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Rethinking Empathic Accuracy

A Dissertation submitted in partial satisfaction
of the requirements for the degree of

Doctor of Philosophy

in

Psychology

by

Joshua D. Meadors

August 2014

Dissertation Committee:

Dr. Carolyn B. Murray, Chairperson

Dr. Daniel Ozer

Dr. Robert Rosenthal

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The Dissertation of Joshua D. Meadors is approved:

Committee Chairperson

University of California, Riverside

ABSTRACT OF THE DISSERTATION

Rethinking Empathic Accuracy

by

Joshua D. Meadors

Doctor of Philosophy, Graduate Program in Psychology
University of California, Riverside, August 2014
Dr. Carolyn B. Murray, Chairperson

The present study is a methodological examination of the implicit empathic accuracy measure introduced by Zaki, Ochsner, and Bolger (2008). Empathic accuracy (EA) is defined as the ability to understand another person's thoughts and feelings (Ickes, 1993). Because this definition is similar to definitions of cognitive empathy (e.g., Shamay-Tsoory, 2011) and because affective empathy does not appear to be related to empathic accuracy (Zaki et al., 2008), the Basic Empathy Scale—which measures cognitive and affective empathy separately—was used to test construct validity. Validity was also examined by relating this implicit measure of EA to psychological constructs characteristically associated with empathy deficits (i.e., autism, alexithymia, and psychopathy) as well as behavioral measures of interpersonal sensitivity (i.e., the DANVA, IPT, and PONS). The "modularity" of this measure is explored by examining EA as a function of group membership (i.e., ingroup and outgroup empathic accuracy).

EA is tested via one group of participants (i.e., targets) providing video-recorded data of themselves discussing a personal event and later making continuous ratings of their emotional appearance. A second group of participants (i.e., perceivers) also makes continuous ratings on the videos and accuracy is defined as the correlation between ratings. Previous research neglects to mention the specifics of obtaining continuous rating utilities, so the present study suggests using the freely available software GTrace in research attempts to implement this methodology. Analyses from the present study indicate this measure of EA does indeed appear to be more related to cognitive empathy than affective empathy. However, there may also be affective aspects to this measure, or perhaps constructs like autism and psychopathy function differently than expected on this task. The measure also does not appear to relate to (or overlap with) other established behavioral measures of interpersonal sensitivity, although the IPT (arguably the most social information-laden measure) seems to be the best predictor of EA. Furthermore, the ingroup and outgroup versions of EA uncovered significant relationships that may have otherwise gone unnoticed. But perhaps beyond all of these results, there are considerable gender differences to contemplate. Research implications, limitations, and future suggestions are discussed in further detail.

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Chapter 1: Introduction

For most people, the "Golden Rule" refers to the idea that we should treat other people as we would like to be treated ourselves. But what happens if there is a breakdown in the mechanism that tells us how other people are being treated and how this treatment has affected them? What about the mechanism that lets us respond to others' treatment? Generally speaking, these mechanisms would be called components of empathy (also known as the empathic process). Empathy can be defined as the ability to comprehend another's emotional state (Hogan, 1969) as well as the ability to react to the experiences of others (Davis, 1983). It has long been researched as an integral process in human interaction (Cottrell & Dymond, 1949), but its importance often understates the complex processes that influence and induce the feelings and displays of empathy.

The literature contains a number of definitions of empathy and its processes, to say the least. Over time, research has provided a consensus for some issues (e.g., that there are both cognitive and affective components of empathy), but semantic differences in terminology still serve as a source of imprecision (Konrath et al., 2010). This may be, in part, due to the tendency to describe empathy as an affective construct (e.g., Bryant, 1982; Miller & Eisenberg, 1988) or a cognitive one (e.g., Hogan, 1969), but not both. Evidence from neuroscience suggests there are in fact two distinct and possibly interacting systems for empathy within the brain: a system of emotional responding involving the inferior frontal gyrus, and a system of cognitive perspective-taking involving the ventromedial prefrontal cortex (Shamay-Tsoory, Aharon-Peretz, & Perry, 2009). Interestingly enough, the theoretical models that do incorporate both affective and

cognitive aspects of empathy into a single process typically come from a neuroscience research perspective (e.g., Decety & Jackson, 2004).

Empathic responding has been described as a three-stage process in psychotherapy literature (Gallop et al., 1990), but a more generalized three-stage model may clarify some of the confusion and inconsistencies within the psychology literature. In contrast to the three-stage "induction, matching, and helping" empathy process proposed by Gallop and colleagues (1990), the researcher proposes a three-stage "recognition, interpretation, and response" empathy process to provide the reader with a basic visualization of the framework for the present study (see Figure 1). There has been extended debate regarding whether or not cognition generally precedes affect (see Zajonc, 1984); however, the model in Figure 1 is strictly concerned with the empathic process. Nevertheless, it is possible these mechanisms are bidirectional or some components may work more independently than depicted. For example, an individual's affective reactions may aid in recognition or interpretation as well as responding. This theoretical framework is primarily presented to show that empathic accuracy (i.e., how accurate a person is about the thoughts and feelings of another) can be clearly defined as a measure of cognitive empathy that influences how others' mental and emotional states are interpreted and ultimately responded to.

In this regard, the present study focuses on measuring what is traditionally defined as cognitive empathy, or the understanding of others' mental states (Jolliffe & Farrington, 2006; Shamay-Tsoory, 2011). Cognitive empathy and theory-of-mind are often treated synonymously or in relation to each other (e.g., Shamay-Tsoory, 2009);

however, it is presently suggested that cognitive empathy is more closely related to Ickes's (1993) definition of the broader concept of empathic accuracy (i.e., understanding of another's thoughts and feelings) and not just perspective-taking, as is commonly associated with theory-of-mind.

Empathic accuracy refers to accuracy about another's internal state, be it a mental state (i.e., thoughts) or an emotional state (i.e., feelings). Empathic accuracy is included under the construct of interpersonal sensitivity, which generally refers to how accurately an individual perceives various characteristics of others (Bernieri, 2001). Ickes (1993) proposes that interpersonal accuracy aspects of interpersonal sensitivity can be categorized hierarchically (in order from the most stable characteristics to the most temporary or fleeting characteristics): personality trait accuracy, self-conception accuracy, affective sensitivity, and empathic accuracy (see Figure 2). Ickes (1993) defines affective sensitivity as the ability to infer others' emotional states (e.g., Rosenthal et al., 1979) and distinguishes this concept from empathic accuracy, although the two are arguably both components of cognitive empathy. To analogize: if empathic accuracy is theory-of-mind, affective sensitivity would be "theory-of-heart."

In fact, it may ultimately be easier to refer to inferences about mental states as "empathic accuracy" and inferences about emotional states as "affective sensitivity." This distinction would appear to create the least confusion while maintaining existing conceptualizations (e.g., that empathic accuracy and theory-of-mind are synonymous), but for the sake of consistency with previous literature, the measure demonstrated by Zaki, Ochsner, and Bolger (2008) and implemented in the present research will still be

referred to as empathic accuracy throughout. However, the reader is encouraged to refer to Figure 1 whenever a reminder of the theoretical differences between the Ickes (1993) and Zaki and colleagues (2008) empathic accuracy paradigms is needed. As a shorthand for the distinction between Ickes's (1993) EA paradigm and the methodology used by Levenson and Ruef (1992), Zaki and colleagues (2008), and the present study, this dissertation will refer to the former as *explicit empathic accuracy* (i.e., inferring thoughts and feelings compared to those explicitly given by the target individual) and the latter as *implicit empathic accuracy* (i.e., inferring thoughts and feelings not otherwise indicated by the target individual).

According to this model, both explicit and implicit empathic accuracy combine into what is commonly referred to as cognitive empathy, which would be best represented as influencing the "interpretation" stage of the empathy process. Affective empathy is defined as experiencing emotional reactions in response to the observed experiences of others (Davis, 1983; Shamay-Tsoory, 2011) and would be best represented as influencing the "response" stage of the empathy process. Both types of empathy have been implicated as important factors in well-adjusted social development and functional human interaction (see de Waal, 2008). As such, literature often focuses on the consequences related to either type of empathy.

For example, deficits in cognitive empathy are associated with autism and bipolar disorder, whereas deficits in affective empathy are associated with psychopathy, schizophrenia, and narcissism (see Cox et al., 2012). Additionally, empathy is often researched in more of an applied sense of how humans interact with each other. Namely,

research that examines both empathy and intergroup relations finds that increases (or inductions) of empathy reduce prejudice toward outgroup members (e.g., Finlay & Stephan, 2000; Finlay & Trafimow, 1998; Nesdale, Griffith, Durkin, & Maass, 2005; Vescio, Sechrist, & Paolucci, 2003). However, there is little to no presently available research that examines intergroup attitudes and the more cognitive and interpretive aspects of empathy (rather than the affective responses or entire process).

The present study is, first and foremost, a methodological examination of the implicit measure of empathic accuracy pioneered by Levenson and Ruef (1992) and established by Zaki and colleagues (2008). Cognitive empathy is often defined in terms of understanding or making inferences about others' mental states (Shamay-Tsoory, Aharon-Peretz, & Perry, 2009), which is similar to the definition of empathic accuracy. Likewise, when researchers describe empathy as a cognitive ability rather than an affective one, they tend to describe it as the ability to understand others rather than share their feelings (e.g., Hogan, 1969). Previous research does not find significant direct relationships between affective empathy and empathic accuracy (e.g., Ickes et al., 1990; Levenson & Ruef, 1992; Zaki et al., 2008), but upon considering affective empathy's closer association to responding rather than interpretation, this expectation may not be necessary. The Basic Empathy Scale (BES; Jolliffe & Farrington, 2006) measures cognitive and affective empathy separately, and is therefore used to examine the construct validity of empathic accuracy as a measure of cognitive empathy.

Construct validity is also examined by relating this measure of empathic accuracy to various psychological constructs characteristically associated with lower levels of

empathy (i.e., autism, alexithymia, and psychopathy). The dynamics between autism, psychopathy, and empathy are especially useful in this examination of construct validity. Autism is generally described in terms of social interaction problems that likely result from a deficit in cognitive empathy or perspective-taking abilities; however, individuals with autistic traits do not necessarily display deficits in affective empathy (Dziobek et al., 2008; but see also Minio-Paluello et al., 2009) and in some cases demonstrate an emphasis on caring behavior, honesty, and justice (e.g., Baron-Cohen, 2013). Psychopathy is characterized by two subtypes: an emotional, impulsive subtype and an unemotional, manipulative subtype (Levenson, Kiehl, & Fitzpatrick, 1995). In contrast to individuals with autistic traits, psychopaths are presumed to have intact cognitive empathy, but severe deficits in affective empathy (Baron-Cohen, 2013; Blair, 2005; Jones et al., 2010).

Given the presence of research that examines the relationship between empathy and intergroup attitudes but the lack of research directly relating intergroup attitudes to smaller components like cognitive empathy, the present study also examines what the researcher calls the "modularity" of the implicit empathic accuracy measure—or the degree to which it can be customized or adapted—by implementing ingroup and outgroup versions of empathic accuracy (i.e., measuring how accurate perceivers are when responding to targets in their ingroups and outgroups, respectively).

The research questions addressed by this study are essentially the same issues addressed by attempts to validate this measure of empathic accuracy. Namely, the first research question asks: is the current operationalization of empathic accuracy more

closely related to cognitive empathy than affective empathy? The second research question asks: how do characteristics associated with particular empathy deficits relate to this measure of empathic accuracy (which is assumed to also be a measure of cognitive empathy, specifically)? The third research question asks: how is this measure differentiated from other established behavioral measures of interpersonal sensitivity (i.e., the DANVA, IPT, and PONS)? The fourth research question attempts to expand on intergroup empathy research by asking: how does empathic accuracy potentially operate as a function of group membership? Additionally, some of the major topics in the literature that can be partially addressed by data obtained from the present study (e.g., the relationship between autism, psychopathy, and empathy) will be examined and reported in a more exploratory manner. In the most general sense, the research question for this study is "What constructs are associated with the cognitive components of empathy and interpersonal sensitivity (i.e., those related to interpreting and understanding communication from others)?"

To test this measure of empathic accuracy, the present study was divided into two phases: the *target phase* and the *perceiver phase*. Participants in the target phase of the study (i.e., targets) shared positive and negative personal experiences, providing video-recorded data of themselves discussing these experiences. Targets later made continuous ratings of their emotional appearance using software that allows for this. Participants in the perceiver phase of the study (i.e., perceivers) also made continuous ratings on the targets' videos, and empathic accuracy is defined as the correlation between target and perceiver ratings. Previous research neglects to offer suggestions for devices or software

capable of allowing video playback and continuous ratings simultaneously, so the researcher suggests using the freely available software GeneralTrace (GTrace; Cowie, McKeown, & Douglas-Cowie, 2012) in future research or replication attempts regarding this measure of empathic accuracy.

The dissertation is divided into five chapters: the current chapter (introducing the topic and providing context for the dissertation); a literature review of topics related to empathy and empathic accuracy; a description of the methodology, including measures, instruments, and procedures; results of various data analyses; and a discussion of the results and their implications, as well as general conclusions drawn from the study.

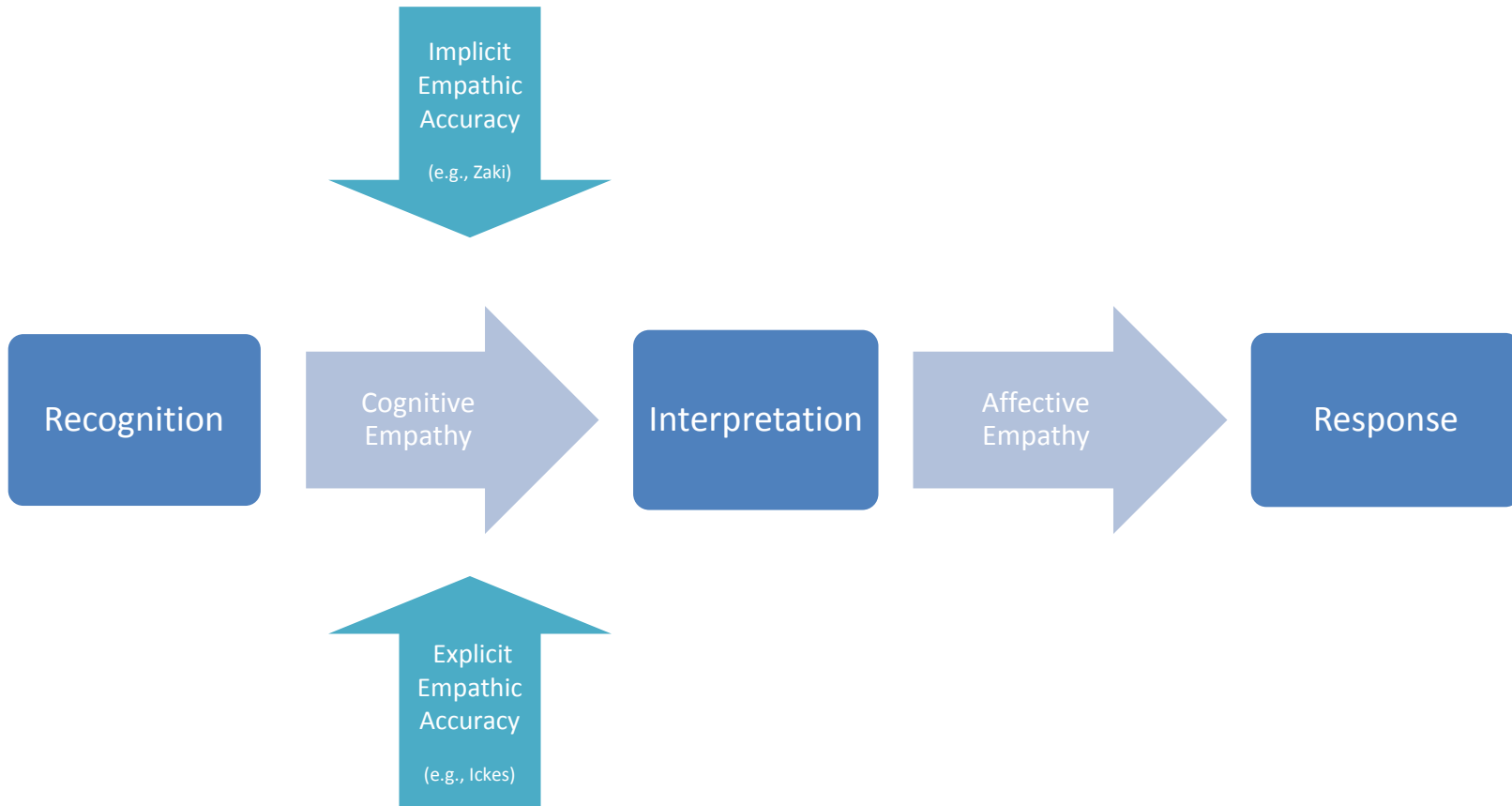


Figure 1. A theoretical model of the empathic process.

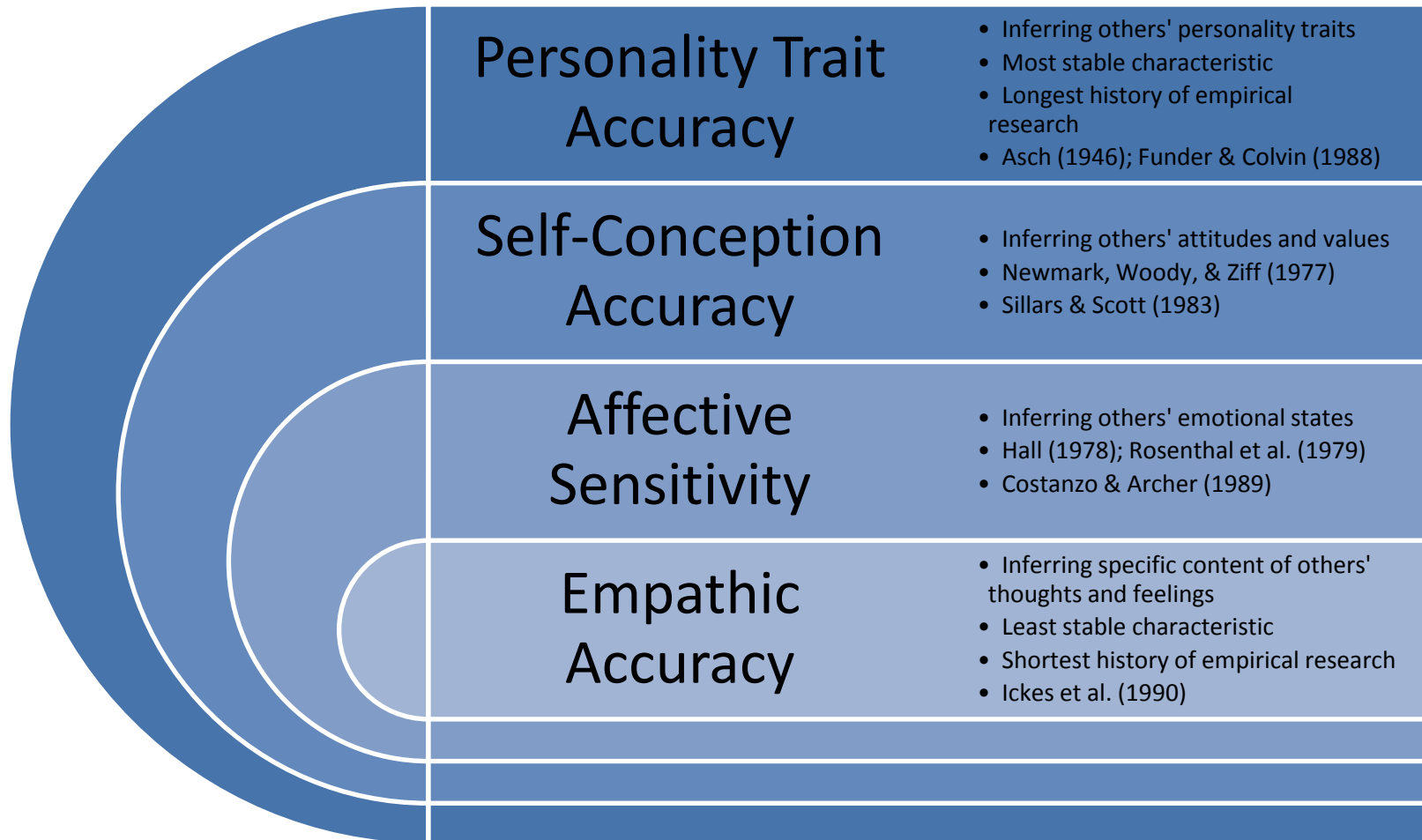


Figure 2. Interpersonal accuracy conceptual distinctions according to Ickes (1993).

Chapter 2: Literature Review

This chapter examines the empirical evidence and theoretical constructs related to empathic accuracy. Because empathic accuracy is part of the broader empathic process, and because the literature regarding the empathic process can be inconsistent or confusing, this chapter first provides an introduction to what is defined as empathy and the empathic process, including its relationships to various constructs. Generally speaking from a combination of definitions provided by the literature, empathy can be considered to be the ability to understand, identify with, and respond to the mental and emotional states of other people. Within this section reviewing empathy, studies particularly examining psychological traits related to empathy deficits and studies particularly examining the relationship between empathy and intergroup attitudes are also reviewed.

The chapter then describes empathic accuracy in detail, including its relationship to the aforementioned constructs of empathy. Within this section, the methodology of Zaki, Ochsner, and Bolger (2008) is discussed as the cornerstone for the present study's primary purpose as a methodological examination. This section also briefly describes the construct of interpersonal sensitivity, of which empathic accuracy is considered a subset. Figure 2 depicts a visualization of interpersonal accuracy paradigms provided by Ickes (1993), and the section regarding interpersonal sensitivity also includes examinations of the relevant instruments used.

This chapter concludes by relating the literature to the present study in terms of how this literature influenced the research questions the present study aims to answer.

Empathy

Many studies, articles, and theoretical papers regarding empathy research in psychology begin with an explanation to the reader detailing various inconsistencies or definitional problems within the literature (e.g., Cox et al., 2012; Konrath et al., 2010). However, empathy research within psychology has conceptually broadened and developed over the years. What was originally considered to be a singular, potentially confusing empathic process is now more accurately understood as two distinct but related processes (i.e., cognitive empathy and affective empathy). Related to this definitional issue, there are several ways to explain empathy, and they are not mutually exclusive. However, the assumed mutual exclusivity of these terms is likely what contributes to the inconsistencies and confusion in the literature.

For example, some researchers define empathy as a cognitive ability that involves understanding others (e.g., Hogan, 1969), while other researchers define empathy as an affective ability that involves emotionally responding to others (e.g., Davis, 1983). Rather than a simple emotional response, empathy is generally considered in terms of how congruent this response is with the other's original emotional state (Jolliffe & Farrington, 2006). Although a more contemporary view of empathy would agree that both the cognitive and affective definitions describe part of the larger process, previous research tends to focus on either the cognitive or affective domain while ignoring the other. Unintentionally or not, even some of the more recent studies (e.g., Zaki and colleagues, 2008) primarily define the empathic process as either cognitive or affective prior to clarifying the individual components.

In line with the previous literature most closely related to the present study, the researcher elects to use the simple definition of empathy as "understanding and responding to the mental and emotional states of others" (Zaki, Bolger, & Ochsner, 2009; p. 1) for the framework of the present study. More colloquially, empathy under this definition can be thought of as the vicarious experiences and interpretations of others' internal states.

Empathy is often referred to as a process, but there are few or no general models that exist in the published psychology literature. An arguably reasonable three-stage model of the empathic process has been provided in the psychotherapy literature (Gallop, Lancee, & Garfinkel, 1990), and the researcher presently suggests that this model can be modified into a more generalized understanding of empathy as a three-stage process involving recognition (of another's internal state or a change in such), interpretation (of said internal state), and response (to the interpreted internal state). The possible order of affect and cognition has been long debated in the literature (e.g., Zajonc, 1984), but the present model focuses strictly on the empathic process. Even so, the model is simplified in the sense it does not indicate the possible bidirectionality or independence of the individual mechanisms presented therein. It is by no means an official model and is primarily presented to the reader as a visual aid for the framework of the present study (see Figure 1).

Cognitive and affective empathy. Although the distinction between cognitive and affective empathy is not new, research that verifies, promotes, or otherwise encourages this distinction of the empathic process is fairly recent (see Cox et al., 2012).

Evidence from neuroscience studies indicates there are in fact two systems of empathy: an emotional system (primarily, the inferior frontal gyrus and the inferior parietal lobule) involving emotion recognition and emotion contagion, and a cognitive system (primarily, the medial prefrontal cortex and hippocampus) involving self-reflection and autobiographical memory (Shamay-Tsoory, 2011). Over time, the literature has distinguished the two components of empathy, referring to one as cognitive empathy and the other as emotional empathy (e.g., Albiro, Matricardi, Speltri, & Toso, 2009; Hurlemann et al., 2010; Jolliffe & Farrington, 2006), with cognitive empathy bearing similarity to the concept of perspective-taking (or theory of mind) and emotional empathy more closely reflecting the affective aspects of emotional contagion and emotionally responding to others.

Meta-analyses of constructs related to social competence find overwhelming evidence that empathy is negatively related to pervasive developmental disorders (e.g., autism) and psychological or personality disorders (e.g., psychopathy) and plenty of the other traits that are associated with poor social functioning (Davis & Kraus, 1997; Hall Andrzejewski, & Yopchick, 2009). Even in the absence of such encompassing meta-analyses, the individual fields of research focusing on characteristically low-empathy constructs such as autism (see Baron-Cohen & Wheelwright, 2004), alexithymia (see Taylor, Bagby, & Parker, 1991), and psychopathy (see Levenson, Kiehl, & Fitzpatrick, 1995) all provide extensive evidence to indicate these traits involve impaired social functioning, so much so that poor social or behavioral outcomes are widely considered to be symptomatic of each.

What does not appear so clearly is how this cognitive/affective distinction of empathy relates to and influences the understanding of constructs that were previously seen as all-around deficiencies of empathy. Related to this problem are once again the previous definitional issues of empathy, but perhaps more importantly, newer perspectives on operationalizations and measures were necessary to accurately define what effect a given component of empathy may have. Most of the widely-used, self-report measures of empathy focus on the emotional aspect of empathic responding (e.g., Mehrabian & Epstein, 1972; Mehrabian, 1997), or refuse to distinguish between cognitive and affective empathy in their design or measurement (e.g., Davis, 1983). One exception to this is the Basic Empathy Scale (BES) developed by Jolliffe and Farrington (2006). The BES was designed considering the definitions of cognitive empathy as understanding others' emotions and affective empathy as experiencing or responding congruently to another's emotional state. A later validation of this measure provided very strong supporting evidence for its division of empathy into cognitive and affective measures (Albiero et al., 2009). As such, the present study employs the BES as the primary mechanism for examining the distinctions between cognitive and affective empathy.

The cognitive/affective distinction offered by the BES is particularly useful in examining the aforementioned psychological traits characterized by low empathy. Over time, research has supported the indication that these empathy-related traits are actually differentially related to either cognitive empathy or affective empathy. Although the evidence has been largely anecdotal in the past (see Baron-Cohen, 2013), there are

clearer indications in recent literature for a set of personality traits and disorders related to deficits in cognitive empathy as well as a different set of personality traits and disorders related to deficits in affective empathy (Cox et al., 2012). Most notably, autistic tendencies are assumed to be related to a deficit in cognitive, but not affective empathy (Dziobek et al., 2008). Conversely, psychopathic tendencies are assumed to be related to a deficit in affective, but not cognitive empathy (Blair, 2005; Jones et al., 2010). Alexithymia has been implicated as having deficits in both cognitive empathy and affective empathy (e.g., Bird et al., 2010; FeldmanHall, Dalgleish, & Mobbs, 2013; Moriguchi et al., 2007; Parker, Taylor, & Bagby, 1993), and this is likely compounded by alexithymia's comorbidity with autism and other pervasive developmental disorders (Hill, Berthoz, & Frith, 2004). Nonetheless, there appears to be a clear distinction in the constellation of personality disorders related to deficits in cognitive empathy (e.g., autism, borderline personality disorder, and bipolar disorder) versus those related to deficits in affective empathy (e.g., psychopathy, narcissism, and schizophrenia; Cox et al., 2012).

Intergroup attitudes and empathy. One particular issue the present study aims to address is the relationship between intergroup contact, intergroup anxiety, and empathy. These variables are usually examined in relation to each other under intergroup contact theory (e.g., Pettigrew & Tropp, 2006) rather than theories more directly related to interpersonal perception. Typically, intergroup contact theory proposes that positive forms of outgroup contact reduce an individual's prejudice towards that outgroup, and empathy is used as a proxy for outgroup treatment. Although the present study does not

intend to measure outgroup prejudice specifically, it does use EA toward outgroup members as a proxy, similar to previous research (e.g., Finlay & Stephan, 2000). However, the present study examines empathy and prejudice in terms of whether prejudice may stem from a lack of understanding or simply a lack of responding empathically to the outgroup (even if the understanding is accurate).

Intergroup anxiety is generally defined as feelings of anxiety (i.e., threat or discomfort) experienced during intergroup interactions due to the individual's expectation of or concern about negative outcomes of said interaction (Stephan & Stephan, 1985). In accordance with intergroup contact theory, higher levels of intergroup anxiety have been found to be predictive of more outgroup prejudice (see Riek, Mania, & Gaertner, 2006). Likewise, both intergroup anxiety and empathy towards the outgroup have been explained as mediators of the relationship between intergroup contact and outgroup prejudice (Pettigrew & Tropp, 2008). In much of the same ways outgroup contact has been found to reduce prejudice, positive outgroup contact (e.g., friendships) has been found to be especially effective in reducing intergroup anxiety as well (Page-Gould, Mendoz-Denton, & Tropp, 2008). Because the videos used as stimuli in the present study include members from a wide variety of cultural backgrounds, perceivers' EA scores allow an opportunity to examine whether or not an individual's intergroup anxiety and self-reported outgroup contact significantly predicts their EA toward the outgroup in the same way it would predict their empathic responding.

However, because of the severe lack of research on these constructs, the present study's examination will be largely exploratory. Although there are studies that examine

the relationship between intergroup attitudes and empathy (e.g., Batson et al., 1997; Finlay & Stephan, 2000; Finlay & Trafimow, 1998; Vescio et al., 2003), virtually all of these published studies examine empathy in terms of the entire process or the component of emotional responding, rather than the component involving interpersonal perception and understanding (i.e., cognitive empathy). In fact, the prevailing definition of empathy among intergroup contact researchers appears to deal with the construct as compassionate and prosocial behavior exhibited towards the outgroup (Stephan & Finlay, 1999). Even though these studies manipulate perspective-taking as an operationalization of empathy, the individual's original capacity for perspective-taking ability (prior to the manipulation) is not viewed as an outcome. These studies, which share similar methodologies, do find that perspective-taking results in more positive outgroup attitudes, but they do not appear to address the degree to which an individual can (not) or will (not) engage in the perspective-taking manipulation. Perspective-taking in these studies is usually manipulated via stimulus transcripts that come from outgroup members (e.g., Batson et al., 1997; Finlay & Stephan, 2000), and participants are instructed to adopt the perspective of the writer before providing self-reports of intergroup attitudes, although the study by Vescio and colleagues (2003) does employ an audio interview rather than a transcript.

By contrast, the present study examines intergroup empathy in a more interpersonal and behavioral context (as opposed to self-reports of attitudes). To date, the most apparent research regarding how EA may differ on the basis of the target-perceiver ethnicity combination does not provide evidence to support the idea that ethnic

congruency is related to higher EA (Soto & Levenson, 2009). However, this study was limited in that it used only female targets, presented only one target from each of four ethnicities (i.e., African American, Chinese American, European American, or Mexican American), and the target videos involved the targets interacting with their dating partners rather than being presented to the perceivers individually (Soto & Levenson, 2009). Furthermore, the study did not provide measures of intergroup attitudes or behaviors (e.g., intergroup anxiety) beyond examining how the behavioral measure of EA varied according to ethnic congruence of the perceiver and target.

One of the few other studies that hint at how the relationship between intergroup anxiety and EA might function is Pickett, Gardner, and Knowles's (2004) examination of the relationship between the need-to-belong and an increased sensitivity to social cues. The need-to-belong refers to the desire (or psychological need) to be a part of a given group, presumably because group membership will reduce personal distress or provide social support or any other number of benefits. Pickett and colleagues (2004) found that need-to-belong was positively related to higher sensitivity towards emotional and nonverbal cues (i.e., affective sensitivity). In this sense, concepts like intergroup anxiety could be positively related to the cognitive empathy component of the process (regardless of intergroup anxiety's relation to the emotional empathic response) when the individual is placed into a context where intergroup anxiety and interpersonal accuracy are much more relevant, if not salient, than normal.

Empathic Accuracy

The term *empathic accuracy (EA)* was first introduced by Ickes, Stinson, Bissonnette, and Garcia (1990), and the established definition largely originates from Ickes's (1993) experimental paradigm differentiating the various dimensions of interpersonal sensitivity. Specifically, Ickes (1993) defines EA as the "ability to accurately infer the specific content of another person's thoughts and feelings" (p. 588). This is distinguished from the concept of empathic inference because empathic inference refers to the attempt to understand the thoughts and feelings of others, whereas EA is concerned with how accurate or successful such attempts are (Ickes, Gesn, & Graham, 2000b). However, the research literature generally focuses on the concept of empathic accuracy rather than the more general concept of empathic inference.

Explicit empathic accuracy. Apart from inferring another person's personality traits or specific attitudes and values they may hold, EA involves inferences to be made on a moment-to-moment basis. Traditionally, EA has been measured by requesting one person (i.e., the target) recall specific thoughts or feelings they may have had during a previously recorded interaction; then, another person (i.e., the perceiver) observes the recorded interaction and attempts to accurately recreate the target's thoughts and feelings when prompted. This usually involves the target re-watching the previously recorded interaction and stopping the tape whenever they recall having a specific thought or feeling. The target is then instructed to write down the explicit thought or feeling they recalled that prompted them to stop the videotape. The explicit thoughts and feelings of the target are then compiled to serve as the target material for the perceiver's EA.

Essentially, the prerecorded interaction involving the target serves as the stimuli, and the target's thoughts and feelings serve as the source for accuracy. EA is typically scored as how closely the perceiver's reports of thoughts and feelings match what was reported by the target. Independent judges examine these thought and feeling entries and rate how similar the target and perceiver entries are on a scale from "0" (i.e., very dissimilar or not at all the same), to "1" (i.e., somewhat similar) to "2" (i.e., very similar or essentially the same). EA is then measured using these "accuracy points" as the basis for any given quantitative analysis (see Ickes, 1993 for a methodology overview).

The prerecorded interaction that serves as the stimulus for perceivers does not necessarily need to follow any particular guidelines to be prepared for the study in which it is employed (e.g., Marangoni, Garcia, Ickes, & Teng, 1995; Gadassi, Mor, & Rafaeli, 2011). Rather, the primary claim to fame for this measure of EA is the instruction to infer the thoughts and feelings of targets based on their own explicit reports. However, the difficulty and ambiguity of operationalizing "thoughts and feelings" that can be accurately detected and reported by participants has proven problematic for empathic accuracy research. Results from studies employing this methodology are often inconsistent or unexpected (see Hall & Schmid Mast, 2007; Ickes et al., 2000a); people are often unaware of or unable to accurately report knowledge of their own EA (Ickes, 1993; Marangoni et al., 1995); no consistent gender differences are found, contrary to research regarding other constructs of interpersonal sensitivity (Hall & Schmid Mast, 2007; Ickes et al., 2000b); and EA often does not correlate with self-report measures of

empathy (Ickes et al., 1990; Marangoni et al., 1995) or other expected individual difference variables (Ickes, 2001).

These difficulties may, to some extent, result from empathic accuracy's conceptual definition which conflates both thoughts and feelings into a composite target of accuracy. Although Ickes and Cheng (2011) attempt to address this via lexical analyses that demonstrate "thoughts" and "feelings" are verbally distinguishable by certain linguistic cues, this does not address the problem of EA representing both of these distinct constructs but still being reported as a single measure. Research indicates participants may be employing different sources of information when attempting to infer thoughts than when attempting to infer feelings (Hall & Schmid Mast, 2007). In fact, Hall and Schmid Mast (2007) found that the use of verbal and nonverbal cues in EA is differentially related to whether thoughts or feelings are being inferred, such that feelings may be easily inferred solely from nonverbal cues but thoughts may not. In this sense, the "inferring feelings" portion of the explicit EA paradigm seems similar to the aforementioned description of affective sensitivity, both in structure and function. Without verbal content (e.g., the "silent video" condition of Hall and Schmid Mast's 2007 study), the explicit EA paradigm could even be seen as a comparable extension of the PONS (or the PONS could be seen as a momentary version of a precursor to explicit EA), which is one of the very measures Ickes (1993) provides as an example of affective sensitivity. Despite this, the explicit EA paradigm is still used as the go-to methodology in a number of unrelated studies that use EA as a predictor or outcome variable (e.g., Hoekner, Wyatt, Decety, & Nusbaum, 2011; Kilpatrick, Bissonnette, & Rusbult, 2002;

Lorimer & Jowett, 2010). Perhaps the most meaningful distinction between affective sensitivity and EA is the idea that EA examines the "specific content" of the individual's feelings, but the researcher suggests via the present study that "explicit content" may provide an even clearer distinction and encourage more varied methodological examinations of the construct.

As indicated by the neuroscience research distinguishing cognitive and affective empathy, inferring thoughts versus inferring feelings may involve entirely different mechanisms or abilities altogether. Beyond the fact affective and cognitive empathy appear to be distinct but related processes, the combined research findings from Hall and Schmid Mast (2007) and Ickes and Cheng (2011) indicate the explicit measure of EA could be reasonably divided into subcomponents of cognition-related EA (i.e., inferring thoughts) and affect-related EA (i.e., inferring feelings). Incidentally, Ickes and colleagues (1990) originally conceptualized "content accuracy" as the degree to which the perceiver's description matches the content mentioned in the target's specific thoughts and feelings and "valence accuracy" as the degree to which the perceiver accurately infers the positivity or negativity of the target's thoughts and feelings. This distinction has been made by other EA researchers (e.g., Ponnet, Buysse, Roeyers, & De Clercq, 2008), but it is a distinction largely overlooked or ignored by the majority of published studies.

Because there is evidence showing a dissociation between cognitive and emotional empathy, especially among autistic individuals (Dziobek et al., 2008), it may be important to develop a measurement of empathic accuracy that clearly distinguishes the emotional component from the cognitive component, and this suggestion may not be

a far cry from the materials already available to measure explicit EA. Nevertheless, there is plenty of evidence indicating individuals with social cognition deficits (e.g., those on the autism spectrum) are significantly worse at various explicit EA tasks and not just empathy (Demurie, De Corel, & Roeyers, 2011; Ponnet et al., 2004; Ponnet et al., 2005; Ponnet et al., 2008; Roeyers & Demurie, 2010). Additionally, measures of social competence, interpersonal sensitivity, and EA in particular appear to be influenced by biology, especially when EA is measured in an implicit rather than explicit manner. Previous research indicates intranasal oxytocin (i.e., an important hormone involved in human bonding) can improve EA scores among individuals who score high on measures of autism (Bartz et al., 2010). Additional research indicates oxytocin improves EA scores by improving affective empathy rather than cognitive empathy (Hurlemann et al., 2010).

Implicit empathic accuracy. Although the methodology still refers to the dependent variable as empathic accuracy, more recent research has foregone the difficulty of having participants recreate specific thoughts and feelings in favor of matching only the target's valence (e.g., Zaki, Bolger, & Ochsner, 2008), which might be best described as measuring "valence accuracy" as originally called by Ickes and colleagues (1990). This procedure operates much like the explicit EA paradigm in terms of targets, perceivers, and videotaped stimuli; however, EA is operationalized in much more implicit terms in Zaki and colleagues' (2008) study.

The methods used by Zaki and colleagues (2008) come from an earlier attempt by Levenson and Ruef (1992) to employ a behavioral measure of empathy. Specifically, Levenson and Ruef (1992) were attempting to examine the idea of shared physiological

responses between individuals (i.e., affective empathy), and created a measure that relies on rating dials to provide continuous responses to the given videotape stimuli. These continuous ratings of affect were then transformed into time-series (i.e., data patterns that represent responses made over given time periods or intervals), and accuracy was calculated as the degree to which the pattern of data in a perceiver's time-series correlates with the pattern of data in the time-series of the target.

Despite the novelty and utility of the measure introduced by Levenson and Ruef (1992), this measure remained relatively unaddressed in the published literature, perhaps due to it being operationalized as a measure of "physiological linkage" rather than EA or interpersonal sensitivity. Nevertheless, Zaki and colleagues (2008) re-established continuous affect ratings as a viable method for measuring EA. Similar to Levenson and Ruef (1992), Zaki and colleagues (2008) required target participants to use rating dials to provide continuous affective responses as they watched prerecorded videotape of themselves. As opposed to the explicit reporting of thoughts and feelings seen in the methods used by Ickes and colleagues (1990), the target's continuous affect ratings are what serve as the source of accuracy in Zaki and colleagues' (2008) methodology. Perceivers then watch a given stimulus videotape and provide their own continuous ratings of the target's affective appearance in the video. Similar to Levenson and Ruef (1992), time-series are created in order to organize the continuous data, and accuracy is calculated as the degree to which the data patterns in the target's and perceiver's time-series correlate with each other.

There is relatively little research utilizing this new direction in EA methodology, but it does appear to correlate as expected with constructs related to social intelligence (e.g., the autism-spectrum quotient; Bartz et al., 2010). The present study aims to expand this line of research by examining correlations of this newer, more restrictive conceptualization of EA with self-report measures of empathy and individual difference variables that have proven not to correlate so well with the original measures of empathic accuracy (e.g., Ickes et al., 1990; Ickes et al., 2000a).

Although it is not always addressed as such, the implicit measure of EA highlighted by Zaki and colleagues' (2008) research deals with a number of issues that may be more difficult to handle via the explicit EA methodology. One particular difficulty of the entire EA paradigm is the interactive nature between perceivers and targets and how this can affect accuracy scores (e.g., Ickes, 2001; Ickes et al., 2000b; Flury, Ickes, Schweinle, 2008; Hancock & Ickes, 1996). Broadly speaking, EA varies as a function of how accurate or sensitive the perceiver may be, as well as how easily the target can be read in the first place. Furthermore, it is difficult to be accurate about a target stimulus who does not provide accurate or trustworthy data themselves. The research so far implies targets are more easily read when they are highly expressive (e.g., Zaki et al., 2009), and there appears to be an interactive effect of increased EA among perceivers who score higher on trait empathy (Zaki et al., 2008). Likewise, individuals who are characteristically bad at interpreting and/or communicating their own feelings tend to produce lower EA scores among perceivers. This seems to be especially true in the case of the autism spectrum, but published research that examines the

psychopathological nature of the target in the EA paradigm tends to deal with very specific clinical samples (e.g., Demurie et al., 2011; Flury et al., 2008), or more general pervasive developmental disorders (Ponnet et al., 2005). Implicit EA, compared to explicit EA, may provide easier methods for examining how a given target's ratings of themselves may influence all perceivers' interpretations of that target.

The present study intends to further examine the interactive nature of empathic accuracy by first measuring variables that are assumed to be related to how accurate a perceiver can be about a given target. These variables include previously examined constructs such as the target's expressivity (e.g., Zaki et al., 2008; Zaki et al., 2009a) or autistic tendencies (Bartz et al., 2010), as well as targets' self-reported trait empathy and alexithymia. Although implicit EA is not a remedy for this problem of trustworthiness in the target's responses, it does easily allow for a closer examination of how concepts related to interpersonal sensitivity may also have intrapersonal effects in contexts such as the present study.

Distinctions within interpersonal sensitivity. Interpersonal sensitivity (IS) is a fairly general concept, and although the researcher has been using this terminology in a broad sense, the specific definition is fairly broad as well (see Bernieri, 2001). IS is defined in relation to how well individuals perceive, judge, engage with, and appropriately respond to others (Hall et al., 2009). Because of the broad and encompassing nature of IS, it has been examined in a number of studies and related to a number of social outcomes, although not necessarily by the name "interpersonal sensitivity" (e.g., Davis & Kraus, 1997). Hall and colleague's (2009) meta-analysis of IS

reveals that it is indeed a general construct, with positive relationships to several measures of social competence, empathy, and nonverbal decoding ability. In fact, this broad conceptualization of IS may ultimately be obscuring research findings, in the event that various terminologies are used to describe the same concepts but go unnoticed prior to a meta-analytic examination.

In terms of judgment and perception (i.e., the IS constructs most closely related to the present study), the most direct outcome of having high or low levels of perception- or judgment-related IS is having more or less accurate social information to use appropriately. Likewise, the most observable outcomes of IS are concerned with how a lack of social information manifests as behavioral and/or interpersonal problems that are symptomatic of certain psychological traits and disorders (Hall et al., 2009). In this sense, interpersonal sensitivity has been conceptualized as more of a quotient (i.e., an intelligence), and research has generally focused on effects related to deficits in IS.

Technically speaking, the present study focuses on the perceiving and judging aspects of IS, as indicated by Ickes's review of dispositional judgment (1993; see also Figure 2). However, the similarities between Ickes's (1993) definition of affective sensitivity (i.e., inferring emotional states of others) and definition of empathic accuracy (i.e., inferring the specific content of others' thoughts and feelings) encourage the creation of a reasonable and reliable distinction between the two. The conceptual similarities and differences between constructs within IS warrants further, in-depth examinations whenever possible, so the present study investigates previously established behavioral measures of IS that are assumed to be related to affective sensitivity. The measures are

examined in relation to the implicit measure of EA in order to help determine implicit EA's placement within the IS construct, especially as a behavioral measure. Specifically, the implicit measure of EA is compared to the DANVA2 (Baum & Nowicki, 1998), the PONS (Rosenthal et al., 1979), and the IPT-15 (Costanzo & Archer, 1993) behavioral measures of IS.

The Diagnostic Analysis of Nonverbal Ability (DANVA2; Baum & Nowicki, 1998) was developed to measure individual differences in the ability to comprehend emotional information specifically through nonverbal means. Testing an individual's abilities with the DANVA2 generally involves displaying various images of posed facial expressions and postures or prerecorded audio of tones of voice. The individual must then accurately determine which of the four most universal emotional expressions (i.e., happiness, sadness, anger, or fear) the person in the given image or audio is conveying, all without any additional verbal content.

The Profile of Nonverbal Sensitivity (PONS; Rosenthal et al., 1979) is a much more comprehensive test than the DANVA, although the two share some similarities. There are various iterations of the PONS, but for the purposes of the present study, only the Face and Body version of the test will be discussed. Like the DANVA, the Face and Body PONS assesses individual ability specifically through nonverbal means (i.e., without audio information or verbal content). However, the PONS is designed to examine a perceiver's comprehension of social information beyond the target's emotional response. The perceiver is typically shown a variety of brief scenes wherein the target displays situation-specific emotional responses, and the perceiver must decide between two

possible explanations—whether the target is "admiring nature" or "ordering food in a restaurant," for example.

The Interpersonal Perception Task (IPT; Costanzo & Archer, 1989) does not rely solely on nonverbal means, although it does assess an individual's ability to comprehend implicit social cues. Of the measures of IS mentioned presently, the IPT is the most "realistic" in the sense that the scenes displayed are full-channel (i.e., audiovisual information and verbal content is present) and represent entire situations that may occur in everyday life. Where the PONS measures comprehension of social information based on brief emotional responses, the IPT measures a more extensive comprehension of social information based on an entire scene depicting a social situation. Perceivers are typically shown a given scene in its entirety; then, they must determine factual information from the implicit social cues displayed therein. For example, the test asks which of two men won a basketball game based on their discussion afterwards (in which the winner is not mentioned), or which of two people is the boss and which is the employee based on how they interact with each other.

All of the behavioral instruments discussed measure IS and the accurate use of implicit social information by not explicitly providing the test-taker with the exact social information asked of them. Instead, these instruments provide relevant social information (to varying degrees), but never a direct answer to the social information being asked of the given task. In this sense these behavioral instruments appear to be implicit measures, and a relative degree of empathic inference—if not empathic accuracy—is a requirement shared among them.

Ickes defines EA as understanding the content of others' thoughts and feelings (1993), but what is the difference between understanding the content of others' feelings and simply understanding their emotional states? According to Ickes's methodology, perceivers generally score higher on inferential accuracy when they provide more detailed rationale or reasoning for the target's reported emotional state (1993). In this regard, it may prove beneficial to refer to the measure introduced by Levenson and Ruef (1992) and used in the present study as something other than a measure of EA (e.g., a measure of affective sensitivity). But perhaps differentiating the two measures by defining Ickes and colleagues' (1990) method as explicit EA and Zaki and colleagues' (2008) method as implicit EA would create the least confusion in the literature while maintaining existing conceptualizations (e.g., that empathic accuracy and theory-of-mind are relatively synonymous).

Technically, both implicit EA and explicit EA are concerned with the accuracy of understanding thoughts and feelings (i.e., cognitive empathy). The researcher simply hesitates to operationalize the present measure according to Ickes's (1993) definition because the implicit measure focuses on quantifying another person's affect as opposed to anything more specific or explicit about their thoughts and feelings. Additionally, the researcher introduces a measure of objective EA that may be more appropriately referred to as affective sensitivity because it does not involve the target's perceptions of their own thoughts and feelings.

The Present Study and Operationalizations

Considering the lack of correlation between self-reported empathy and other measures of interpersonal sensitivity expected to be related to empathic accuracy, as well as the differences in target and perceiver variance highlighted by Zaki and colleagues (2008), the researcher examines empathic accuracy under two different types of operationalizations. *Subjective empathic accuracy* (i.e., subjective EA) refers to the traditional concept of empathic accuracy as the relationship between target and perceiver ratings. *Objective empathic accuracy* (i.e., objective EA) refers to how much a given perceiver's ratings agree with the other perceivers, rather than the target. Although objective empathic accuracy can still be measured using Ickes's procedure, the methodology introduced by Levenson and Ruef (1992) and updated by Zaki and colleagues (2008) is more quantitative and currently better suited to addressing questions of how accurate or trustworthy the target's responses may be—at least in terms of the target's emotional state. Arguably, it is easier to calculate averages and agreement between perceivers' quantitative responses rather than open-ended, qualitative responses.

Furthermore, subtypes of EA appear to be easily operationalized according to characteristics of the targets and perceivers. Considering the previous research on intergroup contact theory (and the lack of research directly related to components of empathy), the present study also operationalizes *ingroup empathic accuracy* (i.e., ingroup EA) as empathic accuracy regarding ingroup targets, and *outgroup empathic accuracy* (i.e., outgroup EA) as empathic accuracy regarding outgroup targets. Roughly speaking, group membership serves as a "module" for the measurement of EA in the present study.

Intergroup EA could be further conceptualized in terms of its subjective or objective nature (e.g., objective ingroup accuracy may reflect how much a given perceiver agrees with the ingroup, or how much a given perceiver agrees with all others when the target is an ingroup member). However, the present research focuses on subjective intergroup empathic accuracy due to the relatively unprecedented nature of these measures and analyses. For a list of the definitions and operationalizations of implicit EA measures used as dependent variables in the present study, refer to Table 1.

It is difficult to provide hypotheses beyond the experimental conditions for the present study not only due to the inconsistencies in the literature, but because most research examines empathy rather than empathic accuracy (which may not be directly related). For example, less intergroup anxiety and more outgroup contact should be positively related to EA because previous research indicates this pattern is related to more empathy towards the outgroup (e.g., Stephan et al., 2002). But the outgroup sensitivity itself could be driven by a fear of threats from the outgroup just as much as it could be driven by a concern for the well-being of the outgroup. Likewise, outgroup contact should be positively related to EA in the present study because the target stimuli contain a larger proportion of outgroup members, but this effect might not be seen in more homogenous samples of data. Examining cognitive empathy in particular allows for a better understanding of what aspects of the empathic process these variables are related to, rather than whether or not these variables are somehow related to the overall process.

Informal hypotheses can be provided based on the consistency of the research regarding constructs characteristically associated with cognitive empathy, but the focus

of the present study is largely exploratory in the sense that the researcher is exploring the validity of the EA measure without making any assumptions beyond the methodological. However, because the behavioral measures of IS were divided into experimental conditions, the researcher hypothesized that these behavioral measures would have an additive effect on EA to varying degrees. It was predicted that the behavioral measures would improve EA scores based on the amount of social information presented and tested by the instrument, such that the IPT would outperform the PONS, which would outperform the DANVA, which would outperform the control group. But it is also worth mentioning that most published research does not examine the interactive effects of multiple behavioral instruments such as these. Because of the various design differences between these instruments, the specific advantage (or disadvantage) of any given instrument's relation to EA will be examined in an exploratory manner. For example, it is unclear whether direct or indirect tests of implicit social cues should be more related to implicit EA. It is also unclear if a measure like the PONS, for example, influences EA based on the nature of the PONS's brief, rapid-fire, multiple items or that it presents and tests a relatively high level of social information. In this respect, the DANVA, PONS, and IPT tests were selected based on their range from containing brief, multiple items testing relatively little social information (e.g., the DANVA2) to containing longer, fewer items that test much more implicit social information (e.g., the IPT-15).

The following informal hypotheses and research expectations are presented mostly to provide the reader with a more complete summary of the literature and framework associated with the experimental design.

For the target phase of this study (i.e., when individuals provide EA ratings about themselves), higher expressivity, higher self-reported empathy and attributional complexity, and lower scores on scales related to alexithymia and the autism quotient should all be related to higher levels of EA among the perceivers. Although other scales and inventories are given to participants during the target phase of this experimental design, these other individual difference variables were examined in an exploratory sense.

For the perceiver phase of this study (i.e., when individuals provide EA ratings about the target stimuli), higher self-reported empathy and attributional complexity, and lower scores on scales related to alexithymia and autism (but not psychopathy) should be related to higher levels of EA. Additionally, more outgroup contact and less intergroup anxiety should be related to higher levels of EA toward outgroup members.

Nevertheless, the present study does examine particular research questions regarding the validity of implicit EA as a measure of IS. First, the present study attempts to address the question of whether or not implicit EA is related to cognitive empathy. Significant relationships between implicit EA and cognitive empathy would lend credence both to the validity of implicit EA as a measure and the concept that empathy can be reliably tested (and self-reported) in distinct cognitive and affective forms.

The second research question aims to address how characteristics associated with particular empathy deficits relate to this implicit measure of EA. This research question is closely related to the first in the sense that it requires the assumption of a relationship between EA and cognitive empathy to be met. Provided this relationship exists, implicit

EA could be used as a proxy to differentiate deficits in cognitive versus affective empathy.

The third research question focuses on differentiating implicit EA from other established behavioral measures of IS (i.e., the DANVA, IPT, and PONS). Provided implicit EA offers a unique contribution to the construct of IS, it should not be too strongly related to or predicted from these previously established behavioral measures.

The fourth research question attempts to develop the literature regarding intergroup attitudes and empathy research by addressing how EA (i.e., a component of empathy rather than its response or the entire process) potentially operates as a function of group membership on the basis of ethnicity. Additionally, some of the more controversial or inconsistently reported topics in the literature that can be addressed by data obtained from the present study will be examined and reported in a more exploratory manner. Altogether, this study explores the specific intrapersonal and interpersonal characteristics that may be important factors in interpreting and understanding communication from others.

Table 1

Empathic Accuracy Definitions and Operationalizations

Measure	Definition and Operationalization
Subjective EA	How closely the perceiver and target ratings correlate Calculated from the perceiver's average accuracy across all 16 targets
Objective EA	How closely a given perceiver's ratings correlate Calculated from the given perceiver's rating and an average from all perceivers
Ingroup EA	How closely the perceiver's ratings correlate with targets from their ingroup Calculated from the perceiver's average accuracy across the 4 ingroup targets
Outgroup EA	How closely the perceiver's ratings correlate with targets from their outgroup Calculated from the perceiver's average accuracy across the 8 outgroup targets

Note. Pencil-and-paper versions of Subjective EA and Objective EA were also implemented. These function similarly to their respective measures with the exception that participants provide single, holistic ratings of positivity and negativity rather than continuous ratings.

Chapter 3: Methodology

This chapter explains the research process in detail. Although this dissertation technically involves only a single study, the study is divided into two procedural phases: the *target phase* and the *perceiver phase*. Details of the respective participants, measures and instruments, and data collection procedures are described for each phase separately.

During the target phase of the experimental design, participants provide data that acts as the target of empathic accuracy for all phases of the experiment. The target phase of the present study consisted of participants (i.e., targets) discussing positive or negative events via recorded videotape and later providing a continuous rating of how their affective state appears during the aforementioned videos.

The perceiver phase of the present study consisted of a different set of participants (i.e., perceivers) who provided continuous ratings of the targets' affective states in the videos. Empathic accuracy is therefore operationalized as the degree to which the target and perceiver's continuous ratings of affect correlate. In other words, empathic accuracy is a measure of how much the target and perceiver agree on the appearance of the target's emotional state in the video (i.e., in terms of how positive or negative the target appears).

Although empathic accuracy research is traditionally concerned with the relationship between perceiver and target ratings, the present study aims to expand on the concept by also examining a measure of objective empathic accuracy (i.e., how much a given perceiver's rating matches other perceivers'). The other behavioral measures of interpersonal sensitivity (i.e., the DANVA, IPT, and PONS) were experimentally

administered to participants in the perceiver phase in order to examine how any of these behavioral measures are differentially related to EA.

Target Phase

Participants. Participants in the target phase of the present study were undergraduate students enrolled in introductory psychology courses at the University of California Riverside between the Fall 2012 and Spring 2013 academic quarters. Students are required to participate in research or attend alternative academic lectures for course credit, and credit for participation in the target phase of the present study was offered to students as an opportunity for fulfilling course requirements. Participants were recruited via the Department of Psychology's online research participation system, wherein students navigate the website and sign up to participate in research or attend academic lectures by selecting them from the listing of available studies. Prior to participating in the study, all participants were asked to give informed consent and asked permission for the researchers to analyze their data and potentially use it in future research studies.

The target phase of the present study included a total of 73 participants. Of these 73 participants, one participant consented to the researchers' analyses of their data but requested their data not to be used in future studies; all other participants consented to the analyses of their data as well as the use of their data in future studies. Only one individual declined to participate in the target phase of the study after being asked to give informed consent. Table 2 provides details of various demographic characteristics for the 73 participants included in the target phase of the present study.

Measures and instruments. Instruments used in the target phase of the present study mostly consisted of questionnaires designed to measure personality and psychological characteristics, especially those presumed to be related to empathy (or interpersonal sensitivity) and/or examined in previous research. Empathic accuracy data was obtained using software that allows for continuous ratings to be made on a sliding scale while a given video file plays. The present study also implemented a holistic rating scale of the target's overall positivity and negativity to serve as an analog to the digital video rating software.

Demographic questionnaire. A brief questionnaire regarding demographic information was provided to the participants prior to all other questionnaires. The demographic questionnaire asked participants about their gender, ethnicity, age, educational status or level, employment status, income, generation status, political orientation, and religion. Responses to the demographic questionnaire were not mandatory, but responses to all other questionnaires were. For the complete demographic questionnaire, see Appendix F.

The Basic Empathy Scale. The Basic Empathy Scale (BES; Jolliffe & Farrington, 2006) is a 20-item scale designed to measure affective empathy and cognitive empathy. Jolliffe and Farrington define affective empathy as "emotional congruence" or the degree to which a perceiver shares the emotional state of the target. Likewise, Jolliffe and Farrington define cognitive empathy as the degree to which a perceiver understands the emotional state of the target.

The BES measures a self-report of empathy by asking respondents to indicate their agreement with particular empathy-related statements on a Likert scale ranging from 1 as "strongly disagree" to 5 as "strongly agree." The twenty items are divided into two subscales: a 9-item cognitive empathy subscale and an 11-item affective empathy subscale. Averages were computed for each subscale, and an overall empathy average was calculated from the combination of these subscales. Higher scores indicate more self-reported empathy. Example items from the cognitive empathy subscale include statements like "I can often understand how people are feeling even before they tell me" and the reverse-scored item "I am not usually aware of my friend's feelings." Example items from the affective empathy subscale include statements like "I get caught up in other people's feelings easily" and the reverse-scored item "Other people's feelings don't bother me at all."

Jolliffe and Farrington's (2006) tests for reliability indicated good internal consistency for both the cognitive empathy subscale ($\alpha = .79$) and the affective empathy subscale ($\alpha = .85$). Among their tests for validity, the authors reported significant relationship between the two subscales ($r = .43$) and pronounced, significant gender differences consistent with previous literature. The BES was negatively related to alexithymia (as measured by the Toronto Alexithymia Scale; see below), but this effect was largely driven by the cognitive subscale. The BES was positively related to the Interpersonal Reactivity Index (IRI; Davis, 1983), but both cognitive and affective empathy appeared to be more strongly related to the IRI's perspective-taking subscale rather than the subscale associated with empathic concern. The BES was also validated in

a separate sample, and the authors' confirmatory factor analysis strongly supported the distinct factors of affective and cognitive empathy (Albiero et al., 2009).

This scale was included as a self-report measure of empathy expected to be related to the behavioral measure of empathic accuracy. Specifically, the behavioral measure of empathic accuracy was expected to be a reflection of Jolliffe and Farrington's (2006) definition of cognitive empathy according to how closely this definition matches the description of empathic accuracy (e.g., Ickes, 1993). As such, the BES serves as an acceptable measure of convergent validity for empathic accuracy. The BES was chosen over the other popular measures of empathy because of the relevancy of the BES's subscales. For example, the Balanced Emotional Empathy Scale (BEES; Mehrabian & Epstein, 1972; Mehrabian, 1997) focuses on affective empathy and the Interpersonal Reactivity Index (IRI; Davis, 1983) avoids the cognitive/affective dichotomy. Additionally, the BES was shown to be unrelated to social desirability or self-presentation bias, unlike the IRI (Jolliffe & Farrington, 2006). Although the Empathy Quotient (EQ; Baron-Cohen & Wheelwright, 2004) has been factor analyzed to reveal cognitive and affective empathy subscales (see Lawrence et al., 2004), it was not used because of the overall design of the present study's questionnaire packet. Participants were also given the Autism Quotient (AQ; Baron-Cohen et al., 2001), which was designed by the same authors as the EQ and shares a similar structure. Furthermore, the two currently available versions of the EQ consist of 40 and 60 items, and pilot testing revealed this version of the questionnaire packet could not be completed in a reasonable amount of time. For a copy of the scale used in the present study, see Appendix G.

The Berkeley Expressivity Questionnaire. The Berkeley Expressivity Questionnaire (BEQ-16; Gross & John, 1997) is a 16-item scale designed to measure emotional expressivity. It is important to note that emotional expressivity in this context refers to differences in the observable behaviors associated with experiencing emotions (e.g., Gross & John, 1995) rather than the degree to which internal states or feelings are expressed through external displays (e.g., Kring, Smith, & Neale, 1994).

The BEQ measures a self-report of emotional expressivity by asking respondents to indicate their agreement with particular statements using a Likert scale ranging from 1 as "strongly disagree" to 7 as "strongly agree." The sixteen items are divided into three subscales: a 6-item subscale measuring negative expressivity, a 4-item subscale measuring positive expressivity, and a 6-item subscale measuring impulse strength. Averages were computed for each subscale, and an overall expressivity average was calculated from the combination of these subscales. Higher scores indicate more self-reported expressivity. Example statements from the BEQ subscales include: "Whenever I feel negative emotions, people can easily see exactly what I'm feeling" from the negative expressivity subscale; "When I'm happy, my feelings show" from the positive expressivity subscale; and "My body reacts very strongly to emotional situations" from the impulse strength subscale.

Gross and John's (1995) first tests for reliability indicated good internal consistency for all three subscales measuring negative expressivity ($\alpha = .72$), positive expressivity ($\alpha = .71$) and impulse strength ($\alpha = .76$), as well as the overall 16-item scale ($\alpha = .85$). Gross and John (1997) found the same three-factor solution in several samples,

and a laboratory manipulation of emotional states revealed support for the self-report of expressivity being significantly related to the behavioral expression of emotions.

The BEQ was used rather than Kring and colleagues' (1994) Emotional Expressivity Scale (EES) because the BEQ examines the degree to which a respondent expresses discrete emotions, whereas the EES is more concerned with whether or not a respondent's internal feelings are displayed externally. In this sense, the BEQ appears more closely related to the nonverbal expressions of emotion. The BEQ was chosen over similar instruments like the Affective Communication Test (ACT; Friedman et al., 1980) primarily to remain consistent with measures used in previous research (i.e., Zaki et al., 2008). The ACT also appeared to examine a more influential or charismatic nature of expressiveness rather than the strength of the expressiveness. For a copy of the scale used in the present study, see Appendix H.

The Autism Spectrum Quotient. The Autism Spectrum Quotient (AQ; Baron-Cohen, Wheelwright, Skinner, Martin, & Clubley, 2001) is a 50-item scale designed to measure characteristics and tendencies associated with the autism spectrum. The AQ is not necessarily a diagnostic instrument, rather it is designed to measure the presence of autistic traits as they appear in adults of normal intelligence (Baron-Cohen et al., 2001). The AQ assesses the respondent's tendency toward common autistic symptoms of social impairment and attention and communication deficits.

Rather than using statements about the respondent's behaviors, the AQ measures autistic traits by asking respondents to indicate their agreement with certain preferences or statements about things the respondent finds difficult to do. Respondents can choose to

"definitely agree," "slightly agree," "slightly disagree," or "definitely disagree" with any given statement, but their responses are ultimately scored on the basis of whether or not they endorsed the given statement (i.e., by agreeing or disagreeing). Agreeing or disagreeing with particular statements increases the resulting score (called the autism quotient) by one point. The 50-item AQ is divided equally into five 10-point subscales: social skill, attention switching, attention to detail, communication, and imagination. The AQ is keyed so that higher scores reflect more autistic tendencies, but the autistic or abnormal traits are actually defined as exceptional attention to detail and poor social skill, attention switching, communication, and imagination (Baron-Cohen et al., 2001). Example items from the AQ subscales include: "I find social situations easy" measuring social skill; "I frequently get so strongly absorbed in one thing that I lose sight of other things" measuring attention switching; "I tend to notice details that others do not" measuring attention to detail; "I frequently find that I don't know how to keep a conversation going" measuring communication; and "When I'm reading a story, I find it difficult to work out the characters' intentions" measuring imagination.

The AQ has been validated across a number of samples, notably Baron-Cohen and colleagues' (2001) comparison of adults diagnosed with Asperger syndrome or high-functioning autism to randomly-selected control groups of adults, students, and scientists. Adults diagnosed with Asperger syndrome or high-functioning autism typically scored in the 7-point range on each subscale and approximately 36 points overall, whereas the comparison groups typically scored in the 2- or 3-point range on each subscale (with the exception of the attention-related subscales, where they scored in the 4- or 5-point range)

and approximately 16 to 19 points overall. The authors suggest a cutoff point of 32 points, and found that 7 of the 11 members of the control group who agreed to clinical interviews after scoring above the cutoff actually met the criteria for Asperger syndrome or high-functioning autism according to the DSM-IV (Baron-Cohen et al., 2001). Baron-Cohen and colleagues' (2001) tests for reliability yielded moderate internal consistency for the subscales measuring attention to detail ($\alpha = .63$), attention switching ($\alpha = .67$), communication ($\alpha = .65$), and imagination ($\alpha = .65$), but higher internal consistency for the social skill subscale ($\alpha = .77$). This may be due to the AQ's focus on preferences that may be more temporary than trait-like. Although Baron-Cohen and colleagues (2001) did not report an overall reliability, the Spearman Brown coefficient calculated from the average reliability of these five subscales is fairly high, $R_{SB} = 0.91$.

The AQ was included in the present study because of the previous research detailing relationships between the autism spectrum, empathy, and interpersonal sensitivity, and the AQ is considered one of the more reliable and popular measures of autistic traits that do not involve time-consuming procedures to administer (Wheelwright et al., 2010). Although the present study is more concerned with the perceiver's autistic traits than the target's, the AQ was administered in the target phase in the event that autistic traits are related to the perceptibility of the target's emotional state, similar to how individuals with alexithymia would have difficulty describing their own feelings. Previous research indicates that people with autistic traits may have a deficit in cognitive empathy but not necessarily affective empathy (Dziobek et al., 2008). Because there are significant gender differences in autistic traits even among the general population (Baron-

Cohen et al., 2001), including the AQ may highlight how gender differences in autistic traits may be related to the gender differences in interpersonal sensitivity. The AQ is divided into subscales examining five distinct autistic traits, so the present study is able to investigate which particular traits are related to interpersonal sensitivity and how. For example, the imagination subscale of the AQ is designed to measure perspective-taking ability, whereas the social skills subscale examines more behavioral outcomes. For a copy of the scale used in the present study, see Appendix I.

The Toronto Alexithymia Scale. The Toronto Alexithymia Scale (TAS-20; Bagby, Parker, & Taylor, 1994) is a 20-item scale designed to measure characteristics of alexithymia in clinical and non-clinical populations. Like the AQ, the TAS-20 is not a diagnostic tool and is designed to measure tendencies related to alexithymia instead. The TAS-20 is the revised version of an earlier attempt to create a self-report measure of alexithymia (i.e., the original TAS; Taylor, Ryan & Bagby, 1985) and addresses many of the original's shortcomings.

The TAS-20 measures self-reported alexithymia by asking respondents to indicate their agreement with statements about the ability to feel, explain, or understand emotions. Respondents indicate their agreement using a Likert scale ranging from 1 as "strongly disagree" to 5 as "strongly agree." Although the original TAS presented a four-factor structure, the TAS-20 consistently produces a three-factor structure (Bagby et al., 1994; Parker, Taylor, & Bagby, 2003; Taylor, Bagby, & Parker, 2003). The twenty items are divided into three subscales of alexithymic characteristics: a 7-item subscale measuring the respondent's difficulty identifying their own feelings, a 5-item subscale measuring the

respondent's difficulty describing their own feelings, and an 8-item subscale measuring the respondent's tendency towards thinking about external details rather than internal experiences (e.g., feelings). Averages were computed for each subscale, and an overall alexithymia average was calculated from the combination of these subscales. Higher scores indicate more self-reported alexithymic tendencies. Example statements from the TAS-20 subscales include: "I am often confused about what emotion I am feeling" from the subscale measuring difficulty identifying feelings, "It is difficult for me to find the right words for my feelings" from the subscale measuring difficulty describing feelings, and "I prefer talking to people about their daily activities rather than their feelings" from the subscale measuring externally-oriented thinking.

Bagby and colleagues' (1994) initial reliability tests revealed good overall internal consistency, with alpha-coefficients ranging from .80 to .83 across the clinical and non-clinical populations. The individual subscales do show varying degrees of reliability, but the consistencies for the measures of difficulty identifying feelings ($\alpha = .78$), difficulty describing feelings ($\alpha = .75$), and externally-oriented thinking ($\alpha = .66$) were all adequate. In addressing research that has not found this degree of reliability and/or validity for the TAS-20, Parker and colleagues (2003) report evidence that continues to support the reliability and replicability of the TAS-20 across a number of samples.

Like the AQ, the TAS-20 was included in the present study because of the relationships found between alexithymia and interpersonal sensitivity, particularly the facets of cognitive and affective empathy. Alexithymia has been characterized as deficits in both cognitive empathy and emotional responding (e.g., FeldmanHall, et al., 2013;

Moriguchi et al., 2007; Parker et al., 1993). The TAS-20 is one of the most widely-used measures of alexithymia, and the present study is able to make use of the structure of the subscales—particularly that identifying and describing feelings are separate factors, and items related to a more external style of social cognition load onto a single factor. In this sense, externalized thinking as well as the separate roles of identifying and describing feelings can be examined in relation to cognitive empathy. For a copy of the scale used in the present study, see Appendix J.

The Attributional Complexity Scale. The Attributional Complexity Scale (ACS; Fletcher et al., 1986) is a 28-item scale designed to measure a respondent's preferences for understanding the causes of others' behavior (e.g., the tendency to ascribe simple versus complex explanations to other people's actions). Although attributional complexity is often researched in the context of the fundamental attribution error (see Ross, 1977), attributional complexity itself can be treated as a measure of social cognition.

The ACS measures attributional complexity by asking respondents to indicate their agreement with particular statements using a Likert scale ranging from 1 as "strongly disagree" to 7 as "strongly agree." The twenty-eight items are divided into seven, 4-item subscales measuring: motivation to understand others' behavior; preference for complex versus simple explanations; preference for understanding one's own cognitions (i.e., metacognition); awareness of behavior as a function of situations and interpersonal interactions; preference for complex internal attributions; preference for complex external attributions; and preference for external causes that are far removed from the behavior (in terms of time). Averages were computed for each subscale, and an

overall attributional complexity average was calculated from the combination of these subscales. Higher scores indicate more attributional complexity (i.e., a tendency to provide more thoughtful or complex explanations of others' behaviors). Example statements from the ACS subscales include: "I really enjoy analyzing the reasons or causes for people's behavior" from the motivation subscale; "I have found that the causes for people's behavior are usually complex rather than simple" from the preference for complex explanations subscale; "I believe it is important to analyze and understand our own thinking processes" from the metacognition subscale; "I believe that to understand a person you need to understand the people who that person has close contact with" from the interaction subscale; "To understand a person's personality/behavior I have found it is important to know how that person's attitudes beliefs and character traits fit together" from the complex internal explanations subscale; "I think a lot about the influence society has on other people" from the complex external explanations subscale; and "I have often found that the basic cause for a person's behavior is located far back in time" from the subscale addressing the temporal dimension of external attributions.

Previous studies have examined the relationship between attributional complexity and empathy (e.g., Joireman, 2004), but the present study focuses on attributional complexity's possible relationship with the much narrower context of empathic accuracy. Although the ACS serves as a predictor variable for the perceivers, it was primarily included as a distraction to reduce demand characteristics on the other questionnaires used during the target phase. For a copy of the scale used in the present study, see Appendix K.

The Big Five Inventory. The Big Five Inventory (BFI; John, Donahue, & Kentle, 1991; John, Naumann, & Soto, 2008) is a 44-item self-report measure of personality traits. Specifically, the BFI measures the five factors of personality traits that have been found consistently over the course of the literature's history (see John & Srivastava, 1999). Due to the massive popularity of the BFI (e.g., the original source has been cited well over a thousand times), it has been validated and even translated across a number of samples (e.g., Benet-Martinez & John, 1998; see John & Srivastava, 1999 for review).

The BFI measures self-reported personality traits by asking respondents to indicate their agreement with statements regarding a number of personality characteristics that may or may not apply to them. Respondents indicate their agreement using a Likert scale ranging from 1 as "disagree strongly" to 5 as "agree strongly." The 44 items are divided into five subscales measuring extraversion, agreeableness, conscientiousness, neuroticism, and openness. Averages were computed for each subscale. Higher scores indicate more characteristics of extraversion, agreeableness, conscientiousness, neuroticism, and openness, whereas lower scores indicate more characteristics of respectively opposing personality traits (e.g., introversion, unfriendliness or argumentativeness, carelessness, calmness or emotional stability, and shallowness or narrow-mindedness). All statements on the BFI begin with the phrase "I am someone who..." and examples from the subscales include: "generates a lot of enthusiasm" measuring extraversion; "is generally trusting" measuring agreeableness; "does things efficiently" measuring conscientiousness; "worries a lot" measuring neuroticism; and "is curious about many different things" measuring openness.

The BFI was primarily included to reduce demand characteristics by serving as a distraction from the questionnaires more directly related to interpersonal sensitivity variables. The BFI is a very popular measure of personality, and several of the more modern attempts to find the personality of the "good judge" incorporate the BFI or some version of it. In the same way a target's expressivity moderates how accurate perceivers can be about them (see Zaki et al., 2008), the present study investigates personality characteristics that may influence the perceptibility of the target's emotional state. For a copy of the scale used in the present study, see Appendix L.

The Rosenberg Self-Esteem Scale. The Rosenberg Self-Esteem Scale (RSE; Rosenberg, 1965) is a self-report measure of self-esteem. Generally speaking, self-esteem can be defined as a person's overall concept of their self-worth, and the RSE has thoroughly been shown to be a valid and reliable measure of this (Gray-Little, Williams, & Hancock, 1997). The RSE is a 10-item scale consisting of statements like "On the whole, I am satisfied with myself," and respondents indicate whether they "strongly agree," "agree," "disagree," or "strongly disagree" with each of these ten statements.

The RSE was primarily included to reduce demand characteristics by serving as a distraction from the questionnaires more directly related to interpersonal sensitivity variables. Previous research does not indicate consistent relationships between empathy and self-esteem, and these studies are often concerned with special populations such as sex offenders (Marshall, Champagne, Brown, & Miller, 1998; Monto, Zgourides, & Harris, 1998) and narcissists (Watson, Little, Sawrie, & Biderman, 1992). In this sense,

the present study only includes exploratory analyses regarding self-esteem. For a copy of the scale used in the present study, see Appendix M.

General Trace. General Trace (GTrace; Cowie, McKeown, & Douglas-Cowie, 2012) is the video rating software used to measure EA. GTrace allows participants to play a video file and simultaneously make continuous ratings about the video file that is being watched. Users can create and customize scales to adjust the nature of what is being rated in the video. GTrace also provides a rating functionality based on selecting choices from categories, but because targets made holistic pencil-and-paper ratings prior to seeing their videos, perceivers were given a pencil-and-paper rating scale in order to remain consistent and to reduce the possible amount of error introduced by the software.

The researcher created a custom, bipolar scale for the program in order to allow participants to rate the positivity or negativity of the target video. This scale is continuous and ranges from "very strongly negative" to "very strongly positive" with seven equidistant points between the two edges. In other words, there were nine visible, but not necessarily labelled, anchor points on the scale. The researcher edited GTrace's configuration file so that the far left point of the scale (i.e., "very strongly negative") was rated as -3, the far right point of the scale (i.e., "very strongly positive") was rated as +3, and the middle point of the scale (i.e., "neutral") was rated as 0. For a picture of the GTrace program and customized scale, see Figure 3.

Procedures. The procedure was administered to only a single participant at a time. Upon arriving at the laboratory (i.e., the research site), participants were introduced to the study and asked to provide informed consent by the research assistant. For a copy

of the consent form given to participants in the target phase, see Appendix A. Upon agreeing to participate in the study and consenting to the use of video-recorded data, participants were brought into a separate room and seated in front of a table and a disassembled camera and tripod. Participants were then provided with instructions and guidelines for the videotaping portion of the study, namely that they would be recorded by videotape as they discussed (in no particular order) one positive and one negative personal event that they felt comfortable sharing in the context of the experiment. Participants were provided with examples of positive and negative experiences (e.g., making a good grade on a test or getting a flat bicycle tire) to establish the nature of what the researchers would consider acceptable experiences to share. For a copy of the instructions given to participants prior to video recording, see Appendix B.

Once participants agreed to share their experience and indicated they were ready to begin speaking, the research assistant assembled the camera and tripod and placed them on the table, facing the participant. The research assistant then started the camera's recording process and left the participant in the room, closing the door behind them. Participants were allowed to speak for as long as they liked, but the typical target participant's video lasted one minute and twenty seconds. Participants were instructed to open the door in order to notify the research assistant that they have finished sharing their experience. Once notified, the research assistant returned to the participant's room, turned off the camera, and provided the participant with a holistic rating scale of how positive and negative they feel they appeared while sharing their experience. These holistic ratings used two unipolar Likert scales ranging from 1 as "not at all positive (or

negative)" to 7 as "very positive (or negative)" to assess how positive or negative the target participants felt they appeared. For a copy of the rating sheet given to target participants, see Appendix C.

Once participants completed the rating sheet, the procedure was essentially repeated with the exception that participants were now instructed to share an experience that was of opposite valence to the first experience they shared (i.e., share a positive experience if the first experience shared was negative). After both experiences were provided, the research assistant disconnected and disassembled the camera and tripod in front of the participant. The research assistant then transferred the videos of the participant from the camera's memory card to a computer system and converted them into a format that is useable by GTrace (i.e., the continuous rating software). Once the video conversion process was underway, the participant was brought into the room and seated in front of the computer.

While waiting for the video conversion process to complete, participants were asked to complete an online questionnaire packet containing the following: the demographic questionnaire, the Big Five Inventory (BFI), the Berkeley Expressivity Questionnaire (BEQ), the Autism Spectrum Quotient (AQ), the Basic Empathy Scale (BES), the Rosenberg Self-Esteem Scale (RSE), the Toronto Alexithymia Scale (TAS-20), and the Attributional Complexity Scale (ACS).

After the completion of the questionnaire packet and video conversion process, participants were introduced to the GTrace program and instructed on how to use it properly. GTrace allows participants to simultaneously watch their video and make

continuous, real-time ratings on a bipolar, sliding scale of positivity and negativity. The research assistant provided the participant with a tutorial of the program, and participants were required to demonstrate proper use of the program (using an example video) before being allowed to make continuous ratings on their videos. As with the holistic rating sheet, participants were instructed to rate their videos based on how positive or negative they appeared while sharing their experiences. Upon completing the video rating portion of the experiment, participants were given a debriefing of the study by the research assistant. Before leaving the research site, the research assistant notified participants that they could still opt not to have their data analyzed or used in future research, but no participants protested against the use of their data at this stage.

Perceiver Phase

Prior to beginning the perceiver phase of the present study, a data set of stimulus videos based on target participants needed to be created. The data collected from participants in the target phase of the study were used to create this set of stimulus videos. Participant videos were rated by independent judges in order to obtain a more objective interpretation of characteristics such as the perceived expressivity, positivity, and negativity displayed by a given participant. The videos were then analyzed and edited to create a final set of 16 videos from 16 different individuals. The researcher originally intended to create a set of videos that was evenly divided on the basis of targets' expressivity in addition to their sexes and cultural backgrounds; however, there was not enough variation in the target videos to create such an even division while also maintaining low variability in the length of these target videos.

The final set of 16 videos was equally divided based on the sex (i.e., male or female) and the cultural background (i.e., Asian, Black, Latino, and White American) of the individuals depicted therein, as well as the positive or negative nature of the experience provided by the target. In other words, the final dataset of target videos contained both a positive and negative video for each of the eight possible demographic combinations (e.g., positive and negative videos depicting Asian males, positive and negative videos depicting Asian females, positive and negative videos depicting Latino males, etc.). For details regarding characteristics of the target videos used, see Table 3.

Participants. Participants in the perceiver phase of the present study were undergraduate students enrolled in introductory psychology courses at the University of California Riverside during the Fall 2013 and Winter 2014 academic quarters. Students are required to participate in research or attend alternative academic lectures for course credit, and credit for participation in the perceiver phase of the present study was offered to students as an opportunity for fulfilling course requirements. Participants were recruited via the Department of Psychology's online research participation system, wherein students navigate the website and sign up to participate in research or attend academic lectures by selecting them from the listing of available studies. Prior to participating in the study, all participants were asked to give informed consent and asked permission for the researchers to analyze their data.

The perceiver phase of the present study included a total of 100 participants. All participants in the perceiver phase consented to the analyses of their data. Of these 100 participants, 21 participants failed to properly follow instructions for using GTrace or

otherwise did not provide sufficient accuracy data.¹ This resulted in a total of 79 participants who provided accuracy data during the perceiver phase of the experiment. Table 1 provides details of the demographic characteristics for all 100 participants included in the perceiver phase of the study, as well as demographic characteristics for the 79 participants with sufficient accuracy data.

Measures and instruments. With the exception of a few questionnaires, the measures and instruments used in the perceiver phase were identical to those used in the target phase. Instruments used in the perceiver phase of the present study consisted of questionnaires designed to measure personality and psychological characteristics, especially those presumed to be related to empathy (or interpersonal sensitivity) and/or examined in previous research. Empathic accuracy data were obtained using the aforementioned GTrace software. The present study once again implemented a holistic rating scale of perceived overall positivity and negativity to serve as an analog to the video rating software. Measures presumably related to targets' variance rather than perceivers' were removed (i.e., the BEQ), the RSE was no longer included as a distraction, and more questionnaires presumably related to perceivers' empathic accuracy were included instead.

Demographic questionnaire. The same demographic questionnaire from the target phase was used and is described in detail in Section 3.1.2 of this dissertation.

¹ Post-hoc analyses in the form of *t*-tests revealed significant differences between participants who did and did not use GTrace properly to provide sufficient data. Participants who failed to provide sufficient data scored significantly higher on psychopathy and externally-oriented thinking, and significantly lower on the motivation to understand others' behavior and the preference for complex external explanations. These results are detailed as exploratory analyses in Chapter 4.

The Levenson Self-Report Psychopathy Scale. The Levenson Self-Report Psychopathy Scale (LSRP; Levenson, Kiehl, & Fitzpatrick, 1995) is a 26-item scale designed to measure psychopathic tendencies—particularly those associated with primary and secondary psychopathy—in non-clinical populations. It has also been referred to as the Levenson Primary and Secondary Psychopathy scale (LPSP) and the Self-Report Psychopathy Scale (SRP or SRPS). The LSRP is not a diagnostic tool, rather it is designed to measure tendencies and characteristics associated with psychopathy that may occur among a more general sample of individuals.

The LSRP measures self-reported psychopathy by asking respondents to indicate their agreement with statements about personal attitudes and behaviors that reflect the callous, manipulative nature of primary psychopathy or the impulsive, emotional nature of secondary psychopathy. Respondents indicate their agreement using a Likert scale ranging from 1 as "strongly disagree" to 5 as "strongly agree." Although there has been debate as to whether the LSRP more clearly supports a two-factor or three-factor solution (e.g., Sellbom, 2011), the present study measures two factors of psychopathy because of the relevance between the (un)emotional nature of psychopathy's subtypes and the present measure of empathic accuracy. The primary psychopathy subscale consists of 16 items (e.g., "For me, what's right is whatever I can get away with"), and the secondary psychopathy subscale consists of 10 items (e.g., "I quickly lose interest in tasks I start"). Averages were computed for each subscale, and an overall average psychopathy was calculated from the combination of these subscales. It is important to note that primary psychopathy is often considered to be the true, representational version of psychopathy,

even though research supports psychopathy as a dimensional construct wherein individuals can exhibit varying degrees of primary and secondary psychopathy (Walters, Brinkley, Magaletta, & Diamond, 2008).

Initially, Levenson and colleagues (1995) found good internal consistency for the primary psychopathy scale ($\alpha = .82$) and adequate consistency for the secondary psychopathy scale ($\alpha = .63$). Levenson and colleagues (1995) also found support for psychopathy's relation to constructs of antisocial behavior, as well as the distinction that secondary psychopathy is related to anxiety while primary psychopathy is not. Other studies have found clear support for the validation of this measure (e.g., Lynam, Whiteside, & Jones, 1999; Walters et al., 2008), but some researchers argue the LSRP and the more diagnostic Psychopathy Checklist (PCL-R; see Hare, Hart, & Harpur, 1991) are measuring distinct constructs (Brinkley, Schmitt, Smith, & Newman, 2001) or that research has not adequately accounted for how psychopathy may appear differently among women (Brinkley et al., 2008).

Like the AQ and the TAS-20, the LSRP was included in the present study because of the previously reported associations between psychopathy and interpersonal sensitivity, particularly the facets of cognitive and affective empathy. Psychopathy has been characterized as deficits in affective empathy but not cognitive empathy (e.g., Jones et al., 2010); however, empirical evidence indicates there are two factors of psychopathy that describe two personality types that largely differ on the basis of emotionality (Hare et al., 1991; Levenson et al., 1995). The LSRP was selected in particular because it is designed to reliably measure these two possible subtypes of psychopathy, allowing the

researcher to examine whether or not what Karpman (1948) refers to as true psychopathy (i.e., primary psychopathy) is the subtype associated with poor affective empathy. For a copy of the scale used in the present study, see Appendix N.

The Intergroup Anxiety Scale. The intergroup anxiety scale used in the present study is an adaptation of Stephan and Stephan's (1985) original version. The scale measures respondents' self-reported attitudes toward intergroup interactions by proposing a hypothetical situation. The scale designed by Stephan and Stephan (1985) originally asks respondents "If you were the only member of your ethnic group and you were interacting with people from a different racial or ethnic group (e.g., talking with them, working on a project with them), how would you feel compared to occasions when you are interacting with people from your own ethnic group?" but this question is often changed or adjusted to reflect the appropriate group membership context of a given study (e.g., Stephan & Stephan, 1989; Stephan et al., 2002). The present study asked participants "If you were the only member of your ethnic background and you were interacting with people from other ethnic groups, how would you feel?"

Regardless of the specific question, adaptations of the intergroup anxiety scale measure intergroup attitudes by asking respondents how much they would feel particular emotions when placed in the given hypothetical situation. Over time, the original list of ten emotions and attitudes has been modified and adjusted to contain twelve items (i.e., uncertain, worried, awkward, anxious, threatened, nervous, comfortable, trusting, friendly, confident, safe, and at ease) as of Stephan and colleagues' (2002) study. The

emotions and attitudes are endorsed using a 10-point Likert scale ranging from 1 as "not at all" to 10 as "extremely."

Stephan and Stephan (1985) report good internal consistency for this scale ($\alpha = .86$) and found this measure to be significantly related to theoretical constructs like intergroup contact, stereotyping, and perceived dissimilarity of outgroup members. As such, the scale has been adapted to a number of other studies as one of the primary measures of intergroup anxiety (e.g., Stephan et al., 2002). The modified version of the scale seen in Stephan and colleagues' (2002) study yielded good internal consistency for samples of Black Americans ($\alpha = .83$) as well as White Americans ($\alpha = .92$), and shows convergent and discriminant validity for a number of constructs related to intergroup attitudes. For the adaptation of this scale used in the present study, see Appendix O.

The outgroup contact questionnaire. The outgroup contact questionnaire is a simple measure developed for the present study by the researcher. Participants were asked to report what percentage of their total friends at college belong to specific cultural backgrounds (i.e., Asian or Pacific Islander, Black or African American, Latino or Hispanic, Southeast Asian, White or Caucasian, or some other unspecified cultural background). Outgroup contact is assessed as the percentage of friends who belong to a different cultural background than the one self-reported by the respondent. For the complete outgroup contact questionnaire, see Appendix P.

The Basic Empathy Scale. The Basic Empathy Scale (BES; Jolliffe & Farrington, 2006) described in the target phase was also used in the perceiver phase. See Section 3.1.2 of this dissertation for details.

The Autism Spectrum Quotient. The Autism Spectrum Quotient (AQ; Baron-Cohen et al., 2001) described in the target phase was also used in the perceiver phase. See Section 3.1.2 of this dissertation for details.

The Toronto Alexithymia Scale. The Toronto Alexithymia Scale (TAS-20; Bagby, Parker, & Taylor, 1994) described in the target phase was also used in the perceiver phase. See Section 3.1.2 of this dissertation for details.

The Attributional Complexity Scale. The Attributional Complexity Scale (ACS; Fletcher et al., 1986) described in the target phase was also used in the perceiver phase. See Section 3.1.2 of this dissertation for details.

The Big Five Inventory. The Big Five Inventory (BFI; John, Donahue, & Kentle, 1991) described in the target phase was also used in the perceiver phase. See Section 3.1.2 of this dissertation for details.

General Trace. General Trace (GTrace; Cowie, McKeown, & Douglas-Cowie, 2012) is the video rating software used and is described in further detail in Section 3.1.2 of this dissertation. For the perceiver version of the holistic rating scale, see Appendix E.

The Diagnostic Analysis of Nonverbal Ability. The Diagnostic Analysis of Nonverbal Ability (DANVA2; Baum & Nowicki, 1998) was developed to measure individual differences in the ability to comprehend basic emotional information specifically through nonverbal means. The DANVA2 is an updated version of the original DANVA (Nowicki & Duke, 1994) that measures an individual's interpersonal sensitivity through a series of images depicting people posing with specific facial expressions and postures, or through a series of prerecorded audio files portraying

specific tones of voice. The individual must then accurately determine which of the four most universal emotional expressions (i.e., happiness, sadness, anger, or fear) the person in the given image or audio is conveying.

Participants who were administered the DANVA2 in the present study completed the 24-item Adult Facial Expressions DANVA (DANVA2-AF) and the 24-item Adult Paralanguage DANVA (DANVA2-AP) tests (Baum & Nowicki, 1998). The DANVA2-AF presents a series of images of people displaying varying intensities of happy, sad, fearful, or angry facial expressions, and participants are asked to correctly identify the given facial expressions as happy, sad, fearful, or angry. The DANVA2-AP presents a series of people speaking the same sentence (i.e., "I'm going out of the room now, and I'll be back later") with varying intensities of how happy, sad, fearful, or angry they sound. Participants are asked to correctly identify the affective state for a given speaker as happy, sad, fearful, or angry. Correctly identifying a facial expression or tone of voice resulted in an increase of one point on the participant's respective DANVA accuracy score. Accuracy was computed separately for the DANVA2-AF and DANVA2-AP tests, and these two scores were combined into an overall DANVA accuracy score for each participant.

The DANVA2-AF comes from the original DANVA-AF (Nowicki & Duke, 1994) and has been validated across a number of samples (e.g., Nowicki & Carton, 1993). Good internal consistency has been found among a variety of age groups, such as young children ($\alpha = .71$), teenagers ($\alpha = .78$), and the elderly ($\alpha = .74$; Nowicki & Duke, 2001). Likewise, DANVA2-AF accuracy scores are found to be consistently related to

social competence as rated by the self and others (e.g., Nowicki & Mitchell, 1997; Maxim & Nowicki, 1997). The DANVA2-AP was not a part of the original DANVA test, but studies demonstrate validity for this version of the instrument as well (e.g., Baum, Diforio, Tomlinson, & Walker, 1996; Maxim & Nowicki, 1997; Nowicki & Mitchell, 1997). The DANVA2-AP yielded good internal consistencies similar to the DANVA2-AF among young children ($\alpha = .74$) and college students ($\alpha = .78$; Nowicki & Duke, 2001).

The Interpersonal Perception Task. The Interpersonal Perception Task (IPT-15; Costanzo & Archer, 1993) was developed to assess an individual's ability to comprehend implicit social cues, although it does not rely solely on nonverbal stimuli. The IPT-15 is a 21-minute test depicting fifteen distinct social situations. The scenes depicted in the IPT-15 were edited from longer videotaped interactions into brief scenes lasting less than a few minutes each. These scenes are full-channel (i.e., audiovisual information and verbal content is present) and represent situations that may occur in everyday life. The IPT-15 accomplishes this by ensuring the people who appear in the scenes are not actors, and the conversations are unscripted and unrehearsed.

The IPT measures an extensive comprehension of implicit social information based on an entire scene depicting a social situation. Respondents are shown a given scene in its entirety, and then they must determine factual information from the implicit social cues displayed therein. For example, the IPT-15 asks which of two men won a basketball game, although the scene only depicts their discussion afterwards (in which the winner is not mentioned). Likewise, one scene asks which of two people is the boss

and which is the employee based on how they interact with each other in the given setting.

Participants who were administered the IPT-15 in the present study were asked to answer multiple choice questions regarding various social aspects of the fifteen scenes depicted. Correctly answering the question about the implicit social information in a given scene resulted in an increase of one point on the participant's IPT accuracy score.

The original IPT (Costanzo & Archer, 1989) yielded a moderately low internal consistency in initial testing ($\alpha = .52$), which the authors attributed to the diversity of the scenes depicted and the relatively few items. Although the test-retest reliability for the IPT-15 was .73, it still yielded fairly low internal consistency ($\alpha = .38$) for possibly the same reasons mentioned before (Costanzo & Archer, 1993). In reality, this relationship between highly diversified items of relatively few number and low internal consistency occurs quite often in tests of nonverbal decoding ability (see Hall, 2001). Nevertheless, content validity for the IPT-15 is supported by the high agreement between the contextual nonverbal behaviors predicted by the literature and the actual nonverbal behaviors that occur in the scenes (Costanzo & Archer, 1993). Likewise, IPT-15 scores were highly correlated with peer ratings of individuals' sensitivity and understanding of communication and nonverbal behavior.

The Profile of Nonverbal Sensitivity. The Profile of Nonverbal Sensitivity (PONS; Rosenthal et al., 1979) measures comprehension of social information based on brief nonverbal displays of emotional responses. There are several versions of the PONS, but the present study implements the 40-item (approximately 7-minute) Face and Body

PONS and the 40-item (approximately 8-minute) Audio PONS. These versions of the PONS assess individual ability specifically through nonverbal means (i.e., without the use of words or verbal content). However, the PONS is unique in that it also limits the availability of other nonverbal channels and examines the perceiver's comprehension of implicit social information based solely on the target's nonverbal emotional response.

In the Face and Body PONS, the perceiver is shown a variety of brief scenes lasting only two seconds each, wherein a female actor displays situation-specific emotional responses. The perceiver must decide between two possible explanations for the nonverbal behavior displayed (e.g., whether the actor is "admiring nature" or "ordering food in a restaurant") without the aid of verbal content or nonverbal audio. In the Audio PONS, the perceiver listens to a variety of brief audio utterances lasting only two seconds each, wherein the target (i.e., a male actor or female actor) is responding to a specific situation. The perceiver must decide between two possible explanations for the given utterance without the aid of visual nonverbal cues or verbal content. The verbal content was removed from the Audio PONS items via one of two processes: content filtering (in which audio frequencies are filtered out so that only characteristics such as intonation and rhythm remain) and random splicing (in which the utterance is divided into pieces and randomly spliced back together to remove verbal content). Correctly deciding which social situation explains the nonverbal behavior displayed in a given scene resulted in an increase of one point on the participant's respective PONS accuracy score. Accuracy was computed separately for the Face and Body PONS and Audio

PONS, and these two scores were combined into an overall PONS accuracy score for each participant.

The full-length, 220-item PONS (Rosenthal et al., 1979) yields good internal consistency ($\alpha = .86$); however, the internal consistencies are fairly low for the shorter versions dealing with video-only ($\alpha < .40$) and audio-only ($\alpha < .30$) channels of communication. This serves as a relatively clear indication of how the reliability of an instrument can be influenced by the number of items (Rosenthal et al., 1979). The PONS has been tested and validated over a very large number of samples (more than 133 samples prior to the original publication) and there are several correlations with constructs related to interpersonal sensitivity and social intelligence (Rosenthal et al., 1979). Although PONS correlations with external criteria were around the range of $r = .20$, a superordinate variable of these criteria would arguably resemble a construct representative of nonverbal sensitivity (Hall, 2001). Higher scores on the PONS are associated with better social adjustment and higher peer ratings of interpersonal sensitivity (Rosenthal et al., 1979), as well as more accurate knowledge about gender differences in nonverbal behavior (Hall & Carter, 1999), and more accuracy judging personality and emotions (Ambady, Hallahan, & Rosenthal, 1995).

Procedures. The perceiver phase operated similarly to the target phase, with the exception that perceivers did not provide any video recorded data. Upon arriving to the laboratory, participants were introduced to the study and asked to provide informed consent by the research assistant. For a copy of the consent form given to participants in the perceiver phase of the study, see Appendix D. Upon agreeing to participate in the

study, participants were brought into a separate room and seated at the computer within. Prior to the experimental portion of the study, participants were asked to complete an online questionnaire packet containing the following: the demographic questionnaire, the Big Five Inventory (BFI), the modified intergroup anxiety scale, the Autism-Spectrum Quotient (AQ), the Basic Empathy Scale (BES), the outgroup contact questionnaire, the Toronto Alexithymia Scale (TAS-20), the Levenson Self-Report Psychopathy Scale (LSRP), and the Attributional Complexity Scale (ACS).

The perceiver phase of the present study consisted of four randomized experimental conditions, based on the behavioral measure of interpersonal sensitivity participants were asked to complete prior to using GTrace. Participants in the DANVA group ($N = 20$) were administered the DANVA2-AF and the DANVA2-AP in random order. Participants in the PONS group ($N = 20$) were administered the Audio PONS and Face and Body PONS in random order. Participants in the IPT group ($N = 19$) were administered the IPT-15. Participants in all of the experimental groups were instructed to complete the respective behavioral measures prior to rating the dataset of 16 target videos using GTrace in a manner similar to participants in the target phase of the study. Participants in the control group ($N = 20$) were not required to complete any additional measures before proceeding to rate the dataset of target videos.

After completing the given measure of interpersonal sensitivity, participants were introduced to the GTrace program and instructed on how to use it properly. The research assistant provided the participant with a tutorial of the program, and participants were required to demonstrate proper use of the program (using an example video) before being

allowed to make continuous ratings on the target videos. After demonstrating they understood how to use GTrace, participants were asked to rate the dataset of 16 target videos using the program. As with the target phase, participants were instructed to rate the videos based on how positive or negative the target appeared while sharing their experience. After rating each video, participants answered questions regarding their holistic perception of the target's positivity and negativity before continuing on to the next video in the set. For a copy of the rating sheet given to participants in the perceiver phase, see Appendix E. Upon completing the video rating portion of the experiment, participants were given a debriefing of the study by the research assistant.

Preliminary Data Reduction and Analysis

In addition to using continuous ratings as a measure of EA, the present study also examined the overall positivity and negativity scores targets provided on paper as a source of accuracy. Empathic accuracy for the pencil-and-paper holistic ratings were calculated as the average correlation between the pencil-and-paper ratings of a given perceiver and the 16 targets. Each of the 16 targets provided an overall positivity rating and an overall negativity rating for their video description, totalling 32 scores. Each of a given perceiver's 32 pencil-and-paper ratings were correlated with the appropriate target's ratings, and these 32 correlations were averaged into an overall pencil-and-paper accuracy score for the perceiver.

Similar to Zaki and colleagues (2008), the continuous rating data was reduced by averaging the continuous affect ratings in 5-second intervals (i.e., each data point in the time series represents the average affective rating in the given five-second period). For

example, a 50-second video would contain 10 data points, and a given perceiver's accuracy is the relationship between that perceiver's 10 data points and the 10 data points provided by the target. For a visualization of the time-series correlations, see Figure 4.

Empathic accuracy is presently operationalized as the *r*-to-*Z* transformed correlation between the time-series for the target's ratings and the time-series for the perceiver's ratings. As such, the researcher needed to consider how much perceiver response data would be an adequate amount to correlate to a given target's response data. For example, if a perceiver provides only 2 out of 10 data points, but they provide the exact same average ratings as the target for those given 5-second intervals, the perceiver would receive a perfect correlation of $r = 1.00$ even though the perceiver has incomplete information for 8 out of 10 data points.

Because of the novelty of this measure of EA, the researcher established a conservative cutoff point of 66% (i.e., the participant needed to rate a clear majority of the video). Incidentally, most participants who did not provide any sufficient accuracy data did not rate more than 25% of a given video and their response patterns resemble fatigue or attrition (i.e., they provide consistent responses in the beginning but the frequency of these ratings quickly trail off and disappear for the remainder of the video). Participants who did provide sufficient accuracy data rated nearly 100% of the given video in most cases.

Participants were also required to rate at least one video from each of the eight combinations of gender and ethnicity (i.e., 8 of the 16 target videos) in order for average EA scores to be calculated. This was done to consider the event that participants may

have recognized the individual in the target video and were not allowed to provide a rating for it, but these circumstances did not typically result in a loss of data. Four participants could not have an ingroup or outgroup EA score calculated because they reported an ethnic background different from the four ethnic backgrounds used in the target videos.

Similar to Zaki and colleagues (2008), the researcher examined the unique target and perceiver effects on EA. Target effects were examined based on the average perceiver EA score for a given target ($N = 16$). Perceiver effects were examined using only perceiver cases and averaged EA values ($N = 79$).

Table 2

Summary of Demographic Variables for Participants

Demographic	Target <i>N</i> (%)	Perceiver <i>N</i> (%)	Final Perceiver <i>N</i> (%)
Average Age	19.22 years	19.65 years	19.44 years
Gender			
Males	38 (52.1%)	33 (33.0%)	27 (34.2%)
Females	35 (47.9%)	67 (67.0%)	52 (65.8%)
Ethnicity			
Asian American	26 (35.6%)	38 (38.0%)	29 (36.7%)
Black American	8 (11.0%)	12 (12.0%)	7 (8.9%)
Latino American	21 (28.8%)	29 (29.0%)	24 (30.4%)
White American	13 (17.8%)	16 (16.0%)	15 (19.0%)
Other	5 (6.8%)	5 (5.0%)	4 (5.0%)
Generation			
Third or more	16 (21.9%)	25 (25.0%)	20 (25.3%)
Second	33 (45.2%)	52 (52.0%)	42 (53.2%)
First	24 (32.9%)	23 (23.0%)	17 (21.5%)

Note. Target *N* = participants in the target phase; Perceiver *N* = participants who completed predictor variables and pencil-and-paper EA during the perceiver phase; Final Perceiver *N* = participants who provided sufficient continuous rating data in the perceiver phase.

Table 3

Summary of Descriptive Statistics for Target Stimuli Videos

Measures	Target Video Number															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ethnicity	A	W	B	L	W	B	L	A	B	L	A	W	L	A	W	B
Gender	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Positivity/Negativity	-	+	+	-	-	+	+	+	-	+	+	-	-	-	+	-
Average Subjective EA <i>r</i>	-.30	.55	.61	.56	.11	.68	.41	.23	.68	.35	-.08	.49	.62	.08	.33	.46
Average Objective EA <i>r</i>	.44	.59	.77	.69	.35	.78	.75	.56	.78	.80	.71	.51	.74	.31	.49	.71
Expressivity (BEQ)	2.86	4.83	4.19	4.31	4.03	5.03	3.75	3.94	3.69	4.61	4.42	2.94	4.00	4.53	4.86	5.36
Cognitive Empathy (BES)	3.89	5.00	3.78	3.44	4.44	4.78	4.00	4.33	3.67	4.78	4.11	4.00	4.33	3.78	4.44	4.44
Affective Empathy (BES)	3.00	3.91	3.45	2.82	3.64	4.64	2.09	3.64	3.27	3.55	3.09	4.45	2.91	4.00	3.18	3.64
Autism (AQ)	21	22	10	16	30	16	11	9	22	14	14	22	13	21	14	13
Alexithymia (TAS-20)	2.80	2.25	2.65	2.85	3.15	1.75	1.70	3.40	2.75	2.85	2.55	2.55	2.05	3.15	1.95	2.15
Difficulty Describing	3.00	3.40	2.80	2.80	4.80	2.20	1.60	4.00	3.60	4.20	2.40	3.00	2.20	3.80	1.60	2.60
Difficulty Identifying	2.86	1.71	2.57	2.86	2.43	1.43	1.00	3.71	2.86	2.43	1.71	1.86	1.57	3.14	2.57	2.14
Externalized Thinking	2.63	2.00	2.63	2.88	2.75	1.75	2.38	2.75	2.13	2.38	3.38	2.88	2.38	2.75	1.63	1.88
Attributional Complexity	4.21	5.89	4.54	4.14	4.18	4.75	5.36	4.86	5.11	5.07	4.79	4.43	5.36	5.39	5.50	5.57
Extraversion	2.13	2.88	3.63	3.25	2.75	2.25	5.00	3.75	2.13	2.38	4.38	2.75	4.00	3.13	3.88	4.13
Agreeableness	2.56	3.56	3.33	4.67	4.33	4.89	4.33	3.56	3.78	4.44	4.33	4.33	4.56	4.78	3.78	4.67
Conscientiousness	3.00	3.78	3.89	4.11	3.56	4.33	4.22	1.78	3.56	3.78	3.22	3.33	4.44	2.89	3.44	4.44
Neuroticism	2.50	3.50	3.25	2.38	2.88	1.88	1.38	1.75	2.88	4.25	2.75	2.88	1.88	3.38	3.00	2.13
Openness	3.30	3.30	3.40	3.70	3.70	3.90	4.20	3.20	4.00	3.70	3.40	2.80	3.70	3.90	3.60	4.30
Self-Esteem	14	20	27	23	19	27	28	29	13	22	20	28	29	16	22	30

Note. For ethnicity, A = Asian American; B = Black American; L = Latino American; W = White American. For Gender, M = Male; F = Female. For Positivity/Negativity, "+" indicates a video about a positive experience, and "-" indicates a video about a negative experience. EA scores are reported as the average untransformed *r* value

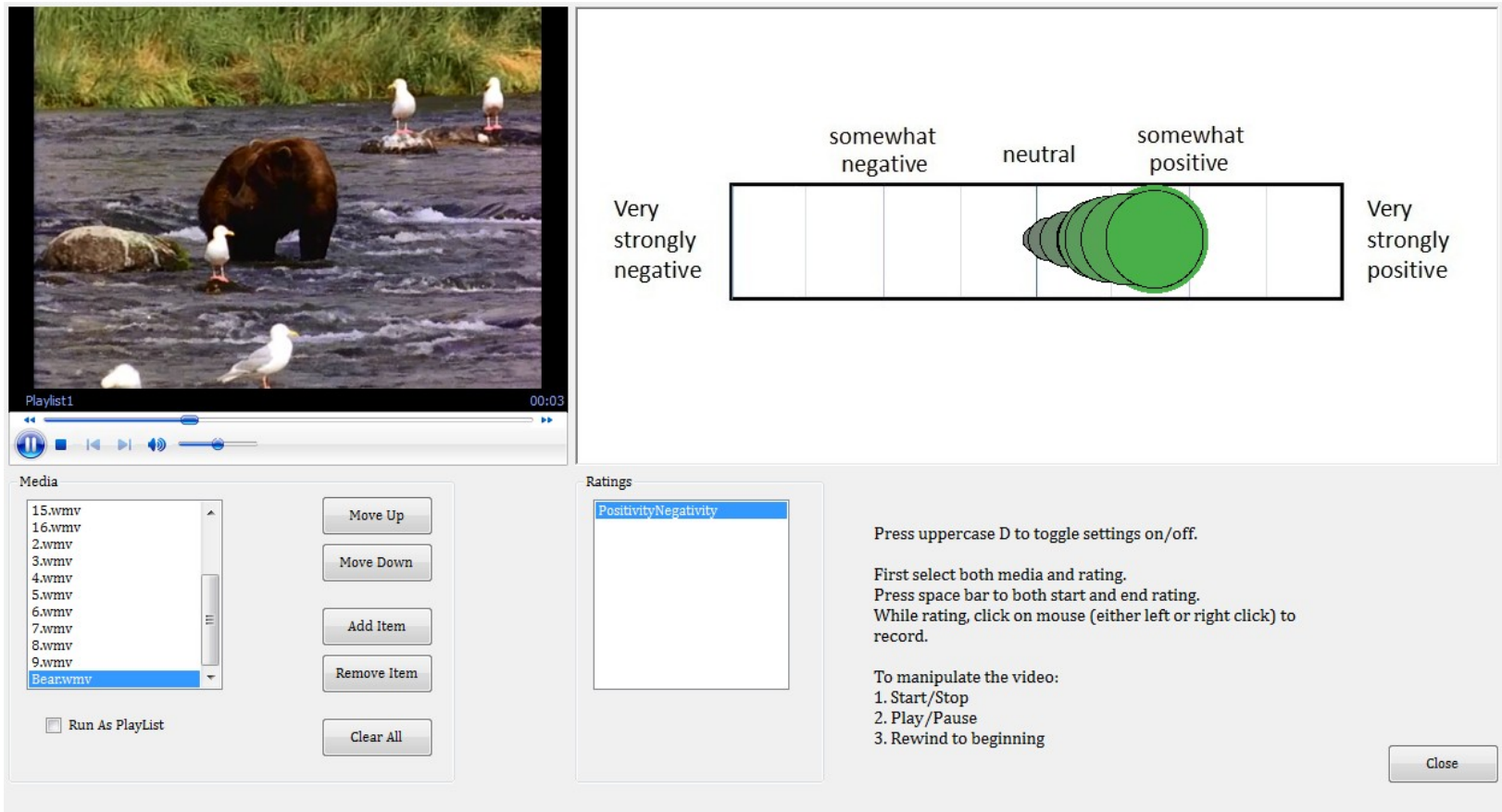


Figure 3. A diagram of the GTrace program (Cowie et al., 2012). Video playback is displayed in the upper left window, and the scale is displayed in the upper right window.

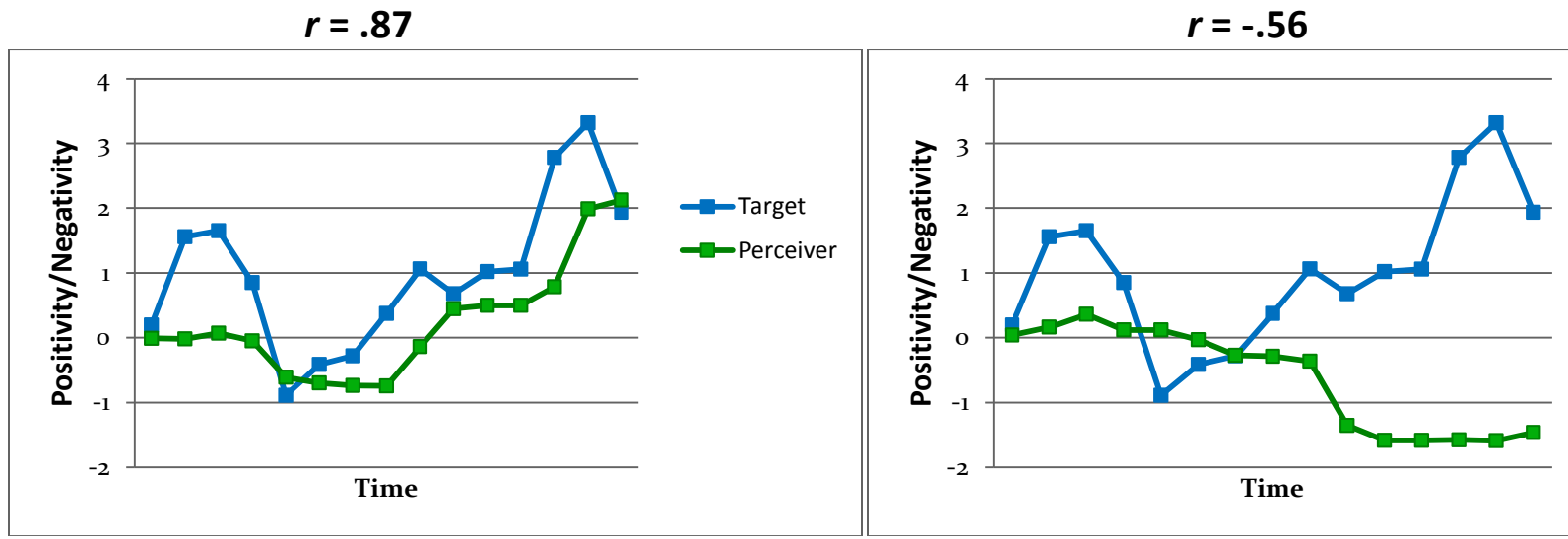


Figure 4. Sample time-series correlations of the subjective EA measure.

Chapter 4: Results

This chapter provides details for the analyses conducted in the present study as an examination of the research questions. The statistics are presented within the text whenever possible, but some of the more cumbersome information (e.g., large lists of data, regression models, etc.) only appears in tables located at the end of this chapter. This chapter is organized to address the overarching research question regarding empathic accuracy, empathy, and interpersonal sensitivity, as well as the specific research questions related to the present measure of EA. Specific results and analyses are presented individually, and a further explanation and summary of results addressing these research questions is located at the end of this chapter.

Preliminary Results

Descriptive statistics and sample characteristics. Overall, perceivers were moderately accurate about the targets' reported emotional states. The raw, average effect size r for perceivers' EA scores was typically in the middle range, but the average objective pencil-and-paper EA score (mean $r = .78$) was much higher than the subjective pencil-and-paper average (mean $r = .54$), subjective EA average (mean $r = .40$), and objective EA average (mean $r = .58$). The average outgroup EA score was also moderate (mean $r = .41$), but the average ingroup EA score was fairly low (mean $r = .29$). The high objective pencil-and-paper scores are likely due to much more common agreement on 7-point scaled items rather than continuous ratings of minute-long videos. The overall subjective EA average is comparable to the average r of .47 reported previously for Zaki and colleagues' (2008) measure of subjective EA.

The typical target participant in the present sample reported levels of agreeableness, extraversion, conscientiousness, and openness slightly above the BFI scale's midpoint, and a level of neuroticism slightly below the BFI's midpoint. The typical target reported levels of expressivity, empathy, self-esteem, and attributional complexity slightly above these scales' respective midpoints. The typical target reported tendencies of alexithymia that were slightly below the TAS-20's midpoint, and the average AQ score for targets was 17.5, which is very close to the average of 17.6 Baron-Cohen and colleagues (2001) report for their sample of students. For a table of descriptive statistics and sample characteristics (e.g., means for all variables) for the target participants, see Table 4.

The typical perceiver participant in the present sample reported levels of agreeableness, extraversion, conscientiousness, and openness slightly above the BFI scale's midpoint, and a level of neuroticism approximately at the BFI's midpoint. The typical perceiver reported intergroup anxiety below the scale's midpoint, and that approximately 45% of their friends belonged to a different cultural background than their own. The typical perceiver reported levels of empathy and attributional complexity above these scales' respective midpoints, and they reported tendencies related to alexithymia and psychopathy that were below these scales' respective midpoints. The average AQ score for perceivers was 17.8, which is very close to the average of 17.6 Baron-Cohen and colleagues (2001) report for their sample of students. For a table of descriptive statistics and sample characteristics for the perceiver participants, see Table 5.

Scale and instrument reliability. Although this measure of EA was not necessarily a scale in the traditional sense, internal consistencies were calculated for demonstrative purposes. Similar to other behavioral measures of interpersonal sensitivity, subjective EA yielded fairly low consistency ($\alpha = .38$), but objective EA yielded good consistency ($\alpha = .78$). The low reliability for subjective EA may be influenced by the diversity and low number of items, but also by how much the perceivers agreed that a given target was not describing their emotional state accurately. For example, when the target with the lowest perceiver accuracy ratings is replaced by the perceiver average for that target, internal consistency approaches adequate levels ($\alpha = .52$).

Internal consistencies for the measures of interpersonal sensitivity were quite varied across the measures: DANVA2-AF ($\alpha = .37$), DANVA2-AP ($\alpha = .09$), Combined DANVA2 ($\alpha = .41$), IPT-15 ($\alpha = .12$), Face and Body PONS ($\alpha = .62$), Audio PONS ($\alpha = -.09$), and Combined PONS ($\alpha = .55$). Although low reliabilities seem standard for behavioral measures of interpersonal sensitivity, the negative reliability coefficient found for the Audio PONS is disconcerting. Negative reliability coefficients indicate there is greater variation within-subjects than between-subjects (see Knapp, 1991), and the Audio PONS is an arguably difficult task. Original tests of the PONS found nearly zero reliability for the audio items provided by the male actor (Rosenthal et al., 1979). Conversely, the Face and Body PONS, which depicts only one female actor, yielded the most reliability of these behavioral measures.

In the target phase, internal consistencies for the questionnaires measuring personality and psychology constructs were good overall. Ranging in order from greatest

to least internal consistency, the scales were RSE ($\alpha = .91$), ACS ($\alpha = .88$), BES ($\alpha = .85$), BEQ-16 ($\alpha = .85$), TAS-20 ($\alpha = .81$), BFI ($\alpha = .78$), and AQ ($\alpha = .58$). In the perceiver phase, internal consistencies for the questionnaires measuring personality and psychology constructs were good overall. Ranging from greatest to least internal consistency, the scales were ACS ($\alpha = .91$), intergroup anxiety ($\alpha = .91$), BES ($\alpha = .86$), TAS-20 ($\alpha = .86$), LSRP ($\alpha = .83$), BFI ($\alpha = .65$), and AQ ($\alpha = .59$).

Target Contributions to EA

Tests for Pearson product-moment correlation coefficients were conducted on the target level data in order to examine how target characteristics related to perceiver EA scores. Specifically, tests were conducted on target level predictor variables' relationships to an EA score based on the average of all 79 perceivers' agreement with the given target ($N = 16$).

Under these circumstances, the only variable significantly related to the perceiver's subjective EA is the target's conscientiousness, $r = .55$, $p = .027$, although the effect size for the target's overall TAS-20 score approaches marginal significance, $r = -.42$, $p = .104$. The perceiver's objective EA was also significantly related to the target's conscientiousness, $r = .57$, $p = .022$, as well as the target's overall AQ scores, $r = -.59$, $p = .017$, and overall TAS scores, $r = -.54$, $p = .032$. Perceiver's objective EA was also marginally related to the valence of the target video, $r = .46$, $p = .075$, such that positive videos were related to more perceiver agreement on the objective EA scores.

Examinations of the subscales did not reveal any significant relationships to subjective EA. Objective EA was significantly related to social skills (AQ), $r = -.51$, $p =$

.046, communication (AQ), $r = -.57, p = .021$, difficulty identifying emotions (TAS), $r = -.49, p = .053$, and preferences for complex external attributions (ACS), $r = .55, p = .026$, and it was marginally related to positive expressivity (BEQ), $r = .46, p = .076$, attention switching (AQ), $r = .47, p = .067$, and difficulty describing emotions (TAS), $r = -.44, p = .091$.

Perceiver Contributions to EA

Correlations between perceivers and EA. Tests for Pearson product-moment correlation coefficients were conducted on the perceiver level data in order to examine how the perceivers' characteristics were related to their average EA scores ($N = 79$). However, subjective EA was not significantly related to any of the predictor variables in this sample. When examining the subscales of these measures, subjective EA was only significantly related to the communication subscale of the AQ, $r = .28, p = .012$.

Objective EA was significantly related to the perceiver's gender, $r = .23, p = .045$, but no other predictor variables. When examining the subscales of these measures, objective EA was significantly related to the communication subscale of the AQ, $r = .23, p = .046$, and marginally related to the cognitive empathy subscale of the BES, $r = .19, p = .091$.

Multiple regression models of perceivers. Multiple linear regression analyses were conducted in order to explore which perceiver-level variables (and subscales, where appropriate) contributed significantly to explaining the variance in perceivers' EA. All predictor variables in the models were entered through SPSS's backward elimination process. In other words, predictor variables were automatically removed from the model

and the model was retested according to an algorithm that examines each variable's significant contribution to explaining the variance in EA.

When examining the variance in subjective EA, backward elimination produced twenty-five models, beginning with the full model that included all variables. The twenty-fifth model was the most significant predictor for the variance in subjective EA, $F(3,75) = 5.23, p = .002$. This model predicts subjective EA from cognitive empathy, the difficulty describing feelings subscale of the TAS-20, and the communication subscale of the AQ (see Table 6).

When examining the variance in objective EA, backward elimination produced twenty-four models, beginning with the full model that included all variables. The twenty-fourth model was the most significant, $F(4, 74) = 4.29, p = .004$. This model predicts objective EA from openness, cognitive empathy, and the communication and imagination subscales of the AQ (see Table 7).

Intergroup Empathic Accuracy

Correlations between perceivers and intergroup EA. Tests for Pearson product-moment correlation coefficients were conducted on the perceiver level data in order to examine how the perceivers' characteristics were related to their average EA scores when responding to ingroup or outgroup members (based on ethnicity; $N = 75$). Ingroup EA was significantly related to the perceiver's gender, $r = .32, p = .005$, conscientiousness, $r = .29, p = .010$, and average psychopathy, $r = -.28, p = .016$, and it was marginally related to the perceiver's average TAS-20 score, $r = -.20, p = .081$. When

examining the subscales of these measures, ingroup EA was only significantly related to primary psychopathy, $r = -.23, p = .050$, and secondary psychopathy, $r = -.24, p = .038$.

Outgroup EA was marginally related to the perceiver's extraversion, $r = -.19, p = .096$, intergroup anxiety, $r = .19, p = .097$, average TAS-20 score, $r = .22, p = .064$, and average AQ score, $r = .20, p = .080$. When examining the subscales of these measures, outgroup EA was significantly related to difficulty describing feelings (TAS-20), $r = .23, p = .051$, secondary psychopathy (LSRP), $r = .25, p = .029$, and communication (AQ), $r = .25, p = .032$, and it was marginally related to social skills (AQ), $r = .22, p = .059$.

Multiple regression models of intergroup EA. When examining the variance in perceivers' ingroup EA, backward elimination produced twenty-six models, beginning with the full model that included all variables. The twenty-sixth model was the most significant, $F(2, 72) = 9.46, p < .001$. This model predicts ingroup EA from gender and conscientiousness (see Table 8).

When examining the variance in outgroup EA, backward elimination produced twenty-seven models, beginning with the full model that included all variables. The twenty-sixth model was the most significant, $F(2, 72) = 4.96, p = .029$. This model predicts outgroup EA from secondary psychopathy and the communication subscale of the AQ (see Table 9).

Behavioral Measure Comparisons

Pencil-and-paper EA. Subjective pencil-and-paper EA scores were strongly correlated to subjective EA, $r = .61, p < .001$, objective EA, $r = .65, p < .001$, and outgroup EA, $r = .50, p < .001$, but not ingroup EA, $r = .16, p = .179$. Subjective pencil-

and-paper EA scores were unrelated to any of the other behavioral measures of interpersonal sensitivity. Objective pencil-and-paper EA scores were strongly correlated to subjective EA, $r = .68, p < .001$, objective EA, $r = .71, p < .001$, and outgroup EA, $r = .55, p < .001$, but not ingroup EA, $r = .19, p = .106$. Objective pencil-and-paper EA scores were marginally related to accuracy on the IPT-15, $r = .33, p = .100$, but not any other behavioral measure of interpersonal sensitivity. Out of all of the predictor variables, subjective pencil-and-paper EA scores were only related to the perceiver's gender, $r = .22, p = .026$, and objective pencil-and-paper EA scores were only related to the perceiver's gender, $r = .23, p = .023$, such that women scored significantly higher on how much their ratings matched the targets' and how much their ratings agreed with other perceivers'.

Continuous rating EA. There were strong relationships between the measures of subjective and objective EA, $r = .86, p < .001$, subjective and outgroup EA, $r = .82, p < .001$, and objective and outgroup EA, $r = .86, p < .001$, but weaker relationships between subjective and ingroup EA, $r = .30, p = .010$, and objective and ingroup EA, $r = .23, p = .050$. Interestingly, ingroup EA and outgroup EA were significantly and negatively related, $r = -.30, p = .008$. The Audio PONS was negatively related to subjective EA, $r = -.48, p = .033$, objective EA, $r = -.51, p = .022$, and outgroup EA, $r = -.50, p = .029$, and the IPT-15 was marginally and positively related to ingroup EA, $r = .46, p = .058$, but there were no other significant relationships between the behavioral measures of interpersonal sensitivity. This suggests ingroup EA may function differently, such that the social information provided by (and used when responding to) ingroup and outgroup

members varies significantly. Otherwise, this measure of EA appears to be distinct from other behavioral measures in terms of what is captured by the instrument.

Univariate analysis of variance (ANOVA) tests were conducted to examine what effect, if any, the different behavioral measures of IS had on perceivers' EA scores. When testing for differences in subjective EA, the ANOVA indicated there were no significant differences between the experimental conditions, $F(3,75) = 1.88, p = .140$. However, post-hoc analyses in the form of least-squares difference (LSD) tests revealed the control group ($M = .521$) scored significantly higher than the DANVA2 group ($M = .404$). When testing for differences in objective EA, the ANOVA indicated there were no significant differences between the experimental conditions, $F(3,75) = 1.08, p = .362$, and post-hoc analyses in the form of LSD tests revealed no significant group differences. When testing for differences in ingroup EA, the ANOVA indicated there were significant differences between the experimental conditions, $F(3,71) = 3.40, p = .022$. Post-hoc analyses in the form of LSD tests revealed the IPT-15 ($M = .522$) and control ($M = .532$) groups scored significantly higher than both the DANVA2 ($M = .246$) and PONS ($M = .220$) groups. When testing for differences in outgroup EA, the ANOVA indicated there were no significant differences between the experimental conditions, $F(3,71) = 0.27, p = .849$, and post-hoc analyses in the form of LSD tests revealed no significant group differences.

Because this portion of the present study involved randomized experimental conditions, it can be said that behavioral measures of a certain design may have an effect on EA task performance. These results suggest the implicit measure of EA may be best administered independently or in the absence of other behavioral measures of IS that do

not emulate social situations closely enough. For a table of how each experimental group performed on the various measures of EA, see Table 10.

Exploratory Analyses

Target variable intercorrelations. For a table of intercorrelations among target-level predictor variables, see Table 11. Most notably, cognitive empathy is negatively related to autism scores and alexithymia scores, but positively related to agreeableness, conscientiousness, and attributional complexity scores. Affective empathy appears to be unrelated to autism scores and alexithymia scores.

Perceiver variable intercorrelations. For a table of intercorrelations among perceiver-level predictor variables, see Table 12. Most notably, cognitive empathy is negatively related to autism scores, alexithymia scores, psychopathy scores, and intergroup anxiety, but it is positively related to agreeableness, openness, and attributional complexity scores. In the same sense that agreeableness and openness appear related to cognitive empathy but not affective empathy, neuroticism appears to be related to affective empathy but not cognitive empathy.

Affective empathy appears to be unrelated to autism scores, alexithymia scores, and psychopathy scores; however, further examination reveals that the subscales of these measures are differentially related to affective empathy (e.g., primary psychopathy is negatively related, but secondary psychopathy is positively related, see Table 13).

Unresponsive perceivers. Because of the large number of perceivers who did not provide GTrace data (i.e., 21 out of 100 participants), the researcher employed independent-samples *t*-tests in order to examine any group differences between

participants who were willing and able to properly use the GTrace software and those who were not. Participants who failed to provide sufficient data scored significantly higher in LSRP's average psychopathy, $t_{(98)} = 2.71, p = .008$, and primary psychopathy, $t_{(98)} = 2.46, p = .016$, and the externally-oriented thinking subscale of the TAS-20, $t_{(98)} = 2.37, p = .020$. Participants who failed to provide sufficient data also scored significantly lower on the ACS subscale regarding preferences for complex external explanations, $t_{(98)} = -2.23, p = .028$, and marginally lower on the subscale regarding the motivation to understand others' behaviors, $t_{(98)} = -1.93, p = .057$. There were no other significant differences between these groups, including their pencil-and-paper subjective EA scores, $t_{(96)} = -0.16, p = .876$, and objective EA scores, $t_{(96)} = -0.91, p = .364$.

Gender Differences

Group differences. Consistent with previous research, preliminary analyses revealed significant gender differences on the present measure of EA. In order to examine basic differences between men and women, independent samples *t*-tests were conducted. Women scored marginally higher than men on both the subjective and objective pencil-and-paper EA measures. Women also scored significantly higher than men on objective EA and ingroup EA, but not subjective EA and outgroup EA. The average subjective EA was higher for women ($M_{Zr} = .488$) than men ($M_{Zr} = .441$), but the average outgroup EA was lower for women ($M_{Zr} = .496$) than men ($M_{Zr} = .520$), although these differences were not significant. The average scores for these subjective EA measures (i.e., subjective EA, ingroup EA, and outgroup EA) were fairly similar, with the exception of

ingroup EA, wherein men scored much lower ($M_{Zr} = .201$) than the average Z_r (approximately 0.48) of the other subjective measures.

Among the predictor variables, women scored significantly higher on average empathy (including both cognitive and affective empathy) and neuroticism. For a list of the significant gender differences analyzed via t -tests, see Table 14.

Correlations among men and women. The subsequent analyses are reported separately for men, $N = 27$, and women, $N = 52$, to help determine how gender differences relate to the present measures of EA. Table 15 reproduces the descriptive statistics for these separate samples of men and women.

Among men, outgroup contact was negatively related to both subjective pencil-and-paper EA, $r = -.41$, $p = .019$, and objective pencil-and-paper EA, $r = -.47$, $p = .006$, but there were no significant relationships among women. When examining the subscales, no further significant relationships were found for subjective pencil-and-paper EA among either men or women. However, objective pencil-and-paper EA was significantly related to attention to detail (AQ), $r = .38$, $p = .030$, and marginally related to temporal explanations (ACS), $r = -.30$, $p = .101$, among men. Among women, objective pencil-and-paper EA was marginally related to social skills (AQ), $r = .21$, $p = .086$, and difficulty describing feelings (TAS-20), $r = .21$, $p = .098$.

Among men, subjective EA was marginally related to average autism scores, $r = .37$, $p = .061$, intergroup anxiety, $r = .37$, $p = .061$, and outgroup contact, $r = -.33$, $p = .092$. Among women, subjective EA was marginally related to agreeableness, $r = .27$, $p = .057$. When examining the subscales among men, subjective EA was significantly related

to secondary psychopathy (LSRP), $r = .42$, $p = .029$, and communication (AQ), $r = .59$, $p = .001$, but no further relationships were found among women.

Among men, objective EA was significantly related to intergroup anxiety, $r = .42$, $p = .029$, and outgroup contact, $r = -.58$, $p = .002$, and marginally related to average alexithymia scores, $r = .36$, $p = .063$. Among women, objective EA was significantly related to agreeableness, $r = .29$, $p = .035$. When examining the subscales among men, objective EA was significantly related to communication (AQ), $r = .55$, $p = .003$, and marginally related to secondary psychopathy (LSRP), $r = .36$, $p = .065$, metacognition (ACS), $r = -.34$, $p = .081$, and temporal explanations (ACS), $r = -.33$, $p = .099$. Among women, objective EA was marginally related to cognitive empathy (BES), $r = .25$, $p = .076$.

Among women, ingroup EA was significantly related to conscientiousness, $r = .63$, $p < .001$, average alexithymia scores, $r = -.31$, $p = .030$, and average LSRP scores, $r = -.39$, $p = .006$, but no significant relationships were found among men. When examining the subscales, no further significant relationships were found for either men or women.

Among men, outgroup EA was significantly related to average AQ scores, $r = .54$, $p = .004$, neuroticism, $r = .39$, $p = .047$, intergroup anxiety, $r = .42$, $p = .030$, and marginally related to outgroup contact, $r = -.35$, $p = .077$, and average alexithymia scores, $r = .33$, $p = .093$. There were no significant relationships among women. When examining the subscales among men, outgroup EA was significantly related to communication (AQ), $r = .65$, $p < .001$, attention switching (AQ), $r = .45$, $p = .019$,

secondary psychopathy (LSRP), $r = .40$, $p = .041$, and marginally related to social skills (AQ), $r = .32$, $p = .104$, and difficulty describing feelings (TAS-20), $r = .33$, $p = .089$. There were no further significant relationships found among women. For a list of correlations between EA and predictor variables for men, see Table 16. For a list of correlations between EA and predictor variables for women, see Table 17.

It is noteworthy to mention that outgroup contact negatively relates to EA and intergroup anxiety positively relates to EA, but this effect is only seen among men and occurs for every measure of EA except ingroup EA. Among women, outgroup contact positively relates to measures of EA, and intergroup anxiety negatively relates to the same measures.

Although the results are not significant, it is also noteworthy to mention that, among men, cognitive empathy is negatively related to EA but affective empathy is positively related to EA. This result was found consistently for every EA measure in the present study. Women typically did not show this pattern, with the exception of ingroup EA (i.e., cognitive empathy was positively related to ingroup EA and affective empathy was negatively related to ingroup EA).

Summary of Research Questions

Is EA related to cognitive empathy? Only the present study's measure of objective EA was related to cognitive empathy. However, this may have been affected by gender differences in empathic accuracy. In fact, the overall relationship found between objective EA and cognitive empathy may have been driven by women. Women scored significantly higher than men on a majority of the EA measures, and the measures

seemed to be more related to men's affective empathy than their cognitive empathy.

These results could also be an indication of Simpson's paradox (see Blyth, 1972), wherein one group that scores uniformly higher than the other can yield a positive trend line for the overall scatterplot. These analyses were conducted on the overall sample as well as separate samples that included only men or only women in order to help determine any possible trends within gender that may have disappeared or otherwise been altered when these groups were combined into a single data set.

The models most significantly predicting subjective and objective EA scores from perceiver characteristics include cognitive empathy as a significant and positive predictor. Most of the other variables in these models come from the scales measuring autism, alexithymia, or psychopathy. Particularly, the model predicting ingroup EA includes the two types of psychopathy, and the model predicting outgroup EA includes AQ and TAS-20 subscales related to difficulties with emotional communication. In other words, this measure does appear to be at least indirectly related to cognitive empathy, among several other related constructs.

Is EA related to empathy-related traits? Although these measures of EA do not appear to be directly related to cognitive empathy (as measured by the BES), they are directly related to several constructs related to cognitive empathy. However, several measures expected to be negatively related to EA (e.g., autism, alexithymia, and psychopathy) yielded positive relationships to these measures of EA. Further examination indicates particular subscales were differentially related to EA. Because this was a non-clinical sample, traits of autism, alexithymia, and psychopathy are likely to operate more

independently than normal. Subscales such as communication difficulties (AQ) and difficulty describing feelings (TAS-20) measure traits that do not necessarily preclude the ability to understand and interpret others, only the ability to communicate that one is able to do so. By contrast, the AQ subscale measuring imagination difficulties deals more directly with perspective-taking, and the TAS-20 subscale measuring difficulty identifying feelings deals more directly with an inability to accurately interpret emotions. Likewise, primary and secondary psychopathy appear to relate to distinct sets of characteristics, with secondary psychopathy appearing to be more emotionally and interpersonally related.

How does EA compare to other behavioral measures? In the experimental portion of this study, the control group appears to outperform all others on the EA measure, although their scores are not significantly different from the IPT-15. As opposed to these behavioral measures priming or improving perceivers' abilities on the EA measure, administering the behavioral measures may interfere or inhibit performance on the EA task. It is difficult to tell whether or not this is a result of fatigue instead of redundancy, but the longest test to administer (i.e., the IPT-15) resulted in comparably high scores, while the shortest test (i.e., the DANVA2) resulted in the lowest scores.

These measures of EA were all virtually unrelated to every behavioral measure of IS, with notable exceptions being the Audio PONS's negative relationship to most measures of EA, and ingroup EA's positive relationship to the IPT-15. Otherwise, these measures of EA were highly intercorrelated, once again with the exception of ingroup EA. Among the measures of EA, ingroup EA appears to be distinct from the others.

Subjective, objective, and outgroup EA share different patterns of relationships to perceiver characteristics, but their patterns are much more similar to each other's than the patterns exhibited by ingroup EA.

How does intergroup EA function? The present measures of ingroup and outgroup EA appear to function differently, or at least there are different sets of personality and psychological traits that influence each. Characteristics that are normally associated with low interpersonal sensitivity (e.g., autism, psychopathy, and alexithymia) appear to be positively related to EA when the targets are outgroup members. Furthermore, the relationship between psychopathy and EA appears to be differentiated on the basis of group membership, such that higher scores on the LSRP relate to lower ingroup EA but higher outgroup EA.

It is difficult to determine whether this variation in EA scores is due to an ingroup effect or an outgroup effect, since the measure of ingroup EA appears so different from all three other versions of EA. Most notably, ingroup EA appears to be the measure of accuracy that differentiates men from women in terms of how empathy related constructs (i.e., autism, alexithymia, and psychopathy) relate to the current measure of EA. Among men, traits of autism, alexithymia, and psychopathy are positively related each EA measure except ingroup EA. Among women, ingroup EA is the only measure significantly related to alexithymia and psychopathy, but these relationships are negative rather than positive. Ingroup EA also appears to be the only measure where women's cognitive empathy is positively related to EA while their affective empathy is negatively related.

Table 4

Summary of Descriptive Statistics for Targets

Measure	Targets (N = 73)	Final Targets (N = 16)
Video Positivity	4.19	3.91
Video Negativity	3.29	3.28
Expressivity (BEQ)	4.51	4.21
Positive Express	5.49	5.11
Negative Express	3.44	3.31
Impulse Strength	4.58	4.21
Empathy (BES)	3.82	3.79
Cognitive Empathy	4.07	4.20
Affective Empathy	3.61	3.45
Autism (AQ)	17.52	16.75
Alexithymia (TAS-20)	2.46	2.53
Attributional Complex	4.92	4.95
BFI	--	--
Extraversion	3.29	3.27
Agreeableness	3.91	4.12
Conscientiousness	3.35	3.61
Neuroticism	2.85	2.66
Openness	3.61	3.63
Self-Esteem	20.77	22.94

Note. Targets = participants in the target phase; Final Targets = the 16 participants selected for the stimulus videos

Table 5

Summary of Descriptive Statistics for Perceivers

Measure	Perceivers (<i>N</i> = 100)	Traced Perceivers (<i>N</i> = 79)	Untraced Perceivers (<i>N</i> = 21)
Cognitive Empathy	4.21	4.20	4.24
Affective Empathy	3.70	3.71	3.66
Alexithymia (TAS-20)	2.40	2.36	2.55
Difficulty Identifying	2.25	2.21	2.42
Difficulty Describing	2.79	2.79	2.78
Externalized Thinking	2.29	2.22	2.54
Primary Psychopathy	2.15	2.08	2.41
Secondary Psychopathy	2.33	2.27	2.54
Autism (AQ)	17.80	17.61	18.52
Social Skills	2.45	2.43	2.57
Attention Switching	4.76	4.72	4.90
Attention to Detail	5.70	5.58	6.14
Communication	2.25	2.23	2.33
Imagination	2.63	2.65	2.57
Intergroup Anxiety	3.26	3.29	3.15
Outgroup Contact	45.26	44.22	49.14
Attributional Complexity	5.25	5.30	5.04
Motivation	5.26	5.37	4.83
Complex Explanations	4.89	4.97	4.57
Metacognition	5.43	5.46	5.30
Behavior as Interaction	5.39	5.39	5.38
Internal Explanations	5.18	5.25	4.94
External Explanations	5.43	5.54	5.04
Temporal Explanations	5.17	5.16	5.20
Extraversion	3.44	3.38	3.67
Agreeableness	3.99	3.95	4.12
Conscientiousness	3.54	3.51	3.66
Neuroticism	2.99	3.02	2.90
Openness	3.58	3.58	3.60

Note. Perceivers = all participants in the perceiver phase; Traced Perceivers = perceivers who provided sufficient GTrace data; Untraced perceivers = perceivers who did not provide sufficient GTrace data.

Table 6

Regression Models for Subjective EA Predicted from Perceiver Variables (Subscales)

Model Statistic	Full Model (27,51)	Most Significant (3,75)		
<i>F</i> -value	0.87	5.23		
<i>p</i> -value	.649	.002		
Total R ²	.32	.17		
R ² Adjusted	-.05	.14		
Δ R ² Adjusted	--	.19		
Variables Entered	b	β	<i>p</i> -value	
Cognitive Empathy	.110	.329	.007	
Difficulty Describing	.038	.213	.067	
Communication	.034	.340	.003	
(Constant)	-.171	--	.398	

Note. Degrees of freedom (numerator, denominator) for *F*-values are listed in parentheses next to the model type. Δ R² Adjusted is reported rather than Δ R² because the former is assumed to be more meaningful in backwards elimination model building, provided the full model adequately explains variance.

Table 7

Regression Models for Objective EA Predicted from Perceiver Variables (Subscales)

Model Statistic	Full Model (27,51)	Most Significant (4,74)		
<i>F</i> -value	1.02	4.29		
<i>p</i> -value	.458	.004		
Total R ²	.35	.19		
R ² Adjusted	.01	.14		
Δ R ² Adjusted	--	.13		
Variables Entered	b	β	<i>p</i> -value	
Openness	-.155	-.230	.056	
Cognitive Empathy	.227	.328	.008	
Communication	.074	.362	.002	
Imagination	-.053	-.217	.059	
(Constant)	.557	--	.171	

Note. Degrees of freedom (numerator, denominator) for *F*-values are listed in parentheses next to the model type. Δ R² Adjusted is reported rather than Δ R² because the former is assumed to be more meaningful in backwards elimination model building, provided the full model adequately explains variance.

Table 8

Regression Models for Ingroup EA Predicted from Perceiver Variables (Subscales)

Model Statistic	Full Model (27,47)	Most Significant (2,72)		
<i>F</i> -value	1.11	9.46		
<i>p</i> -value	.373	< .001		
Total R ²	.39	.21		
R ² Adjusted	.04	.19		
Δ R ² Adjusted	--	.15		
Variables Entered	b	β	<i>p</i> -value	
Gender	.303	.350	.001	
Conscientiousness	.253	.326	.003	
(Constant)	-1.012	--	.004	

Note. Degrees of freedom (numerator, denominator) for *F*-values are listed in parentheses next to the model type. Δ R² Adjusted is reported rather than Δ R² because the former is assumed to be more meaningful in backwards elimination model building, provided the full model adequately explains variance.

Table 9

Regression Models for Outgroup EA Predicted from Perceiver Variables (Subscales)

Model Statistic	Full Model (27,47)	Most Significant (2,72)		
<i>F</i> -value	0.59	3.88		
<i>p</i> -value	.926	.025		
Total R ²	.25	.06		
R ² Adjusted	-.17	.05		
Δ R ² Adjusted	--	.22		
Variables Entered	b	β	<i>p</i> -value	
Secondary Psychopathy	.088	.197	.096	
Communication	.025	.191	.106	
(Constant)	.250	--	.034	

Note. Degrees of freedom (numerator, denominator) for *F*-values are listed in parentheses next to the model type. Δ R² Adjusted is reported rather than Δ R² because the former is assumed to be more meaningful in backwards elimination model building, provided the full model adequately explains variance.

Table 10

EA Differences by Experimental Condition

Measure	DANVA	PONS	IPT	Control
Subjective EA	.40	.46	.51	.52
Objective EA	.87	.97	1.08	1.00
Ingroup EA	.25	.22	.52	.53
Outgroup EA	.48	.54	.49	.52
Paper Subjective EA	.65	.64	.68	.62
Paper Objective EA	1.18	1.11	1.24	1.20

Note. Empathic accuracy (EA) scores are reported as average Z_r values for the group.

Table 11

Intercorrelations Among Target Predictor Variables

Measures	1	2	3	4	5	6	7	8	9	10	11	12
1) Cognitive Empathy	--											
2) Affective Empathy	.36**	--										
3) Expressivity (BEQ)	.16	.28*	--									
4) Alexithymia (TAS-20)	-.45***	-.09	-.15	--								
5) Autism Quotient (AQ)	-.24*	.19	-.11	.42***	--							
6) Attributional Complexity	.50***	.34**	.20	-.37**	-.08	--						
7) Extraversion	.187	-.13	.35**	-.29*	-.49***	.17	--					
8) Agreeableness	.37**	.12	.03	-.21	-.29*	.31**	.22	--				
9) Conscientiousness	.27*	-.14	-.01	-.36**	-.23*	.16	.12	.50***	--			
10) Neuroticism	-.19	.38**	.25*	.34**	.47***	.01	-.42***	-.24*	-.22	--		
11) Openness	.23	.03	-.01	-.16	-.15	.52***	.22	.35**	.27*	-.18	--	
12) Self-Esteem (RSE)	.12	-.13	.04	-.41***	-.46***	.13	.41***	.47***	.44***	-.43***	.23	--

Note. $N = 73$. * indicates significance, $p < .05$; ** indicates significance, $p < .01$; *** indicates significance, $p < .001$

Table 12

Intercorrelations Among Perceiver Predictor Variables

Measures	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1) Cognitive Empathy	--													
2) Affective Empathy	.34***	--												
3) Alexithymia	-.52***	.03	--											
4) Primary Psychopathy	-.44***	-.18	.27**	--										
5) Secondary Psychopathy	-.35***	.19	.59***	.40***	--									
6) Autism Quotient	-.36***	-.00	.33**	.25*	.35***	--								
7) Intergroup Anxiety	-.24*	.15	.30**	.24*	.28**	.36***	--							
8) Outgroup Contact	.21*	-.01	-.22*	.06	-.08	-.11	-.31**	--						
9) Attributional Complexity	.53***	.31**	-.40***	-.30**	-.30**	-.18	-.09	.09	--					
10) Extraversion	.19	.00	-.17	.01	-.12	-.47***	-.29**	.11	.07	--				
11) Agreeableness	.36***	.04	-.08	-.31**	-.27**	-.21*	-.28**	-.05	.16	.06	--			
12) Conscientiousness	.11	-.22*	-.31**	-.12	-.42***	-.00	-.20*	-.10	.02	.22*	.18	--		
13) Neuroticism	-.04	.41***	.29**	-.01	.34**	.27**	.20*	-.15	.07	-.41***	-.21*	-.32**	--	
14) Openness	.35***	.08	-.35***	-.24*	-.11	-.09	-.22*	.21*	.32*	.20*	.01	.14	-.06	--

Note. $N = 100$. * indicates significance, $p < .05$; ** indicates significance, $p < .01$; *** indicates significance, $p < .001$

Table 13

Correlations between Empathy and Empathy-Related Traits

Measure	Cognitive Empathy		Affective Empathy	
	<i>r</i>	<i>p</i>	<i>r</i>	<i>p</i>
Alexithymia (TAS-20)	-.52	< .001	.03	.760
Difficulty Identifying	-.34	< .001	.28	.005
Difficulty Describing	-.40	< .001	.02	.832
Externally-Oriented Thinking	-.50	< .001	-.34	.001
Autism Quotient (AQ)	-.36	< .001	-.00	.965
Social Skills	-.29	.004	-.01	.928
Attention Switching	-.17	.093	.18	.069
Attention to Detail	.08	.415	-.09	.400
Communication	-.33	.001	.14	.175
Imagination	-.30	.002	-.31	.002
Primary Psychopathy	-.44	< .001	-.18	.081
Secondary Psychopathy	-.35	< .001	.19	.066
Attributional Complexity	.53	< .001	.31	.002
Motivation	.49	< .001	.36	< .001
Complex Explanations	.42	< .001	.18	.078
Metacognition	.37	< .001	.16	.120
Behavior as Interaction	.41	< .001	.34	< .001
Internal Explanations	.48	< .001	.21	.034
External Explanations	.33	.001	.25	.011
Temporal Explanations	.41	< .001	.19	.058

Note. *N* = 100.

Table 14

Independent-Samples t-Tests of Group Differences between Men and Women

Measure	<i>t</i> -value	df	<i>r</i>	<i>p</i> -value	Women's Mean	Men's Mean
Paper Subjective EA (Z_r)	1.70	76	.19	.093	.691	.577
Paper Objective EA (Z_r)	1.73	76	.19	.088	1.26	1.09
Objective EA (Z_r)	2.04	77	.23	.045	1.04	.868
Ingroup EA (Z_r)	2.89	73	.32	.005	.478	.201
Neuroticism (BFI)	3.03	77	.33	.003	3.19	2.68
Average Empathy (BES)	3.25	77	.35	.002	4.06	3.68
Cognitive Empathy (BES)	1.93	77	.21	.057	4.28	4.04
Affective Empathy (BES)	3.08	77	.33	.003	3.88	3.38

Table 15

Summary of Descriptive Statistics for Men and Women

Measure	Men (N = 27)	Women (N = 52)
Cognitive Empathy	4.04	4.28
Affective Empathy	3.38	3.88
Alexithymia (TAS-20)	2.30	2.39
Difficulty Identifying	1.99	2.32
Difficulty Describing	2.66	2.85
Externalized Thinking	2.34	2.15
Primary Psychopathy	2.08	2.09
Secondary Psychopathy	2.26	2.28
Autism (AQ)	18.00	17.40
Social Skills	2.74	2.27
Attention Switching	4.67	4.75
Attention to Detail	5.56	5.60
Communication	2.26	2.21
Imagination	2.78	2.58
Intergroup Anxiety	3.32	3.27
Outgroup Contact	40.83	45.98
Attributional Complexity	5.14	5.39
Motivation	5.14	5.49
Complex Explanations	4.82	5.05
Metacognition	5.39	5.50
Behavior as Interaction	5.12	5.52
Internal Explanations	5.09	5.33
External Explanations	5.40	5.61
Temporal Explanations	5.00	5.24
Extraversion	3.22	3.46
Agreeableness	3.86	4.00
Conscientiousness	3.60	3.47
Neuroticism	2.68	3.19
Openness	3.66	3.53

Table 16

Empathic Accuracy Correlations among Men

Measure	Subjective EA	Objective EA	Ingroup EA	Outgroup EA
Cognitive Empathy	-.08	-.11	-.04	-.05
Affective Empathy	.27	.10	.05	.25
Alexithymia (TAS-20)	.26	.36	-.08	.33
Difficulty Identifying	.12	.20	-.15	.23
Difficulty Describing	.24	.20	-.09	.33
Externally-oriented Thinking	.15	.31	.11	.08
Average Psychopathy (LSRP)	.10	.05	-.07	.16
Primary Psychopathy	-.11	-.13	-.13	-.03
Secondary Psychopathy	.42*	.36	.08	.40*
Autism Quotient (AQ)	.37	.32	-.19	.54**
Social Skills	.20	.12	-.12	.32
Attention Switching	.21	.14	-.31	.45*
Attention to Detail	.11	.14	.11	.05
Communication	.59**	.55**	-.01	.65***
Imagination	-.27	-.17	-.15	-.21
Attributional Complexity	-.11	-.22	-.14	-.01
Motivation	-.08	-.09	-.20	.04
Complex Explanations	-.09	-.18	-.10	-.01
Metacognition	.25	-.34	-.11	-.18
Behavior as Interaction	.04	-.12	-.10	.12
Internal Explanations	-.05	-.19	-.18	.08
External Explanations	.06	-.07	-.02	.10
Temporal Explanations	-.31	-.33	-.11	-.24
Intergroup Anxiety	.34	.42*	-.12	.42*
Outgroup Contact	-.33	-.58**	-.02	-.35
Extraversion	-.21	-.16	.19	-.37
Agreeableness	-.21	-.20	.25	-.38*
Conscientiousness	.06	-.03	-.11	.13
Neuroticism	.23	.14	-.21	.39*
Openness	.03	-.13	.24	-.13

Note. $N = 27$. * indicates significance, $p < .05$; ** indicates significance, $p < .01$; *** indicates significance, $p < .001$.

Table 17

Empathic Accuracy Correlations among Women

Measure	Subjective EA	Objective EA	Ingroup EA	Outgroup EA
Cognitive Empathy	.20	.25	.19	.02
Affective Empathy	-.04	.03	-.20	.10
Alexithymia (TAS-20)	-.01	.01	-.31*	.19
Difficulty Identifying	-.04	-.00	-.30*	.11
Difficulty Describing	.09	.08	-.21	.20
Externally-oriented Thinking	-.08	-.11	-.27	.17
Average Psychopathy	-.12	-.07	-.39**	.13
Primary Psychopathy	-.12	-.13	-.30*	.07
Secondary Psychopathy	-.08	.04	-.42**	.20
Autism Quotient (AQ)	.08	.02	.07	.08
Social Skills	.20	.21	.16	.17
Attention Switching	-.12	-.11	-.04	-.03
Attention to Detail	.11	.04	.02	.06
Communication	.15	.11	.18	.09
Imagination	-.09	-.16	-.10	-.05
Attributional Complexity	.09	.12	.16	-.07
Motivation	.13	.17	.21	-.05
Complex Explanations	-.01	-.06	.10	-.18
Metacognition	.01	.07	.11	-.08
Behavior as Interaction	.13	.12	.07	.06
Internal Explanations	.23	.18	.32*	.02
External Explanations	.03	.09	.08	-.09
Temporal Explanations	-.03	.05	-.03	-.02
Intergroup Anxiety	-.03	-.06	-.18	.10
Outgroup Contact	.09	.03	.13	.02
Extraversion	-.11	-.16	-.13	-.11
Agreeableness	.27	.29*	.08	.18
Conscientiousness	.19	.16	.63***	-.16
Neuroticism	-.13	.00	-.10	-.03
Openness	.01	.05	.22	-.13

Note. $N = 52$. * indicates significance, $p < .05$; ** indicates significance, $p < .01$.

Chapter 5: Discussion

This chapter provides a discussion of research implications reported in the results (i.e., Chapter 4 of the dissertation). This discussion first focuses on the validity of the empathic accuracy (EA) measures used in the present study, followed by broader implications for cognitive empathy and interpersonal sensitivity research. Whenever possible, the researcher attempts to provide explanations for results that run counter to expectations and/or previous research. However, some issues may be best addressed through further research. This chapter concludes with a discussion of the limitations of the present study and suggestions offered for future research and applications.

Validity of Empathic Accuracy

Relation to cognitive empathy. The subjective EA and objective EA regression models tested through an exploratory backwards elimination approach revealed cognitive empathy to be a significant predictor of EA. Likewise, the ingroup EA and outgroup EA regression models yielded empathy-related traits (e.g., psychopathy, communication difficulties from autism or alexithymia) as the most significant predictors. Whether or not cognitive empathy is directly and statistically significantly related to a given implicit measure of EA, it does appear to be a significant component in predicting EA from variable relationships in the present data.

Although objective EA was only marginally related to cognitive empathy, it can still be said this measure performed approximately as well as can be expected. The research literature has indicated, on a number of occasions, that self-report measures of interpersonal sensitivity (e.g., empathy) typically do not relate to behavioral measures of

accuracy and sensitivity (see Riggio & Riggio, 2001 for review). This has been especially problematic for the explicit EA measure (see Ickes et al., 2000), but the present research not only highlights the weak effect found for the relationship between implicit EA and self-reported empathy, it provides a context for this effect by examining multiple versions of the EA measures.

Interestingly enough, objective EA rather than subjective EA was related to cognitive empathy. Most previous research, including Zaki and colleagues' (2008), only examined the subjective nature of EA (i.e., the term is operationalized according to how accurate the targets are about themselves). It can be seen from the negative correlations in target participant data (Chapter 3, Table 3) that individuals may not always be accurate about themselves, even in the case of continuous ratings rather than explicitly reported thoughts and feelings. Cognitive empathy appears to be more related to how much a given person agrees with (or is deviant from) other perceivers, rather than how much they agree with the target. Although agreement or synchrony with the target's responses seems more indicative of affective empathy, it is important to remember that participants were instructed to rate the target's appearance rather than their own emotional responses to the target's video. Previous research does find an interaction between target expressivity and perceiver affective empathy (Zaki et al., 2008), and the present study consistently found positive, but not significant relationships between affective empathy and these EA measures.

Perhaps most telling of the difficulties distinguishing cognitive and affective empathy in this measure of EA is the fact that men and women display different patterns

of variable relationships and directionality. For men, these measures of EA were not significantly related to cognitive empathy, but these relationships were negative. For women, cognitive empathy was positively related to the EA measures, and these effect sizes were so much greater that it is likely women are primarily responsible for the statistical significance of the relationship seen between cognitive empathy and EA. This may also be an indication of Simpson's paradox (see Blyth, 1972): if all women score significantly higher than all men on cognitive empathy as well as this measure of EA, there can be a positive correlation between these variables (even if there is no correlation within the individual groups of men and women) because the trend line extending from the men's data points to the women's data points will be positive and significant.

Nevertheless, these measures of EA are uniformly positively related to affective empathy among men, and these effect sizes are larger than those for cognitive empathy, although they are still not significant. These EA variables are not uniformly related to affective empathy among women. Ingroup accuracy is negatively related to affective empathy, and outgroup accuracy is positively related to affective empathy. Although most of these results are not statistically significant, their consistency does lend credence to the gender differences in empathy and interpersonal sensitivity. Combined with the prevalence of autistic traits among males, this may explain why Bartz and colleagues (2010) and Hurlemann and colleagues (2010) both found that oxytocin improves EA, especially among individuals scoring high on the AQ.

Women typically perform better than men on measures of interpersonal sensitivity, as is the case with the present study. However, gender differences have been

found inconsistently within the EA paradigm (Ickes et al., 2002). Hall and Schmid Mast (2007) suggest that the gendered socialization of women promotes sensitivity to nonverbal cues rather than verbal cues. The extension of this idea is that women should perform better on tasks related to affective sensitivity (e.g., "inferring feelings" on the explicit EA measure) compared to tasks related to perspective-taking (e.g., "inferring thoughts" on the explicit EA measure). However, this does not imply that women should exhibit differing degrees of cognitive empathy and affective empathy, despite the terminology. The implicit EA measures in the present study can be described as measuring both cognitive empathy and affective sensitivity with an emphasis on the use of nonverbal cue information, but the women still did not completely outperform the men on these measures, specifically the subjective EA measure that is more or less the standard accuracy methodology. Why?

According to the theoretical "recognition, interpretation, response" framework of this study, EA appears to deal only with sensitivity and interpretation, and should not be related to measures of constructs that occur later in the process (e.g., affective empathy). However, it is more likely that the empathic process—however it may look—is more likely cyclical than linear, and it likely operates much more quickly than it appears in a diagram. It is possible that women's greater sensitivity to nonverbal cues allow for a more immediate recognition of emotional states (i.e., "how *do you* feel?"), whereas men first rely on information or intuition gained from some estimate of empathic response (e.g., "how *would I* feel?").

Relation to empathy-related traits. Autistic tendencies were essentially unrelated to the implicit EA measures among women. But among men, the communication subscale was very strongly related to every implicit measure of EA except ingroup EA. The communication subscale of the AQ generally deals with difficulties communicating with others, but not necessarily difficulties in understanding the communication from others. In this sense, individuals with these communication difficulties may be at least attempting to augment their sensitivity in order to improve social interactions. Although alexithymia shares a similar issue regarding difficulties describing feelings, this construct did not appear to have the same relationship to EA as the communication subscale of the AQ did. Difficulty describing feelings was a significant predictor in some models (and it is marginally, positively associated to pencil-and-paper EA among women and outgroup EA among men), but the comorbidity of the difficulty identifying feelings likely nullified the possibly augmenting effects associated with a difficulty describing feelings.

Baron-Cohen and colleagues (2001) suggest that autistic tendencies are more prevalent in males than females in the general population, so it may be the case that men with autistic tendencies (at least in terms of communication difficulty) are reducing gender differences in samples consisting of adults of normal intelligence, especially if the task contains a verbal rather than nonverbal emphasis (e.g., explicit EA). At the very least, the present study provides supporting evidence for the prevalence of autistic tendencies in men rather than women. What is unclear is whether or not communication

difficulties augment an already average ability, or if they serve to bring a handicap to average levels.

Within Ickes's (1993) method, the relative importance of verbal versus nonverbal cues is potentially determined by how much of the content provided by the targets is labelled "thoughts" and how much of this content is labelled "feelings." An examination of how men and women perform on exclusively thought-related or feeling-related material provided by the targets may clarify some of the inconsistencies in gender differences for explicit EA, but creating such a measure for implicit EA would require much more complexity (e.g., a continuous rating measure that is solely dependent on the verbal content of the target).

At worst, the communication difficulties implied by the AQ may inform behavioral difficulties or possibly even manifest as frustration that leads to antisocial behavior. This is akin to the concept of "I have no mouth, and I must scream," but the relevance of this quote may be in how the individual responds to such personal distress. It is noteworthy to mention the communication subscale was significantly and positively related to secondary psychopathy for both men and women, and the imagination subscale was significantly and positively related to primary psychopathy for both men and women. This implies communication difficulties are indeed related to antisocial behavior, although we cannot determine a specific direction for this relationship without more experimental data. Likewise, difficulties in perspective-taking inform the characteristics of what is normally considered the "true" type of psychopathy involving cruelty and manipulative behavior (i.e., primary psychopathy; Karpman, 1948; Levenson et al.,

1995), but we are unable to determine whether or not these respective indicators (i.e., communication difficulty and perspective-taking difficulty) actually lead to psychopathic personalities and behaviors. Nevertheless, the consistency, strength, and pattern of these results are informative.

Relation to behavioral measures. The implicit EA measures were almost completely unrelated (in terms of statistical significance) to the other behavioral measures, and the control group typically performed better than all other experimental conditions (i.e., those employing the DANVA, PONS, or IPT tests prior to the implicit EA measure). This is taken as a good sign of the unique contribution of this measure of EA, since all of the behavioral measures should measure distinct constructs of interpersonal sensitivity. Beyond the lack of correlations to existing measures, the fact that the control group consistently outperformed most other groups implies there are not additive or positively interacting effects of the DANVA, PONS, or IPT on these implicit measures of EA. Additive effects would have been indicated by any of the experimental groups scoring significantly higher on the EA measure than the control group, effectively "improving" EA scores by being exposed to the given behavioral measure beforehand. However, if there appear to be any interactive effects of these behavioral measures, it seems that the design of particular measures negatively interferes with the EA task.

For better or worse, certain tests may reduce how well an individual would have performed on the implicit EA measure. This may be due to a difference in what the task focuses on, therefore, what social information the individual is being trained to pay attention to. This would explain why the DANVA2 scores are lowest, since the task

provides relatively little social information and requires the individual to use relatively little social information when completing the task. Contrast this to the PONS, which provides more social information but also asks more use of social information from the individual. Nevertheless, the PONS group typically scored higher than the DANVA group. However, the IPT-15 provides stimuli most accurately depicting real-life situations and the social information within, and it asks for a comparably high level use of this social information to answer the questions accurately. In this sense, the EA scores (from least to greatest) trending from DANVA, to the PONS, to the IPT makes sense, but why does no exposure to these instruments appear to work better than exposure? If this is not a case of behavioral measures proactively interfering with performance on the EA measures, it may be a case of the questionnaire packet priming abilities related to EA without a task to distract or reduce such possible priming effects. However, a more focused methodological study is required to disentangle several of the nuances associated with behavioral measures of interpersonal sensitivity.

To borrow an analogy from Hall (2001), interpersonal sensitivity may be an empirical consequence of how much certain variables are characteristic of the individual, rather than a latent construct that is equally indicated by these variables. For example, socioeconomic status can be reliably predicted from income, prestige, or education, even though income, prestige, and education do not have to be highly correlated to each other (e.g., military leaders or Silicon Valley entrepreneurs). In this respect, self-report measures of IS may be difficult to relate to behavioral measures until a given behavioral

measure reliably covers a number of facets of IS, but the present measure of EA is nonetheless a distinct contribution to the existing behavioral measures.

Intergroup empathic accuracy. Ingroup and outgroup EA do indeed appear to be functional versions of the implicit EA measure, as the "modularity" of this task on the basis of group membership appears to be relatively simple. Furthermore, ingroup and outgroup EA seem to be initially valid, as intergroup anxiety and outgroup contact were unrelated to the other constructs, but intergroup anxiety was marginally related to outgroup EA. However, intergroup anxiety was positively related to outgroup EA, indicating that feelings of nervousness or threat or discomfort towards outgroup members may be related to heightened sensitivity towards the outgroup. This is counter-intuitive to the intergroup contact hypothesis (Allport, 1954) and previous research that indicates outgroup contact reduces prejudice (or improves empathy) by way of reducing intergroup anxiety (Stephan et al., 2002). These higher levels of EA or IS associated with intergroup anxiety may be some form of a defense mechanism if the anxious individual is afraid of what the outgroup member(s) may do. Likewise, the anxious individual may be afraid of how they may be seen by the outgroup member(s), and this heightened sensitivity would reflect concern about how well the outgroup members are responding to intergroup interaction at hand.

The researcher mentions "with the exception of ingroup EA" several times and ingroup EA appears to function very differently from the three other measures. But without prior research examining the capacity for cognitive empathy, it is difficult to draw conclusions without introducing speculation. Next to self-reported empathy,

ingroup EA is the largest gender difference in terms of effect size and statistical significance. Additionally, ingroup EA appears to be the only implicit EA where both types of psychopathy are negatively correlated. Because of ingroup EA's high correlation to the IPT, it may be a more general measure than the others, in the sense that any given individual is likely to have more social interaction experience with their ingroup rather than outgroup members.

Again, men and women show drastically different patterns of this variable relationship. With the exception of ingroup EA, intergroup anxiety is positively related to the implicit EA measures and outgroup contact is negatively related to the implicit measures. All of these relationships are at least marginally significant, but they only occur among men. These same variables are unrelated among women, but at the very least, the directionality is reversed such that outgroup contact is positively related to EA, and intergroup anxiety is negatively related to EA.

Because there were no significant gender differences in variables like intergroup anxiety and outgroup contact, it is difficult to say why men adopt this pattern of intergroup anxiety and outgroup contact when interpreting emotional states. The previously mentioned gender difference in cognitive and affective empathy (i.e., that these implicit measures of EA were related to affective empathy among men, but not women) may help explain the roles of outgroup contact and intergroup anxiety. If men really are basing their response off of a personal empathic estimate, then intergroup anxiety and affective empathy may be necessarily related under these circumstances. In any case, intergroup anxiety does appear to be part of the coalescing group of variables

that are unexpectedly and positively related to EA among males (i.e., the communication subscale of autism, secondary psychopathy, and average autism and alexithymia scores).

Limitations and Suggestions

Perhaps the biggest limitation of the present study is the loss of data from participants who did not use GTrace properly. This was especially a problem because the study is designed to examine how constructs characteristically related to empathy related to the present measure of EA, but certain people with these empathy-related characteristics may not have been motivated to provide data. In the absence of selection bias (i.e., choosing not to sign up for the study to begin with) or response bias (e.g., responding in a particular way to the EA measure, such as dragging the mouse to the edge of the bar and leaving it there), a certain subset of participants appeared to simply not respond at all to the measure of EA.

It appears these participants specifically did not respond to the computer task, because they still provided pencil-and-paper EA responses that are required after each video. Furthermore, participants were instructed by the research assistants to notify them if anything went wrong with the GTrace program or if the participant felt like they made an error or otherwise did not provide accurate data and would like to retry the given video. Further analysis revealed a particular personality profile for these unresponsive individuals that involved primary psychopathy, externalized thinking, lack of a preference for complex external explanations, and lack of motivation to understand the behaviors of others.

Because GTrace requires constant attention, fatigue and/or any of these variables related to unresponsiveness may be moderating each other to affect the attrition rate of responses on the implicit EA measure. The data for these responses typically resembles attrition: perceivers provide a genuine frequency of responses in the beginning that soon drops off and occasionally increases near the end of a given video. There is likely a motivational component to this measure (as seen by the ACS subscale), but it may also be a genuinely demanding task if one out of five participants quickly stop responding to the measure. Although the group numbers are too small for the differences to be statistically significant, the group that didn't use GTrace properly scored lower than the group that did on every measure of accuracy or sensitivity. The target videos used in the present study were an average of one minute and twenty seconds, so future research may elect to use shorter stimulus videos in the examination of this fatigue-motivation complex.

One of the more relevant and easily addressed limitations of this study is the experimental procedure regarding the control group. The control group was not given any form of a delay and/or distraction task prior to being given the implicit EA measure. This was done to prevent interference with the implicit EA measure and to maintain as pure or clean of a test of validity as possible. The researcher essentially made the conscious choice of using a no-treatment control group because the absence of such would also be a considerable limitation. The consequences of the no-treatment control group are that any effects or demand characteristics that were primed by the questionnaire packet may have lingered long enough to influence the implicit measures of EA. Of particular concern are the scales relating to empathy, but the fact that the ACS appeared at the end of the packet

may have also been problematic if participants were primed to think about how much they consider explaining the behaviors of others prior to the EA measure.

Additionally, the present study relied primarily on regression and correlation analyses in the absence of a completely experimental design. Although the study provides supporting evidence and contributions to the literature regarding empathy and interpersonal sensitivity, the causal nature of some of these relationships have yet to be explored and are especially warranted in the cases of the psychological constructs related to empathy (i.e., autism, alexithymia, and psychopathy). Experimental manipulations of tendencies related to autism, alexithymia, and psychopathy may appear difficult, but the present study (among others) offers the suggestion that these characteristics appear commonly enough in normal and student populations that more informative studies examining what has not been remotely explained can be successfully conducted.

Considering the adaptability of the implicit EA measures demonstrated in this study, there are a number of possible directions for future research. The present study was more or less a validation of the implicit measure of EA and how it operates. Given this, future research should elect to use implicit measures of EA whenever appropriate, as they appear to be reasonable alternatives to the more explicit measure of EA. This implicit measure is considerably underused in published research, and this is perhaps due to a lack of notoriety or easy access to tools required for this methodology. Regarding this, the researcher provides GTrace as a suggestion of freely available software that can be used for simultaneous video playback and continuous rating; however, there is plenty of available software capable of being customized or repurposed into behavioral

psychological instruments. And although the pencil-and-paper EA measures employed in the present study were used as checks against the more sophisticated digital measure, they do appear to capture some of what is also measured by the software, and more thoroughly developed versions might be useful as additional cost-effective alternatives.

Previous evidence indicates explicit EA can be trained when the perceivers are given feedback about their performance (e.g., Barone et al., 2005; Sripada et al., 2011), and the same may be true for implicit EA. Feedback for this measure could potentially be given in real time, as well as in a holistic, overall form based on the target video scene. Like several behavioral measures of IS, implicit EA seems like it could be used for teaching as well as assessment (see Costanzo, 1992; Costanzo & Archer 1991).

The present study employed an adaptation of the implicit EA measure that was simple enough to include alongside the present validity examinations, but much more can be done with both the explicit and implicit measures of EA. Accuracy research is usually not just concerned with the accuracy scores themselves, but also how they relate to others. Simply changing the nature of instructions given to participants may drastically impact operationalizations and study results (e.g., asking "how did the individual appear emotionally?" versus "how do you think this individual rated themselves emotionally?"). As was previously mentioned, the modules of EA can be combined together, but the definitions and operationalizations become that much more complex. For example, intergroup EA can be further conceptualized in terms of its subjective or objective nature (e.g., objective ingroup EA may reflect how much a given perceiver agrees with the

ingroup, or how much a given perceiver agrees with all others when the target is an ingroup member).

Likewise, an entirely new behavioral measure of affective EA could be designed as a complement to these measures of cognitive EA (i.e., implicit and explicit EA related to the definition of cognitive empathy). Under this framework, affective EA would ask perceivers to provide a continuous rating of their own feelings while watching the videos, which could be correlated to others' continuous ratings of their own feelings to serve as a behavioral measure of affective empathy, or how closely the two individuals share emotional responses to the same stimuli.

Summary and Conclusions

Why is there so much trouble finding characteristics of "good judges?" Why do so many interpersonal sensitivity studies and measures not correlate with the expected self-report measures, especially empathy? The problem may stem from there being valid self-report measures of empathy and interpersonal sensitivity, but no valid self-report measures focusing on specific components of empathy and/or interpersonal sensitivity. Conversely, several valid behavioral measures exist, but they are typically focused on a specific component or aspect of interpersonal sensitivity. Although researchers may intend to examine a specific component of empathy via self-reports, most scales incorporate several aspects of social cognition and emotional intelligence into a holistic measure of the process. Furthermore, discrepancies in the definitions of these components may have drastic effects when a given measure acts as the cornerstone of a study.

Results from this validation of implicit EA indicate perhaps we should not expect such a measure to correlate well with self-reports. If empathy is indeed a multi-stage process, self-report scales that focus on how people respond to others (i.e., a later stage of the process) may be less useful to examining cognitive empathy than scales focusing on how well people interpret others separately from how they respond to others. Because the detection of emotional states does not imply whether or how the person will respond to such states, these implicit measures of EA essentially occupy a grey area between previously established behavioral measures and self-reported empathy. Or perhaps these measures serve to color the grey area, allowing new and further research questions to address how the lack of a communicated response may not always imply a lack of understanding.

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Appendix A

Consent Form for Target Participants

UNIVERSITY OF CALIFORNIA, RIVERSIDE - CONSENT TO PARTICIPATE
Survey of College Student Experiences

Hello, and welcome to our study. In order to participate, you are asked to discuss and respond to two experiences in your life that you feel comfortable sharing. You will also be asked to respond to questionnaires about your personal communication style and preferences. Participation in this study is completely voluntary. Please read the information below and ask questions about anything that you do not understand before deciding if you want to participate.

This study examines how different people express and interpret their own emotions. The interview portion of the study asks you to provide a brief description of one positive experience and one negative experience from your life (for example, making good or bad grades on a test). These can be stories about whatever you would like to share, as long as you feel comfortable sharing this information openly. Although we are not directly measuring, judging, or examining the content of your stories, please be aware there is a possibility that this information may be viewed by other students in the course of future research and analyses.

You will also be asked to complete a series of questionnaires about your personal communication style and preferences, and these questionnaires will be directly entered into a computer. The experiences you discuss will be video recorded before being transferred to a computer, but no identifying information will be attached to your questionnaire responses or your video interview. Please indicate below if you are willing to be videotaped for the purposes of this study. Sharing and responding to your own experiences is a requirement for this study, but if you do not wish to be videotaped, you may decline participation in this study and seek an alternative opportunity to receive course credit.

Your participation in this study should last approximately one hour, and you will earn one hour of research participation credit upon completing today's study. Should you choose not to participate, alternatives to participation credit are available in the form of other research studies or academic lectures provided by UCR's psychology department.

If you would like to know more about this study or if you have any further questions, you can contact Professor Carolyn B. Murray at carolyn.murray@ucr.edu or Joshua Meadors at joshua.meadors@email.ucr.edu. If you have any comments or questions regarding the conduct of this research or your rights as a research subject, please contact the Office of Research Integrity by phone (951-827-4811/4810/6332), by e-mail (irb@ucr.edu) or at University Office Bldg #200, Riverside, CA 92521.

I understand that I will be videotaped for the purpose of this research. [] Yes [] No

Signature _____ Date ____/____/____

If you agree to participate, please indicate your informed consent by signing the bottom portion of this form and returning it to the research assistant.

Name _____

Signature _____ Date ____/____/____

Thank you!

Appendix B

Video Recording Instructions for Target Participants

College Student Experiences Video Instructions

The video portion of today's study will ask you to share one positive and one negative experience you've had in your personal life.

For example, a positive experience could be a fun birthday party, while a negative experience could be a time when your car or bicycle had a flat tire.

The experiences you share with us can be stories about things that have happened to you personally or things that you have personally witnessed. They can be as major or minor as you feel comfortable sharing, and you can provide as much or as little detail as you would like.

You can be as informal as you would like when sharing your experiences. The most important thing is that you feel comfortable. We suggest telling your stories to the camera as if you were telling them for a close friend or family member. If it helps, you can also think of it as a reality TV confessional.

We hope you are able to feel as comfortable as possible telling your story here, but please keep in mind that your stories may eventually be viewed by the researchers or other students in the lab. As such, please try not to give away any sensitive or identifying information (like names) about yourself or other people mentioned in your stories.

Do you have any questions so far?

Please direct your responses toward the camera when describing each of your experiences.

We'll record your descriptions one at a time, but feel free to discuss them in any order you would like, as long as you describe one positive experience and one negative experience.

When you're ready, I'll leave the room and close the door behind me to give you some privacy, and you can begin describing the first experience of your choice (positive or negative).

When you are finished, open the door and let me know that you are ready to describe the next event, and we will proceed from there.

If you have any questions or concerns during this part of the study, or if you'd like to stop or take a break, just open the door and let me know.

These stories usually only last a few minutes, but these are your stories and you should feel free to tell them in a way that is most comfortable to you.

If you're concerned about what to talk about, some questions to consider are:

How did the event start, or what caused it?

What happened during this experience?

What were the results or consequences?

How did you feel during this time?

Why was this an experience you decided to share?

(continued on next page)

If you're having trouble thinking of experiences to share, here are some examples:

Positive:

- Good grades for a test or a class
- Good meal/dinner
- Good birthday party
- Birth of a family member
- Winning a competition or receiving an award

Negative:

- Bad grades for a test or class
- Bad meal/dinner
- Car trouble or traffic; getting a traffic ticket
- Losing a competition or game
- Forgetting something important at home (like homework, or a phone)

Do you have any questions before we begin?

If not, I'll go ahead and turn on the camera and leave the room so you can begin discussing your first experience. Once you've finished, just open the door and let me know.

[After the experience is provided]

Alright. This sheet has a scale for your positive experience and your negative experience. If you can, write down a brief explanation (just a few words) describing the experience you just discussed, then rate how positive and negative **you believe you appeared** while describing that experience.

When you're finished, hand the sheet to me, and we'll move on to your discussion of the next experience.

Appendix C

Video Rating Sheet for Target Participants

Please provide a brief title or description of your first experience.

Experience #1: _____

Was this a positive experience or a negative experience?

Positive Negative

Please rate **how positive you believe you appeared** while discussing this experience.

① ② ③ ④ ⑤ ⑥ ⑦
not at all somewhat very
positive positive positive

Please rate **how negative you believe you appeared** while discussing this experience.

① ② ③ ④ ⑤ ⑥ ⑦
not at all somewhat very
negative negative negative

Please provide a brief title or description of your second experience.

Experience #2: _____

Was this a positive experience or a negative experience?

Positive Negative

Please rate **how positive you believe you appeared** while discussing this experience.

① ② ③ ④ ⑤ ⑥ ⑦
not at all somewhat very
positive positive positive

Please rate **how negative you believe you appeared** while discussing this experience.

① ② ③ ④ ⑤ ⑥ ⑦
not at all somewhat very
negative negative negative

Appendix D

Consent Form for Perceiver Participants

UNIVERSITY OF CALIFORNIA, RIVERSIDE - CONSENT TO PARTICIPATE
Responding to College Students' Experiences

Hello, and welcome to our study. In order to participate, you are asked to respond to surveys about your personal communication skills and abilities, followed by an opportunity for you to respond to the communication styles of other students. Participation in this research study is completely voluntary. Please read the information below and ask questions about anything that you do not understand before deciding if you want to participate.

This study examines how emotions are communicated and interpreted. You will be asked to complete surveys about your personal communication skills and abilities. Afterwards, you will be asked to respond to pre-recorded videotape interviews provided by other students. If you recognize the student you see in the interview or they are otherwise familiar to you, tell the research assistant immediately so that a different student's interview can be provided.

The survey data and your responses to these interviews will be directly entered into a computer, but no identifying information will be attached to your survey responses or your responses to the interviews.

Your participation in this study should last approximately one and a half hours (90 minutes), and you will earn one and a half (1.5) hours of research participation credit upon completing today's study. Should you choose not to participate, alternatives to participation credit are available in the form of other research studies or lectures provided by UCR's psychology department.

If you would like to know more about this study or if you have any further questions, you can contact Joshua Meadors through the research participation website or at joshua.meadors@email.ucr.edu, and you can contact Professor Carolyn Murray at carolyn.murray@ucr.edu. If you have any comments or questions regarding the conduct of this research or your rights as a research subject, please contact the UCR Office of Research Integrity by phone (951-827-4811 or 951-827-5549), by e-mail (IRB@ucr.edu) or at University Office Building, Room 200, Riverside, CA 92521.

If you agree to participate, please indicate your informed consent by signing the bottom portion of this form and returning it to the research assistant.

Name _____

Signature _____ Date ____/____/____

Thank you!

Appendix E

Video Rating Sheet for Perceiver Participants

VIDEO RATING SCALE

For each of the videos, please rate **both how positive and negative the student appeared while discussing their experience.**

#1	① not at all positive	②	③	④ somewhat positive	⑤	⑥	⑦ very positive
	① not at all negative	②	③	④ somewhat negative	⑤	⑥	⑦ very negative
#2	① not at all positive	②	③	④ somewhat positive	⑤	⑥	⑦ very positive
	① not at all negative	②	③	④ somewhat negative	⑤	⑥	⑦ very negative
#3	① not at all positive	②	③	④ somewhat positive	⑤	⑥	⑦ very positive
	① not at all negative	②	③	④ somewhat negative	⑤	⑥	⑦ very negative
#4	① not at all positive	②	③	④ somewhat positive	⑤	⑥	⑦ very positive
	① not at all negative	②	③	④ somewhat negative	⑤	⑥	⑦ very negative
#5	① not at all positive	②	③	④ somewhat positive	⑤	⑥	⑦ very positive
	① not at all negative	②	③	④ somewhat negative	⑤	⑥	⑦ very negative
#6	① not at all positive	②	③	④ somewhat positive	⑤	⑥	⑦ very positive
	① not at all negative	②	③	④ somewhat negative	⑤	⑥	⑦ very negative
#7	① not at all positive	②	③	④ somewhat positive	⑤	⑥	⑦ very positive
	① not at all negative	②	③	④ somewhat negative	⑤	⑥	⑦ very negative
#8	① not at all positive	②	③	④ somewhat positive	⑤	⑥	⑦ very positive
	① not at all negative	②	③	④ somewhat negative	⑤	⑥	⑦ very negative

VIDEO RATING SCALE

For each of the videos, please rate **both how positive and negative the student appeared while discussing their experience.**

	① not at all positive	②	③	④ somewhat positive	⑤	⑥	⑦ very positive
#9	① not at all negative	②	③	④ somewhat negative	⑤	⑥	⑦ very negative
	#10	① not at all positive	②	③	④ somewhat positive	⑤	⑥
① not at all negative		②	③	④ somewhat negative	⑤	⑥	⑦ very negative
#11	① not at all positive	②	③	④ somewhat positive	⑤	⑥	⑦ very positive
	① not at all negative	②	③	④ somewhat negative	⑤	⑥	⑦ very negative
#12	① not at all positive	②	③	④ somewhat positive	⑤	⑥	⑦ very positive
	① not at all negative	②	③	④ somewhat negative	⑤	⑥	⑦ very negative
#13	① not at all positive	②	③	④ somewhat positive	⑤	⑥	⑦ very positive
	① not at all negative	②	③	④ somewhat negative	⑤	⑥	⑦ very negative
#14	① not at all positive	②	③	④ somewhat positive	⑤	⑥	⑦ very positive
	① not at all negative	②	③	④ somewhat negative	⑤	⑥	⑦ very negative
#15	① not at all positive	②	③	④ somewhat positive	⑤	⑥	⑦ very positive
	① not at all negative	②	③	④ somewhat negative	⑤	⑥	⑦ very negative
#16	① not at all positive	②	③	④ somewhat positive	⑤	⑥	⑦ very positive
	① not at all negative	②	③	④ somewhat negative	⑤	⑥	⑦ very negative

Appendix F

Demographic Questionnaire

Before you begin answering the survey questions, please complete the following demographic information. These questions are optional and the information in today's study will remain anonymous and secure.

Gender:

Male Female

Current Age (in years) : _____

Ethnicity and/or Nationality:

- African American
- Asian American ; please specify _____
- Caucasian
- Hispanic/Latino ; please specify _____
- Mixed ; please specify _____
- Other ; please specify _____

What is your generation status with the United States?

- First generation (born outside of U.S.)
- Second generation (born in U.S.; at least one parent born outside U.S.)
- Third generation or more (born in U.S., parents born in U.S)

What is your current year in college?

- Freshman
- Sophomore
- Junior
- Senior
- Graduate

What is your current or expected major in college? _____

Do you work at a job during the academic year?

Yes No

If yes, what is your job title? _____

If yes, how many hours per week do you work? _____

What is your political orientation?

- Extremely Conservative
- Moderately Conservative
- Slightly Conservative
- Neutral
- Slightly Liberal
- Moderately Liberal
- Extremely Liberal

What political party do you identify with (Democrat, Republican, Independent, etc.)?

What religion (if any) do you identify with? _____

Please indicate your personal annual income:

- \$0-\$4,999
- \$5,000-\$9,999
- \$10,000-\$14,999
- \$15,000-\$19,999
- \$20,000-\$24,999
- \$25,000-\$29,999
- \$30,000-\$34,999
- \$35,000-\$39,999
- \$40,000-\$49,999
- \$50,000-\$59,999
- \$60,000-\$69,999
- \$70,000-\$79,999
- \$80,000-\$89,999
- \$90,000-\$99,999
- Over \$100,000

Please indicate your family annual income:

- \$0-\$4,999
- \$5,000-\$9,999
- \$10,000-\$14,999
- \$15,000-\$19,999
- \$20,000-\$24,999
- \$25,000-\$29,999
- \$30,000-\$34,999
- \$35,000-\$39,999
- \$40,000-\$49,999
- \$50,000-\$59,999
- \$60,000-\$69,999
- \$70,000-\$79,999
- \$80,000-\$89,999
- \$90,000-\$99,999
- Over \$100,000

Appendix G

Basic Empathy Scale (BES; Jolliffe & Farrington, 2006)

For each statement below, please indicate your agreement or disagreement. Do so by filling in the blank in front of each item with the appropriate number from the following rating scale:

1	2	3	4	5
strongly disagree		neutral		strongly agree

1. My friend's emotions don't affect me much.
2. After being with a friend who is sad about something, I usually feel sad.
3. I can understand my friend's happiness when she/he does well at something.
4. I get frightened when I watch characters in a good scary movie.
5. I get caught up in other people's feelings easily.
6. I find it hard to know when my friends are frightened.
7. I don't become sad when I see other people crying.
8. Other people's feelings don't bother me at all.
9. When someone is feeling 'down' I can usually understand how they feel.
10. I can usually work out when my friends are scared.
11. I often become sad when watching sad things on TV or in films.
12. I can often understand how people are feeling even before they tell me.
13. Seeing a person who has been angered has no effect on my feelings.
14. I can usually work out when people are cheerful.
15. I tend to feel scared when I am with friends who are afraid.
16. I can usually realize quickly when a friend is angry.
17. I often get swept up in my friend's feelings.
18. My friend's unhappiness doesn't make me feel anything.
19. I am not usually aware of my friend's feelings.
20. I have trouble figuring out when my friends are happy.

Appendix H

Berkeley Expressivity Questionnaire (BEQ-16; Gross & John, 1997)

For each statement below, please indicate your agreement or disagreement. Do so by filling in the blank in front of each item with the appropriate number from the following rating scale:

1	2	3	4	5	6	7
strongly disagree			neutral			strongly agree

- ___ 1. Whenever I feel positive emotions, people can easily see exactly what I am feeling.
- ___ 2. I sometimes cry during sad movies.
- ___ 3. People often do not know what I am feeling.
- ___ 4. I laugh out loud when someone tells me a joke that I think is funny.
- ___ 5. It is difficult for me to hide my fear.
- ___ 6. When I'm happy, my feelings show.
- ___ 7. My body reacts very strongly to emotional situations.
- ___ 8. I've learned it is better to suppress my anger than to show it.
- ___ 9. No matter how nervous or upset I am, I tend to keep a calm exterior.
- ___ 10. I am an emotionally expressive person.
- ___ 11. I have strong emotions.
- ___ 12. I am sometimes unable to hide my feelings, even though I would like to.
- ___ 13. Whenever I feel negative emotions, people can easily see exactly what I am feeling.
- ___ 14. There have been times when I have not been able to stop crying even though I tried to stop.
- ___ 15. I experience my emotions very strongly.
- ___ 16. What I'm feeling is written all over my face.

Appendix I

Autism Spectrum Quotient (Baron-Cohen et al., 2001)

For each statement below, please indicate your agreement or disagreement. Do so by circling your response (definitely agree, slightly agree, slightly disagree, or definitely disagree) for each statement.

1. I prefer to do things with others rather than on my own.	definitely agree	slightly agree	slightly disagree	definitely disagree
2. I prefer to do things the same way over and over again.	definitely agree	slightly agree	slightly disagree	definitely disagree
3. If I try to imagine something, I find it very easy to create a picture in my mind.	definitely agree	slightly agree	slightly disagree	definitely disagree
4. I frequently get so strongly absorbed in one thing that I lose sight of other things.	definitely agree	slightly agree	slightly disagree	definitely disagree
5. I often notice small sounds when others do not.	definitely agree	slightly agree	slightly disagree	definitely disagree
6. I usually notice car number plates or similar strings of information.	definitely agree	slightly agree	slightly disagree	definitely disagree
7. Other people frequently tell me that what I've said is impolite, even though I think it is polite.	definitely agree	slightly agree	slightly disagree	definitely disagree
8. When I'm reading a story, I can easily imagine what the characters might look like.	definitely agree	slightly agree	slightly disagree	definitely disagree
9. I am fascinated by (calendar) dates.	definitely agree	slightly agree	slightly disagree	definitely disagree
10. In a social group, I can easily keep track of several different people's conversations.	definitely agree	slightly agree	slightly disagree	definitely disagree
11. I find social situations easy.	definitely agree	slightly agree	slightly disagree	definitely disagree
12. I tend to notice details that others do not.	definitely agree	slightly agree	slightly disagree	definitely disagree
13. I would rather go to a library than a party.	definitely agree	slightly agree	slightly disagree	definitely disagree
14. I find making up stories easy.	definitely agree	slightly agree	slightly disagree	definitely disagree
15. I find myself drawn more strongly to people than to things.	definitely agree	slightly agree	slightly disagree	definitely disagree
16. I tend to have very strong interests, which I get upset about if I can't pursue.	definitely agree	slightly agree	slightly disagree	definitely disagree
17. I enjoy social chit-chat.	definitely agree	slightly agree	slightly disagree	definitely disagree
18. When I talk, it isn't always easy for others to get a word in edgeways.	definitely agree	slightly agree	slightly disagree	definitely disagree
19. I am fascinated by numbers.	definitely agree	slightly agree	slightly disagree	definitely disagree
20. When I'm reading a story, I find it difficult to work out the characters' intentions.	definitely agree	slightly agree	slightly disagree	definitely disagree
21. I don't particularly enjoy reading fiction.	definitely agree	slightly agree	slightly disagree	definitely disagree
22. I find it hard to make new friends.	definitely agree	slightly agree	slightly disagree	definitely disagree
23. I notice patterns in things all the time.	definitely agree	slightly agree	slightly disagree	definitely disagree
24. I would rather go to the theatre than a museum.	definitely agree	slightly agree	slightly disagree	definitely disagree
25. It does not upset me if my daily routine is disturbed.	definitely agree	slightly agree	slightly disagree	definitely disagree
26. I frequently find that I don't know how to keep a conversation going.	definitely agree	slightly agree	slightly disagree	definitely disagree
27. I find it easy to "read between the lines" when someone is talking to me.	definitely agree	slightly agree	slightly disagree	definitely disagree
28. I usually concentrate more on the whole picture, rather than the small details.	definitely agree	slightly agree	slightly disagree	definitely disagree
29. I am not very good at remembering phone numbers.	definitely agree	slightly agree	slightly disagree	definitely disagree
30. I don't usually notice small changes in a situation, or a person's appearance.	definitely agree	slightly agree	slightly disagree	definitely disagree
31. I know how to tell if someone listening to me is getting bored.	definitely agree	slightly agree	slightly disagree	definitely disagree

32. I find it easy to do more than one thing at once.	definitely agree	slightly agree	slightly disagree	definitely disagree
33. When I talk on the phone, I'm not sure when it's my turn to speak.	definitely agree	slightly agree	slightly disagree	definitely disagree
34. I enjoy doing things spontaneously.	definitely agree	slightly agree	slightly disagree	definitely disagree
35. I am often the last to understand the point of a joke.	definitely agree	slightly agree	slightly disagree	definitely disagree
36. I find it easy to work out what someone is thinking or feeling just by looking at their face.	definitely agree	slightly agree	slightly disagree	definitely disagree
37. If there is an interruption, I can switch back to what I was doing very quickly.	definitely agree	slightly agree	slightly disagree	definitely disagree
38. I am good at social chit-chat.	definitely agree	slightly agree	slightly disagree	definitely disagree
39. People often tell me that I keep going on and on about the same thing.	definitely agree	slightly agree	slightly disagree	definitely disagree
40. When I was young, I used to enjoy playing games involving pretending with other children.	definitely agree	slightly agree	slightly disagree	definitely disagree
41. I like to collect information about categories of things (e.g., types of cars, types of birds, types of trains, types of plants, etc.).	definitely agree	slightly agree	slightly disagree	definitely disagree
42. I find it difficult to imagine what it would be like to be someone else.	definitely agree	slightly agree	slightly disagree	definitely disagree
43. I like to plan any activities I participate in carefully.	definitely agree	slightly agree	slightly disagree	definitely disagree
44. I enjoy social occasions.	definitely agree	slightly agree	slightly disagree	definitely disagree
45. I find it difficult to work out people's intentions.	definitely agree	slightly agree	slightly disagree	definitely disagree
46. New situations make me anxious.	definitely agree	slightly agree	slightly disagree	definitely disagree
47. I enjoy meeting new people.	definitely agree	slightly agree	slightly disagree	definitely disagree
48. I am a good diplomat.	definitely agree	slightly agree	slightly disagree	definitely disagree
49. I am not very good at remembering people's date of birth.	definitely agree	slightly agree	slightly disagree	definitely disagree
50. I find it very easy to play games with children that involve pretending.	definitely agree	slightly agree	slightly disagree	definitely disagree

Appendix J

Toronto Alexithymia Scale (TAS-20; Bagby, Parker, & Taylor, 1994)

For each statement below, please indicate your agreement or disagreement. Do so by filling in the blank in front of each item with the appropriate number from the following rating scale:

1	2	3	4	5
strongly disagree		neutral		strongly agree

1. I am often confused about what emotion I am feeling.
2. It is difficult for me to find the right words for my feelings.
3. I have physical sensations that even doctors do not understand.
4. I am able to describe my feelings easily.
5. I prefer to analyze problems rather than just describe them.
6. When I am upset, I do not know if I am sad, frightened, or angry.
7. I am often puzzled by sensations in my body.
8. I prefer to just let things happen rather than to understand why they turned out that way.
9. I have feelings that I cannot quite identify.
10. Being in touch with emotions is essential.
11. I find it hard to describe how I feel about people.
12. People tell me to describe my feelings more.
13. I do not know what's going on inside me.
14. I often do not know why I am angry.
15. I prefer talking to people about their daily activities rather than their feelings.
16. I prefer to watch 'light' entertainment shows rather than psychological dramas.
17. It is difficult for me to reveal my innermost feelings, even to close friends.
18. I can feel close to someone, even in moments of silence.
19. I find examination of my feelings useful in solving personal problems.
20. Looking for hidden meanings in movies or plays distracts from their enjoyment.

Appendix K

Attributional Complexity Scale (ACS; Fletcher et al., 1986)

For each statement below, please indicate your agreement or disagreement. Do so by filling in the blank in front of each item with the appropriate number from the following rating scale:

_____	-3	-2	-1	0	1	2	3
	strongly disagree		neutral			strongly agree	

- ___ 1. I don't usually bother to analyze and explain people's behavior.
- ___ 2. Once I have figured out a single cause for a person's behavior I don't usually go any further.
- ___ 3. I believe it is important to analyze and understand our own thinking processes.
- ___ 4. I think a lot about the influence that I have on other people's behavior.
- ___ 5. I have found that the relationships between a person's attitudes, beliefs, and character traits are usually simple and straightforward.
- ___ 6. If I see people behaving in a really strange or unusual manner I usually put it down to the fact that they are strange or unusual people and don't bother to explain it any further.
- ___ 7. I have thought a lot about the family background and personal history of people who are close to me, in order to understand why they are the sort of people they are.
- ___ 8. I don't enjoy getting into discussions where the causes for people's behavior are being talked over.
- ___ 9. I have found that the causes for people's behavior are usually complex rather than simple.
- ___ 10. I am very interested in understanding how my own thinking works when I make judgments about people or attach causes to their behavior.
- ___ 11. I think very little about the different ways that people influence each other.
- ___ 12. To understand a person's personality/behavior I have found it is important to know how that person's attitudes, beliefs, and character traits fit together.
- ___ 13. When I try to explain other people's behavior I concentrate on the person and don't worry too much about all the existing external factors that might be affecting them.
- ___ 14. I have often found that the basic cause for a person's behavior is located far back in time.
- ___ 15. I really enjoy analyzing the reasons or causes for people's behavior.
- ___ 16. I usually find that complicated explanations for people's behavior are confusing rather than helpful.
- ___ 17. I give little thought to how my thinking works in the process of understanding or explaining people's behavior.
- ___ 18. I think very little about the influence that other people have on my behavior.
- ___ 19. I have thought a lot about the way that different parts of my personality influence other parts (e.g., beliefs affecting attitudes or attitudes affecting character traits).
- ___ 20. I think a lot about the influence that society has on other people.
- ___ 21. When I analyze a person's behavior I often find the causes form a chain that goes back in time, sometimes for years.
- ___ 22. I am not really curious about human behavior.
- ___ 23. I prefer simple rather than complex explanations for people's behavior.
- ___ 24. When the reasons I give for my own behavior are different from someone else's, this often makes me think about the thinking processes that lead to my explanations.
- ___ 25. I believe that to understand a person you need to understand the people who that person has close contact with.
- ___ 26. I tend to take people's behavior at face value and not worry about the inner causes for their behavior (e.g., attitudes, beliefs, etc).
- ___ 27. I think a lot about the influence that society has on my behavior and personality.
- ___ 28. I have thought very little about my own family background and personal history in order to understand why I am the sort of person I am.

Appendix L

Big Five Inventory (BFI; John, Donahue, & Kentle, 1991)

How I am in general

Here are a number of characteristics that may or may not apply to you. For example, do you agree that you are someone who *likes to spend time with others*? Please write a number next to each statement to indicate the extent to which **you agree or disagree with that statement.**

1	2	3	4	5
Disagree Strongly	Disagree a little	Neither agree nor disagree	Agree a little	Agree strongly

I am someone who...

1. ____ Is talkative
2. ____ Tends to find fault with others
3. ____ Does a thorough job
4. ____ Is depressed, blue
5. ____ Is original, comes up with new ideas
6. ____ Is reserved
7. ____ Is helpful and unselfish with others
8. ____ Can be somewhat careless
9. ____ Is relaxed, handles stress well.
10. ____ Is curious about many different things
11. ____ Is full of energy
12. ____ Starts quarrels with others
13. ____ Is a reliable worker
14. ____ Can be tense
15. ____ Is ingenious, a deep thinker
16. ____ Generates a lot of enthusiasm
17. ____ Has a forgiving nature
18. ____ Tends to be disorganized
19. ____ Worries a lot
20. ____ Has an active imagination
21. ____ Tends to be quiet
22. ____ Is generally trusting
23. ____ Tends to be lazy
24. ____ Is emotionally stable, not easily upset
25. ____ Is inventive
26. ____ Has an assertive personality
27. ____ Can be cold and aloof
28. ____ Perseveres until the task is finished
29. ____ Can be moody
30. ____ Values artistic, aesthetic experiences
31. ____ Is sometimes shy, inhibited
32. ____ Is considerate and kind to almost everyone
33. ____ Does things efficiently
34. ____ Remains calm in tense situations
35. ____ Prefers work that is routine
36. ____ Is outgoing, sociable
37. ____ Is sometimes rude to others
38. ____ Makes plans and follows through with them
39. ____ Gets nervous easily
40. ____ Likes to reflect, play with ideas
41. ____ Has few artistic interests
42. ____ Likes to cooperate with others
43. ____ Is easily distracted
44. ____ Is sophisticated in art, music, or literature

Appendix M

Rosenberg Self-Esteem Scale (RSE; Rosenberg, 1965)

Below is a list of statements dealing with your general feelings about yourself. If you strongly agree, circle **SA**. If you agree with the statement, circle **A**. If you disagree, circle **D**. If you strongly disagree, circle **SD**.

- | | | | | | |
|-----|--|----|---|---|----|
| 1. | On the whole, I am satisfied with myself. | SA | A | D | SD |
| 2. | At times, I think I am no good at all. | SA | A | D | SD |
| 3. | I feel that I have a number of good qualities. | SA | A | D | SD |
| 4. | I am able to do things as well as most other people. | SA | A | D | SD |
| 5. | I feel I do not have much to be proud of. | SA | A | D | SD |
| 6. | I certainly feel useless at times. | SA | A | D | SD |
| 7. | I feel that I'm a person of worth, at least on an equal plane with others. | SA | A | D | SD |
| 8. | I wish I could have more respect for myself. | SA | A | D | SD |
| 9. | All in all, I am inclined to feel that I am a failure. | SA | A | D | SD |
| 10. | I take a positive attitude toward myself. | SA | A | D | SD |

Appendix N

Levenson Self-Report Psychopathy Scale (LSRP; Levenson, Kiehl, & Fitzpatrick, 1995)

For each statement below, please indicate your agreement or disagreement. Do so by filling in the blank in front of each item with the appropriate number from the following rating scale:

1	2	3	4	5
strongly disagree		neutral		strongly agree

- _____ 1. Success is based on survival of the fittest; I am not concerned about the losers.
- _____ 2. I find myself in the same kinds of trouble, time after time.
- _____ 3. For me, what's right is whatever I can get away with.
- _____ 4. I am often bored.
- _____ 5. In today's world, I feel justified in doing anything I can get away with to succeed.
- _____ 6. I find that I am able to pursue one goal for a long time.
- _____ 7. My main purpose in life is getting as many goodies as I can.
- _____ 8. I don't plan anything very far in advance.
- _____ 9. Making a lot of money is my most important goal.
- _____ 10. I quickly lose interest in tasks I start.
- _____ 11. I let others worry about higher values; my main concern is with the bottom line.
- _____ 12. Most of my problems are due to the fact that other people just don't understand me.
- _____ 13. People who are stupid enough to get ripped off usually deserve it.
- _____ 14. Before I do anything, I carefully consider the possible consequences.
- _____ 15. Looking out for myself is my top priority.
- _____ 16. I have been in a lot of shouting matches with other people.
- _____ 17. I tell other people what they want to hear so that they will do what I want them to do.
- _____ 18. When I get frustrated, I often "let off steam" by blowing my top.
- _____ 19. I would be upset if my success came at someone else's expense.
- _____ 20. Love is overrated.
- _____ 21. I often admire a really clever scam.
- _____ 22. I make a point of trying not to hurt others in pursuit of my goals.
- _____ 23. I enjoy manipulating other people's feelings.
- _____ 24. I feel bad if my words or actions cause someone else to feel emotional pain.
- _____ 25. Even if I were trying very hard to sell something, I wouldn't lie about it.
- _____ 26. Cheating is not justified because it is unfair to others.

Appendix O

Adapted version of the intergroup anxiety scale (Stephan & Stephan, 1985)

For the statement below, please indicate your agreement or disagreement. Do so by filling in the blank in front of each item with the appropriate number from the following rating scale:

1	2	3	4	5	6	7	8	9	10
not at all									extremely

If you were the only member of your ethnic background and you were interacting with people from other ethnic groups, how would you feel?

- _____ Uncertain
- _____ Worried
- _____ Awkward
- _____ Anxious
- _____ Threatened
- _____ Nervous
- _____ Comfortable
- _____ Trusting
- _____ Friendly
- _____ Confident
- _____ Safe
- _____ At ease

Appendix P

Outgroup Contact Questionnaire

What percentage of your friends at UCR are from the following cultural backgrounds? (Note: These should sum to 100%)	
Asian/Pacific Islander	_____
Black/African American	_____
Latino/Hispanic	_____
Middle Eastern	_____
Southeast Asian	_____
White/Caucasian	_____
Other	_____

