



دائلو دکنده مقالات علمی  
freepaper.me paper

Michelle P. Martin-Raugh <sup>a,\*</sup>, Harrison J. Kell <sup>a</sup>, Stephan J. Motowidlo <sup>b</sup>

<sup>a</sup> Educational Testing Service, United States

<sup>b</sup> Rice University, United States

*Article history:*

Received 8 July 2015

Received in revised form 7 October 2015

Accepted 8 October 2015

Available online xxxx

**Keywords:**

Prosocial behavior

## Personality

### Emotional intelligence

### Situational judgment tests

## ABSTRACT

We present two studies that replicate and extend predictions made by implicit trait policy theory about the association between basic traits, knowledge, and behavior. Study 1 examined relations between personality traits, prosocial knowledge, and performance in a role-play casting participants ( $N = 102$ ) as a physician dealing with challenging interpersonal situations. Study 2 ( $N = 197$ ) replicated and extended these findings to include emotional intelligence (EI). In both studies, participants with higher prosocial knowledge scores behaved more prosocially. Mediation analyses suggest the relationship between individual differences, such as agreeableness and EI, and prosocial behavior is mediated by prosocial knowledge. Findings suggest basic traits influence prosocial behavior indirectly, through the acquisition of knowledge about how to behave in interpersonally challenging situations.

© 2015 Published by Elsevier Ltd.

## 1. Introduction

Prosocial behavior refers to “a broad category of acts that are defined by some significant segment of society and/or one’s social group as generally beneficial to other people” (Penner, Dovidio, Piliavin, & Schroeder, 2005, p. 2) and includes behaviors such as helping, sharing, donating, cooperating, and volunteering. Although prosocial behavior yields obvious benefits for the targets of these behaviors, both actors that carry out these behaviors and society as a whole can benefit from prosociality. For instance, gratitude from the recipients of prosocial acts can result in positive feelings about oneself and may garner support from others when one is in need (Caprara, Alessandri, & Eisenberg, 2012; Oman, Thoresen, & McMahon, 1999). Moreover, in the medical field, research indicates that physicians displaying warmth and enthusiasm to help obtain more favorable patient outcomes (Gryll & Katahn, 1978). Consequently, understanding the determinants of prosocial behavior is an important area of research because these behaviors can yield economic benefits and also serve to improve the overall well-being of society.

Much of the work on the individual difference determinants of prosocial behavior has examined the tendency to engage in prosocial behavior using self-report measures (e.g., [Caprara et al., 2012](#); [Carlo, Okun, Knight, & de Guzman, 2005](#)). We aim to expand on this existing work by proposing that individual differences affect prosocial behavior primarily through their effects on what we term *prosocial knowledge*, and examining prosocial behavior in a medical context directly via a laboratory simulation.

### 1.1. Prosocial behavior

Recently, there has been increased interest from the psychological research community in prosocial behavior both inside and outside of work, and in the positive effects of prosocial behavior on “the greater good” (cf. [García, Perry, Ellis, & Rineer, 2015](#)). For instance, “patient-centered approaches” common in the medical field emphasize the benefits physicians’ prosocial behavior have on patients and their well-being ([Brown, Parker, Furber, & Thomas, 2011](#)). The importance of prosocial behavior is especially salient in the field of medicine, where physicians’ levels of caring and compassion for patients and respect for patients are explicitly valued ([National Board of Medical Examiners, 2002](#)). Although much of what physicians do as caretakers is centered around technical behaviors such as correctly diagnosing and prescribing treatment for patients, physicians’ effectiveness in interacting personally with patients while delivering care is also important. Aspects of prosocial behavior are explicitly reflected in definitions of medical professionalism, as the [National Board of Medical Examiners \(2002\)](#) includes in its definition the expression of *Caring and Compassion* (e.g., treats the patient as an individual, taking into account lifestyle, beliefs, personal idiosyncrasies, support system; communicates bad news with sincerity and compassion) and *Respect* (e.g., respects patient’s rights and dignity; knocks on door; introduces self; drapes patients appropriately; shows respect for the patient’s privacy; demonstrates tolerance to a range of behaviors and beliefs). Consequently, in this investigation we plan to examine prosocial behavior and its antecedents in the context of interpersonal interactions between physicians and patients. Although we have chosen a specific context in which to couch our study, we expect that the pattern of relationships we observe

\* Corresponding author.

*E-mail address:* [mmartin-raugh@ets.org](mailto:mmartin-raugh@ets.org) (M.P. Martin-Raugh).

in this investigation will generalize to other contexts where prosocial behavior is important.

## 1.2. Knowledge about prosocial behavior

Previous research on the antecedents of prosocial behavior has highlighted the role of affect in predicting helping behavior, suggesting that people who *feel* better, do better (George & Brief, 1992). However, our goal is to demonstrate that cognition can also be a meaningful determinant of prosocial behavior, by positing that beliefs about the value of behaving prosocially are predictive of actual prosocial behavior. We contend people who believe prosocial behavior is “effective” are more likely to behave prosocially than people who do not believe prosocial behavior results in positive outcomes. Thus, we predict that people who *know* better (i.e., have greater prosocial knowledge) *do* better (i.e., are more likely to act prosocially).

Prosocial knowledge specifically refers to an individual's cognitions about how to behave in interpersonal encounters, rather than cognitions about technical facts and principles. Consequently, these cognitions can be considered a type of procedural knowledge (Motowidlo, Martin, & Crook, 2013; Schmitt & Chan, 2006). Further, the knowledge these cognitions comprise can be measured by evaluating the extent to which individuals are able to recognize the effectiveness of prosocial actions and the ineffectiveness of antisocial actions in interpersonal interactions (Motowidlo, Hooper, & Jackson, 2006). The effectiveness and ineffectiveness of the actions described is determined using the mean of effectiveness ratings made by subject matter experts in the domain being assessed (Motowidlo et al., 2013).

### 1.2.1. Assessment of knowledge about prosocial behavior

As a kind of procedural knowledge, prosocial knowledge is amenable to being measured by situational judgment tests (SJTs). Most commonly, SJTs consist of descriptions of difficult interpersonal situations, with each followed by a series of response options describing potential behavioral responses to the situations that differ in effectiveness (Wagner & Sternberg, 1985). Individuals who consistently choose options deemed more effective by experts earn higher scores and have more knowledge.

As an alternative to multiple-response SJTs, single-response SJTs may also be used to measure prosocial, procedural knowledge about the effectiveness of prosocial and antisocial actions. Short behavioral episodes can be gathered using the critical incident technique (Flanagan, 1954) and then edited for form and content to create the items that comprise the measure. Thus far, measures of prosocial knowledge constructed in this manner have successfully predicted prosocial behavior in the medical field. For instance, Kell, Motowidlo, Martin, Stotts, and Moreno (2014) found that prosocial knowledge measured with an SJT correlated .20 ( $p < .05$ ) with medical students' clinical skill in interacting with patients. Measures of prosocial knowledge have also been found to be predictive of American (Kell et al., 2014) and Indian (Ghosh, Motowidlo, & Nath, 2015) medical students' clinical performance.

Importantly, research on the predictive validity of measures of prosocial behavior constructed using critical incidents has revealed that personality traits do not account for incremental variance in the prediction of prosocial behavior beyond what is accounted for by prosocial knowledge (Crook et al., 2011; Motowidlo et al., 2013). The theoretical rationale for this finding is that personality traits influence prosocial behavior indirectly, through the acquisition of prosocial knowledge (Campbell, McCloy, Oppler, & Sager, 1993; Motowidlo et al., 2006). As distal antecedents of prosocial behavior, the influence of basic traits (Costa & McCrae, 1992) is mediated by beliefs about the effectiveness of that behavior. The studies reported here aim to replicate these findings in regard to personality traits and extend this prior work by also exploring the role of emotional intelligence (EI) as an antecedent of prosocial knowledge and behavior.

## 1.3. Individual difference antecedents of prosocial behavior

### 1.3.1. Personality

Several researchers have proposed theories to explain why basic personality traits predict behavior (e.g., Ackerman, 1996; McCrae & Costa, 1996; Motowidlo & Beier, 2010). Motowidlo et al. (2006) proposed a causal mechanism to explain why people in the possession of a basic personality trait are more likely to believe expressing their basic trait is effective. This theory, about what are called *implicit trait policies* (ITPs), draws on McCrae and Costa's (1996) “model of the person” in proposing that people's basic tendencies (e.g., abilities, personality traits) interact with their experiences to shape their implicit beliefs about the effectiveness of various kinds of behaviors across various situations (Motowidlo & Beier, 2010; Motowidlo et al., 2006). These beliefs can be conceptualized as ITPs about the relationship between expressions of personality traits and effective performance in a given job. People have different life experiences that teach them about the effectiveness and utility of expressing certain personality traits in certain situations, whether these are in the form of work experiences or social interactions that occur outside of work. For instance, someone who is naturally disagreeable may learn over time that expressing disagreeableness when trying to convince someone to do a favor may not be the most effective course of action in that particular situation. In the same way individuals form policies in the policy capturing literature (Karren & Barringer, 2002), ITP theory proposes that people form policies about the effectiveness of trait expression. Thus, ITPs can denote knowledge about effective trait expression when they are aligned with the beliefs of experts. ITPs represent an individual's procedural knowledge about how to behave prosocially (or antisocially). Consequently, individuals with more knowledge about effective trait expression are more likely to both recognize when situations call for the expression of a particular trait and actually engage in that trait-consistent behavior.

We propose that people consider behavior expressive of their standing on a trait to be effective because in much of their past experience it *has* been effective. People tend to select themselves into situations and environments based partially on congruence with their standings on basic traits (Roberts, Caspi, & Moffitt, 2003). This self-selection principle underlies prominent theories of fit, such as the Theory of Work Adjustment (Dawis & Lofquist, 1984), the theory of individual-environment fit (Pervin, 1968), and the Attraction-Selection-Attrition model (Schneider, 1987), which stipulates that people are more likely to be attracted to (and selected by) environments that complement their personality traits, and more likely to leave (or be dismissed from) environments that do not complement their personalities. Individuals may seek out and maintain contact with environments congruent with their traits because those environments allow them to express their trait standings behaviorally, which has been linked to the elicitation of positive affect for several traits (Côté & Moskowitz, 1998).

Agreeableness, specifically, is likely to be an important antecedent of prosocial behavior. Agreeable people are generally empathetic, have a tendency to get along with others, and are more likely to respond constructively to interpersonal conflict than disagreeable people (Graziano & Eisenberg, 1997; Graziano, Jensen-Campbell, & Hair, 1996). Consequently, in domains that involve interpersonal interaction, agreeableness should be positively related to prosocial behavior. Several experimental studies have found empirical support for the association between agreeableness and prosocial behavior (Graziano & Eisenberg, 1997; Graziano, Habashi, Sheese, & Tobin, 2007). Moreover, meta-analytic research (Organ & Ryan, 1995) has also supported this claim, showing that agreeableness is marginally correlated with altruistic action ( $\rho = .10$ ).

### 1.3.2. Emotional intelligence

Another individual difference that may be an antecedent of prosocial behavior is emotional intelligence (EI). The two most popular models of

EI define the construct as either a) an ability or aptitude or b) a combination of dispositions and self-perceptions relating to emotions. Petrides, Pita, and Kokkinaki (2007, p. 273) define trait EI as a lower-order personality trait that encompasses “emotion-related dispositions and self-perceptions measured via self-report.” Conversely, ability models of EI posit that because EI is a particular type of intellectual ability, the construct should overlap with cognitive ability to some extent (Mayer, Salovey, & Caruso, 2000). Ability models define EI as a combination of four emotion-related abilities: the perception of emotions, the integration of emotions through thought processes, the understanding of relations between emotions and circumstances, and the regulation of emotions, also called emotion management (Mayer et al., 2000). These abilities are positioned hierarchically, with emotion perception placed at the bottom of the hierarchy and emotion management at the top. Emotion perception and emotion integration form the *experiential area* of EI, while emotion understanding and emotion management comprise the *strategic area* (Mayer, Salovey, Caruso, & Sitarenios, 2001).

According to the *cascading model* of EI (Joseph & Newman, 2010), emotion understanding is causally related to emotion management, and is considered a more distal predictor of job performance than emotion management, which is thought to be more proximally related to performance. Emotion management is most strongly related to job performance for two reasons. First, emotion management allows individuals to create and maintain positive affective states, which facilitate behavioral flexibility and improve job performance (Fredrickson, 2001). Second, individuals low in emotion management are more likely to suppress their moods and to refrain from expressing their emotions, which can reduce cognitive resources that could be otherwise contribute to effective job performance (Butler et al., 2003).

Recently, some research on EI has examined the boundary conditions of the emotional intelligence-performance relationship. There has been some evidence to suggest EI is most strongly predictive of job performance in work contexts requiring a high level of emotional labor (Joseph & Newman, 2010). Meta-analytic findings have shown EI is positively related to job performance for high emotional labor jobs but is negatively related to performance for jobs low in emotional labor (Joseph & Newman, 2010). In addition, Farh, Seo, and Tesluk (2012) used a trait activation framework (Tett & Burnett, 2003) to explore the boundary conditions of the emotional intelligence-performance relationship specifically in the context of teams. They found EI was more strongly related to team effectiveness when the job was filled with many salient emotional cues. Because physicians provide a service to patients who may experience a broad range of strong emotions in response to their health condition, emotional intelligence may be especially important in predicting effective patient-physician interactions (Hariharan & Padhy, 2011).

#### 1.4. The current investigation

The two studies reported here aim to extend prior work on the role of individual differences and prosocial knowledge in predicting prosocial behavior in interpersonal interactions that occur between physicians and patients in a medical context. In Study 1, we aim to replicate prior findings that the personality trait of agreeableness is related to prosocial knowledge, which is in turn related to prosocial behavior in a medical context. In Study 2, we extend the basic trait → knowledge → behavior model to an ability construct: EI.

##### 1.4.1. Setting rationale

We conducted our investigation using a laboratory simulation of the interpersonal interactions between physicians and patients. This medical setting is ideally suited to our purposes because effective patient care requires a substantial degree of prosocial behavior (e.g., demonstration of caring and compassion, helping; National Board of Medical Examiners, 2002). Further, tying our investigation to a real-world context (see Supplemental Material online) allows us to

a) develop a measure of prosocial knowledge based on experts' opinions about prosocial behaviors that truly are effective or ineffective in that specific domain, and b) assess this measure's ability to predict real-world prosocial behavior prior to using it in the laboratory. Setting our investigation in a laboratory allows us a finer degree of control and first-hand observation of actual prosocial behavior (versus self-reports; Baumeister, Vohs, & Funder, 2007) uncontaminated by other influences, while using an assessment with pre-established predictive validity outside the laboratory allays concerns about external validity sometimes leveled at laboratory studies (cf. Mook, 1983).

Because we posit that prosocial knowledge is accumulated as basic traits interact with life experiences to shape knowledge, prosocial knowledge may be acquired without any particular experience within a specific job (Motowidlo & Beier, 2010; Motowidlo et al., 2006). Consequently, participants will be undergraduate students that have not received targeted instruction about what behaviors are most effective in a medical context, as would be the case with medical students or experienced medical professionals.

First, we plan to replicate prior findings that personality traits are related to prosocial knowledge and only affect prosocial behavior through their effects on knowledge. As prior research supports the association between agreeableness and prosocial behavior (e.g., Graziano & Eisenberg, 1997; Graziano et al., 2007), we predict that agreeableness is most likely to be related to prosocial knowledge.

**Hypothesis 1.** Agreeableness will be positively related to prosocial knowledge.

We also posit that personality traits are more distally related to prosocial behavior than prosocial knowledge. In keeping with the causal relations proposed in Campbell and colleagues' (Campbell et al., 1993) model of direct and indirect determinants of behavior at work, we predict that personality traits should predict knowledge, and knowledge should predict prosocial behavior.

**Hypothesis 2.** Prosocial knowledge will mediate the relationship between agreeableness and prosocial behavior.

## 2. Study 1

### 2.1. Method

#### 2.1.1. Participants and procedure

Undergraduate students at a small, private Southwestern university participated in the experiment for course credit ( $N = 102$ ). Sixty-seven students were female. Students' average age was 18.94 years ( $SD = 1.21$ ). Forty-seven students identified as Caucasian, 3 as African American, 14 as Hispanic, 33 as Asian/Pacific Islander, and 3 identified as “other.” Fifty-four students identified as being in their first year of college, 19 in their second year, 17 in their third year, and 12 in their final year. A total of 38 students (37.3% of the sample) indicated that they were on the pre-medical track. Pre-medical students did not score significantly higher than students who indicated they were not on the pre-medical track on the measure of prosocial knowledge ( $t(100) = .43, p = .67$ , Cohen's  $d = .08$ ) or prosocial behavior ( $t(99) = .55, p = .58$ , Cohen's  $d = .12$ ). Participants first completed the knowledge measure and then completed the personality inventory. They then engaged in a role-play simulation designed to elicit nine demonstrations of their prosocial behavior in medical service encounters.

#### 2.1.2. Measures

**2.1.2.1. International Personality Item Pool, NEO-PI-R (IPIP-NEO; Goldberg, 1999).** Participants' Big Five personality traits were evaluated using the 50-item IPIP (10 items per trait), a measure that is available on the



Internet. Sample items for each scale are 'I am the life of the party' for extraversion, 'I sympathize with others' feelings' for agreeableness, 'I am always prepared' for conscientiousness, 'I have a rich vocabulary' for openness to experience, and 'I get stressed out easily' (reverse scored) for adjustment. Students were asked to rate how accurately each statement describes themselves using a 7-point scale, ranging from 1 (very inaccurate) to 7 (very accurate). Reliabilities (alphas) for the Big Five traits are displayed on the diagonal of Table 1.

**2.1.2.2. Measure of prosocial knowledge.** This study used a single-response SJT called the Opinions about Physicians' Interactions with Patients (OPIP) as the measure of prosocial knowledge. This tool assesses knowledge of behaviors that are either high or low in prosociality for physicians who regularly interact with patients, patients' family members, and nurses. The items in the measure describe physicians interacting interpersonally with others in ways that were either effective or ineffective, and contain no organization-specific detail. Items in the measure were adapted from critical incidents that were collected by asking nurses to provide examples of occasions when they witnessed a physician interact with nurses, patients, or patients' family members in ways that were either particularly effective or particularly ineffective. The knowledge measure contains a total of 40 brief items (20 representing knowledge of ineffective, antisocial behavior and 20 representing knowledge of effective, prosocial behavior). Participants were asked to rate each item for its overall effectiveness using a scale with anchors ranging from 1 (very ineffective) to 7 (very effective). Details of the development and validation of the OPIP are presented in the Supplemental Material.

First, items deemed ineffective by experts were reverse scored so that higher scores signify greater knowledge. Prosocial knowledge scores were calculated by computing the mean of the respondent's effectiveness ratings for items determined effective by experts and a separate average for items determined ineffective by experts. These scores were then averaged to represent a respondent's overall score. It is important to note that expert ratings of effectiveness tended to be either very high or very low for most items, because items were adapted from critical incidents representing the extreme ends of the effectiveness distribution. According to this scoring scheme, the higher an individual's ratings are for effective, prosocial actions and the lower an individual's ratings are for the ineffective, antisocial actions, the more overall prosocial knowledge the individual has. Cronbach's alpha for the OPIP was .85. Two example items appear below:

"When her child broke his arm while playing, the mother called her general practitioner. Even though he was not on call that night, the physician agreed to help the child, met the family at the ER, and set the child's arm. (Effective)."

"After exploratory surgery, a patient wanted to know about his post-surgery diet. The surgery showed that he had inoperable cancer, but no one told him yet. The physician examined the patient's chart and blurted out, "You've got cancer. You'll have to go to an oncologist."

The patient was shocked and asked how this would affect his diet. The physician replied, "Well, you'll be dead in 3 months anyway, so you can eat anything you want." (Ineffective)."

**2.1.2.3. Measure of prosocial behavior.** Participants engaged in a series of role-play exercises designed to elicit prosocial or antisocial responses to difficult interpersonal situations physicians may encounter. It is worth noting these situations did not contain any technical details in relation to the practice of medicine. Participants were cast in the role of Pat Duncan, a physician, and engaged in nine role-play exercises that involved an interaction with someone with whom the physician interacts, such as a nurse, patient, or patient's family member. Each role-play lasted approximately 1 min. After research participants were introduced to their role and told that they would be video-taped for the duration of the nine role-play exercises, they read along while a brief description of the circumstances describing the first role-play exercise was read aloud by the research assistant. When participants signaled they were ready to begin the exercise, the research assistant asked if they had any questions and answered the questions, if there were any. Then, the research assistant began the role-play. This procedure was repeated for the next eight role-play situations. Three different research assistants, who were all females, played this role for different participants.

Six psychology graduate students watched the video-taped role-plays and made independent and separate ratings for both the level of Caring and Compassion and Respect displayed by participants. Three students made ratings for each role-play for one half of the research participants and three different students made ratings for the other half. For Caring and Compassion ratings, anchors ranged from 1 (very harsh and indifferent) to 7 (very caring and compassionate). For the dimension of Respect, anchors ranged from 1 (very disrespectful) to 7 (very respectful). For the first group of three raters rating the first half of participants on Caring and Compassion the reliability of their ratings (intraclass correlation coefficient; ICC) is .94, and for the second group of raters it is .87. For the first group of three raters rating the first half of participants on Respect the reliability of their ratings (ICC) is .90, and for the second it is .80. The ratings for Caring and Compassion and Respect, which correlate .91 with one another, were then averaged to form a composite score for prosociality displayed in the role-play simulation. When the Spearman-Brown prophecy formula is applied using the correlation between the two prosocial behavior dimension ratings, the reliability estimate produced is .95.

### 3. Results

Zero-order correlations between individual difference variables, prosocial knowledge scores, and prosocial behavior in the simulation appear in Table 1. Agreeableness correlated .35 ( $p < .01$ ) with prosocial knowledge, providing support for Hypothesis 1. Results also show prosocial knowledge scores predict prosocial behavior in the role-play, reaching marginal significance ( $r = .22, p < .05$ ).

Table 2 shows the unique variance in prosocial behavior accounted for by personality traits and prosocial knowledge scores through the results of a multiple regression, where all of the predictor variables were entered into the regression simultaneously. When both personality traits and knowledge scores are entered into the regression, only prosocial knowledge nears accounting for significant variability in prosocial behavior ( $\beta = .21, p = .06$ ), although the estimate does not quite reach conventional levels of statistical significance.

Hypothesis 2 stated that prosocial knowledge will mediate the effects of agreeableness on prosocial behavior. Although the correlation between agreeableness and prosocial behavior is not significant ( $r = .16, NS$ ), it is not always necessary for an independent variable to exert a significant direct effect on a dependent variable for mediation to occur (MacKinnon & Fairchild, 2009). MacKinnon and Fairchild (2009) suggest that because the traditional requirement that

**Table 1**  
Correlations between all variables in Study 1 ( $N = 101$ – $102$ ).

	M	SD	1	2	3	4	5	6	7
1. Emotional stability	4.54	1.16	.89						
2. Agreeableness	5.65	0.75	-.04	.81					
3. Conscientiousness	5.04	0.79	.04	.04	.75				
4. Extraversion	4.23	1.16	.07	.27**	-.11	.90			
5. Openness	5.04	0.86	-.13	.35**	.30**	.14	.83		
6. Prosocial knowledge	6.07	0.41	-.01	.35**	.08	.11	.02	.85	
7. Role-play performance	4.12	0.75	.08	.16	.04	.00	.16	.22*	.95

Note. \*  $p < .05$ . \*\*  $p < .01$  (two-tailed). Reliability estimates appear on the diagonal. Reliability estimates for role-play performance scores were computed using the Spearman-Brown prophecy formula.

**Table 2**

Multiple regression showing standardized beta weights and variance accounted for by personality traits and prosocial knowledge in Study 1.

Independent Variables	Dependent Variables	
	Prosocial Behavior	Prosocial Knowledge
Emotional Stability	.12	-.03
Agreeableness	.06	.39***
Conscientiousness	-.03	.12
Extraversion	-.07	.04
Openness	.16	-.17
Prosocial Knowledge	.21 <sup>a</sup>	–
R <sup>2</sup>	.09	.15
Adjusted R <sup>2</sup>	.03	.10
F	1.47*	3.24*

\*  $p < .05$ .

\*\*\*  $p < .001$ .

<sup>a</sup> = .06 (two-tailed).

there be a significant relationship between the predictor and criterion variables (cf. Baron & Kenny, 1986) greatly reduces statistical the power with which to detect mediation, especially in the instance of complete mediation, tests of mediation with bootstrapping should be employed. Consequently, we more rigorously tested the indirect effect of agreeableness on prosocial behavior by using a non-parametric bootstrapping technique involving bias-corrected confidence intervals (BCCI) and resampling techniques (Preacher & Hayes, 2008). All tests for mediation with bootstrapping were conducted using Preacher and Hayes' (2008) macro for SPSS where  $k$  was specified at 5000. The bootstrap results of the indirect effect of agreeableness on prosocial behavior produced bias corrected 95% confidence intervals that do not include zero (point estimate = 0.32, SE = 2.17, BCCI [0.24, 9.11],  $R^2 = .05$ ), supporting Hypothesis 2.

## 4. Discussion

Results of Study 1 suggest that prosocial behavior in interpersonally demanding situations can be successfully predicted using a knowledge test constructed directly from critical incidents. Our findings show that prosocial knowledge as measured by our instrument is significantly correlated with prosocial behavior displayed in a simulation and that agreeableness is positively related to prosocial knowledge, as predicted by ITP theory (Motowidlo et al., 2006). We also found support for the finding that prosocial knowledge mediates the relationship between traits and prosocial behavior.

## 5. Study 2

EI may be another important antecedent of prosocial behavior in medical contexts. Research suggests people higher in EI tend to criticize others less frequently (Brackett, Rivers, Shiffman, Lerner, & Salovey, 2006), behave less aggressively (Brackett, Mayer, & Warner, 2004), engage in less conflict with others (Lopes et al., 2011), and help others more frequently (Lopes, Salovey, Côté, & Beers, 2005) than less emotionally intelligent individuals. Libbrecht, Lievens, Carette, and Côté (2014) showed that EI predicted medical students' performance in courses on communication and interpersonal sensitivity, where students engaged in a variety of experiential exercises, such as role-plays with simulated patients. Consequently, in Study 2, we extend our findings from Study 1 by examining EI as a predictor of prosocial behavior in a medical context. We also include measures of personality traits in this study to examine the respective variance accounted for by each construct, and to replicate our findings in regard to Study 1's hypotheses.

We predict individuals higher in EI will have knowledge about how to behave prosocially in a medical context. Because the strategic area of EI is thought to be most closely related to behavior, we will focus specifically on this branch of EI in Study 2. We predict individuals that

are better able to manage their emotions will have more prosocial knowledge.

**Hypothesis 3.** EI will be positively related to prosocial knowledge.

Because we are considering EI an ability, we propose that it will be more distally related to prosocial behavior than prosocial knowledge. Consequently, we predict prosocial knowledge will mediate the relationship between EI and prosocial behavior.

**Hypothesis 4.** Prosocial knowledge will mediate the relationship between EI and prosocial behavior.

We would also like to examine whether our findings from Study 1 regarding agreeableness can be replicated in Study 2. We predict that, once again, agreeableness will be positively related to prosocial knowledge scores, and that prosocial knowledge will mediate the relationship between agreeableness and prosocial behavior.

## 6. Method

### 6.1. Research participants and procedures

Undergraduates ( $N = 197$ ) at a private university in the Southwestern United States participated in return for course credit. Participants ranged in age from 18 to 24 ( $M = 19.1$ ,  $SD = 1.15$ ). Females comprised 68.3% of the sample. Sixty-seven students identified as Caucasian, 12 as African American, 30 as Hispanic, 85 as Asian/Pacific Islander, and 5 as "other." One-hundred and eight students identified as being in their first year of college, 50 in their second year, 29 in their third year, and 10 in their final year. A total of 61 students (30.7% of the sample) indicated they were on the pre-medical track. Pre-medical students scored marginally higher than students who indicated they were not on the pre-medical track on the measure of prosocial knowledge ( $t(195) = 2.38$ ,  $p = .02$ , Cohen's  $d = .38$ ), but not on the measure of prosocial behavior ( $t(192) = 1.75$ ,  $p = .08$ , Cohen's  $d = .26$ ). Participants completed a brief demographics form, the 40-item OPIP, and then the 50-item personality measure (IPIP). They then engaged in a role-play simulation designed to elicit nine demonstrations of their prosocial behavior in the medical domain. It took participants approximately one hour to complete the study.

### 6.2. Measures

#### 6.2.1. Personality (IPIP; Goldberg, 1999)

Participants completed the same 50-item measure of the Big Five personality traits as in Study 1. Reliability estimates using Cronbach's alpha, displayed on the diagonal of Table 3.

#### 6.2.2. Emotional intelligence

**6.2.2.1. Emotional understanding (STEU; MacCann & Roberts, 2008b).** Due to time constraints, participants were asked to complete a short form of the STEU, a 25-item multiple-choice measure of emotional understanding. Total scores were computed by summing all of the items. Cronbach's alpha for the short form of the STEU is .54.

**6.2.2.2. Emotional management (STEM; MacCann & Roberts, 2008b).** Participants also completed a short form of the STEM, a 20-item multiple-choice measure of emotional management. Each item represents one of three emotions (anger, sadness, and fear) and is framed in either a personal-life or workplace context. Participants' total scores were computed by combining item totals to create a summed score. Cronbach's alpha for the short form of the STEM in the investigation is .68.

As according to the cascading model (Joseph & Newman, 2010) emotional understanding and emotion management form two branches of EI, we created a composite EI score of the STEM and the STEU by first

**Table 3**Means, standard deviations, and correlations between Study 2 variables ( $N = 189$ – $197$ ).

	M	SD	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1. Emotional stability	4.44	1.07	.88									
2. Conscientiousness	4.87	0.99	.29**	.84								
3. Agreeableness	5.57	0.77	.26**	.14	.81							
4. Openness	5.03	0.76	.04	.03	.20**	.79						
5. Extraversion	4.34	1.23	.18*	.06	.33**	.29**	.92					
6. Emotion understanding	19.24	2.78	-.05	.06	-.03	.18*	-.07	.54				
7. Emotion management	96.16	4.46	.05	.21**	.20**	.21**	.00	.41**	.68			
8. EI composite	00.00	0.84	.00	.17*	.10	.23**	-.04	.84*	.84	.72		
9. Prosocial knowledge	6.17	0.42	.06	.20**	.27**	.15*	.05	.22**	.41**	.38**	.86	
10. Role-play performance	4.42	0.73	.07	.19**	.13	.07	.16*	.08	.12	.13	.21**	.84

EI = Emotional Intelligence. Reliability estimates appear on the diagonal. Reliability estimates for role-play performance scores were computed using the Spearman-Brown prophesy formula. Reliability estimates for the EI composite were computed using a linear combination (Nunnally, 1978).

\*  $p < .05$ .

\*\*  $p < .01$  two-tailed tests.

standardizing and then averaging the two scores together, as has been done in other empirical studies (cf. Libbrecht et al., 2014). This composite was used in the mediation analyses. The reliability estimate for the composite was calculated as a linear combination and was .72 (Nunnally, 1978).

### 6.2.3. Prosocial knowledge

The 40-item OPIP used in Study 1 was also used as the measure of prosocial knowledge in Study 2. Participants were asked to rate each item for its overall effectiveness using a scale with anchors ranging from 1 (very ineffective) to 7 (very effective). Cronbach's alpha for the overall knowledge score comprised of all 40 items is .86.

### 6.2.4. Prosocial behavior

The simulation used in Study 2 was the same as that used for Study 1. Four different female research assistants played this role for different participants. Six psychology doctoral students rated the prosocial behavior exhibited in the role-play performances. Three raters rated all participants' role-play performances for the extent to which they displayed Caring and Compassion, and the other three raters rated all participants' role-play performances for the extent to which they displayed Respect. Raters watched the video-taped role-plays individually and made independent and separate ratings. The three raters evaluating participants for their Caring and Compassion were shown a detailed description of the performance dimension and were shown the anchors they would use to generate their evaluations, ranging from 1 (very harsh and indifferent) to 7 (very caring and compassionate). The same procedure was repeated for the other set of raters assessing participants' Respect demonstrated in the role-plays. For the dimension of Respect, anchors ranged from 1 (very disrespectful) to 7 (very respectful).

The average of these six ratings constituted the overall measure of prosocial behavior demonstrated in the role-play simulation. The average of the ratings provided by each rater across all nine of the recorded role-play performances that were available for each participant was computed. Because three raters evaluated participants on the dimension of Caring and Compassion and the other three raters evaluated participants on the dimension of Respect, each participant had two scores for their behavior displayed in the role-play simulations. These were computed by averaging across the three raters who provided them to form two scores. The average correlation between the three raters who rated participants on Caring and Compassion was .60, which, according to the Spearman–Brown prophesy formula, yields an inter-rater reliability estimate of .81. The average correlation between the three raters who rated participants on the dimension of Respect was .64, and according to the Spearman–Brown prophesy formula, the inter-rater reliability estimate produced is also .81. The scale score for ratings of Caring and Compassion correlates .73 ( $p < .001$ ) with the scale score for ratings of Respect. Ratings for Caring and Compassion

were averaged with ratings for Respect to compute a total mean score for prosocial behavior. When the Spearman–Brown prophesy formula is again applied using the correlation between the two prosocial behavior dimension ratings, the reliability estimate produced for the combined prosocial behavior score is .84.

## 7. Results

Descriptive statistics and zero-order correlations among all predictor variables and the criterion are displayed in Table 3. Reliability estimates for each measure are shown in the diagonal.

Although they are within the range of reliabilities reported during the original measure development (see MacCann & Roberts, 2008b), reliabilities for the EI measures were somewhat low. Consequently, we examined the item total correlations for both the emotion understanding and emotion management subscales. The average item-total correlation for the short form of the STEU is .16 in this investigation, while the average item-total correlation reported by MacCann and Roberts (2008b) for the short form of the STEU ranges from .23 to .29. For the STEM, the average item-total correlation for the short form is .25 in this investigation, while the average item-total correlation reported by MacCann and Roberts (2008b) for the short form ranges from .32 to .43. Two STEM items yielded slightly negative item-total correlations (–.03 and –.04) in this investigation. However, as MacCann and Roberts (2008b) observed item-total correlations of a similar magnitude and direction in their report describing the development of these two short forms, we have chosen to retain all scale items for subsequent analyses.

Table 4 shows the unique variance in prosocial behavior accounted for by personality traits, EI, and prosocial knowledge scores through

**Table 4**

Multiple regression showing standardized beta weights and variance accounted for personality traits, EI, and prosocial knowledge in Study 2.

Independent variables	Dependent variables	
	Prosocial behavior	Prosocial knowledge
Emotional stability	.04	.00
Agreeableness	.03	.18*
Conscientiousness	.13	.11
Extraversion	.12	.01
Openness	-.03	.02
Emotion management	.00	.27***
Emotion understanding	.06	.08
Prosocial knowledge	.18*	–
$R^2$	.10*	.19
Adjusted $R^2$	.05	.15
$F$	2.16*	5.57***

\*  $p < .05$ .

\*\*\*  $p < .001$ , (two-tailed).



could be due to sampling error, future work examining the trait antecedents of prosocial knowledge should focus on fine-tuning understanding of the personality characteristics that are consistently related to prosocial knowledge.

Surprisingly, although prior research has shown that agreeable people are more likely to engage in prosocial behavior (e.g., [Graziano & Eisenberg, 1997](#); [Graziano et al., 2007](#)) agreeableness was not significantly correlated with prosocial behavior in Study 1 ( $r = .16, p = .12$ ) or Study 2 ( $r = .13, p = .07$ ). Also unexpectedly, EI did not yield significant zero-order correlations with prosocial behavior ( $r = .13, p = .08$ ). However, although these correlations do not reach conventional levels of statistical significance, they are in the expected direction. Future studies with larger sample sizes and greater statistical power may be able to detect significant relationships between these individual differences and prosocial behavior.

EI was significantly related to prosocial knowledge in Study 2, replicating the work of other researchers (e.g., [Libbrecht et al., 2014](#)) in showing EI is an important antecedent of prosocial behavior in the domain of medical service encounters. Individuals who are better able to understand and manage their emotions and the emotions of others may be more likely to recognize and value prosocial behaviors considered effective in service-oriented professions. As physicians regularly provide a service to individuals experiencing heightened emotions regarding their health, possessing the ability to recognize effective strategies for managing these emotions may enable physicians to more successfully identify effective prosocial approaches to dealing with patients, family members, and nurses. Moreover, results showed the relationship between EI and prosocial behavior was mediated by prosocial knowledge. The majority of research on the relationship between EI and performance has examined EI as a direct predictor of behavior (e.g., [Joseph & Newman, 2010](#)); however, this study is one of few (see [Mikolajczak, Petrides, Coumans, & Luminet, 2009](#) for one exception) positioning EI within a broader theoretical framework that posits EI affects behavior primarily through its effects on knowledge.

Findings from these two investigations show that people who score more highly on our measure of prosocial knowledge are more likely to *actually behave* prosocially (Baumeister et al., 2007) in simulations designed to elicit prosocial action. These results support the usefulness of single-response SJTs for predicting real-world prosocial behaviors. This is particularly important, as the prosocial domain is saturated with social desirability (Penner et al., 2005), along with the variables often found to predict it, such as agreeableness (Caprara, Alessandri, Di Giunta, Panerai, & Eisenberg, 2010; Caprara et al., 2012). Consequently, due to their susceptibility to distortion, self-reports of predictors of prosocial behavior are not ideal. SJTs, however, have been shown to be less susceptible to faking than self-report measures of personality (e.g., Motowidlo et al., 2006).

Further, although the more commonly-used multiple-response SJT format is time-consuming to build, single-response SJTs can be developed much more quickly. Thus, one practical implication of our findings is that a single-response SJT such as that used in this investigation may be used in the selection or training of medical students or practitioners. It should be noted, however, that research on the suitability of single-response SJTs for high-stakes settings is currently lacking. Future research should examine the utility of single-response SJT in high-stakes selection or admission settings, and should explore whether scores on this prosocial knowledge measure may be improved via training or coaching.

Analyses also revealed that both personality traits and EI did not account for additional variance in predicting prosocial behavior beyond that accounted for our measure of prosocial knowledge. This finding is in keeping with theories (McCrae & Costa, 1996) that suggest individual differences, such as personality, are distal antecedents of more proximal behavioral determinants, such as knowledge. Although prior studies have shown that agreeable people are more likely to behave prosocially (e.g., Caprara et al., 2010), the studies reported here extend these

Unexpectedly, conscientiousness and openness to experience were significantly related to prosocial knowledge scores only in Study 2. As our measure of prosocial knowledge and simulation designed to elicit prosocial behavior were identical in both studies, the inconsistency of the relationship between these traits and knowledge scores across studies is somewhat surprising. Although it is possible this inconsistency

findings by showing that prosocial knowledge acts as an intervening variable in the relationship between agreeableness and prosocial behavior. Moreover, these findings add to a growing body of work suggesting these distal individual difference constructs primarily affect behavior *through* their effects on knowledge (e.g., Crook et al., 2011; Motowidlo et al., 2013). This existing work has principally focused on straightforward measures of personality (Crook et al., 2011; Motowidlo & Beier, 2010; Motowidlo et al., 2013); the current study extends this line of research by demonstrating that an ability construct – EI – is also an antecedent of knowledge.

### 9.1. Limitations and future directions

One limitation of this study is the low alphas of our emotion management (.68) and emotion understanding (.54) measures, although they are within the range of reliabilities reported during the development of these measures (MacCann & Roberts, 2008a). Both measures consist of series of contextualized situations with multiple choice response options, however, suggesting that Cronbach's alpha may not be the most appropriate reliability coefficient to apply to them (McDaniel, Hartman, Whetzel, & Grubb, 2007). Research has highlighted some of the problematic features associated with the consensus-based scoring of ability-based EI measures, including commonly low reliability estimates (e.g., MacCann, Roberts, Matthews, & Zeidner, 2004). Future research using these EI measures may benefit from using test-retest, rather than internal consistency, reliability indices. Despite these relatively low reliabilities both measures demonstrated significant correlations with other variables. Additionally, it should be noted that while our measure of emotion understanding relied on theoretical scoring, our measure of emotion management was scored using expert-based consensus, which some researchers have suggested can be problematic (e.g., Maul, 2012).

Using role-plays in the laboratory as our criterion allowed for more experimental control than would have been obtained had real-world ratings of medical performance been used. However, future research examining the pattern of relations among personality, EI, and prosocial knowledge on behavior displayed in real-world service settings is warranted. Moreover, although our samples contained a substantial percentage of pre-medical students, because our prosocial knowledge and prosocial behavior measures were couched within a medical context and participants were undergraduate students, future research on prosocial behavior in such environments should examine the relationships we observed in a sample of practicing physicians. It would be especially interesting to systematically examine the effects of specialized training and years of experience, perhaps via longitudinal research designed to better understand the factors underlying the acquisition of prosocial knowledge. More broadly, it is also important to examine the generalizability of our results to establish whether the same pattern of relationships is observed in other jobs.

Because both the role-play and knowledge measure deal with prosocial behavior in a medical context, we cannot rule out the possibility that responses to the measure presented first would affect responses to the measure administered second. Perhaps, for example, completing the prosocial knowledge measure “primed” participants to behave in a more prosocial manner than if they had engaged in the role-play first. On the other hand, if participants had engaged in the role-play first, perhaps that would have primed their prosocial beliefs, causing them to score higher on the knowledge measure. Future studies would benefit from counter-balancing the administration of knowledge and behavior measures to examine these possibilities.

Finally, some research has suggested individuals higher in EI may use this ability to engage in deceitful, antisocial behavior (e.g., Côté, DeCelles, McCarthy, Van Kleef, & Hideg, 2011; Kilduff, Chiaburu, & Menges, 2010). For instance, Kilduff et al. (2010) showed individuals higher in EI are better able than individuals lower in EI to use this ability to further their own gains by engaging in behaviors such as disguising

one's emotions or behaving in a way that manipulates the emotions of others. Thus, although individuals higher in EI may use this ability to behave prosocially when such behavior is aligned with their goals, as in this study where prosocial behavior was considered effective, we cannot be certain individuals will not use EI to behave maliciously in other contexts to further their own interests. Future research should examine the boundary conditions of the relationship between EI and prosocial behavior.

### Appendix A. Supplementary data

Supplementary data to this article can be found online at <http://dx.doi.org/10.1016/j.paid.2015.10.024>.

### References

- Ackerman, P.L. (1996). A theory of adult intellectual development: process, personality, interests, and knowledge. *Intelligence*, 22, 227–257.
- Baron, R.M., & Kenny, D.A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 51, 1173.
- Baumeister, R.F., Vohs, K.D., & Funder, D.C. (2007). Psychology as the science of self-reports and finger movements: whatever happened to actual behavior? *Perspectives on Psychological Science*, 2, 396–403.
- Brackett, M.A., Mayer, J.D., & Warner, R.M. (2004). Emotional intelligence and its relation to everyday behaviour. *Personality and Individual Differences*, 36, 1387–1402.
- Brackett, M.A., Rivers, S.E., Shiffman, S., Lerner, N., & Salovey, P. (2006). Relating emotional abilities to social functioning: a comparison of self-report and performance measures of emotional intelligence. *Journal of Personality and Social Psychology*, 91, 780–795.
- Briggs, S.R. (1992). Assessing the five-factor model of personality description. *Journal of Personality*, 60, 253–293.
- Brown, V.A., Parker, P.A., Furber, L., & Thomas, A.L. (2011). Patient preferences for the delivery of bad news—the experience of a UK Cancer Centre. *European Journal of Cancer Care*, 20, 56–61.
- Butler, E.A., Egloff, B., Wilhelm, F.H., Smith, N.C., Erickson, E.A., & Gross, J.J. (2003). The social consequences of expressive suppression. *Emotion*, 3, 48–67.
- Campbell, J.P., McCloy, R.A., Oppler, S.H., & Sager, C.E. (1993). A Theory of Performance. In N. Schmitt, & W.C. Borman (Eds.), *Personnel selection in organizations* (pp. 35–70). San Francisco: Jossey-Bass.
- Caprara, G.V., Alessandri, A., Di Giunta, L., Panerai, L., & Eisenberg, N. (2010). The contribution of agreeableness and self-efficacy beliefs to prosociality. *European Journal of Personality*, 24, 36–55.
- Caprara, G.V., Alessandri, G., & Eisenberg, N. (2012). Prosociality: the contribution of traits, values, and self-efficacy beliefs. *Journal of Personality and Social Psychology*, 102, 1289–1303.
- Carlo, G., Okun, M., Knight, G.P., & de Guzman, M.R.T. (2005). Prosocial value motivation as a mediator and moderator of the relations between agreeableness, extraversion and volunteering. *Personality and Individual Differences*, 38, 1293–1305.
- Costa, P.T., & McCrae, R.R. (1992). Four ways five factors are basic. *Personality and Individual Differences*, 13, 653–665.
- Côté, S., & Moskowitz, D.S. (1998). On the dynamic covariation between interpersonal behavior and affect: prediction from neuroticism, extraversion, and agreeableness. *Journal of Personality and Social Psychology*, 75, 1032–1046.
- Côté, S., DeCelles, K.A., McCarthy, J.M., Van Kleef, G.A., & Hideg, I. (2011). The Jekyll and Hyde of emotional intelligence: emotion-regulation knowledge facilitates prosocial and interpersonally deviant behavior. *Psychological Science*, 22, 1073–1080.
- Crook, A.E., Beier, M.E., Cox, C.B., Kell, H.J., Hanks, A.R., & Motowidlo, S.J. (2011). Measuring relationships between personality, knowledge, and performance using single response situational judgment tests. *International Journal of Selection and Assessment*, 19, 363–373.
- Dawis, R.V., & Lofquist, L.H. (1984). *A Psychological Theory of Work Adjustment*. Minneapolis, MN: University of Minnesota Press.
- Farh, C.I.C.C., Seo, M.G., & Tesluk, P.E. (2012). Emotional Intelligence, teamwork effectiveness, and job performance: the moderating role of job context. *Journal of Applied Psychology*, 97, 890–900.
- Flanagan, J.C. (1954). The critical incident technique. *Psychological Bulletin*, 51, 327–358.
- Fredrickson, B.L. (2001). The role of positive emotions in positive psychology: the broaden-and-build theory of positive emotions. *American Psychologist*, 56, 218–226.
- Garcia, A., Perry, M., Ellis, A., & Rineer, J. (2015). TIP-TOPics: prosocial I-O psychology: having an impact beyond traditional research and practice. *The Industrial Organizational Psychologist*, 53, 24–29.
- George, J.M., & Brief, A.P. (1992). Feeling good – doing good: a conceptual analysis of the mood at work – organizational spontaneity relationship. *Psychological Bulletin*, 112, 310–329.
- Ghosh, K., Motowidlo, S.J., & Nath, S. (2015). Technical knowledge, prosocial knowledge, and clinical performance of Indian medical students. *International Journal of Selection and Assessment*, 23, 59–70.
- Goldberg, L.R. (1999). A broad-bandwidth, public-domain, personality inventory measuring the lower-level facets of several five-factor models. In I. Mervielde, I. Deary, F. De Fruyt, & F. Ostendorf (Eds.), *Personality psychology in Europe*, vol. 7. (pp. 7–28). Tilburg, The Netherlands: Tilburg University Press.



- Graziano, W.G., & Eisenberg, N.H. (1997). Agreeableness: A Dimension of Personality. In R. Hogan, J. Johnston, & S. Briggs (Eds.), *Handbook of personality psychology* (pp. 795–824). San Diego, CA: Academic Press.
- Graziano, W.G., Habashi, M.M., Sheese, B.E., & Tobin, R.M. (2007). Agreeableness, empathy, and helping: a person  $\times$  situation perspective. *Journal of Personality and Social Psychology*, 93, 583–599.
- Graziano, W.G., Jensen-Campbell, L.A., & Hair, E.C. (1996). Perceiving interpersonal conflict and reacting to it: the case for agreeableness. *Journal of Personality and Social Psychology*, 70, 820–835.
- Gryll, S.L., & Katahn, M. (1978). Situational factors contributing to the placebo effect. *Psychopharmacology*, 57, 253–261.
- Hariharan, M., & Padhy, M. (2011). Emotional intelligence of doctors. *Social Science International*, 27, 15.
- Joseph, D.L., & Newman, D.A. (2010). Emotional intelligence: an integrative meta-analysis and cascading model. *Journal of Applied Psychology*, 95, 54–78. <http://dx.doi.org/10.1037/a0017286>.
- Karren, R.J., & Barringer, M.W. (2002). A review and analysis of the policy-capturing methodology in organizational research: guidelines for research and practice. *Organizational Research Methods*, 5, 337–361.
- Kell, H.J., Motowidlo, S.J., Martin, M.P., Stotts, A.L., & Moreno, C.A. (2014). Testing for independent effects of prosocial knowledge and technical knowledge on skill and performance. *Human Performance*, 27, 311–327.
- Kilduff, M., Chiaburu, D.S., & Menges, J.I. (2010). Strategic use of emotional intelligence in organizational settings: exploring the dark side. *Research in Organizational Behavior*, 30, 129–152.
- Libbrecht, N., Lievens, F., Carette, B., & Côté, S. (2014). Emotional intelligence predicts success in medical school. *Emotion*, 14, 64–73.
- Lopes, P.N., Nezelek, J.B., Extremera, N., Hertel, J., Fernández-Berrocá, P., Schütz, A., et al. (2011). Emotion regulation and the quality of social interaction: does the ability to evaluate emotional situations and identify effective responses matter? *Journal of Personality*, 79, 429–467.
- Lopes, P.N., Salovey, P., Côté, S., & Beers, M. (2005). Emotion regulation abilities and the quality of social interaction. *Emotion*, 5, 113–118.
- MacCann, C., & Roberts, R.D. (2008a). New paradigms for assessing emotional intelligence: theory and data. *Emotion*, 8, 540–551.
- MacCann, C., & Roberts, R.D. (2008b). *The Brief Assessment of Emotional Intelligence: Shortforms of the Situational Test of Emotional Understanding (STEU) and Situational Test of Emotion Management (STEM)*. Princeton, NJ: Educational Testing Service.
- MacCann, C., Roberts, R.D., Matthews, G., & Zeidner, M. (2004). Consensus scoring and empirical option weighting of performance-based emotional intelligence (EI) tests. *Personality and Individual Differences*, 36, 645–662.
- MacKinnon, D.P., & Fairchild, A.J. (2009). Current directions in mediation analysis. *Current Directions in Psychological Science*, 18, 16–20.
- Maul, A. (2012). The validity of the Mayer–Salovey–Caruso Emotional Intelligence Test (MSCEIT) as a measure of emotional intelligence. *Emotion Review*, 1–9.
- Mayer, J.D., Salovey, P., & Caruso, D.R. (2000). Models of emotional intelligence. In R.J. Sternberg (Ed.), *Handbook of intelligence* (pp. 392–420). Cambridge, England: Cambridge University Press.
- Mayer, J.D., Salovey, P., Caruso, D.R., & Sitarenios, G. (2001). Emotional intelligence as a standard intelligence. *Emotion*, 3, 232–242.
- McCrae, R.R., & Costa, P.T. (1996). Toward A New Generation of Personality Theories: Theoretical Contexts for the Five-factor Model. In J.S. Wiggins (Ed.), *The five-factor model of personality* (pp. 51–87). New York: Guilford Press.
- McCrae, R.R., & John, O.P. (1992). An introduction to the five-factor model and its applications. *Journal of Personality*, 60, 175–215.
- McDaniel, M. A., Hartman, N. S., Whetzel, D. L., & Grubb, W. (2007). Situational judgment tests, response instructions, and validity: a meta-analysis. *Personnel psychology*, 60, 63–91.
- Mikolajczak, M., Petrides, K.V., Coumans, N., & Luminet, O. (2009). The moderating effect of trait emotional intelligence on mood deterioration following laboratory-induced stress. *International Journal of Clinical and Health Psychology*, 9, 455–477.
- Mook, D.G. (1983). In defense of external invalidity. *American Psychologist*, 38, 379–387.
- Motowidlo, S.J., & Beier, M.E. (2010). Differentiating specific job knowledge from implicit trait policies in procedural knowledge measured by a situational judgment test. *Journal of Applied Psychology*, 95, 321–333.
- Motowidlo, S.J., Hooper, A.C., & Jackson, H.L. (2006). Implicit policies about relations between personality traits and behavioral effectiveness in situational judgment items. *Journal of Applied Psychology*, 91, 749–761.
- Motowidlo, S.J., Martin, M.P., & Crook, A.E. (2013). Relations between personality, knowledge, and behavior in professional service encounters. *Journal of Applied Social Psychology*, 43, 1851–1861.
- National Board of Medical Examiners (2002). *Embedding professionalism in medical education: Assessment as a tool for implementation*. Philadelphia, PA: Author.
- Nunnally, J.C. (1978). *Psychometric theory* (2nd ed.). New York: McGraw Hill.
- Oman, D., Thoresen, E., & McMahon, K. (1999). Volunteerism and mortality among the community-dwelling elderly. *Journal of Health Psychology*, 4, 301–316.
- Open Science Collaboration. (2015). Estimating the reproducibility of psychological science. *Science*, 349(6251) (Retrieved from <http://www.sciencemag.org/content/349/6251/aac4716.full>).
- Organ, D.W., & Ryan, K. (1995). A meta-analytic review of attitudinal and dispositional predictors of organizational citizenship behavior. *Personnel Psychology*, 48, 775–802.
- Pashler, H., & Wagenmakers, E.J. (2012). Editors' introduction to the special section on replicability in psychological science: a crisis of confidence? *Perspectives on Psychological Science*, 7, 528–530.
- Penner, L.A., Dovidio, J.F., Piliavin, J.A., & Schroeder, D.A. (2005). Prosocial behavior: Multilevel perspectives. *Annual Review of Psychology*, 56, 1–28.
- Pervin, L.A. (1968). Performance and satisfaction as a function of individual-environment fit. *Psychological Bulletin*, 69, 56.
- Petrides, K.V., Pita, R., & Kokkinaki, F. (2007). The location of trait emotional intelligence in personality factor space. *British Journal of Psychology*, 98, 273–289.
- Preacher, K.J., & Hayes, A.F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods*, 40, 879–891.
- Roberts, B.W., Caspi, A., & Moffitt, T.E. (2003). Work experiences and personality development in young adulthood. *Journal of Personality and Social Psychology*, 84, 582–593.
- Schmitt, N., & Chan, D. (2006). Situational Judgment Tests: Method or Construct? In J. Weekley, & R. Ployhart (Eds.), *Situational judgment tests* (pp. 135–155). San Francisco: Jossey-Bass.
- Schneider, B. (1987). The people make the place. *Personnel Psychology*, 40, 437–453.
- Tett, R.P., & Burnett, D.D. (2003). A personality trait-based interactionist model of job performance. *Journal of Applied Psychology*, 88, 500.
- Wagner, R.K., & Sternberg, R.J. (1985). Practical intelligence in real-world pursuits: The role of tacit knowledge. *Journal of Personality and Social Psychology*, 49, 436–458.