable effects, they are also intertwined and not independent of each other (Decety, 2015). Given this, it is probable that they work together to motivate charitable giving and other prosocial behaviors. Indeed, research suggests that individuals differentially recruit neural processes related to affective and cognitive components of empathy when making donation decisions, and these processes together predict charitable donation behavior (Tusche et al., 2016). This indicates a need for further research assessing how affective and cognitive collectively predict charitable donation behaviors.

Lastly, empathy is often characterized as a relatively stable dispositional trait (Singer & Lamm, 2009). However, a growing body of work suggests empathy can be influenced age (Bailey, Brady, Ebner, & Ruffman, 2018) and context (Konrath, O'Brien, & Hsing, 2011). Despite this, there has been little longitudinal work examining how contextual driven changes in empathy over time are associated charitable giving (Prot et al., 2014). One area where longitudinal changes in empathy over time has been examined extensively is the growing body of research suggesting empathy changes over the course of medical school (Decety, Smith, Norman, & Halpern, 2014; Neumann et al., 2011). This literature offers the opportunity to examine how longitudinal changes in empathy in medical students relate to their charitable giving behavior, the influences of both cognitive and affective components of empathy to charitable giving, and which observed changes in empathy during medical school have implications for students' behaviors. Examining the relationship between empathy and charitable giving in the medical context is additionally of interest as medical school and medicine represent an environment where students and physicians are consistently exposed to high stress situations (Cheng, Chen, & Decety, 2017), and there is recent work suggesting that experiences of stress modulate the relationships of empathy and charitable giving (Buchanan & Preston, 2014; Tomova et al., 2017).

The current study utilized a unique data set, where measures of empathy and prosocial behavior were collected at regular intervals from medical students over the course of the first three years of medical school to examine whether changes in medical students' self-reported empathy predict their willingness to make a charitable donation. Students' self-reported

empathy was assessed in the fall and spring of each academic year during their first three years of medical school. At the end of this time, students were asked if they were willing to donate money to a well-known charity as a measure of their prosocial behavior. We then assessed whether individual differences in changes in students' empathy predicted how much money they donated to charity. Based on the previous literature linking empathy to charitable behavior, we expected that positive changes in both cognitive and affective empathy would be positively associated with donating more money to charity.

Materials and Methods

Participants

This study was part of a larger longitudinal project conducted in the greater Chicago area examining changes in students' empathy over the course of medical school which has been described elsewhere (Smith, Norman, & Decety, 2017). Study participants were 110 students, ages 21 to 33 years at start of medical school ($n = 57$ (51.9%) female) who had complete data survey and behavioral data for the last data collection time point (Spring of third year of medical school; for full attrition information see: Smith et al., 2017). Of these students, 16 (14.5%) identified as Asian or Asian American, 8 (7.3%) identified as Black or African American, 4 (3.6%) identified as Hispanic or Latino, 67 (60.9%) identified as non-Hispanic White, 14 (12.7%) identified as multiracial, and 1 (0.01%) identified as other. All participants gave written consent to participate at each appointment, and this study was approved by the *blinded* Institutional Review Board.

Procedure

Students attended appointments at the beginning and end of each academic year for their first three years of medical school (2012 – 2015) for a total of six appointments. At each appointment, students completed a set of online surveys and computerized tasks, assessing different components of empathy (see Smith et al., 2017). This study focuses on study measures assessing medical students' self-reported empathy and charitable donation behavior.

Survey Measures

Students' completed two questionnaires at each time point assessing changes in empathy over the course of their medical training. First, the Jefferson Scale of Physician Empathy – Student Version (JSE), developed to measure physician and medical student empathy specific to patient interactions (Hojat et al., 2009), widely used in much of the previous literature demonstrating declines in medical student empathy. The JSE is thought to assesses primarily cognitive aspects of clinical empathy (Hojat et al., 2009). However, it is unclear whether the JSE predicts patient perceived prosocial behaviors in medical students (Chen et al., 2010). Second, students also completed the Questionnaire of Cognitive and Affective Empathy (QCAE), which assesses overall cognitive and affective empathy in concert (Reniers, Corcoran, Drake, Shryane, & Völlm, 2011) (for further detail see Smith et al., 2017).

Prosocial Behavior Measure

At their last appointment, students were given the option to donate money from their \$60 subject payment (up to \$10 in dollar increments) to one of two charities (the Red Cross or the Inspiration Corporation). The amount of money students chose to donate was used as a measurement of their prosocial behavior. The majority of students who opted to donate an amount of money greater than 0 chose to donate to the Inspiration Corporation, a Chicago area based organization that provides programs for the homeless, (n = 42 of 50), and as such we did not look at differences between donation place.

Statistical Analyses

Descriptive statistics for all study variables are reported in Table 1. Correlations across all study variables for the current sample are reported in Table 2. To assess whether individual differences in changes in self-reported empathy affect prosocial behavior, a linear regression was run with donation amount (in dollars) as the outcome variable and change in QCAE cognitive and affective subscales and JSE total score as predictors. Change scores for predictors were calculated by subtracting scale score at the start of medical school from scale score at the end of students' third year in medical school (coinciding with end of study and collection of donation behavior), such that positive values represent greater positive change. While there are strong statistical methods available to analyze relationships between co-occurring repeated measures longitudinal data, these methods do not allow for examining relationships between a repeated measures predictor and single time-point outcome (Chen, Ferguson, Meeker, McElrath, & Mukherjee, 2015; Welten et al., 2018). Given there is still debate over which methods are best equipped for this type of data, chose to use the most parsimonious method, calculating change scores to examine how change over the course of medical school relates to students donation behavior. Given there have been reliable gender differences observed in empathy, and differential effects of empathy on charitable donation behavior by gender, it was included as a covariate. Additionally, given previously evidenced relationships between age and the predictor variables (Smith et al., 2017), age was incorporated as a predictor in the model. To this end, we ran four different models: 1) all predictors of interest; 2) all predictors of interest and gender; 3) all predictors of interest and age; and 4) all predictors of interest along with age and gender. Model fit was compared using the adjusted R^2 , which increases when the addition of a predictor improves the model above chance and decreases when the addition of a predictor improves the model less than expected by chance.

Given change in JSE scores were significantly associated with change in QCAE Cognitive scores ($r = 0.48$, $p < 0.001$) and changes in QCAE Cognitive scores were significantly associated with changes in QCAE Affective scores ($r = 0.27$, $p < 0.01$), all predictor variables were centered to reduce issues of collinearity (Raudenbush & Bryk, 2002). For all models, to ensure there were no problems of multicollinearity across the predictor variables, the variance inflation factor (VIF), which measures how much the estimated variance of the i th regression coefficient is increased above what it would be if equaled zero and provides a reasonable indication of the effects of multi-collinearity on the variance of each regression coefficient (Alin, 2010), was calculated.

Results

The model which best fit the data was that of Model 3: including predictors of interest and gender. There was a significant effect of change in the QCAE cognitive subscale on the amount of money students' donated ($\beta = 0.18$, $SE = 0.08$, $CI = [0.02, 0.34]$, $p < 0.05$; full model results reported in Table 3), such that students who had larger increases in cognitive empathy as assessed by the QCAE (0.5 sd above the mean) donated more money to charity (Figure 1). There were no significant effects of QCAE affective subscale score, JSE scores, or gender on students' donation amount (Table 3). The VIFs for this model were all < 2.00 (Table 3), indicating minimal issues with multicollinearity (Alin, 2010).

The model with no covariates, only primary predictors (change in QCAE Affective empathy, change in QCAE Cognitive empathy, change in JSE), demonstrated no significant effects on donation amount and had an adjusted $R^2 = 0.001$ (Table 4). Adding gender to the model improved the model fit ($R^2 = 0.04$; Table 3), and there was a significant effect of change in QCAE Cognitive scores on donation amount ($\beta = 0.18$, $SE = 0.08$, $CI = [0.02, 0.34]$, $p < 0.05$). Adding age to the model did not improve model fit ($R^2 = -0.02$; Table 5) and there were no significant effects of any of the predictor variables or age. Including both age and gender did not improve model fit beyond the model including only gender ($R^2 = 0.01$; Table 6), and the effect of change in QCAE Cognitive Empathy was no longer significant but still trending ($\beta = 0.16$, $SE = 0.09$, $CI = [-0.02, 0.35]$, $p < 0.10$).

Discussion

The current study takes advantage of a unique longitudinal data set, which includes measures of both empathy and prosocial behavior, to examine the relationship between longitudinal changes in both cognitive and affective empathy and charitable donation behavior in medical students. This work finds that changes in cognitive empathy during medical school influence students' charitable giving, with students who demonstrate greater increases in cognitive empathy being more willing to give money to charity. This work adds to the growing literature suggesting that aspects of cognitive empathy, along with affective, may play an role in motivating charitable donations (Marjanovic et al., 2012; Tusche et al., 2016). Additionally, this work provides evidence that long term changes in empathy over time have implications for individuals' helping behaviors.

Our finding that cognitive empathy, but not affective, is associated with charitable giving, is in contrast to some previous work, which suggests that affective empathy predominantly predicts charitable giving (Kim & Kou, 2014; Mesch et al., 2011; Ottoni Wilhelm & Bekkers, 2010). However, other recent work has found that cognitive and affective empathy act together to predict charitable donation behaviors (Marjanovic et al., 2012; Tusche et al., 2016). Indeed, cognitive and affective components of empathy do not act in isolation, but rather collectively motivate prosociality (Decety et al., 2017), making it important to continue examining them in parallel when attempting to understand how empathy, and changes in empathy, motivate charitable giving and other forms of prosocial behavior. It is also possible this finding stems from the specificity of the population and context being studied, which is in line with research suggesting that empathy's involvement in certain

prosocial behavior differs based on the population and context being studied (Böckler et al., 2016; Lim & DeSteno, 2016; Mesch et al., 2011). Not only do medical students tend to be higher income and more highly educated than the general population, factors which influence the likelihood of charitable giving (Yen, 2002), there is also evidence that medical students and physicians demonstrate higher levels of empathy than other populations (Handford, Lemon, Grimm, & Vollmer-Conna, 2013). It is possible that in populations with high empathy, cognitive empathy may be more susceptible to long term changes due to exposure to certain types of experience, and may be more important to motivating specific types of prosocial behaviors. Indeed, in the current population, we previously found that cognitive aspects of empathy on average demonstrated positive change while affective aspects remained stable (Smith et al., 2017).

Additionally, this study provides an initial step in linking empathy changes in medical school to medical students' behaviors. Empathy changes during medical school have been the target of a wealth of recent research, that finds somewhat conflicting results (Neumann et al., 2011) with some work finding decreases in students' empathy (Hojat et al., 2004, 2009) and some finding increases or no change (Costa, Magalhães, & Costa, 2013; Ferreira-Valente et al., 2016; Smith et al., 2017). Generally, this work assumes that the observed changes in empathy have implications for medical students' patient directed behaviors (Hojat et al., 2009; Neumann et al., 2011), yet this has not been directly tested (Chen et al., 2010; Handford et al., 2013). The current study takes an initial step in addressing this gap, finding that observed changes in cognitive empathy during medical school influence students' charitable giving, with students who demonstrate greater increases in cognitive empathy being more willing to give money to charity. This is especially important, as it is medical students' cognitive empathy that has previously been demonstrated to exhibited the most pronounced positive change during medical school (Smith et al., 2017).

One limitation of the current study is that it only examined students' charitable donation behavior at the end of the study time period, meaning we cannot assess how students' willingness to give to others changes over medical school and if any changes parallel those observed in cognitive components of empathy. It is possible that students who are more susceptible to changes in empathy are more willing to donate to others. However, when donation behavior was included as the predictor of empathy (cognitive and affective QCAE, and JSE), there were no significant relationships (see Table 7), which is consistent with the argument that it is changes in empathy that influence donation behaviors. Additionally, we chose to only collect charitable giving behavior at the end of the study as assessing donation behavior at multiple time points makes it difficult to determine whether any changes are due to changes in students' generosity or due to their previous giving behavior (i.e. students who already gave money may be less likely to give money again). This study is also somewhat limited by the fact that it utilized such a specific population, and the observed effects may not generalize to other populations. However, the advantage of using this population, was that we were able to examine changes over an extended period of time. Future work should continue to explore the relationships between longitudinal empathy changes and prosocial behavior across a range of contexts, to better understand how empathy influences behavior.

This work provides initial evidence of a relationship between long term changes in empathy and individuals' prosocial behaviors, and indicates a need for more research examining how different aspects of empathy contribute to prosocial behaviors in different populations and contexts. Additionally, this work indicates that cognitive empathy, along with affective empathy, plays an important role in certain prosocial behaviors, indicating a need for future work that incorporates measures of both cognitive and affective empathy, rather than focusing primarily on affective components. Given the continued debate about the role of empathy in prosocial behaviors (Chierchia & Singer, 2017; Zahavi & Rochat, 2015), future work should continue to examine the subtleties of the relationships between cognitive and affective components of empathy in prosocial behaviors, as well as explore how changes in empathy in other contexts relates to individual differences in prosocial behaviors, and examine whether these relationships are congruent across different populations and contexts.

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Figure 1:

The relationship between change in cognitive empathy and donation behavior. Change in Questionnaire of Cognitive and Affective Empathy (QCAE) cognitive empathy positively predicts the amount of money medical students are willing to donate ($\beta = 0.18$, $SE = 0.08$, $p < 0.05$), such that students who demonstrate greater increases in cognitive empathy during the first three years of medical school, donate more money to charity.

Table 1

Descriptive Statistics

		Average (SD)
Age		23.35 (1.86)
Change QCAE Affective		0.95 (6.21)
Change QCAE Cognitive		0.02 (4.72)
Change JSPE		-3.34 (9.84)
Donation		3.65 (4.43)
		Total (%)
Gender	Female	57 (51.9%)
	Male	53 (48.2%)
Race	Non-Hispanic White	67 (60.9%)
	Black/African American	8 (7.3%)
	Hispanic/Latino	4 (3.6%)
	Asian/Asian American	16 (14.5%)
	Multiracial	14 (12.7%)
	Other	1 (0.01%)

Table 2

Correlations between predictor variables

	Age	Gender	Donation	QCAE Change Cognitive	QCAE Change Affective	JSE Change
Gender	−0.15	-	0.13	−0.04	0.01	−0.06
Donation	−0.11	0.13	-	0.13	0.05	−0.03
QCAE Change Cognitive	−0.04	−0.04	0.13	-	0.27**	0.48***
QCAE Change Affective	−04*	0.01	0.05	0.27**	-	0.17 [†]
JSE Change	0.03	−0.06	−0.03	0.48***	0.17 [†]	-

Note: All predictor variables were mean centered.

[†] p < 0.10
* p < 0.05
** p < 0.01
*** p < 0.00

Table 3

Model effects from best fit model examining effects of changes in empathy components and gender on charitable donation amount

Predictor Variables	β (SE)	CI	VIF
Intercepts	3.63 *** (0.42)	[2.80, 4.45]	-
QCAE Cognitive Empathy (Change)	0.18 * (0.08)	[0.02, 0.34]	1.47
QCAE Affective Empathy (Change)	0.03 (0.10)	[-0.16, 0.22]	1.16
JSE (Change)	-0.08 (0.05)	[-0.19, 0.03]	1.67
Gender	1.16 (0.83)	[-0.49, 2.81]	1.01
QCAE Cognitive Empathy (Change) * Gender	-0.06 (0.16)	[-0.39, 0.26]	1.47
QCAE Affective Empathy (Change) * Gender	-0.37 † (0.20)	[-0.75, 0.002]	1.15
JSE (Change) * Gender	-0.05 (0.11)	[-0.26, 0.16]	1.68
Adjusted R^2	0.04		

Note: All predictor variables were mean centered.

†
p < 0.10

*
p < 0.05

**
p < 0.01

p < 0.001

Table 4

Model effects from regression examining effects of changes in empathy components on charitable donation amount no covariates

Predictor Variables	β (SE)	CI	VIF
Intercept	3.64*** (0.42)	[2.80, 4.48]	-
QCAE Cognitive Empathy (Change)	0.13 (0.08)	[-0.03, 0.29]	1.37
QCAE Affective Empathy (Change)	0.02 (0.10)	[-0.17, 0.20]	1.08
JSE (Change)	-0.06 (0.05)	[-0.15, 0.04]	1.30
Adjusted R^2	0.001		

Note: All predictor variables were mean centered.

$\dagger$
p < 0.10

*
p < 0.05

**
p < 0.01

p < 0.001

Table 5

Model effects from regression examining effects of changes in empathy components on charitable donation amount including age

Predictor Variables	β (SE)	CI	VIF
Intercept	3.72 *** (0.45)	[2.83, 4.60]	-
QCAE Cognitive Empathy (Change)	0.12 (0.09)	[-0.06, 0.30]	1.78
QCAE Affective Empathy (Change)	0.02 (0.10)	[-0.18, 0.22]	1.28
JSE (Change)	-0.05 (0.05)	[-0.15, 0.04]	1.37
Age	-0.13 (0.29)	[-0.70, 0.43]	1.55
Age * QCAE Cognitive Empathy (Change)	-0.0005 (0.07)	[-0.13, 0.13]	1.65
Age * QCAE Affective Empathy (Change)	0.03 (0.06)	[-0.08, 0.15]	1.68
Age * JSE (Change)	-0.02 (0.03)	[-0.08, 0.03]	1.42
Adjusted R^2	-0.02		

Note: All predictor variables were mean centered.

[†]
p < 0.10

*
p < 0.05

**
p < 0.01

p < 0.001

Table 6

Model effects from regression examining effects of changes in empathy components on charitable donation amount including age and gender

Predictor Variables	β (SE)	CI	VIF
Intercept	3.60 *** (0.44)	[2.7, 4.48]	-
QCAE Cognitive Empathy (Change)	0.16 $\dagger$ (0.09)	[-0.02, 0.35]	1.86
QCAE Affective Empathy (Change)	0.02 (0.10)	[-0.19, 0.23]	1.34
JSE (Change)	-0.07 (0.06)	[-0.19, 0.04]	1.70
Gender	1.02 (0.86)	[-0.69, 2.73]	1.05
Age	-0.17 (0.29)	[-0.75, 0.39]	1.60
Gender *QCAE Cognitive Empathy (Change)	-0.06 (0.17)	[-0.40, 0.27]	1.49
Gender *QCAE Affective Empathy (Change)	(-0.39) $\dagger$ (0.20)	[-0.80, 0.01]	1.29
Gender *JSE (Change)	-0.06 (0.11)	[-0.28, 0.16]	1.69
Age *QCAE Cognitive Empathy (Change)	-0.007 (0.07)	[-0.14, 0.12]	1.70
Age *QCAE Affective Empathy (Change)	-0.01 (0.06)	[-0.13, 0.11]	1.88
Age *JSE (Change)	-0.02 (0.03)	[-0.07, 0.04]	1.44
Adjusted R^2	0.01		

Note: All predictor variables were mean centered.

$\dagger$
p < 0.10

*
p < 0.05

**
p < 0.01

p < 0.001

Table 7:

Donation amount as a predictor of empathy changes

Outcome	β (SE)
QCAE Cognitive Empathy (Change)	0.18 (0.13)
QCAE Affective Empathy (Change)	0.05 (0.10)
JSE (Change)	-0.08 (0.21)

Note: Donation amount is not a significant predictor of changes during the first three years of medical school in any of the empathy measures.