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
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Proneness to Guilt, Shame, and Pride in Children with Autism Spectrum Disorders and Neurotypical Children

Denise Davidson , Elizabeth Hilvert, Ieva Misiunaite, and Michael Giordano

Self-conscious emotions (e.g., guilt, shame, and pride) are complex emotions that require self-reflection and self-evaluation, and are thought to facilitate the maintenance of societal norms and personal standards. Despite the importance of self-conscious emotions, most research has focused on basic emotion processing in children with Autism Spectrum Disorders (ASD). Therefore, in the present study, we used the *Test of Self-Conscious Affect for Children* (TOSCA-C) to assess proneness to, or propensity to experience, the self-conscious emotions guilt, shame, and pride in children with ASD and neurotypical children. The TOSCA-C is designed to capture a child's natural tendency to experience a given emotion across a range of everyday situations [Tangney, Stuewig, & Mashek, 2007]. We also assessed how individual characteristics contribute to the development of proneness to self-conscious emotions, including theory of mind (ToM) and ASD symptomatology. In comparison to neurotypical children, children with ASD showed less proneness to guilt, although all children showed relatively high levels of proneness to guilt. Greater ToM ability was related to more proneness to guilt and authentic pride in children with ASD. Additionally, we found that children with ASD with more severe symptomatology were more prone to hubristic pride. Our results provide evidence of differences in proneness to self-conscious emotions in children with ASD, as well as highlight important mechanisms contributing to how children with ASD may experience self-conscious emotions. *Autism Res* 2017, 4:xxx-xxx. ©2017 International Society for Autism Research, Wiley Periodicals, Inc.

Lay Summary: This research examined proneness to guilt, shame, and pride in children with Autism Spectrum Disorders (ASD) and neurotypical children. We found that children with ASD showed less proneness to guilt than neurotypical children. Better understanding of theory of mind was related to greater proneness to guilt and pride, but only for children with ASD. These findings are important because these complex emotions are linked with both positive and negative social behaviors towards others and oneself.

Keywords: autism; self-conscious emotions; theory of mind; symptom severity; guilt; shame; pride

Introduction

Self-conscious emotions include, but are not limited to, guilt, shame, and pride [Lewis, 2008; Tracy, Robins, & Tangney, 2007]. According to Tracy and Robins, "although basic emotions, like fear and sadness, can and often do involve self-evaluative processes, only self-conscious emotions *must* involve these processes (2007a; p. 5)." Indeed, converging evidence from studies with neurotypical children identify a number of necessary components of self-conscious emotions, the development of which provide important means for children to become socialized [Lagattuta & Thompson, 2007; Tangney & Dearing, 2002; Tracy & Robins, 2007a]. First, self-conscious emotions are strongly connected to, and appear to arise from, external standards, which include socially constructed conventions, rules,

and values that children must learn [Lagattuta & Thompson, 2007]. Second, self-conscious emotions demand one's awareness of the self in relation to those standards, including how one's behavior is viewed by others [Tracy et al., 2007]. Last, self-conscious emotions are necessary for accomplishing complex social goals, including engaging in appropriate behaviors with others [Davidson, 2006; Lagattuta & Thompson, 2007; Lewis, 2008; Tracy & Robins, 2007a].

The study of self-conscious emotions in children with Autism Spectrum Disorders (ASD) is important because it can reveal their ability to reflect on personal experiences and appraise them in relation to societal standards and social norms. Additionally, the study of self-conscious emotions provides a window into how children with ASD evaluate themselves and are aware of other's evaluations of them. Lastly, the degree to which

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children with ASD exhibit proneness to specific self-conscious emotions has significant clinical implications. For instance, a number of disruptive and maladaptive behaviors have been found in neurotypical children and adults who do not adequately or appropriately experience self-conscious emotions. For example, maladaptive behaviors have been seen in children who experience extended high levels of negatively valenced self-conscious emotions, such as shame and guilt [e.g., Stuewig, Tangney, Heigel, Harty, & McCloskey, 2010].

Self-Conscious Emotions: Guilt, Shame, and Pride in Neurotypical Children

Research has shown that guilt usually involves a particular incident that causes a person to feel badly about that incident [Tangney & Dearing, 2002]. According to Tangney, Wagner, Hill-Barlow, Marshall, and Gramzow [1996], "with the tension, remorse, and regret of guilt comes a press toward reparative action, such as apologizing, undoing, or in some way repairing the harm that was done" (p. 798). Thus, guilt proneness typically leads to positive behaviors, including appropriate means of making corrective actions [Roos, Hodges, & Salmivalli, 2014; Tangney et al., 1996]. From a developmental perspective, we know that children have internalized moral values, in part, if they are able to anticipate feeling guilty about inappropriate behaviors [Tangney & Dearing, 2002]. Nevertheless, when children experience high levels of guilt-proneness it can increase symptoms of anxiety [Cohen, Panter, & Turan, 2012].

Shame is the product of moral transgressions to the extent that the person considers that he or she has defied a moral standard or norm [Tangney et al., 2007]. When feeling ashamed, the behavior generalizes to the self, resulting in a significant degree of negative feelings toward oneself and often toward others [Tangney & Dearing, 2002]. Therefore, unlike guilt, shame typically causes one to feel negative about oneself on a global level. Moreover, guilt and shame manifest themselves differently in terms of their consequences: guilt usually encourages reparative actions through apology and attempts to mend the situation, whereas shame usually motivates defensive or avoidance behavior [de Hooge, Zeelenberg, & Breugelmans, 2007; Tangney et al., 2007; Muris et al., 2014; Schmader & Lickel, 2006]. In an early study, 5- to 12-year-old children with higher shame proneness scores were more likely to show externalizing symptoms, including delinquency and aggression, than children with lower scores [Ferguson, Stegge, Miller, & Olsen, 1999]. In longitudinal research, Stuewig et al. [2015] found that neurotypical children who showed more shame proneness between 10 and 12 years of age were more likely than their less shame-

prone peers to have engaged in deviant behaviors (e.g., illegal drug use) by 18 years of age. Overall, the experience of shame is associated with a number of maladaptive responses, including displayed anger and aggression, as well as a propensity to blame others [e.g., Tangney, Stuewig, & Martinez, 2014; Tangney, Wagner, Fletcher, & Gramzow, 1992; Tangney, Wagner, Hill-Barlow, Marshall, & Gramzow, 1996]. However, when a person does not experience shame, or appropriate levels of shame, this too can lead to negative outcomes, such as disruptive behavior or criminal activity [Ferguson et al., 1999; Tangney et al., 1996].

Finally, pride is a positive emotion that occurs as a result of reaching internal goals that meet societal standards [Orth, Robins, & Soto, 2010; Tangney, 1999; Tracy & Robins, 2004]. As Hart and Matsuba [2007] suggest, the desire to experience pride reinforces a number of positive behaviors, including altruism and achievement. However, two forms of pride, hubristic pride and authentic pride, are often distinguished in research [Tracy & Robins, 2007b]. Hubristic pride leads to global, positive feelings about oneself (e.g., "I am a good person"). Yet, too much hubristic pride can result in narcissism and maladjusted behavior [Morf & Rhodewalt, 2001; Paulhus, Robins, Trzesniewski, & Tracy, 2004; Tracy, Cheng, Robins, & Trzesniewski, 2009]. In contrast, attributions about individual acts (e.g., "I did a good thing."), results in authentic pride. In general, authentic pride is associated with positive, prosocial behavior and overall well-being [Herrald & Tomaka, 2002].

Self-Conscious Emotions and Autism Spectrum Disorders

The study of self-conscious emotions in children with ASD, to our knowledge, has only been examined in a handful of studies. These studies have explored whether children with ASD differ from neurotypical children in their recognition and expression of self-conscious emotions. Hobson, Chidambi, Lee, and Meyer [2006] found that children and adults with ASD could identify videotaped scenes of guilt, shame and embarrassment. Additionally, employing a rating task methodology, Hillier and Allinson [2002] found that children with and without ASD were similar in their ratings of embarrassing situations. Finally, Tracy, Robins, Scliber, and Solomon [2011] showed that children with ASD were able to quickly recognize pride from photographs, and they did so as accurately as neurotypical children.

In contrast, others have found that children with ASD appeared to experience, as reported by their parents, significantly fewer episodes of guilt, shame, and embarrassment than neurotypical children [Hobson et al., 2006]. In a study by Losh and Capps [2006], neurotypical children and children with ASD were asked to define basic and self-conscious emotions, and to

provide personal narratives based on their experiences of each emotion. According to Losh and Capps [2006], children with ASD were less likely than neurotypical children to recount their emotional experiences, especially for self-conscious emotions, using “personalized causal-explanatory frameworks”. Williams and Happé [2010] also found that self-conscious emotions (e.g., pride, guilt) were more difficult for children with ASD to accurately define and report examples of than basic emotions (e.g., happiness, scared). Finally, and perhaps more closely connected to the goals of the present study, recent research has shown that adults with ASD traits (ASD-T) exhibit more proneness to shame and externalization, and less proneness to guilt, hubristic pride and authentic pride than neurotypical adults [Davidson, Vanegas, & Hilvert, 2017]. It is not known whether a similar pattern would be found in children.

Overview of the Present Study

In order to examine proneness to self-conscious emotions in the current research, children with ASD and neurotypical children were given the Test of Self-Conscious Affect for Children [TOSCA-C; Tangney & Dearing, 2002]. The TOSCA-C is one of the most commonly used assessments of proneness to self-conscious emotions in children [Robins, Nofle, & Tracy, 2007]. It is designed to capture the natural tendency a child has to experiencing self-conscious emotions in everyday life [Tangney et al., 2007]. Specifically, on the TOSCA-C, children are read hypothetical scenarios and are then given a set of outcomes to each scenario. Children are asked to rate the likelihood that they would perform the behaviors outlined in each outcome. These everyday emotion scenarios presented on the TOSCA-C, and their follow-up questions, are designed to tap into affective states, yielding proneness scores for guilt, shame, hubristic pride, and authentic pride. Scores for two additional mental states: externalization and detachment, are also included on the TOSCA-C. Detachment and externalization can be used as coping mechanisms for feelings of shame. That is, because shame can lead to global attributions about oneself, individual actions may not assuage these feelings. Instead, it may be easier to use an externalizing strategy (e.g., blame others) or to detach from the situation (e.g., withdraw) than confront shameful feelings.

An additional goal of the present research was to examine mechanisms that underlie proneness to self-conscious emotions, including theory of mind (ToM) and ASD symptomatology. According to Nader-Grosbois and Day [2011], ToM “refers to one’s ability to understand nine mental states of others including perceptive states (visual perception and attention), volitional and motivational states (desires and intention), epistemic

states (beliefs and false beliefs), pretense, thinking, and emotions” (p. 128). Put more simply, ToM abilities enable one to understand the mental state of oneself and others. Related to the present study, Heerey, Keltner, and Capps [2003] found that ToM was positively related to the ability to recognize self-conscious emotions in both children with and without ASD. In a similar vein, research has shown that ToM skills were positively related to proneness to guilt, shame and pride in adults with Autism Spectrum Disorder Traits [ASD-T; Davidson et al., 2017]. In contrast, ToM skills were found to be negatively related to proneness to shame in neurotypical adults, but positively related in adults with ASD-T [Davidson et al., 2017]. According to Davidson et al. [2017], ToM skills may be needed to experience self-conscious emotions, skills that are often impaired in individuals with ASD [e.g., Senju, 2013]. Thus, individuals with ASD may experience proneness to self-conscious emotions in a manner similar to those without ASD, provided they possess sufficient ToM skills to do so.

Finally, ASD symptomology may affect one’s proneness to self-conscious emotions. For example, social responsiveness may be related to proneness to these emotions, given that self-conscious emotions are highly involved in social relations. Additionally, research on basic emotion processing has shown that difficulties with social responsiveness were related to more errors on emotion recognition tests [Tell, Davidson, & Camras, 2014], and were associated with atypical eye gaze patterns when processing dynamic social and emotional scenes for children with ASD [Speer, Cook, McMahon, & Clark, 2007].

Specific hypotheses were as follows:

1. It is predicted that children with ASD will differ from neurotypical children in terms of proneness to guilt, shame, hubristic and authentic pride.
 - a. In particular, we predicted that children with ASD will show less proneness to guilt, but more proneness to shame, than neurotypical children. This prediction would be consistent with the findings with adults with ASD-T [Davidson et al., 2017]. It would also be in alignment with the results of Hobson et al. [2006], who showed that children with ASD experienced fewer episodes of guilt and shame than neurotypical children, at least as reported by their parents.
 - b. It is predicted that lower levels of proneness to hubristic and authentic pride may be found given past findings showing that defining and providing personal examples of self-conscious emotions, such as pride, were more difficult for children with ASD than neurotypical children [Williams & Happé, 2010].

Table 1. Participant Characteristics

	Diagnostic group		t/ χ^2	P	d/ <i>d</i>
	ASD (N= 23)	NT (N= 23)			
Age	11.10 (1.9)	11.06 (2.08)	0.54	0.59	0.16
Males/ females	19:4	18:5	0.14	0.71	0.06
CARS-2 raw score	31.3 (4.0)	—	—	—	—
CARS-2 T-score	46.5 (6.2)	—	—	—	—
SRS-2					
Overall T-score	73.9 (10.7)	43.8 (4.1)	12.2	0.00	3.7
SD T-score	72.9 (10.4)	43.1 (4.6)	12.2	0.00	3.7
RRB T-score	72.3 (11.0)	46.5 (4.1)	10.3	0.00	3.1
SCQ	21.2 (5.7)	3.0 (3.1)	12.7	0.00	4.0
WASI-II FSIQ	97.0 (16.3)	107.5 (10.5)	2 2.6	0.01	0.77
WASI-II matrix reasoning	49.0 (13.1)	50.1 (6.2)	2 0.65	0.52	0.11
WASI-II vocabulary	46.0 (13.3)	58.0 (8.0)	2 4.1	0.00	1.1
Strange stories test	9.9 (2.8)	10.6 (2.4)	2 0.85	0.40	0.27

Note. ASD, autism spectrum disorders; NT, neurotypical. The frequency of males and females was examined with a Chi-square test, thus phi was used instead of *d* to determine effect size. Cohen's *d* larger than one results when the difference between the two means is greater than one standard deviation. CARS-2, childhood autism rating scale, second edition. A raw score of 33.5 or greater on the CARS-2 indicates mild-to-moderate symptoms of an ASD. A T-score of 50 on the CARS-2 indicates that a child with ASD falls in at least the 50th percentile or less compared to other individuals with ASD. SRS-2, social responsiveness scale, second edition. See text for explanation of SRS-2 T-scores. SCQ, social communication questionnaire. A score of 15 or greater on the SCQ indicates a possible ASD diagnosis. WASI-II, Wechsler abbreviated scale of intelligence, second edition. WASI-II FSIQ refers to the full-scale IQ score.

2. Based on results with neurotypical adults and adults with ASD-T [Davidson et al., 2017], it is expected that a positive relation will be found between ToM ability and higher levels of guilt, shame and pride, particularly in children with ASD. ASD symptomatology is expected to be negatively related to proneness to self-conscious emotions.

Methods

Participants

A total of 46 children participated in the study: 23 children with ASD, which included 19 males and 4 females (M_{age} 5 11.10, Range 5 7.09–14.06), and 23 neurotypical children, 18 males and 5 females (M_{age} 5 11.06, Range 5 8.02–14.05). Consistent with previous research on emotion processing in children with ASD [e.g., Begerer, Reiffe, Terwogt, & Stockmann, 2006; Tell & Davidson, 2014], a broad age range was used in order to assess the association between age and proneness to self-conscious emotions. To be eligible for participation, children had to have an overall IQ of ≥ 70 as determined by the Wechsler Abbreviated Scale of Intelligence, Second Edition [WASI-II; Wechsler, 2011], and be native speakers of English as reported by their parents. All children were recruited from a school district in a middle-class suburb of Chicago, IL, USA. Additional participant characteristics are provided in Table 1.

Children with ASD. All children with ASD were receiving services in their schools under an Autism

classification that was established through a multidisciplinary evaluation that included an education plan as part of the individualized education program (IEP). In order to receive these services, clinical diagnosis of children with ASD had been determined by a pediatrician or a licensed psychologist in accordance with the *Diagnostic and Statistical Manual of Mental Disorders-IV* [DSM-IV; APA, 2000], as well as the criteria for an ASD diagnosis as established by the Individuals with Disabilities Education Improvement Act (IDEA; 2004). For the present study, symptom severity was established through the Childhood Autism Rating Scale, Second Edition [CARS-2; Schopler & van Bourgondien, 2010], the Social Responsiveness Scale, Second Edition [SRS-2; Constantino, 2012], and the Social Communication Questionnaire [SCQ; Rutter, Bailey, & Lord, 2003].

The CARS-2 helps identify children with ASD and determine symptom severity through a 15-item behavior rating scale that is based on direct observation by the examiner as well as parent report. The CARS-2 shows strong interrater reliability (0.95), high internal consistency (0.96), and good concurrent validity (0.77) with the Autism Diagnostic Observation Schedule [ADOS; Lord & Corsello, 2005]. All children with ASD received an overall score that placed them in the mild-to-moderate (N 5 18) or severe (N 5 5) symptomatology group (see Table 1 for group means and comparisons).

The SRS-2 identifies the presence and severity of social impairment associated with ASD through a 65-item parent questionnaire. The SRS-2 shows good interrater reliability (r 5 0.61–0.92) and high internal consistency (α 5 0.95). Mean total scores (T-scores) and scores

Table 2. Sample TOSCA-C Scenario

Scenario Prompt: "You stop playing all the time with one friend to play with someone who doesn't have any friends."	
Guilt scenario	I'd feel bad because it is not fair to forget about one friend when you make another.
Shame scenario	My other friends might think I am weird playing with somebody who doesn't have any friends.
Hubristic pride scenario	I'm a really nice person to play with someone who didn't have any friends.
Authentic pride scenario	I did something good.
Externalization scenario	That new kid had lots of fun games I wanted to play.

Note. For this test, children must judge the extent to which they think they would experience each emotion (e.g., shame) on a five-point scale, from 1 = Not Likely to 5 = Very Likely. Based on studies with close to 700 children, Tangney & Dearing (2002) reported that the average reliability across emotions was a α 0.62, with shame and guilt showing the highest reliability (a α 0.80).

for the Social Communication and Interaction and the Restricted Interests and Repetitive Behavior indices are given in Table 1. Scores on the SRS-2 are designed to be in line with the ASD diagnostic criteria of the DSM [Constantino, 2012]. Additionally, past research has shown that T-scores are correlated with scores on the ADI-R and ADOS [Bélte, Westerwald, Holtman, Freitag, & Poustka, 2011]. In our study, five children with ASD were in the mild-range (60–65 T-Score), eight were in the moderate range (66–75 T-score), and seven were in the severe range (76 T or higher). Three parents did not return the SRS-2. However, no differences were found in age, $t(21) = 2.087$, $P = 0.40$, $d = 0.60$, or CARS-2 T-scores, $t(21) = 2.064$, $P = 0.53$, $d = 0.34$, between children who had an SRS-2 score and those who did not.

ASD-level symptoms were also confirmed with the SCQ [Rutter et al., 2003], a 40-item parent questionnaire that asks about children's communication skills and social functioning that are characteristic of ASD. The SCQ has shown good sensitivity (0.88) and specificity (0.72) with an ASD diagnosis [Chandler et al., 2007]. Scores above 15 suggest the individual is likely to have ASD. Seventeen children with ASD scored above 15, and two scored below 15 (i.e., 11, 12). Four parents did not return the SCQ, and of those, three did not return the SRS-2. However, no differences were found in age, $t(20) = 2.036$, $P = 0.73$, $d = 0.17$, or CARS-2 T-scores, $t(20) = 2.030$, $P = 0.77$, $d = 0.16$, between children who had an SCQ score and children with ASD who did not.

Neurotypical children. Parents of neurotypical children also completed the SRS-2 and SCQ to determine that their children did not exhibit significant ASD symptoms. All neurotypical children obtained scores on the SRS-2 and SCQ below the thresholds for ASD-level symptomatology and, as expected, scored significantly lower on both measures compared to children with ASD. See Table 1 for group means and comparisons.

Materials

Test of self-conscious affect for children. The Test of Self-Conscious Affect for Children [TOSCA-C; Tangney & Dearing, 2002] was used to measure children's

proneness to self-conscious emotions, and is deemed appropriate to use with children ages eight through early adolescence. The TOSCA-C consists of 15 scenarios reflecting real-life situations which are read aloud to children and are accompanied with an illustration depicting the events in the given situation. Four or five follow-up statements are then presented, each tapping into proneness to a different emotional or mental state. Children are asked to imagine that the situation is happening to them, and to judge the extent to which they think they would experience each emotion (e.g., shame) on a five-point scale (1 = Not Likely, 2 = Unlikely, 3 = Maybe, 4 = Likely, 5 = Very Likely). Table 2 provides a sample of one of the scenarios and additional information about the TOSCA-C. Children's proneness scores for each emotion/mental state were obtained by totaling the ratings (1–5) for each item. Higher ratings indicated greater proneness to a given self-conscious emotion (i.e., guilt, shame, hubristic pride, authentic pride) or mental (i.e., externalization, detachment) state [Tangney & Dearing, 2002].

Theory of mind. To assess ToM, the Strange Stories Test [Happé, 1994] was administered. The Strange Stories Test is a measure of higher-order mentalizing abilities that consists of short stories underlying everyday interactions that are not literally meant, such as pretense. One comprehension question ("Was it true, what s/he said?") and one justification question ("Why did s/he say that?") accompanies each story. The accuracy of justification responses were rated on a 0–2 scale, with a maximum possible score of 16. Two experimenters, blind to participant's diagnostic classification, double-coded children's responses to the justification questions (inter-rater reliability: a α 0.92).

Procedures

The procedures of the study were reviewed and approved by the Institutional Review Board at the host university. All children completed the measures in a quiet room at their school (e.g., library). The assessments were administered across two sessions, and were part of a larger study on emotional development in

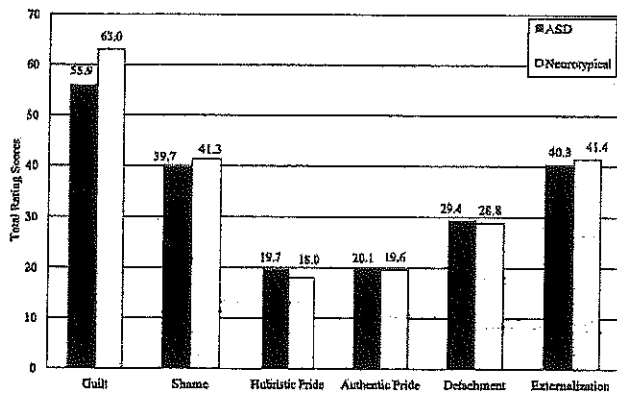


Figure 1. Total scores for proneness to self-conscious emotions on the TOSCA-C for children with ASD and neurotypical children. Possible total scores were: 75.5 Guilt; 75.5 Shame; 25.5 Hubristic Pride; 25.5 Authentic Pride; 50.5 Detachment; 75.5 Externalization.

children with ASD. Children received small prizes (e.g., school supplies) for their participation after each session.

Results

Proneness to Self-Conscious Emotions in ASD and Neurotypical Children

Depicted in Fig. 1 are the mean total proneness scores for each emotion/mental state for the children with ASD and neurotypical children. To allow for comparability across emotions/mental states which differed in terms of items available, z-scores for each were used in the analyses. A mixed-model analysis of variance revealed a main effect of Emotions (guilt, shame, hubristic pride, authentic pride, detachment, externalization), $F(5, 290) = 3.03$, $P = 0.012$, $\eta^2_p = 0.06$, and a significant Emotion X Diagnostic Group (ASD, neurotypical) interaction, $F(5, 290) = 4.32$, $P = 0.001$, $\eta^2_p = 0.10$. Post hoc analyses with Bonferroni correction showed that all children exhibited proportionately more proneness to guilt, hubristic pride and authentic pride than to the other emotions, $t(47) = 2.834-11.95$, $P = 0.001$, $d = 0.43-0.82$ (see Fig. 1). Additionally, children with ASD exhibited less proneness to guilt, $t(44) = 2.290$, $P = 0.006$, $d = 0.86$, than neurotypical children (see Fig. 1). Proneness to hubristic pride approached significance, $t(44) = 1.54$, $P = 0.08$, $d = 0.51$, with children with ASD exhibiting more proneness to hubristic pride than neurotypical children. No other comparisons were significant, $t(44) = 0.22-0.66$, $P = 0.57$.

In addition to total proneness scores, we also examined the degree to which children rated how much they would experience each emotion/mental state, or endorse them, from 1 = Not Very Likely to 5 = Very Likely. Mean Likert ratings are shown in Table 3. Analyses demonstrated a main effect of Emotion, $F(5,$

Table 3. Mean Ratings of Proneness to Self-Conscious Emotions on the TOSCA-C

	ASD	NT
Guilt	3.80 (0.72)	4.07 (0.42)
Shame	2.63 (0.66)	2.77 (0.64)
Hubristic pride	3.94 (0.63)	3.60 (0.70)
Authentic pride	4.02 (0.61)	3.92 (0.54)
Detachment	2.92 (0.65)	2.87 (0.43)
Externalization	2.70 (0.60)	2.76 (0.52)

Note. Standard deviations are included in parentheses. Ratings for each emotion ranged from 1 to 5, with higher values indicating greater endorsement of the emotion.

290) = 65.56, $P = 0.0001$, $\eta^2_p = 0.59$. Mean Likert ratings for guilt and authentic pride were significantly greater than mean Likert ratings for shame, hubristic pride, externalization and detachment regardless of diagnostic group, $t(47) = 2.938-12.29$, $P = 0.001$, $d = 0.44-0.86$. Additionally, the Emotion X Diagnostic Group interaction approached significance, $F(5, 290) = 1.99$, $P = 0.08$, $\eta^2_p = 0.05$, and was further explored. Mean Likert ratings for guilt proneness were significantly lower in children with ASD than neurotypical children, $t(44) = 2.274$, $P = 0.01$, $d = 0.44$, see Table 3. No other comparisons between groups were significant. Note that the pattern of significant findings did not change when age and full-scale IQ were used as covariates in the ANOVA analyses conducted on the total scores or Likert ratings.

Associations between Proneness to Self-Conscious Emotions

In children with ASD, proneness to shame was found to be positively correlated with proneness to externalization, $r(21) = 0.536$, $P = 0.008$. Proneness to shame was negatively correlated with authentic pride, $r(21) = -0.467$, $P = 0.025$. In neurotypical children, proneness to externalization was positively related to hubristic pride, $r(21) = 0.535$, $P = 0.008$, whereas proneness to guilt was positively correlated with proneness to authentic pride, $r(21) = 0.394$, $P = 0.048$.

Associations between Proneness to Self-Conscious Emotions and Individual Factors

Age and full-scale IQ (FSIQ). No significant relations were found between age and proneness to self-conscious emotions in children with ASD, $r(21) = 0.21$, $P = 0.327$, or in neurotypical children, $r(21) = 0.36$, $P = 0.093$. Additionally, no significant relations were found between FSIQ and proneness to self-conscious emotions in children with ASD, $r(21) = 0.30$, $P = 0.17$, or in neurotypical children, $r(21) = 0.39$, $P = 0.07$.

Theory of mind. When comparing children with ASD to neurotypical children, we found no significant differences in ToM ability between groups on the

Strange Stories Test (see Table 1). However, in children with ASD, performance on the Strange Stories Test was positively correlated with proneness to guilt, $r(21) = 0.51$, $P = 0.014$, and authentic pride, $r(21) = 0.42$, $P = 0.046$, indicating that children with ASD with more advanced ToM understanding had greater proneness to guilt and authentic pride. No significant relations were found between ToM and proneness to self-conscious emotions in neurotypical children.

ASD symptomatology. Examining Pearson correlations among children with ASD revealed that T-scores on the CARS-2 were positively correlated with hubristic pride, $r(21) = 0.48$, $P = 0.021$. In contrast, overall scores on the SRS-2, $r(20) = 0.24$, $P = 0.318$, and the SCQ, $r(19) = 0.23$, $P = 0.343$, were not related to proneness to self-conscious emotions in children with ASD. For neurotypical children, no significant correlations were found between proneness to self-conscious emotions and scores on the SRS-2, $r(22) = 0.23$, $P = 0.228$, or the SCQ, $r(22) = 0.26$, $P = 0.235$.

Discussion

Using the TOSCA-C in this research, we examined proneness to self-conscious emotions (guilt, shame, hubristic pride, authentic pride), and two mental states known to be related to self-conscious emotions, externalization and detachment, in children with ASD and neurotypical children. In partial support of our first hypothesis (1a), we found that children with ASD showed less proneness to guilt, and rated their experience of guilt as less likely, than neurotypical children. We believe that this finding is noteworthy, given that guilt proneness often leads to appropriate reparative actions, including apology, following a transgression [Cohen et al., 2012; Tangney, Stuewing, Mashek, & Hastings, 2011]. This finding is also noteworthy because it is consistent with a recent study that has shown that adults with ASD-T exhibited less guilt proneness than neurotypical adults [Davidson et al., 2017]. Taken together, these results suggest that the way in which individuals with ASD experience guilt differs not only in childhood, but persists into adulthood.

Nevertheless, children with ASD showed relatively high levels of proneness to guilt, and significantly greater proneness to guilt than proneness to the other emotions, except both forms of pride, which did not differ. Additionally, in children with ASD, greater ToM skills predicted higher levels of proneness to guilt, suggesting a possible mechanism for the establishment of guilt proneness in children with ASD. This finding is consistent with our second prediction, as well as recent research with adults with ASD-T who showed a similar

association between ToM and proneness to guilt [Davidson et al., 2017]. As previous researchers have noted, detecting mental states in others allows one to understand the causes and consequences of emotion, allows one to react appropriately in emotional situations, and allows one to develop empathy toward others [Nader-Grosbois & Day, 2011]. Thus, we would argue that through the development of such mentalizing skills, an appreciation and understanding of social norms germane to experiencing self-conscious emotions can develop. Although performance on the ToM measures was not related to proneness to self-conscious emotions in neurotypical children, this may be due to a number of reasons, including the possibility that ToM skills play a greater role in proneness to self-conscious emotions in children with ASD. This assertion is supported by past research that has shown that the magnitude of the correlation between ToM and performance on an emotion vocabulary test and a facial cues test was greater in children with ASD than in neurotypical children [Dyck, Piek, Hay, Smith, & Hallmeyer, 2006]. According to Dyck et al., stronger than usual correlations between abilities indicate what cognitive processes might play a particularly strong role on a given task.

Pride may also be experienced differently in children with ASD, to the extent that children with ASD exhibited more proneness to hubristic pride than neurotypical children. Hubristic pride involves a global attribution about oneself (e.g., "I am a good person"), although in unhealthy amounts, can result in maladjusted behavior and narcissism [Orth et al., 2010; Tracy, et al., 2009]. In contrast to our prediction (1b), no significant difference was found between the children in terms of proneness to authentic pride. This latter finding is important because past research has shown that children with ASD may be uncomfortable experiencing praise following a pride-inducing situation [Kasari, Sigman, Baumgartner, & Stipek, 1993]. Our results also contrast with research showing that children with ASD had difficulty recounting personal experiences of pride [Capps, Yirmiya, & Sigman, 1992], and were less able to define pride [Williams & Happé, 2010] than neurotypical children. These inconsistencies in findings may be explained by the nature of the tasks: recounting personal experiences of pride requires more verbal ability than simply rating the likelihood one would experience pride in a given situation. Compatible with this assertion, we found that our results were not affected by vocabulary ability, even though it differed significantly between the ASD and neurotypical groups. Using a recognition task that required minimum verbal input, Tracy et al. [2011] also found no significant differences between children with ASD and neurotypical children when asked to label pictures of people experiencing pride.

Also consistent with our second prediction, in children with ASD, greater proneness to authentic pride, often viewed as “healthy” pride [Wubben, DeCremer, & van Dijk, 2012], was found to be associated with greater ToM ability. In contrast, greater levels of ASD symptomatology (i.e., scores on the CARS-2) were related to greater proneness to hubristic pride in children with ASD. These findings are noteworthy because increased levels of hubristic pride are associated with maladjustment, such as narcissism in neurotypical adults [Tracy & Robins, 2007b]. In neurotypical children, proneness to externalization was positively related to proneness to hubristic pride, whereas proneness to guilt was positively related to proneness to authentic pride. These results suggest interesting explorations for future research, with regard to associations between hubristic and authentic pride, guilt and shame in all children.

Also, noteworthy, children with and without ASD did not differ in their proneness to shame, contrary to our prediction. However, positive relations between shame and externalization were found in children with ASD, but not in neurotypical children. Future research is needed to assess whether children with ASD who are higher on shame proneness engage in more externalizing behaviors (e.g., displaced aggression) than their peers who are lower in shame proneness.

Limitations

To our knowledge, this research is the first to examine proneness to guilt, shame, and pride in children with ASD in comparison to neurotypical children. However, several methodological limitations should be acknowledged. First, the TOSCA-C cannot quantify *clinical* levels of proneness to self-conscious emotions. Second, although none of the children appeared to have any difficulty understanding the scenarios on the TOSCA-C, we did not complete comprehension checks to confirm this assertion. Third, other factors we did not study, such as executive functioning or alexithymia, may contribute to differences in proneness to self-conscious emotions. It may be particularly important in future research to explore the relation between alexithymia and children’s responses on the TOSCA-C, given that this measure asks children to imagine how they would respond to the scenarios. In fact, previous research suggests that alexithymia, or difficulty in identifying and describing one’s own emotions, may explain most of the variance in emotion processing differences [Bird & Cook, 2013]. However, it should be noted that the design of the TOSCA-C, with its simple Likert scale responses to everyday scenarios, may minimize the impact of such factors.

Conclusions

The findings of this study show that proneness to guilt, and to a lesser extent pride, differs between children with ASD and neurotypical children. Moreover, the fact that a positive association was found between proneness to shame and externalization in children with ASD suggests the need to explore exactly how shame and externalizing behaviors are related in children with ASD. Based on past research with neurotypical populations [e.g., Cohen et al., 2012; Muris et al., 2014; Roos et al., 2014; Stuewig et al., 2010], it is clear that proneness to self-conscious emotions can lead to both adaptive and maladaptive behaviors. Therefore, it will be important for future studies to explore how proneness to self-conscious emotions are associated with such behaviors in children with ASD.

The present research also provides insight into how children with ASD and neurotypical children may differ in their propensity to feel certain self-conscious emotions, and the mechanisms that may underlie proneness to self-conscious emotions in these children. More specifically, the current study showed that ToM skills are positively associated with proneness to guilt and pride in children with ASD, and suggests that interventions that focus on developing ToM skills, such as perspective-taking and empathy training, may be appropriate.

Conflict of interest

The authors declare no conflict of interest.

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