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Revisiting the Association Between Self-Reported Empathy and Behavioral Assessments of Social Cognition

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Previous research has shown a weak association between self-reported empathy and performance on behavioral assessments of social cognition. However, previous studies have often overlooked important distinctions within these multifaceted constructs (e.g., differences among the subcomponents of self-reported empathy, distinctions in tasks assessing lower- vs. high-level social cognition, and potential covariates that represent competing predictors). Using data from three separate studies (total $N = 2{,}376$), we tested whether the tendency to take the perspective of others (i.e., perspective-taking), and the tendency to catch the emotions of others (i.e., emotional contagion for positive and negative emotions), were associated with performance on tasks assessing lower- to higher-level social–cognitive ability (i.e., emotion recognition, theory of mind, and empathic accuracy) and affect sharing. Results showed little evidence of an association between any of the self-reported empathy measures and either social–cognitive ability or affect sharing. Using several large samples, our findings add additional evidence to previous work showing that self-report measures of empathy are not valid proxies of behaviorally assessed social cognition. Moreover, we find that the ease with which individuals recognize and understand their own emotions (i.e., alexithymia) is more related to social–cognitive abilities and affect sharing, than their tendency to take the perspective of others, or to vicariously experience the emotions of others.

Keywords: empathy, social cognition, perspective-taking, emotional contagion, alexithymia

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Understanding others' thoughts and feelings (i.e., engaging in empathy) can help us predict and sensitively respond to the behaviors of those around us (Eckland et al., 2020; Eisenberg & Miller, 1987). In this way, empathy plays an integral role in the formation and maintenance of close social bonds, and has been shown to benefit both social and psychological adjustment (Kardos et al., 2017; Morelli et al., 2015, 2017). The importance of empathy in social functioning has been studied across the psychological sciences, including developmental psychology (e.g., investigating its role in socioemotional development; Decety & Meyer, 2008), industrial/organizational psychology (e.g., examining the benefit of empathy in the workplace; Clark et al., 2019), clinical psychology (e.g., identifying impairments in social functioning; Green et al., 2015), as well as health, affective, and social psychology (e.g., exploring the role of empathy in relationship satisfaction, and its link to health outcomes; Sened et al., 2017).

As noted in nearly all reviews on the subject, empathy is a complex, multidimensional construct with numerous definitions and measures (Cuff et al., 2016; Murphy & Lilienfeld, 2019). Researchers must therefore decide how to best capture individual differences in empathy based on their specific research questions. Of particular importance is the distinction between self-reported *perceptions* of one's own empathic tendencies or ability, and behavioral assessments of *objective* empathic abilities (e.g., assessing the ability to accurately recognize or infer the thoughts and feelings of others), which is typically referred to as social–cognitive ability. Although self-report and behavioral measures are often used interchangeably, there is evidence that self-reported empathy and behaviorally assessed social–cognitive ability can be differentially related to interpersonal processes. For example, whereas higher levels of self-reported empathy are associated with interpersonal conflict resolution (McCullough et al., 1997), there is some evidence that lower levels of empathic accuracy during

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conflict are associated with greater relationship satisfaction (Simpson et al., 2003).

There has been growing concern regarding the lack of association between self-report and behavioral measures of the same construct—an issue that cuts across subdisciplines in psychology (Dang et al., 2020). This issue has become increasingly apparent in research on empathy as well, with studies showing weak associations between self-reported empathy and behaviorally assessed social–cognitive ability (Davies et al., 1998; Ickes, 1997, 2010; Realo et al., 2003). Indeed, a meta-analysis by Hall et al. (2009) found a weak (r = .12) average correlation between self-reported empathy and behaviorally assessed social–cognitive ability, and most recently Murphy and Lilienfeld (2019) found that self-report measures only accounted for approximately 1% of the variance in performance on behavioral tasks. Together, these meta-analytic findings suggest that self-report measures of empathy may not be valid proxies of behaviorally assessed social–cognitive abilities.

Why would self-reported empathy and behavioral measures of social–cognitive ability show so little convergence in studies so far? As noted previously, weak correlations have been observed between self-report and behavioral measures of the same construct across many other areas of psychology. This has led to a broader discussion on the theoretical explanations for these weak associations. Work in affective science, for instance, has highlighted that different sources of information may be called upon when individuals self-report on their own emotions (Robinson & Clore, 2002a, 2002b). While episodic information (i.e., knowledge about oneself in a particular place and time) is readily accessible when individuals are asked to identify their current emotions, this information is less available when individuals are asked to describe their tendency to experience emotions across situations and time. For these trait-level self-descriptions, individuals access more generalized semantic knowledge (i.e., beliefs regarding their emotions), which are more invariant and less situational than specific behaviors or experiences in the moment. This divergence in the knowledge retrieved by general self-descriptions (across situations and time) versus momentary experiences may be one reason why self-reported empathy and behavioral measures of social–cognitive ability show weak associations. A similar divergence has been observed between trait-level empathy and empathy assessed in daily life using experience sampling (Depow et al., 2021), with recent work highlighting that empathy may be modulated by situational and motivational factors in daily life (Weisz & Cikara, 2021). That said, given the complexity of empathy as a construct, several methodological considerations have been largely overlooked in previous studies examining associations between self-reported empathy and behaviorally assessed social–cognitive ability.

First, empathy is a multifaceted construct that broadly includes cognitive and affective dimensions (Cuff et al., 2016), as well as distinctions among the subcomponents of these dimensions (Murphy & Lilienfeld, 2019). The multifaceted nature of this construct has important implications when evaluating the extent to which self-reported empathy and behavioral measures of social cognition are related. Second, there are important differences across levels of social cognition (Ochsner, 2008), and these distinctions are often overlooked when aggregating across tasks assessing different levels of social cognition (see Lower- Versus Higher-Level Social Cognition section for a detailed description). In this way, meaningful heterogeneity within the construct of social cognition may have previously obscured existing associations between self-reported empathy and behavioral measures of social cognition. Third, few studies have considered the extent to which associations exist above and beyond relevant covariates, such as age, gender, socioeconomic status, as well as difficulties in identifying and understanding one's *own* emotions. Addressing these gaps in the literature will help refine our understanding and potentially elucidate associations between self-reported empathy and behaviorally assessed social cognition.

In the current work, we first provide a brief overview of the theoretical distinctions between constructs assessed by self-report measures of empathy and behavioral measures of social cognition, and highlight the notable implications of these distinctions for research examining the link between self-report and behavioral measures. We then present our comprehensive investigation which aims to address the identified gaps in the field.

Measurement of Self-Reported Empathy and Behavioral Assessments of Social Cognition

Domains of Self-Reported Empathy

Despite numerous definitions (Batson, 2009; Cuff et al., 2016; Hall & Schwartz, 2019), empathy is typically conceptualized as a construct with cognitive and affective components (Cuff et al., 2016). While cognitive empathy consists of understanding and predicting the thoughts and feelings of others, affective empathy involves sharing and caring for others' feelings (Shamay-Tsoory, 2011). At the trait-level, self-report measures of empathy can be further categorized into subcomponents of both cognitive and affective empathy. For example, self-reported cognitive empathy is often measured as the tendency to engage in perspective-taking (i.e., "intuitively putting oneself in another person's shoes to see things from his or her perspective"; Davis, 1983; Reniers et al., 2011), and/or the ease with which individuals recognize and infer the thoughts and feelings of others (Vachon & Lynam, 2016). In this way, a distinction is made between the tendency to take the perspective of others (i.e., perceived tendency), which may involve a motivational component (Murphy & Lilienfeld, 2019), and the perception of one's own empathic ability (i.e., perceived ability). For affective empathy, self-report measures often assess the tendency to vicariously experience the emotions of others (i.e., emotional contagion; Preston & de Waal, 2002) and/or feel concern for the well-being of others (i.e., empathic concern; Jordan et al., 2016).

Evolutionary models have proposed that the subcomponents of cognitive and affective empathy are hierarchically organized, with fast and automatic processes forming the basis for slower and more complex processes (de Waal, 2008). Emotional contagion, for example, is among the first steps in the empathic process, as it involves "catching" others' emotions. Through emotional contagion, we come to understand others' thoughts and feelings, by first simulating and experiencing these internal experiences for ourselves (de Waal, 2008). In contrast to emotional contagion, empathic concern—that is, feeling concerned for the wellbeing of others—is considered a more intentional affective process (de Waal, 2008), and may be closely related to cognitive processes such as perspective-taking (Jordan et al., 2016). In this way, after vicariously experiencing others' emotions, we are better equipped to understand their internal states, and to feel concerned for their well-being.

Despite the theoretical distinctions between these components of empathy, a recent meta-analysis by Murphy and Lilienfeld (2019) found that they show similar associations with behavioral assessments of social–cognitive ability; for example, self-reported cognitive empathy (whether assessed as one's perceived *ability* to understand others' thoughts and feelings, or as one's *tendency* to take the perspective others) is no more related to behaviorally assessed social–cognitive ability than affective empathy (i.e., emotional contagion and empathic concern). Importantly, however, the specific subcomponents of empathy (i.e., perspective-taking, emotional contagion and empathic concern) have been found to co-occur on most occasions in daily life, and only occur in isolation 5% of the time (Depow et al., 2021). Moreover, these subcomponents are often correlated, even between cognitive and affective empathy components. For instance, measures of cognitive and affective empathy, such as perspective-taking and empathic concern, respectively, have been found to load onto the same factor (with correlations between *rs* = .47–.58), suggesting that these constructs share important overlap (Jordan et al., 2016). This is consistent with the moderate positive correlations (r = .47–.51) observed between perspective-taking and empathic concern in other large-scale studies (Miklikowska, 2018). By contrast, weak positive correlations have been observed between perspective-taking and emotional contagion (Jordan et al., 2016; Vachon & Lynam, 2016), with these cognitive and affective subcomponents loading onto different factors (Jordan et al., 2016). Taken together, although subcomponents of empathy are theoretically distinct, self-report measures of these constructs point to both shared and unique characteristics.

In the same way, the related but distinct subcomponents of empathy may also have shared and unique associations with behaviorally assessed social–cognitive ability. However, previous meta-analyses have been unable to account for the shared and unique variance predicted by measures of cognitive and affective empathy because it is uncommon for studies to include multiple self-reported empathic dimensions in the same statistical model. Accounting for the shared variance between related constructs can allow researchers to better understand the unique associations of each component. In fact, controlling for this shared variance can sometimes reveal unique *opposing* relationships, which would have otherwise been overlooked. For example, a recent study by Mayukha et al. (2020) tested whether empathic concern and emotional contagion were associated with performance on tasks assessing social–cognitive ability. Although empathic concern and emotional contagion are both subsumed within affective empathy, accounting for the variance shared between these two subcomponents revealed a pattern of divergent associations. Indeed, empathic concern was positively associated with behaviorally assessed social–cognitive ability, whereas a negative association was found with emotional contagion. Importantly, these effects were only observed when accounting for the shared variance between these two subcomponents of affective empathy. This is in line with findings from Jordan et al. (2016), which highlighted the importance of distinguishing between emotional contagion and motivational aspects of empathy such as empathic concern and perspective-taking (which loaded onto the same factor). Indeed, when tested in separate models, these components of empathy were positively associated with prosocial behaviors. However, accounting for their shared variance revealed that empathic concern and perspective-taking were positively associated with prosocial behaviors, while emotional contagion was either not associated, or sometimes negatively associated, with prosocial behavior. Taken together, these studies underscore the importance of considering the shared and unique variance predicted by different subcomponents of self-reported empathy, as these features are not redundant, and accounting for their shared variance may sometimes reveal unique associations with particular outcomes.

A similar point is often overlooked among studies assessing self-reported emotional contagion. Emotional contagion is commonly assumed to be a unidimensional construct, characterizing a tendency to catch others' emotions in general. However, this assumption may be misleading, as there are important distinctions between emotional contagion for positive and negative emotions (Murphy et al., 2018). For instance, self-reported emotional contagion for positive emotions (e.g., happiness) and negative emotions (e.g., anger) show opposing contributions to social well-being; whereas contagion for positive emotions has been associated with greater interpersonal confidence, emotional authenticity and prosociality, contagion for negative emotions has been linked to greater interpersonal disconnection and emotional distress (Murphy et al., 2018). This is consistent with empirical data showing that positive and negative emotionality (i.e., the trait-level tendency to experience positive and negative emotions) are distinct and separable constructs, and not simply two polar ends of the same construct (Diener et al., 1995). To date, however, this distinction has largely been overlooked when examining the association between self-reported emotional contagion and behaviorally assessed social–cognitive ability. By aggregating across emotional contagion for positive and negative emotions, researchers may be effectively canceling out their unique and opposing associations, and potentially underestimating the association between self-reported emotional contagion and social–cognitive ability.

Lastly, the overlap between the various components of empathy makes it difficult to interpret the findings from studies relying on one self-report measure of empathy. For example, a recent multi-study investigation found a small (r = .20) association between self-report measures of perspective-taking and performance on four different tasks assessing social–cognitive ability (Israelashvili et al., 2019). Although these findings suggest that self-reported perspective-taking is positively associated with behaviorally assessed social–cognitive ability, it is unclear whether these findings reflect the effect of cognitive versus affective empathy, perspective-taking versus empathic concern, or the shared variance with other components such as emotional contagion.

In sum, recent meta-analytic and large-scale studies have explored the associations between self-reported empathy (e.g., perspective-taking, empathic concern, and emotional contagion) and behaviorally assessed social–cognitive abilities. However, the measurement of empathy through self-report is complex, and there are many subcomponents with shared and unique (and sometimes opposing) associations to social outcomes. Neglecting these distinctions—for example, between cognitive and affective empathy, or between emotional contagion for positive and negative emotions—can potentially underestimate each subcomponents' unique association with social–cognitive abilities. To date, however, no comprehensive investigation has addressed the shared and unique variance predicted by multiple subcomponents of empathy, which have previously displayed unique opposing associations (i.e., perspective-taking, emotional contagion for positive emotions, and emotional contagion for negative emotions).

Lower- Versus Higher-Level Social Cognition

As with self-reported empathy, distinctions have been made among task-based measures of social cognition (R. L. C. Mitchell & Phillips, 2015). One distinction separates tasks into lower-level and higher-level social cognition. Lower-level perceptual processes involve involuntary and automatic affect sharing (Singer & Lamm, 2009), and the detection and recognition of facial expressions or body movement in the environment (e.g., emotion recognition; Green et al., 2015). In contrast, higher-level processes involve integrating and interpreting these cues to infer the mental states of others (e.g., others' feelings, thoughts and intentions) in a context-sensitive manner (R. L. C. Mitchell & Phillips, 2015; Ochsner, 2008). These distinctions have been observed in studies examining the factor structure of social cognition overall (Etchepare & Prouteau, 2018), and in neuroimaging studies that have found both common and distinct brain regions supporting lower- and higher-level social processes (R. L. C. Mitchell & Phillips, 2015; Ochsner, 2008).

It is important to note that the meta-analyses by Murphy and Lilienfeld (2019) and Hall et al. (2009) showed substantial heterogeneity in their findings, ranging from small negative associations (r = –.16; r = –.24) to moderate positive associations (r = .33; r = .48) between self-reported empathy and performance on behavioral assessments of social–cognitive ability. This heterogeneity in findings may be explained, in part, by different aspects of social cognition that are assessed in performance-based measures. Indeed, aggregating data across tasks assessing different levels of social cognition may conceal important distinctions between self-reported empathy and lower-level versus higher-level abilities. Although these meta-analyses point to a weak association between self-reported empathy and behavioral assessments of social cognition, there is a need to examine potential differences in associations of self-reported empathy with lower- versus higher-level social cognition. Therefore, multiple behavioral measures should be used to assess the range of lower- to higher-level social–cognitive ability.

Affect Sharing and Emotional Contagion for Positive Versus Negative Emotions

There has also been a dearth of research examining associations between self-reported empathy and affect sharing—that is, the extent to which an individual's emotions match those of a target (Mackes et al., 2018). For emotional contagion in particular, one might assume that the self-reported tendency to vicariously experience others' emotions would be associated with behavioral indicators of affect sharing. However, among the few studies reporting associations between self-reported emotional contagion and affect sharing, findings have been inconsistent. For example, one study found that individuals who self-reported higher levels of emotional contagion reported feeling more positive emotions in response to viewing pictures of others expressing positive emotions, but no association was found with responses to viewing pictures of others expressing negative emotions (Vachon & Lynam, 2016). By contrast, Czarna et al. (2015) found that self-reported emotional contagion was not significantly associated with changes in mood after watching videos of others expressing positive or negative emotions. Importantly, however, most studies measuring affect sharing tend to assess participants' mood *following* the presentation of social stimuli (i.e., pictures and videos of others expressing positive and negative emotions). As an index of affect sharing, this is similar to measuring participants' response to a mood induction task (i.e., a snapshot of participants' response to others' emotions), and may not capture subtle changes in emotions which occur in real-time, as one would expect in real-world social interactions. In this way, behavioral tasks which track continuous changes in emotions offer greater sensitivity to individual differences in affect sharing.

In particular, video tasks have been created to measure the natural, moment-to-moment fluctuations in emotions which may unfold while listening to others' emotional experiences. Individuals (i.e., observers) watch a video of a target describing either a positive or negative autobiographical event (Zaki et al., 2008), and are asked to rate their emotions continuously throughout the video (Morrison et al., 2016). These scores are then compared to the target's continuous ratings of their own emotions, and affect sharing can thus be operationalized as the moment-to-moment congruence between the observer and the target's scores. Importantly, these tasks also allow researchers to control for factors such as the target's level of emotional expressivity (Zaki et al., 2008), as well as the valence of the video (i.e., whether the target discussed positive or negative autobiographical events), which may impact the observer's ratings.

Relatedly, while the importance of distinguishing emotional contagion for positive and negative emotions has been identified in self-report measures (Jordan et al., 2016), no study has yet examined whether self-reported emotional contagion is related to behaviorally assessed affect sharing in a valence-specific way. As mentioned previously, the tendency to experience positive emotions is a separable construct from the tendency to experience negative emotions (Diener et al., 1995). Given this divergence between positive and negative emotionality, one might expect that emotional contagion for positive emotions may be more strongly related to affect sharing for others' positive emotions, while emotional contagion for negative emotions may be a better predictor of affect sharing for others' negative emotions. In this way, the naturalistic video task described above presents a unique opportunity to test whether the distinction between emotional contagion for positive and negative emotions is also observed in behavioral assessments of affect sharing.

Including Relevant Covariates

Finally, in examining the association between self-reported empathy and behavioral assessments of social cognition, several relevant covariates should be considered, including gender, age, and socioeconomic status (SES). Indeed, these factors have been shown to predict both self-reported empathy (O'Brien et al., 2013; Stellar et al., 2012) and behaviorally assessed social cognition (e.g., Hall, 1978; Kraus et al., 2010; Richter & Kunzmann, 2011; Rosip &

Hall, 2004; Thompson & Voyer, 2014), which may confound the link between these methods of assessment.

A growing body of evidence also highlights the importance of recognizing and understanding one's *own* emotions in social cognition (Di Tella et al., 2020). As noted earlier, the ability to understand others' thoughts and emotions may be rooted in the fast and automatic process of "catching" and matching others emotions (de Waal, 2008). In this way, self-reflection (i.e., relating information back to the ourselves) may underlie our ability to understand and empathize with others (Dinulescu et al., 2021; J. P. Mitchell et al., 2005), as our own emotional experience can be used as a template for understanding the emotions of others. As a result, individuals who have difficulty identifying and describing their own emotions, which is characteristic of alexithymia (Taylor et al., 2003), may also have difficulties understanding and empathizing with others. Accordingly, alexithymia has been negatively associated with various forms of social–cognitive ability, including emotion recognition and theory of mind (Di Tella et al., 2020; Gökçen et al., 2016; Grynberg et al., 2012; Martínez-Sánchez et al., 2017; Oakley et al., 2016; Pedrosa Gil et al., 2009; Pisani et al., 2021). This raises the possibility that previously observed associations between self-reported empathy and behavioral measures of social cognition, albeit small, may be better attributed to individual differences in alexithymia. Alternatively, self-report measures of empathy are only moderately correlated with alexithymia (*r*s = −.24 to −.28; Eddy & Hansen, 2021; Grynberg et al., 2010), suggesting that they may show independent contributions in the prediction of social cognition. For these reasons, it is important to statistically control for the effect of alexithymia in examining the association between self-reported empathy and behavioral assessments of social cognition.

In sum, previous meta-analyses examining the association between self-reported empathy and behavioral assessments of social cognition have not accounted for: (a) the extent to which associations may differ when including self-report measures of both cognitive and affective empathy (particularly, emotional contagion for both positive and negative emotions, separately) in the same statistical model; (b) the heterogeneity across behavioral measures of social cognition (specifically, lower- vs. higher-level processes), including behaviorally assessed affect sharing; and (c) whether these associations are robust to the inclusion of relevant covariates. Therefore, in the present study, we sought to address these issues.

The Current Investigation

We used data from three different studies (comprising 2,376 participants in total) to test whether specific aspects of self-reported empathy predict performance on behavioral assessment of social cognition across different tasks involving either lower- or higher-level abilities, including a task assessing affect sharing (see OSF link for preregistered hypotheses and analysis plan: https://osf.io/ncwsg). In particular, we chose to examine whether perspective taking, emotional contagion for positive emotions, and emotional contagion for negative emotions were related to social–cognitive ability, given our interest in individuals' *tendency* to engage in empathic processes (as opposed to their perceptions of their social–cognitive *ability*; Murphy & Lilienfeld, 2019). Although both empathic tendencies and perceived empathic ability are studied at the self-report level, we chose to focus on self-report measures of empathic tendencies because they are much more common, relative to measures of one's own perceptiveness (Hall & Schwartz, 2019), and research suggests that individuals may have low metacognitive insight into their own abilities (Dunning et al., 2004). Relevant covariates were also included in this investigation, such as gender, age, SES, and alexithymia. By pooling data across multiple studies and including relevant covariates, this work aims to leverage large sample sizes to determine whether self-reported perspective-taking and/or emotional contagion for positive and negative emotions is associated with: (a) performance on tasks assessing lower-level social–cognitive processes (e.g., emotion recognition from body movements or facial expressions); (b) performance on tasks assessing intermediate- to higher-level social–cognitive processes (e.g., theory of mind and empathic accuracy); and (c) behavioral indicators of affect sharing.

Following the results of Murphy and Lilienfeld (2019), we hypothesized that self-reported perspective-taking and emotional contagion would demonstrate a small positive association with performance on both lower-level and higher-level social–cognitive tasks. Based on the more cognitively demanding integration of social cues and contextual information that occurs in higher-level social cognition (Green et al., 2013), we hypothesized that the tendency or motivation to engage in perspective-taking would show a stronger association (albeit still small) with performance on higher-level social–cognitive tasks, relative to emotional contagion. Although cognitive and affective empathic processes work together, we hypothesized that the more automatic and reflexive process of emotional contagion (de Waal, 2008) would show a slightly smaller positive association than perspective taking.

To our knowledge, no study has examined whether self-reported emotional contagion for positive (vs. negative) emotions differentially predict social–cognitive ability and affect sharing. Given that our study is the first to examine this research question, by including both emotional contagion for positive and negative emotions in the same model, as well as perspective-taking, we did not have prior findings to inform our hypothesis. Nonetheless, we believed that separating positive and negative contagion would potentially reveal small associations that may have been "washed out" or negated in combined indices of contagion such as those meta-analyzed in Murphy and Lilienfeld (2019). For affect sharing, we hypothesized that perspective-taking and emotional contagion would demonstrate small positive associations, and that contagion for positive emotions would be more strongly associated with affect sharing when stimuli were positively valenced (compared with emotional contagion for negative emotions), and similarly, that emotional contagion for negative emotions would be more strongly associated with affect sharing for negatively valenced stimuli, relative to emotional contagion for positive emotions. In addition, we conducted three sets of exploratory analyses. First, we examined participant gender as a moderator of the association between the three self-reported empathy variables and performance on behavioral tasks. We also examined the moderating role of stimuli valence on the association between our main predictors of interest and task performance. Finally, we examined the interaction of perspective-taking and emotional contagion on performance on tasks assessing different forms of social cognition and affect sharing.

General Method

The present investigation included five tasks: the emotion perceptions of biological motion task (hereon referred to as the biological motion task; Heberlein et al., 2004; Kern et al., 2013), the Penn Emotion Recognition test (ER-40; Kohler et al., 2003, 2005), the Reading the Mind in the Eyes test (RMET; Baron-Cohen et al., 2001), the empathic accuracy (EA) task (Kern et al., 2013), and a modified version of the EA task that measures affect sharing (similar to A. S. Morrison et al., 2016). Because similar methods were used to examine the association between self-reported empathy and performance on all tasks, the following section presents the methods common to all five tasks. In the subsequent sections, we present the methods, results, and discussion for each task separately.

Participants

Data were pooled from three separate studies to maximize the sample size. Details regarding the sampling and data collection procedures for these studies can be found in their associated preregistration documents on the OSF page of the senior author.

Study 1

Data collection for Study 1 (between January and December 2017) occurred across three sites: (a) undergraduate students from Southern Methodist University in Dallas, Texas (hereafter referred to as University 1); (b) undergraduate students from Boston University (hereafter referred to as University 2); and (c) an adult sample from within the United States via Amazon Mechanical Turk (MTurk). Participants completed self-report questionnaires and behavioral tasks in the context of a larger study that sought to examine, among other questions, the relation between social anxiety and social–cognitive ability (for more details see https://osf.io/n3s4q). In total, 1,485 participants took part in Study 1 (553 from University 1, 426 from University 2, and 506 from MTurk). Overall, participants (*M age* = 25.76 years old; *SD* = 11.63; age range = 18–77 years) were predominantly female (68.7%) and self-identified as White (71.4%), Black or African American (6.2%), Asian (16%), Native American or Alaska Native (.5%), or “Other” (5.3%). The study was approved by Institutional Review Boards at both universities, and informed consent was obtained from all participants.

Study 2

Data from Study 2 were collected from a different sample of undergraduates at Southern Methodist University (between January 2018 and October 2019), who took part in a study that examined, among several questions, associations between empathic accuracy for video and music stimuli (for more details see Tabak et al. (in press) and https://osf.io/6juyn). This study included one online and one in-person session. During the online session, participants completed a battery of self-report and behavioral measures, which included the self-report measures of interest described below, as well as several measures that are not relevant to the present investigation. During the in-person session, participants completed additional behavioral tasks after being randomly assigned to either an experimental condition (intended to increase levels of state anxiety) or a control condition. Importantly, our analyses revealed that the manipulation had no significant effect on levels of state anxiety, $t(381) = .025$, $p = .98$. Thus, in the present analyses, we collapsed across both conditions, and included all participants.[1] In total, 452 participants completed the study (*M age* = 19.64 years old; *SD* = 1.78; age range = 18–31 years). Participants were predominantly female (68.1%), self-identified as White (74.6%), Black or African American (3.1%), Asian (17.3%), Native American or Alaska Native (.9%) or “Other” (3.8%). The study was approved by the Southern Methodist University Institutional Review Board, and informed consent was obtained from all participants.

Study 3

Data from Study 3 were collected online from MTurk (between July 2019 and February 2020); participants were located in the United States and were asked to complete self-report questionnaires and behavioral tasks, in the context of a larger project on social and music perception (for more details see: https://osf.io/rtxqk). In total, 745 participants completed the study (*M age* = 37.08 years old; *SD* = 11.05; age range = 20–80 years). Participants were predominantly male (53.3%), and self-identified as White (76.8%), Black or African American (16.2%), Asian (4%), Native American or Alaska Native (1.6%) or “Other” (1.3%). Based on concerns that have been raised regarding data quality from samples recruited through MTurk in more recent years (Chmielewski & Kucker, 2020), we implemented extensive data screening steps to identify and remove problematic participants such as potential “bots” and “farmers” (details regarding this process can be found in the Identifying Problematic Participants section of the online supplemental materials). The study was approved by the Southern Methodist University Institutional Review Board, and informed consent was obtained from all participants.

Table 1 (which appears onthe next page) shows which tasks were included in each of the three studies.

Self-Report Measures

Perspective Taking

The perspective-taking (PT) subscale of the Interpersonal Reactivity Index (IRI; Davis, 1980) was used to measure the self-reported tendency to take the perspective of others. Items were rated on a scale from 0 (*does not describe me at all*) to 4 (*describes me very well*). A total score was calculated by averaging across all items (α = .80–.83, across samples). Missing data on PT were imputed using the expectation maximization (EM) algorithm (see Missing Data and Descriptive Statistics on Self-Report Measures in the online supplemental materials for details).

Emotional Contagion

The Emotional Contagion Scale (ECS; Doherty, 1997) was used to measure participants’ susceptibility to experiencing others’ emotions, across five dimensions: happiness, love, fear, anger, and sadness. Items were rated on a scale ranging from 1 (*never*) to 4 (*always*). Scores on items assessing emotional contagion for positive emotions were averaged to create an emotional contagion for positive emotions subscale (ECp; α = .83–.86), and scores on items assessing emotional contagion for negative emotions were averaged

[1] Of note, for the two tasks that were performed following this manipulation (which included the biological motion task and the ER-40 task, described below), we re-ran analyses without data from Study 2, and the results did not meaningfully change.

Table 1
Summary of Study Data Available for Each Task

Behavioral assessment	Study 1	Study 2	Study 3
Biological motion task	✓	✓	
ER-40 task		✓	
RMET	✓		
Empathic accuracy	✓	✓	✓
Affect sharing		✓	✓

Note. RMET = Reading the Mind in the Eyes test; ER = Penn Emotion Recognition test.

to create an emotional contagion for negative emotions subscale (ECn; α = .81–.84).[2] Missing data on ECp and ECn were imputed using EM (see Missing Data and Descriptive Statistics on Self-Report Measures in the online supplemental materials for details).

Alexithymia

The Toronto Alexithymia Scale (TAS-20; Bagby et al., 1994) was used to measure alexithymia, including difficulties identifying feelings, difficulties describing feelings, and externally oriented thinking. Items were rated on a scale from 1 (*strongly disagree*) to 5 (*strongly agree*). A total score was calculated by averaging across all items (α = .87–.90). Missing data were imputed using EM (see Missing Data and Descriptive Statistics on Self-Report Measures in the online supplemental materials for details).

Socioeconomic Status

To index participants' SES, we used a modified variant of the Hollingshead social status index (Hollingshead, 1975), the Barratt simplified measure of social status (Barratt, 2006). This measure assesses participants' SES during childhood by inquiring about their primary caregiver(s)'s educational attainment and occupational status. Participants with no data on this measure were not included in the analyses (see Missing Data and Descriptive Statistics on Self-Report Measures in the online supplemental materials for details).

Statistical Analysis Plan

Biological Motion Task, ER-40 Task, and RMET

To test whether PT, ECp, and ECn were associated with performance on the biological motion task, the ER-40 task, and the RMET, we conducted hierarchical multiple regressions. PT, ECp, and ECn were included in Step 1. In Step 2, demographic variables including age, gender, and SES were entered as covariates, and then alexithymia was entered as an additional covariate in Step 3 for each model. For data that were pooled from multiple sites (i.e., for the biological motion task, and the ER-40 task), we also tested for the presence of site-specific effects by including interactions between our main variables of interest (i.e., PT, ECp, and ECn) and variables coding for the site at which participants completed the study.

EA and Affect Sharing Tasks

Across studies, participants either completed the EA or affect sharing tasks (i.e., no participants completed both tasks). For analyses with the EA task, as well as the modified EA task assessing affect sharing, we used multilevel models to account for repeated assessments (i.e., video stimuli) within subjects, and for differences in the valence (i.e., positive or negative) of the stimuli, as well as the expressivity of the target in each video (see EA Task Methods section for details). For these analyses, we also tested for the presence of study-specific effects by including interactions between our main variables of interest (i.e., PT, ECp and ECn) and variables coding for the study participants completed.[3]

Multiple Tests Correction

For our primary analyses, which examined the association between self-reported empathy and performance on the four tests of social cognition (i.e., the biological motion task, the ER-40 task, the RMET, and the EA task), we used the Benjamini and Hochberg (1995) false discovery rate (FDR) correction to maintain the Type I error rate at .05, in the final statistical models (i.e., after controlling for demographic covariates and alexithymia). We did not include the analysis of affect sharing into these corrections, given the different (i.e., valence-specific) hypothesis that was proposed for affect sharing specifically.

Exploratory Analyses

For the first exploratory analysis, we added to the primary analyses previously described by including the interaction between gender and our main variables of interest (i.e., PT, ECp and ECn). For our second exploratory analysis, we used multilevel modeling to account for differences in stimuli valence (for details, see online supplemental materials). Finally, in our third exploratory analysis, we added to the primary analyses previously described and included the interaction between PT and ECp, and between PT and ECn. Multiple test correction was used for these exploratory analyses as well (see online supplemental materials for details).

Lower-Level Social Cognition: Emotion Recognition From Body Movements

Method

Participants

Data from the biological motion task and self-report measures were available for 1,756 participants, from Study 1 (n = 1,473) and Study 2 (n = 283). With this sample size, we had greater than .95 power to detect a small effect of each of our main variables of interest (R^2 = .01, as would be expected based on estimates from Murphy & Lilienfeld, 2019). Demographics for the overall sample

[2] An exploratory factor analysis (EFA) was conducted on data from Study 1 to examine the underlying factor structure of the ECS. Promax rotation was used to allow factors to correlate with one another. Results revealed that a two-factor model fit the data well (see Factor Structure of the Emotional Contagion Scale (ECS) section of online supplemental material for details on the EFA, as well as the results from parallel analysis and Velicer's Minimum Average Partial test). All positively valenced items (i.e., items assessing emotional contagion for positive emotions) loaded onto one factor, and all negatively valenced items (i.e., items assessing emotional contagion for negative emotion) loaded onto a separate factor. The correlation between the two factors was r = .54, suggesting related but distinct factors.

[3] For the EA and affect sharing tasks, different software programs were used between Study 1, Study 2 and Study 3. In Study 1 and Study 2, MediaLab was used for these tasks, whereas in Study 3, we used a custom platform hosted on Google Cloud Platform (created using Node.js and standard web technologies).

can be found in the Demographic Information by Outcome Measure section of the online supplemental materials.

Emotion Perceptions of Biological Motion Task

The emotion perceptions of biological motion task (Heberlein et al., 2004; Kern et al., 2013) measures the ability to accurately identify emotions expressed through 24 short videos of point-light walkers depicting one of four basic emotions (i.e., happiness, sadness, anger, and fear), or a neutral expression. Point light walkers were created by attaching lights to the joints and head of a human actor as they performed actions associated with specific emotions (e.g., walking slowly, with arms loosely hanging and head bowed, to depict sadness). For each video, participants were asked to select the emotion portrayed: happy, sad, angry, afraid and neutral. Participants' response to each stimulus was assigned an accuracy score (for the method by which accuracy scores were computed, see Heberlein et al., 2004). A total accuracy score was calculated by averaging scores across all stimuli (% correct). Missing data on the biological motion task (n = 21 participants) were imputed using EM.

Results

Primary Analyses

Table 2 presents the results of the analysis examining the associations of PT, ECp, and ECn with performance on the biological motion task. Although PT and ECp (but not ECn) were positively associated with task performance in Steps 1 and 2, with the addition of alexithymia in the model, these associations did not maintain significance following multiple test correction.

Exploratory Analyses: Gender and Valence Moderation, and the Interaction of PT and EC

Neither gender, nor stimuli valence, were significant moderators of the association between self-reported empathy (i.e., PT, ECp, and ECn) and emotion recognition via the biological motion task. In addition, no interaction effects between PT and ECp, nor between PT and ECn significantly predicted emotion recognition (for details see the Biological Motion Task Exploratory Analyses section of the online supplemental materials).

Discussion

Before the inclusion of alexithymia, we found small associations of self-reported perspective-taking, as well as emotional contagion for positive emotions, with emotion recognition via the biological motion task. These results are similar to the overall effect size obtained in Murphy and Lilienfeld's (2019) meta-analysis; however, unlike the meta-analysis, these results were observed when including both self-reported perspective-taking and emotional contagion in the same model, to examine the unique variance predicted by each variable when accounting for the other. Murphy and Lilienfeld (2019) raised concerns regarding a potential lack of discriminant validity in self-report measures of cognitive and affective empathy; our results suggest that, without the inclusion of other covariates, both self-reported perspective-taking and emotional contagion for positive emotions are uniquely associated with performance on the biological motion task. Furthermore, we found evidence that highlights the importance of distinguishing between emotional contagion for positive emotions and emotional contagion for negative emotions; our observed association between self-reported emotional contagion and task performance were specific to emotional contagion for positive emotions.

Importantly, however, our findings revealed that after including alexithymia in the model, and correcting for multiple testing, associations between self-reported empathic traits and emotion

Table 2
Hierarchical Regression Predicting Performance on the Biological Motion Task

Predictor variables	Step 1 *b*	Step 1 95% CI	Step 2 *b*	Step 2 95% CI	Step 3 *b*	Step 3 95% CI
Intercept	−.00	[−.05, .04]	−.00	[−.05, .04]	−.00	[−.05, .04]
IRI PT	**.07**	[.02, .12]	**.07**	[.02, .12]	**.05**	[.00, .10]
EC positive	**.09**	[.03, .14]	**.08**	[.03, .14]	.06	[−.00, .11]
EC negative	−.03	[−.08, .02]	**−.06**	[−.11, .00]	−.04	[−.10, .02]
University 1 (U1) sample	**.20**	[.14, .26]	**.26**	[.17, .34]	**.26**	[.17, .35]
University 2 (U2) sample	**.14**	[.08, .20]	**.20**	[.12, .28]	**.20**	[.12, .28]
IRI PT × U1	−.05	[−.11, .00]	**−.06**	[−.11, −.00]	−.05	[−.11, .00]
IRI PT × U2	−.02	[−.08, .04]	−.02	[−.07, .04]	−.01	[−.07, .04]
EC Positive × U1	.02	[−.05, .08]	.02	[−.05, .08]	.01	[−.05, .08]
EC Positive × U2	−.00	[−.07, .06]	−.00	[−.07, .06]	−.00	[−.07, .06]
EC Negative × U1	.00	[−.06, .06]	.00	[−.06, .06]	.000	[−.06, .06]
EC Negative × U2	−.04	[−.10, .02]	−.04	[−.10, .03]	−.04	[−.10, .02]
Age			**.10**	[.02, .17]	**.08**	[.01, .16]
Female gender			**.07**	[.03, .12]	**.07**	[.02, .12]
SES			.04	[−.01, .09]	.03	[−.02, .08]
Alexithymia					**−.07**	[−.12, −.02]
ΔR^2	**.050**		**.009**		**.004**	

Note. IRI = Interpersonal Reactivity Index; PT = perspective-taking; EC = emotional contagion; SES = socioeconomic status. N = 1,756. All variables were standardized. Site (i.e., University 1, University 2, or MTurk) was dummy-coded (with MTurk as the reference group) and standardized such that the main effects of PT, EC positive, and EC negative represent effects at the average site. 95% percent CIs for parameter estimates in boldface do not include zero, and bolded ΔR^2 are statistically significant.

recognition were no longer significant. In addition, alexithymia accounted for a larger portion of the variance in task performance, relative to self-reported perspective-taking and emotional contagion. Our results showed that higher levels of alexithymia predicted lower emotion recognition accuracy, in line with previous studies on the importance of alexithymia in social cognition (Di Tella et al., 2020).

Lower-Level Social Cognition: Emotion Recognition From Facial Expressions

Method

Participants

Data on ER-40 performance were available from 384 participants in Study 2. With this sample size, we could detect a small effect of $R^2 = .02$ with an alpha level of .05, and with .80 power. Therefore, we had sufficient power to detect effect sizes similar to those observed in previous studies (e.g., Israelashvili et al., 2019), but not for those observed in the Murphy and Lilienfeld (2019) meta-analyses.

Penn Emotion Recognition Test

The Penn Emotion Recognition Test (ER-40; Kohler et al., 2003, 2005) measures the ability to correctly identify emotions in 40 photographs of static faces depicting one of four emotions (i.e., happiness, sadness, anger, and fear), or a neutral expression. Participants were asked to select the correct emotion from the five options. Stimuli were balanced for the actors' gender, age, and ethnicity, and equal number of stimuli were presented for each emotion. A total accuracy score was calculated by taking the sum of scores across all stimuli. No data were missing.

Results

Primary Analyses

Table 3 presents the results of the hierarchical linear regression analysis examining the associations of PT, ECp, and ECn with performance on the ER-40 task. No significant associations between PT, ECp, or ECn were found with emotion recognition accuracy.

Exploratory Analyses: Gender and Valence Moderation, and the Interaction of PT and EC

Following multiple test correction, gender was not a significant moderator of the association between self-reported empathy and emotion recognition via the ER-40. However, there was a significant interaction between PT and stimuli valence (FDR corrected, $p < .001$). For neutral stimuli, higher PT scores predicted lower accuracy ($p = .004$). For negative and positive stimuli, PT was not significantly associated with task performance ($p > .05$). Lastly, no interaction effects between PT and ECp, nor between PT and ECn significantly predicted emotion recognition (for details see the ER-40 Exploratory Analyses section of the online supplemental materials).

Discussion

Our results showed that self-reported empathy was not significantly associated with emotion recognition accuracy. Although previous findings have been mixed regarding the association between self-reported empathy and emotion recognition from facial expression, past studies did not differentiate between emotional contagion for positive and negative emotions.

Intermediate-Level Social Cognition: Theory of Mind Based on the RMET

Method

Participants

Data from the RMET and self-report measures were available for 1,473 participants from Study 1. With this sample size, we had greater than .95 power to detect a small effect of each of our main variables of interest ($R^2 = .01$, as would be expected based on estimates from Murphy & Lilienfeld, 2019). Demographics for the overall sample can be found in the Demographic Information by Outcome Measure section of the online supplemental materials.

Reading the Mind in the Eyes Test

The Reading the Mind in the Eyes Test (RMET; Baron-Cohen et al., 2001) measures the ability to accurately identify the mental states of others (i.e., intentions and emotions). Although most researchers have classified this task as a measure of theory of mind, others have found evidence that the RMET may index emotion recognition (Oakley

Table 3
Hierarchical Regression Predicting ER-40 Task Performance

	Step 1		Step 2		Step 3	
Predictor variables	*b*	95% CI	*b*	95% CI	*b*	95% CI
Intercept	.00	[−.10, .10]	.00	[−.10, .10]	.00	[−.10, .10]
IRI PT	−.03	[−.13, .08]	−.03	[−.13, .08]	−.03	[−.14, .08]
EC positive	.07	[−.04, .19]	.07	[−.05, .19]	.05	[−.07, .18]
EC negative	.04	[−.08, .16]	.05	[−.08, .17]	.05	[−.07, .18]
Age			−.04	[−.14, .07]	−.04	[−.14, .06]
Female gender			−.00	[−.11, .11]	−.01	[−.12, .10]
SES			−.04	[−.14, .07]	−.04	[−.15, .06]
Alexithymia					−.04	[−.15, .07]
ΔR^2	.009		.002		.001	

Note. IRI = Interpersonal Reactivity Index; PT = perspective-taking; EC = emotional contagion; SES = socioeconomic status. $n = 384$. All variables were standardized.

et al., 2016); the discrepancy in classification appears to be based on the use of only static faces with no additional context. Nonetheless, the choices provided include more complex thoughts/emotions than standard assessments of emotion recognition. Thus, we refer to the RMET as an assessment of intermediate-level social cognition. The RMET consists of 36 photographs of the eye-region of male and female actors; participants were asked to select the word that best describes what the individual in the photograph was thinking or feeling, from the four available options (e.g., jealous, panicked, arrogant, or hateful). A total accuracy score was calculated by averaging scores across all stimuli (% correct). No data were missing on RMET accuracy scores.

Results

Primary Analyses

Table 4 presents the results of the hierarchical linear regression analysis examining the associations of PT, ECp, and ECn with performance on the RMET. PT, and ECp (but not ECn) were positively associated with task performance in Steps 1 and 2, and with the addition of alexithymia in the model, PT maintained a significant positive association with RMET performance after multiple tests correction (FDR corrected, $p = .048$).

Exploratory Analyses: Gender and Valence Moderation, and the Interaction of PT and EC

Neither gender, nor stimuli valence, were significant moderators of the association between self-reported empathy and theory of mind via the RMET. Results revealed a significant interaction between PT and ECp ($p < .001$). For individuals with low levels of emotional contagion for positive emotions (i.e., with ECp scores that were one standard deviation below the mean), PT was positively associated with RMET performance ($p < .001$). Similarly, for individuals with average levels of ECp, PT was positively associated with RMET performance ($p = .011$). However, for individuals with high levels of ECp (i.e., with ECp scores that were one standard deviation above the mean), PT was not significantly associated with RMET performance ($p > .05$). For details, see the RMET Exploratory Analyses section of the online supplemental materials.

Discussion

Our analyses revealed a pattern of results similar to those observed with emotion recognition accuracy via the biological motion task. Before the inclusion of alexithymia, we found small associations of self-reported perspective-taking, as well as emotional contagion for positive emotions, with theory of mind. Although slightly larger than the association observed with performance on the biological motion task, self-reported perspective-taking was still only weakly associated with RMET performance ($r = .11$). These results replicate the small ($r = .12$) associations observed in Murphy and Lilienfeld (2019) between self-reported perspective-taking and theory of mind, without the inclusion of covariates, as well as previous findings from Israel-ashvili et al. (2019) and Mayukha et al. (2020) observing correlations ranging from $r = .12–.20$ between perspective-taking and performance on the RMET. In contrast to Murphy and Lilienfeld (2019) who found no association between self-reported emotional contagion and RMET performance, we found an initial positive association between emotional contagion for positive emotions and performance. However, following the inclusion of alexithymia in the model, this association was no longer significant. In contrast, self-reported perspective-taking was a significant predictor of theory of mind, with higher levels associated with greater accuracy. Nevertheless, alexithymia still accounted for a larger portion of the variance in task performance, relative the other self-report measures, and our results were consistent with previous findings showing negative associations between alexithymia and RMET performance (Di Tella et al., 2020).

Table 4

Hierarchical Regression Predicting Performance on the RMET

	Step 1		Step 2		Step 3	
Predictor variables	*b*	95% CI	*b*	95% CI	*b*	95% CI
Intercept	.00	[−.06, .05]	.00	[−.05, .05]	.00	[−.05, .05]
IRI PT	**.11**	[.06, .17]	**.11**	[.05, .16]	**.067**	[.02, .12]
EC positive	**.09**	[.03, .15]	**.09**	[.03, .15]	.021	[−.04, .08]
EC negative	.05	[−.01, .11]	.00	[−.06, .06]	.048	[−.01, .11]
University 1 (U1) sample	**.11**	[.05, .17]	**.22**	[.13, .30]	**.21**	[.13, .30]
University 2 (U2) sample	.05	[−.01, .11]	**.17**	[.08, .25]	**.19**	[.11, .27]
IRI PT × (U1)	−.04	[−.10, .02]	−.04	[−.10, .01]	−.040	[−.10, .02]
IRI PT × (U2)	−.03	[−.09, .03]	−.03	[−.09, .03]	−.020	[−.08, .04]
EC Positive × U1	−.00	[−.07, .06]	−.00	[−.07, .06]	−.007	[−.07, .06]
EC Positive × U2	.01	[−.06, .08]	.01	[−.06, .08]	.015	[−.05, .08]
EC Negative × U1	−.01	[−.08, .05]	−.01	[−.08, .06]	−.017	[−.08, .05]
EC Negative × U2	−.05	[−.12, .01]	−.05	[−.11, .02]	−.060	[−.13, .00]
Age			**.18**	[.10, .26]	**.14**	[.06, .22]
Female gender			**.13**	[.07, .18]	**.12**	[.06, .17]
SES			.03	[−.02, .09]	.025	[−.03, .08]
Alexithymia					**−.19**	[−.25, −.14]
ΔR^2	**.054**		**.027**		**.028**	

Note. RMET = Reading the Mind in the Eyes test; IRI = Interpersonal Reactivity Index; PT = perspective-taking; EC = emotional contagion; SES = socioeconomic status. $N = 1,473$. All variables were standardized. Site (i.e., University 1, University 2, or MTurk) was dummy-coded (with MTurk as the reference group) and standardized such that the main effects of PT, EC positive, and EC negative represent effects at the average site. 95% percent CIs for parameter estimates in boldface do not include zero, and bolded ΔR^2 are statistically significant.

Higher Level Social Cognition: Empathic Accuracy

Method

Participants

EA data were available for 841 participants from Study 1 (*n* = 385), Study 2 (*n* = 185), and Study 3 (*n* = 271). Demographics for the overall sample can be found in the Demographic Information by Outcome Measure section of the online supplemental materials. With a sample size of 841 participants and conservatively assuming an average of seven assessments per person, we had greater than .95 power to detect a small effect size (d = .20) for associations between each of our main variables of interest and EA.

Empathic Accuracy Video Task

The empathic accuracy (EA) task (Kern et al., 2013) was used to measure the accuracy with which participants track the emotions of others. In this task, participants watched videos in which individuals (i.e., "targets") discussed positive or negative autobiographical events; throughout each video, participants were asked to continuously rate on a 9-point scale (1 = *extremely negative*; 9 = *extremely positive*) how the target was feeling on a moment-to-moment basis. Participants' ratings throughout each video were then compared with the target's ratings of their own emotions during the video, which were obtained during the creation of this task. Accuracy was determined by correlating the target and participant ratings for each two-second epoch throughout the video and then averaging the correlations. During the creation of the task, targets also completed the Berkeley Expressivity Questionnaire (BEQ; Gross & John, 1997) to assess their self-reported level of emotional expressivity. As greater target expressivity has been associated with increased accuracy among perceivers (Zaki et al., 2008), target expressivity was accounted for in analyses of EA.

Statistical Analyses

Because the EA data were negatively skewed (–2.38), a generalized linear mixed model (GLMM) was used to test whether PT, ECp, and ECn were associated with EA performance. First, EA data were reversed.[4] We then used a GLMM with γ distribution and a log linking function (which is recommended for positively skewed data; Heck et al., 2013). Video valence and target expressivity were entered as Level 1 (within-person) predictors. The Level 2 (between-person) predictors included two dummy variables indicating which study participants completed (i.e., Study 1 and Study 2, with Study 3 as the reference group), our main variables of interest (i.e., PT, ECp, and ECn), demographic covariates (age, gender, and SES), and alexithymia. Moreover, we tested for the presence of study-specific effects by including the six two-way interactions of the three variables of interest and the two study variables (PT × Study 1, PT × Study 2, ECp × Study 1, ECp × Study 2, ECn × Study 1, ECn × Study 2). A random intercept was included in the model.

We also conducted exploratory analyses to examine whether: (a) participant gender moderated any of the associations between our main variables of interest and EA, (b) valence moderated any of the associations, and (c) there was a significant interaction effect of PT and emotional contagion (for both positive and negative emotions) on task performance. Of note, due to the study-specific effects observed in our primary analyses, we also tested for study-specific effects in these exploratory analyses. FDR correction was also applied to exploratory analyses as well (see the EA Exploratory Analyses section of the online supplemental materials for details).

Table 5
GLMM Predicting Performance on EA Task (Averaging Across All Studies)

Predictor variables	*b*	95% CI
Intercept	**−.86**	[−.92, −.80]
Positive valence	**.16**	[.14, .17]
Target expressivity	**.11**	[.10, .12]
Study 1	**.05**	[.04, .07]
Study 2	**.04**	[.03, .05]
IRI PT	−.00	[−.01, .01]
EC positive	−.00	[−.01, .01]
EC negative	−.00	[−.01, .01]
IRI PT × Study 1	−.01	[−.01, .00]
IRI PT × Study 2	−.00	[−.01, .00]
EC Positive × Study 1	−.01	[−.01, .00]
EC Positive × Study 2	−.01	[−.01, .00]
EC Negative × Study 1	.01	[−.00, .01]
EC Negative × Study 2	**.01**	[.00, .02]
Age	**.03**	[.02, .04]
Female gender	**.01**	[.00, .02]
SES	−.00	[−.01, .01]
Alexithymia	**−.02**	[−.03, −.01]

Note. IRI = Interpersonal Reactivity Index; PT = perspective-taking; EC = emotional contagion; EA = empathic accuracy; SES = socioeconomic status; GLMM = generalized linear mixed model. EA scores were reversed, and a GLMM with a gamma distribution and log link was used for this analysis. For presentation purposes, *b* values presented here were reversed again. Study (i.e., Study 1, Study 2, and Study 3) was dummy-coded (with Study 3 as the reference group) and standardized such that the main effects of PT, EC positive, and EC negative represent effects at the average study. PT, EC positive, EC negative, age, female gender, SES, and alexithymia were standardized. Video valence and target expressivity were not standardized in this model. 95% CIs for parameter estimates in boldface do not include zero.

Results

Primary Analyses

Table 5 presents the results of the GLMM analysis examining the associations of PT, ECp, and ECn with performance on the EA task. Averaging across all studies, there was no association between our main variables of interest (i.e., PT, ECp, and ECn) and EA. However, there was a significant ECn × Study 2 interaction, suggesting that the association between ECn and EA differed between Study 2 and Study 3. Therefore, three similar GLMM models were conducted to further investigate the conditional main effects of PT, ECp, and ECn on EA scores within each of the three studies separately. Within Study 3, ECn was negatively associated with EA scores ($b = -.01$, 95% CI [–.02, –.00], $t(5863) = 2.05$, $p = .04$); however, this association did not maintain significance after correcting for multiple tests (FDR corrected, $p = .12$). Similarly, all other associations between our variables of interest and EA were not significant within each study.

[4] For presentation purposes, all *b* values reported for these EA analyses have been reversed, following the initial reverse coding of the EA data.

Exploratory Analyses: Gender and Valence Moderation, and the Interaction of PT and EC

Results of exploratory analyses suggested differences across the three studies in the moderation effect of gender. In Study 3, ECn was associated with lower EA performance in men ($p < .001$), whereas ECn was related to higher EA performance in women ($p = .005$). After multiple test correction, no other gender moderation was observed (see EA Exploratory Analyses section of the online supplemental materials for details). In examining potential valence moderation, we found significant three-way interactions between ECp, study, and stimuli valence. In Study 2, there was a significant interaction between ECp and stimuli valence, which remained after multiple test correction ($p = .03$). ECp was associated with lower EA for positive stimuli ($p = .023$), whereas ECp was not significantly associated with EA for negative stimuli ($p > .05$). After multiple test correction, no other valence moderation was observed (see online supplemental materials for more details). Our third set of exploratory analyses examined whether there was a significant interaction effect of PT and emotional contagion (for both positive and negative emotions) predicting EA performance. After multiple test correction, our results revealed no significant interaction between PT and ECp, nor between PT and ECn (see online supplemental materials for additional details).

Discussion

Across three studies, our results revealed no significant association between self-reported empathy measures and EA. The lack of association with PT differs from results from previous studies using a similar EA task. For example, Mackes et al. (2018) found a moderate positive correlation between self-reported perspective-taking and EA scores in a sample of 47 participants, and using data available from a study of 121 participants (i.e., from Devlin et al., 2014), Murphy and Lilienfeld (2019) found a small positive correlation between perspective-taking and EA in women (whereas in men, they found a nonsignificant negative correlation). Of note, however, our use of multilevel modeling to analyze EA data allowed us to control for the effects of stimuli valence and target expressivity, which differs from the methods used in these previous studies. In line with our previous analyses, neither emotional contagion for positive emotions, nor emotional contagion for negative emotions (after correcting for multiple tests), were significantly associated with EA. These results differ from those observed in Mayukha et al. (2020), which found that emotional contagion for negative emotions was related to lower EA, whereas we found no such association. Additionally, our exploratory analyses revealed a potential moderating effect of gender and valence; of note, however, these effects were study-specific, with no clear pattern emerging across these study-effects.

Affect Sharing Task (Lower-Level Social Cognition)

Method

Participants

Data on affect sharing were available for 536 participants from Study 2 ($n = 321$) and Study 3 ($n = 215$). With a sample size of 536, and conservatively assuming an average of seven assessments per person, we had greater than .95 power to detect a small effect size ($d = .20$) for each of our main variables of interest, as well as their valence-moderated effects, on affect sharing.

Affect SharingVideo Task

A modified version of the EA task (Kern et al., 2013) was used to measure affect sharing; this task consisted of the same video stimuli and calculation described previously for the EA task, with a slight variation on the instructions for the task. For each video, participants were asked to continuously rate *how they—the participant—*were feeling on a moment-to-moment basis while watching the video (as opposed to the EA task where participants are asked to rate *how they believe the target is feeling*).

Statistical Analyses

As with the EA data, the affect sharing data were negatively skewed (–1.57), and therefore a GLMM was conducted using a log linking function and γ distribution, paralleling the statistical model utilized for the EA data. Level 1 predictors included: video valence and target expressivity. Level 2 predictors included a dummy variable indicating which study participants completed (i.e., Study 2 or Study 3), our main variables of interest (i.e., PT, ECp, and ECn), demographic covariates (age, gender, and SES), and alexithymia. Moreover, we tested for the presence of valence-specific and study-specific effects by including the three-way interactions between our main variables of interest, video valence, and study, along with all lower-level interaction terms. A random intercept was included for each participant.

Additionally, we conducted two exploratory analyses to examine: (a) whether participant gender moderated any of the associations between our main variables of interest and affect sharing, and (b) whether there was a significant interaction effect of PT and emotional contagion (for both positive and negative emotions) on task performance (for additional details, see the Affect Sharing Exploratory Analyses section of the online supplemental materials).

Results

Primary Analyses

Table 6 presents the results of the GLMM analysis examining the associations of PT, ECp, and ECn with affect sharing. Averaging across all studies, and after controlling for relevant covariates (i.e., age, gender, SES, and alexithymia), no significant main or interaction effects were found.

Exploratory Analyses: Gender and the Interaction of PT and EC

Exploratory analyses revealed no significant interaction between our main variables of interest and participant gender (all p's $>.05$). Similarly, no significant interaction between PT and ECp, nor between PT and ECn were found (all p's $>.05$). See online supplemental materials for more details.

Table 6
GLMM Predicting Affect Sharing

Predictor variables	*b*	95% CI
Intercept	**−.86**	[−.95, −.78]
Positive valence	**.06**	[.05, .07]
Target expressivity	**.10**	[.08, .12]
Study 2	**.05**	[.03, .07]
IRI PT	.01	[−.00, .03]
EC positive	.01	[−.01, .03]
EC negative	.00	[−.01, .02]
Positive Valence × IRI PT	.01	[−.00, .01]
Positive Valence × EC Positive	.01	[−.00, .01]
Positive Valence × EC Negative	.00	[−.01, .01]
Positive Valence × Study 2	**−.02**	[−.02, −.01]
Study 2 × IRI PT	−.01	[−.02, .01]
Study 2 × EC Positive	−.02	[−.03, .00]
Study 2 × EC Negative	.01	[−.01, .03]
Study 2 × IRI PT × Positive Valence	.01	[−.00, .01]
Study 2 × EC Positive × Positive Valence	−.00	[−.01, .01]
Study 2 × EC Negative × Positive Valence	−.00	[−.01, .01]
Age	.02	[−.00, .04]
Female gender	**.02**	[.00, .03]
SES	**−.02**	[−.03, −.00]
Alexithymia	**−.04**	[−.06, −.03]

Note. IRI = Interpersonal Reactivity Index; PT = perspective-taking; EC = emotional contagion; EA = empathic accuracy; SES = socioeconomic status; GLMM = generalized linear mixed model. Affect sharing scores were reversed, and a GLMM with a gamma distribution and log link was used for this analysis. For presentation purposes, *b* values presented here were reversed again. Study (i.e., Study 2 and Study 3) was dummy-coded (with Study 3 as the reference group) and standardized such that the main effects of PT, EC positive, and EC negative represent effects at the average study (for the average video valence; video valence was also standardized). PT, EC positive, EC negative, age, female gender, SES, and alexithymia were standardized. Target expressivity was not standardized in this model. 95% CIs for parameter estimates in boldface do not include zero.

Discussion

Our results revealed no significant association between self-reported perspective-taking and affect sharing, nor between self-reported emotional contagion (for positive or negative emotions) and affect sharing. The lack of association between self-reported empathy and affect sharing has been noted previously (e.g., Czarna et al., 2015), but we are unaware of previous studies that have examined whether emotional contagion for positive and negative emotions differentially predicts affect sharing for positive and negative stimuli.

General Discussion

Using data from three separate studies (total N = 2,376), we tested whether the tendency to take the perspective of others, and the tendency to catch the emotions of others, were associated with behaviorally assessed social–cognitive ability (and affect sharing). Across five tasks assessing lower-level social cognition (e.g., emotion recognition from body movements and facial expressions), as well as intermediate- to higher-level social cognition (e.g., theory of mind as assessed via the RMET and empathic accuracy, respectively), we found little evidence of an association between self-reported empathy and performance on these behavioral measures. Following multiple test correction, and including all covariates, the only significant—albeit weak—association was between perspective-taking and theory of mind. These results mirror those found in recent studies (e.g., Israelashvili et al., 2019; Murphy & Lilienfeld, 2019), suggesting that self-reported empathic tendencies are not valid proxies for behaviorally assessed social–cognitive ability. Moreover, our investigation also contributes to the limited research that has examined whether self-report measures of empathic tendencies are associated with behaviorally assessed affect sharing. Expanding upon previous research, we distinguished between emotional contagion for positive and negative emotions, and found no valence-specific associations between individuals' self-reported and actual susceptibility toward emotional contagion, as measured using a continuous video rating task.

An important element of the present study is the consistent evidence showing the importance of including demographic covariates (e.g., age and gender), and other relevant covariates such as alexithymia, in examining the association between self-reported empathy and behavioral assessments of social cognition. Gender was significantly associated with emotion recognition from body movements, theory of mind, empathic accuracy, and affect sharing. Consistent with previous research (e.g., Hall, 1978; Rosip & Hall, 2004; Thompson & Voyer, 2014), female participants consistently outperformed male participants in all tasks (except the ER-40 task), and also showed greater affect sharing with the targets in the video task. We also found that older participants displayed greater accuracy on all tasks (except the ER-40 task), relative to younger participants. Our age-related findings contrast with those observed in previous studies on social cognition and aging (e.g., Isaacowitz et al., 2007; Mill et al., 2009), which have noted age-related *deficits* in performance on social–cognitive tasks. These conflicting results are likely due to the narrower range of ages examined across our studies (where the majority of participants were below the age of 30), relative to studies of aging. Of note, although age and gender were consistently associated with social–cognitive ability across all tasks (with the exception of the ER-40 task), the inclusion of these factors did not impact the association between self-reported empathic tendencies and social–cognitive ability.

Interestingly, alexithymia emerged as a consistent predictor of lower social–cognitive ability, and its inclusion in our statistical models often reduced the effect of self-reported empathic tendencies. For example, without the inclusion of alexithymia, we found that perspective-taking and emotional contagion for positive (but not negative) emotions were associated with higher accuracy on the biological motion task, as well as the RMET, and these effects were maintained after controlling for demographic covariates (i.e., age, gender, and SES) and correcting for multiple tests. These results, without accounting for alexithymia, are consistent with past work showing small but positive correlations between perspective-taking and social–cognitive ability (Israelashvili et al., 2019; Murphy & Lilienfeld, 2019), as well as research highlighting that emotional contagion for positive and negative emotions may show opposite associations with social functioning (Murphy et al., 2018). Extending prior work, our findings highlight that these subcomponents of empathy may account for unique (i.e., nonoverlapping) variability in social–cognitive ability; nonetheless, these effects were not maintained after accounting for individual differences in alexithymia. This pattern of results suggests that the associations previously reported in other studies (e.g., Israelashvili et al., 2019; Mayukha et al., 2020; Murphy et al., 2018) may have been weaker, or nonexistent, because most studies examining self-reported and behavioral assessments of empathic processes have not controlled for alexithymia.

Indeed, we found that alexithymia was negatively associated with performance across the range of tasks assessing lower- to higher-level social–cognitive ability (with the exception of the ER-40). Prior research has noted that alexithymia is negatively associated with emotion recognition and theory of mind (Di Tella et al., 2020; Gökçen et al., 2016; Grynberg et al., 2012; Martínez-Sánchez et al., 2017; Oakley et al., 2016; Pedrosa Gil et al., 2009), or perhaps only forms of theory of mind that involve emotion recognition (Pisani et al., 2021), and our investigation provides further evidence to this effect. In addition to replicating the negative association between alexithymia and both emotion recognition and theory of mind, we found that alexithymia predicted lower levels of empathic accuracy. As measured in the current study, empathic accuracy assessed individuals' sensitivity to the *continuous changes* in others' emotions across time—an advancement in ecological validity that approximates the ebbs and flows of real-life conversation (Zaki et al., 2008). As such, individuals with higher levels of alexithymia had more difficulty tracking the naturally occurring changes in others' emotions. Furthermore, we found that individuals with higher levels of alexithymia displayed lower levels of affect sharing—that is, the extent to which an individual's own emotions matches those of a target. Taken together, these findings suggest that alexithymia appears to impact the way in which individuals *perceive* and *emotionally respond* to others' naturally unfolding emotions, above and beyond the effects of self-reported empathy.

Although speculative, one possibility is that alexithymia's negative impact on social–cognitive ability (i.e., emotion recognition, theory of mind, and empathic accuracy) may be mediated by decreased affect sharing; theoretical models of empathy have suggested that our ability to understand others' emotions is reliant on vicariously experiencing their emotions (Preston & de Waal, 2002). That is, by first simulating how we would feel in a similar situation, we gain a better understanding of others' emotions. In this way, it is possible that difficulties identifying and describing one's own emotions may hinder this first step, which may then result in a breakdown of subsequent empathic processes (Bird & Viding, 2014).

While our findings align with theoretical models of alexithymia and reduced social–cognitive ability (Bird & Viding, 2014), other potential confounds are worth discussing. For example, one confound may be related to the measurement of self-reported alexithymia, which in the Toronto Alexithymia Scale (Bagby et al., 1994) has an emphasis on *perceived ability* (i.e., the ease with which individuals believe they able to identify and describe their emotions). This focus on perceived ability diverges from our self-report measures of empathy, which emphasized behavioral and emotional *tendencies* during social interactions. In this way, relative to self-reported empathic tendencies, it is possible that our measure of alexithymia may be more strongly related to behaviorally assessed social–cognitive ability due to its focus on perceived ability. That said, we also found that alexithymia was associated with affect sharing, for which accuracy and ability are not the target. In the case of affect sharing, individuals were asked to continuously report how positive or negative they were feeling (i.e., their own emotions) while watching videos of others discussing emotional autobiographical events. Thus, it could be argued that our measures of empathic tendencies, rather than perceived ability, may be more relevant to this task. Yet, self-reported alexithymia, and not empathic tendencies, was associated with affect sharing. Still, future research should examine whether these effects can be replicated using other measures of alexithymia such as the Perth Alexithymia Questionnaire (Preece et al., 2018), which appears to include more items that do not focus primarily on perceived ability.

Moreover, there are several potential explanations for the general lack of association between self-reported empathy measures and behavioral assessments of social cognition in the present study. Most notably, trait-level self-report and behavioral measures may assess different constructs, reflecting tendencies *in general* versus experiences and behaviors *in the moment*, respectively (Robinson & Clore, 2002a, 2002b). In particular, momentary experiences and behaviors are often influenced by contextual factors (e.g., one's mood, or specific interaction partners), whereas beliefs about trait-level tendencies are more generalized and less situational. For example, there may be individuals who describe themselves as highly motivated to take the perspective of others, but who display low levels of social–cognitive ability within competitive environments, during conflicts with others, or when cognitive resources are low. This divergence between belief-based self-perceptions and situation-specific behaviors may explain the weak associations observed between self-report and behavioral measures of empathy so far, as contextual and motivational factors may regulate various empathic processes in the moment (Depow et al., 2021; Weisz & Cikara, 2021). To the extent that self-report and behavioral measures of empathy assess different constructs, empathy researchers should carefully consider which construct is most relevant for a given research question.

Similarly, it is important to consider the target of empathy, which may differ between self-report and task-based measures of empathy. Although the items in our measures of perspective-taking and emotional contagion were worded to assess empathic tendencies in general (e.g., "I try to look at everybody's side of a disagreement before I make a decision" or "If someone I'm talking with begins to cry, I get teary-eyed"), it is possible that participants complete these measures thinking about their tendency in daily interactions with familiar others. By contrast, in task-based measures of social cognition, participants are presented with pictures or videos of strangers. In this way, these tasks may index different levels of motivation to empathize with others; while participants may self-report high motivation to empathize with familiar others, they may also be less motivated to empathize with strangers. Therefore, our results may reflect a low concordance between participants' self-reported tendency to empathize with *familiar* others and participants' social–cognitive ability vis-à-vis *unfamiliar* others. This point has been reinforced by research using experience sampling to examine daily experiences of empathy. According to Depow et al. (2021), when individuals encounter opportunities to empathize with others, it is often with someone with whom they have a very close relationship. By contrast, these opportunities arise only 6% of the time with a stranger. As such, it would be important for future large-scale studies to examine whether self-report measures of empathy are more strongly associated with social–cognitive ability when the target is a familiar other, or when the motivation to empathize is strong (e.g., if accuracy on social–cognitive tasks was incentivized).

In addition to these theoretical explanations, measurement issues have also been raised in relation to the weak associations observed between self-report and behavioral measures (Dang et al., 2020). In particular, the low reliability of behavioral tasks may play an important role. Across the social–cognitive tasks included in the current investigation, we observed a range of internal consistency estimates: with α = .48 for the ER-40 task (i.e., an average interitem correlation, or AIC, of .02), α = .62 for the biological motion task (AIC = .06), α = .64 for the EA task (AIC = .16), α = .70 for the affect sharing task (AIC = .21), and α = .72 for the RMET task (AIC = .07). Thus, the low reliability of these behavioral measures may be responsible for the lack of associations observed between self-report measures and performance on these tasks. That said, these estimates of internal consistency are not uncommon in the study of social cognition; similar estimates have been observed in studies using the same tasks (e.g., Ludwig et al., 2017; Morrison et al., 2019; Pinkham et al., 2018), and other reports have omitted these estimates altogether or reported reliability estimates from previous studies. In this way, the low internal consistency of these behavioral measures may limit the strength of associations observed between self-reported empathy and social–cognitive ability. Additionally, these low internal consistency estimates may suggest that items included in these behavioral measures of social cognition assess a vastly heterogeneous construct; indeed, with average interitem correlations ranging from .02 and .21, the common practice of utilizing a total score to represent a single construct may not be warranted.

In the same way, weak correlations *between* tasks assessing social–cognitive abilities may be a consequence of low reliability, although it may also indicate a divergence in the constructs assessed by these different tasks. In the current study, we found a moderate correlation between the biological motion task and the RMET (r = .30), and a small correlation between the biological motion task and the ER-40 task (r = .14). Similarly, the biological motion task was also positively associated with EA performance. Correlations between the other behavioral measures were nonsignificant (details regarding the intercorrelations of the five tasks can be found in the Intercorrelations of Tasks section of the online supplemental materials). Given the low reliability of these tasks, interpreting the weak correlations between self-reported empathy and behavioral measures of social cognition, as well as between different behavioral measures, remains difficult. For this reason, it is also a challenge to interpret findings that were observed with one measure of social–cognitive ability but not the others (e.g., in our exploratory analyses, we found a significant interaction between perspective-taking and emotional contagion for positive emotions predicting performance on the RMET). That is, whether these findings reflect an effect that is specific to one aspect of social–cognitive ability, or whether these findings would replicate across other tasks with better psychometric properties, remains unknown. With this in mind, future studies should examine whether behavioral measures with improved reliability (e.g., with measures developed using item response theory, such as the Geneva Emotion Recognition Test; Schlegel, 2014) may be more strongly associated with self-report measures of empathy.

A final consideration should be given to the possibility of biased responding in self-report measures, particularly with regard to measures of socially desirable traits. For example, research shows that self-reported empathic tendencies (which are generally considered desirable traits) are associated with the tendency to present oneself in an overly positive light (Sassenrath, 2020). Indeed, participants who self-reported more perspective-taking and empathic concern (as measured with the IRI) also self-reported greater conscious effort to present a favorable image of oneself to others. In other words, self-report measures of empathic tendencies may be confounded with socially desirable responding, which may have weakened the correlation between self-report and behavioral measures of empathy.

One key strength of the present investigation is its comprehensiveness in examining the association between self-reported empathy and behaviorally assessed social–cognitive ability (and affect sharing). First, by pooling across multiple studies, our analyses had sufficient power to detect small effects, which would be expected given prior research (e.g., Murphy & Lilienfeld, 2019). Moreover, the inclusion of all self-report empathy measures as predictors in all statistical models, as well as the inclusion of relevant covariates (i.e., age, gender, SES, and alexithymia) allowed us to expand on previous findings by examining whether associations remained after statistically controlling for these variables. The former is particularly relevant given that cognitive and affective empathic processes interact (R. L. C. Mitchell & Phillips, 2015), yet most studies examining self-reported empathy include only one facet of empathy, or a more global measure of empathy that does not distinguish between subcomponents, as a predictor in statistical models.

Finally, based on previous research (Murphy et al., 2018), a distinction was made between self-reported emotional contagion for positive and negative emotions; to our knowledge, this is the first study to examine this difference with respect to behavioral assessments of social cognition. Although some studies have previously observed negative associations between emotional contagion and emotion recognition, as well as empathic accuracy (e.g., Mayukha et al., 2020), commonly used measures of emotional contagion often contain very few items assessing positive emotionality, with most items assessing contagion for more negative emotions. As a result, these negative associations could have been heavily influenced by items assessing contagion for negative emotions. In this way, our investigation expands on past research by testing the independent associations of emotional contagion for positive and negative emotions.

The results from the present investigation should also be considered in light of its limitations. First, as measures of self-reported empathy, we chose to use the perspective-taking subscale of the IRI (Davis, 1983), and the ECS (Doherty, 1997; subdivided into contagion for positive and negative emotions). However, many other self-report measures of cognitive and affective empathy exist, and these measures may differ in meaningful ways from those utilized in the current study. For example, some have argued that the perspective-taking subscale of the IRI should be considered an index of the *motivation* to take the perspectives of others (Murphy & Lilienfeld, 2019). We chose to focus on perspective-taking as a measure of cognitive empathy because we were interested in examining individuals' tendency to engage in empathic processes, instead of their perceived *ability*. This decision follows concerns from past research showing that individuals tend to have low metacognitive insight into their own empathic abilities (Kelly & Metcalfe, 2011; Realo et al., 2003), as well as a tendency to overestimate their abilities in general (Dunning et al., 2004). That said, in order to rule out potential confounds related to the assessment of perceived ability, future research could test whether the association between self-report and behavioral measures of empathic ability is more robust to the inclusion of alexithymia as a covariate, which is also a measure of perceived ability.

In addition, we chose not to focus on empathic concern within the current investigation, based on past research showing that perspective-taking and empathic concern load onto the same factor (Jordan et al., 2016). In light of our interest in exploring the hierarchical organization of social–cognitive ability, we opted to instead focus on emotional contagion and perspective-taking, which we considered prototypical representations of lower-level automatic processes and higher-level cognitive processes, respectively. Similarly, although the ECS was well-suited for our goal of examining differences in contagion for positive and negative emotions (as it contained items assessing contagion for both positive and negative emotions), its representation of basic emotions differs from other measures of emotional contagion, for example, with its inclusion of items assessing "love" (see Murphy et al., 2018; for a discussion on other scales of emotional contagion). Therefore, other self-report measures of empathy may potentially yield different associations with behaviorally assessed social cognition (though previous studies have found similar effects when comparing the IRI perspective-taking subscale to other measures of self-reported empathy; Murphy & Lilienfeld, 2019). Although our choice of self-report measures fits well with our goal of examining the association between self-reported empathic tendencies and behavioral assessments of social cognition, more work is needed to verify whether these findings replicate when using other well-validated self-report measures that distinguish different subcomponents of empathy (e.g., Vachon & Lynam, 2016).

Moreover, these results should be considered in light of our sample characteristics. The current investigation utilized data from different subsamples, such as Americans recruited through an online platform (MTurk) and college students from two different universities. Across all analyses, however, our overall samples were predominantly young, White, and female. As a result, care should be taken when attempting to generalize these results to non-Western cultures, which may differ in cultural values and norms related to social tendencies and emotional processes.

In sum, the current investigation adds to evidence pointing to weak associations between self-report measures of empathic tendencies and behavioral assessments of social–cognitive ability(Davies et al., 1998; Hall et al., 2009; Ickes, 1997, 2010; Murphy & Lilienfeld, 2019; Realo et al., 2003). Extending extant work on this topic, we employed a variety of behavioral assessments of lower- and higher-level social cognition and affect sharing and found little evidence for an association between self-report measures of empathic tendencies and performance on the tasks. Instead, our findings add to evidence that our self-reported ability to understand our *own* emotions is more predictive of performance on behaviorally assessed social cognition than our self-reported engagement in empathy.

On a final note, although our study aimed to address gaps in the literature with respect to self-reported empathic tendencies and behaviorally assessed social cognition, our findings are by no means limited to empathy research. Indeed, as outlined by Dang et al. (2020), weak associations between self-report and behavioral measures have also been identified in research on emotional intelligence, self-control, risk preference, and creativity. Diverging associations between self-report and behavioral measures of the same construct highlights the complexity of measurement within psychology, which we believe merits further consideration and discussion. It is also important to note that even when self-report and behavioral measures are weakly correlated, they often independently predict relevant outcomes (Sharma et al., 2014). Therefore, while it is important to recognize the sometimes-poor psychometric properties of behavioral measures, and the effects of socially desirable responding that is a potential concern in many self-report measures, it is also possible that the divergence between self-report and behavioral measures reflects meaningful differences between belief-based self-descriptions and situation-specific behaviors. These measurement considerations are relevant to all areas of psychology.

Context of the Research

The Social and Clinical Neuroscience Lab is located in the Department of Psychology at Southern Methodist University. In the lab, we conduct research examining biological and psychological factors related to social processes—with a particular focus on social cognition and empathy. As our lab investigates topics from both social psychology and clinical psychology, the first author of this article became interested in the measurement of empathy during her first year project at SMU, following a course on psychometrics, which highlighted the importance of testing the convergence between different methods of measurement (e.g., self-report and behavioral measures of the same construct). Throughout this project, we learned about the complexity of measuring a broad multifaceted construct such as empathy, both at the self-report and behavioral measurement level. That said, we also learned that low convergence between self-report and behavioral measures is not unique to empathy research, and is an issue that cuts across subdisciplinary boundaries in psychology. It is our hope that the results of the present study furthers a growing discussion on the relevance of measurement issues in psychology. After conducting several cross-sectional studies in this area, the lab plans on designing more studies that connect self-report measures of empathy and/or behavioral measures of social–cognitive ability with measures of real-world social functioning.

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