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# Gender Differences in Emotion Expression in Low-Income Adolescents Under Stress

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**Abstract** Gender roles in mainstream US culture suggest that girls express more happiness, sadness, anxiety, and shame/embarrassment than boys, while boys express more anger and externalizing emotions, such as contempt. However, gender roles and emotion expression may be different in low-income and ethnically diverse families, as children and parents are often faced with greater environmental stressors and may have different gender expectations. This study examined gender differences in emotion expression in low-income adolescents, an understudied population. One hundred and seventy nine adolescents (aged 14–17) participated in the Trier Social Stress Test (TSST). Trained coders rated adolescents' expressions of happiness, sadness, anxiety, shame/embarrassment, anger, and contempt during the TSST using a micro-analytic coding system. Analyses showed that, consistent with gender roles, girls expressed higher levels of happiness and shame than boys; however, contrary to traditional gender roles, girls showed higher levels of contempt than boys. Also, in contrast to cultural stereotypes, there were no differences in anger between boys and girls. Findings suggest gender-role inconsistent displays of externalizing emotions in low-income adolescents under acute stress, and may reflect different emotion socialization experiences in this group.

**Keywords** Emotion expression · Gender differences · Adolescence · Stress · Low-income

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## Introduction

Researchers have proposed and found evidence for gender differences in emotion expression in children and adolescents (Brody 1999). Overall, girls have been found to be more emotionally expressive than boys (Briton and Hall 1995; Brody 1999; Hess et al. 2000; Kring and Gordon 1998). Additionally, consistent with gender roles in US culture, girls are theorized to express more sadness/anxiety, while boys are hypothesized to show more anger and contempt (Brody and Hall 2000; Jordan et al. 1991; Zahn-Waxler et al. 2011). Recent meta-analyses find small but significant gender differences consistent with these gender roles, with girls expressing greater happiness and greater internalizing emotions such as sadness, anxiety, and shame, than boys (Chaplin and Aldao 2013; Else-Quest et al. 2006; LaFrance et al. 2003) and with boys expressing greater "externalizing" emotions such as anger and contempt than girls (Chaplin and Aldao 2013), particularly in middle childhood and particularly when with unfamiliar adults or with peers (Chaplin and Aldao 2013). It has been proposed that these gender differences are the result of a combination of biologically based gender differences in temperament and differential socialization of boys and girls to adopt societal gendered display rules for emotion expression, with girls expected to display greater levels of most emotions than boys, particularly happiness and internalizing emotions (sadness, fear, anxiety, shame, and guilt), but boys expected to show externalizing emotions such as anger (Brody 1999; Brody and Hall 2008). These display rules are consistent with societal gender roles for males to be powerful and in control and for females to be more nurturing and maintain relationships (Brody 1999). Brody (1999) also notes that gender differences in emotion are impacted by societal and cultural contexts, indicating that factors such as age, socioeconomic status, and ethnicity, all play a role in how these gender differences are expressed (Brody 1999).

Notably, though, there are relatively few studies of gender differences in emotion expression in adolescence. For example, Chaplin and Aldao (2013) only found 14 studies of adolescents. There is a clear need for further study of emotion expression in adolescence, given that adolescence is a critical period for emotional development on many levels, including changes in structure and function in areas of the brain known to impact emotions and emotion regulation (Barnea-Goraly et al. 2005; Steinberg 2010).

Moreover, all of the existing studies of adolescent emotion expression were with middle-income adolescents and most were with majority White samples. Thus, no studies have directly looked at adolescents from low-income families or from ethnic minority families. It is particularly important to examine emotion expression in low-income youth given that economic disadvantage is often a marker of chronic family stress that in turn may have a significant impact on children's development of emotional arousal and regulation (Raver 2004). Children from low-income families show higher levels of internalizing and externalizing behavior problems (Dodge et al. 1994; Linares et al. 2001; Qi and Kaiser 2003); problems that show gender differences (Patterson et al. 1990; Shaw et al. 1994). Furthermore, it is important to understand patterns of gender differences in emotion expression in different ethnic groups, given the role of social and cultural context in emotion expression (Brody 1999).

The studies that exist on middle-income, primarily European American youth reviewed in the Chaplin and Aldao (2013) meta-analysis found that girls showed greater positive and "internalizing" emotion expressions than boys (Becker-Stoll et al. 2001; DeSantis et al. 2005a, b; Dodd et al. 1999; Safyer and Hauser 1994; Sheeber et al. 2009). Interestingly, the studies of adolescents found conflicting results for externalizing expressions, with some

showing gender-role consistent patterns and some not, with the overall effect size for all studies of adolescents showing that girls expressed slightly greater levels of externalizing emotions than boys ($g = .27$; Chaplin and Aldao 2013; note that Hedgers's $g$ values are similar to Cohen's $d$ values in their interpretation; Rosenthal and DiMatteo 2001). For example, Eisenberg et al. (2008) found that girls expressed slightly (but not significantly) higher levels of anger than boys in a family conflict task, but Becker-Stoll et al. (2001) found that girls showed slightly (but not significantly) lower anger in a similar task, and slightly (but not significantly) higher levels of contempt. Only Sheeber et al. (2009) found that girls showed significantly higher levels of anger than boys in a family-interaction task. These findings are interesting given that research on psychopathology indicates that females generally experience internalizing disorders, such as depression, anxiety, and eating disorder, more so than males starting in adolescence (Angold et al. 1998; Costello et al. 2003; Wichstrom 1999), and males generally experience externalizing disorders, such as conduct disorder and antisocial personality disorder, more so than females (Eme 2007).

As noted above, there have not been observational studies of low-income ethnic minority adolescents' emotion expression. There has been some research on emotion socialization in low-income families. Interestingly, this research does not show strong socialization of gender-role consistent emotion expressions, possibly a result of differences in environmental stressors or different cultural display rules that are socialized in low-income families (Chaplin et al. 2010). For example, Miller and Sperry (1987) found that girls raised by working-class women were *encouraged* to display anger to cope with the stressors of dangerous neighborhood environments. Brody (1999) argues "that expression of emotions [needs to be] useful and adaptive for accomplishing our social roles" (p. 3); therefore, the display of anger and contempt in females from low-income settings likely serves a purpose. Other research examining emotion socialization in low-income, primarily minority youth, has reported few gender differences in parents' socialization of emotion (Garner et al. 1994; O'Neal and Magai 2005). We know of no published reports of gender differences in observed emotion expressions in low-income adolescents. We know of only one published report of gender differences in observed emotion expression in lower-middle income adolescents, which did not find significant gender differences in expressions of anger and contempt (Becker-Stoll et al. 2001).

Ethnicity also plays a significant role in how emotions are expressed. Within the United States, we see ethic differences in emotion expression, emotion regulation, intensity of emotions, and gender stereotypes of emotion between various ethnic groups (Butler et al. 2007; Durik et al. 2006; Matsumoto 1993). For instance, Matsumoto (1993) found that African Americans displayed anger more often than European, Hispanic, and Asian Americans. Alternatively, when imagining positive scenarios, Vrana and Rollock (2002) found that adolescent African Americans smiled more than adolescent European Americans, and when imagining negative scenarios, European Americans displayed more negative expressions than African Americans. Even stereotypes of how emotions should be expressed differ by ethnicity. For example, Durik et al. (2006) found that European Americans believe that men express more pride than women, while African Americans made no such distinction between the genders.

Few studies exist that particularly examine gender differences in emotion expression in different ethnic groups. In one study, Frymier and Klopf (1990) found that Japanese men and women expressed less emotion when communicating than American men and woman. A meta-analysis by Else-Quest et al. (2012) found significant gender differences in the experience of guilt and shame in European American men and women (effect sizes $d = -0.27$ for guilt, $d = -0.32$ for shame), but no significant gender differences for other

ethnicities. We found only three studies that assess gender differences in emotion expression in African American samples, and the results are not consistent. Hubbard (2001) found that African-American 2nd grade boys expressed more anger than girls, but did not differ on expressions of happiness and sadness. Vrana and Rollock (2002) found no gender differences in joy, fear, or anger expressions in African American adults. Third, a study of yearbook photos from Kindergarten to 12th grade showed that gender differences in smiling appeared around the age of 10, where boys started smiling less often than girls. Additionally, this study found that African American boys smiled less than European American boys, possibly indicating stronger gender differences in happiness expressions, in yearbook photos at least, for African-American teenagers (Wondergem and Friedlmeier 2012). In sum, there are a lack of studies of gender differences in emotion expressions in African-American adolescents. The extant literature is mixed, with some finding attenuation of gender differences in African-American children and adult, but one showing perhaps a greater gender difference in smiling in yearbook photos.

Stress may also impact emotion expressions and high levels of daily/chronic stress are common for low-income individuals (Conger et al. 2002; Morris et al. 2007; Wadsworth and Berger 2006), for ethnic minority youth who may encounter racism (Williams and Mohammed 2008) and also for adolescents, who undergo several normal, yet stressful, changes in this developmental period, including changes in peer relationships, schooling, and family relationships (Suldo et al. 2009; De Wit et al. 2011). Emotions in stressful situations are often heightened, both behaviorally and physiologically (Brune et al. 2013; Gross 1998; Hastings et al. 2007; Stein et al. 2007; Thomason et al. 2010); therefore, it may be of interest to examine emotion expression in an acute stressful situation to better understand the gender differences in a low-income, primarily ethnic minority sample of adolescents, a seriously understudied population.

The present study examined gender differences in observed emotion expressions (happiness, sadness, anxiety, shame/embarrassment, anger, and contempt) during a social stress task [the Trier Social Stress Test (TSST); Buske-Kirschbaum et al. 1997] in a sample of low-income, primarily African-American inner-city adolescents, an under-studied population in terms of emotion expression. We explored whether these youth would express gender-role consistent emotions, with girls showing higher levels of happiness and internalizing negative emotions (sadness, anxiety, and shame/embarrassment) than boys, and boys showing higher levels of externalizing negative emotions (anger and contempt) or whether these gender differences would be attenuated in this population. Based on previous findings of adolescent emotion expression, we hypothesized that girls would continue to display more happiness and internalizing emotions than boys (Becker-Stoll et al. 2001; DeSantis et al. 2005a, b; Dodd et al. 1999; Safyer and Hauser 1994; Sheeber et al. 2009). However, we expected there to be fewer differences in boys and girls on externalizing emotions, such as anger and contempt, as a result of the findings in Chaplin and Aldao (2013) and theories that low-income families may socialize girls to display more anger (Miller and Sperry 1987).

## Methods

### Participants

Participants were drawn from a larger longitudinal study of youth from low-income, urban neighborhoods in the Northeast United States. Demographics for the larger sample did not

**Table 1** Demographics for males and females

| | Boys $n = 88$ | Girls $n = 91$ | Test of gender differences |
|---|---|---|---|
| Age: mean (SD) | 14.8 (1.0) | 14.8 (1.1) | $t(177) = 0.02$, *ns* |
| Race: number (%) in each group | | | |
| European American | 8 (9.1) | 5 (5.5) | $\chi^2(4, n = 179) = 4.81$, *ns* |
| African American | 74 (84.1) | 77 (84.6) | |
| Hispanic | 1 (1.1) | 6 (6.6) | |
| Biracial | 2 (2.3) | 1 (1.1) | |
| Other | 3 (3.4) | 2 (2.2) | |
| Mother's education: number (%) completed high school only | 70 (70.7) | 75 (72.8) | $\chi^2(1, n = 179) = 0.66$, *ns* |

*ns* non-significant

differ from the present study. Children in the larger study cohort ($N = 371$) were followed since birth, with bi-annual assessments to research social and cognitive development as related to poverty, stress, and environmental factors. Youth in the larger cohort ranged in age from 11 to 18 and the first 200 who were aged 14–18 years (i.e., in middle adolescence) were invited to join the present laboratory stress study if they met criteria for the laboratory study (no acute serious psychiatric condition, no serious medical condition, and IQ $> 80$). Two hundred adolescents, aged 14–18 years, met the criteria and were invited to participate. All 200 agreed to participate. Out of these 200 subjects, 179 had code-able videotape data on the TSST task and these are the focus of the present study on coded emotion expression. Of the remaining 21 subjects, 9 refused to be videotaped and 12 were unable to be coded due to videotaping malfunction. These 179 participants were not different from the overall sample of 371 on demographic variables (sex, race, or mother education level), $ps > .17$.

Demographics are shown in Table 1. As shown in Table 1, there were 88 boys and 91 girls. 84.2 % of participants were African-American. Boys and girls did not differ in age, race, or maternal education level (a proxy index of socio-economic status; Andersen and Mortensen 2006). Due to the sample being primarily African American, we re-ran analyses removing all non-African American participants. Findings remained unchanged, thus we have included all participants in analysis presented here.

## Procedure

Participating adolescents completed a laboratory stress session as part of a larger study, which involved the Trier Social Stress Test-Child version (TSST-C; Buske-Kirschbaum et al. 1997). Informed parental consent and adolescent assent was obtained and the study protocol was approved by the University's Institutional Review Board.

### *TSST-C Laboratory Stress Session*

On the stress session day, adolescents were first lead through progressive muscle relaxation for 5 min by the research assistant and then were told to sit quietly and practice relaxing for 45 min to ensure that they had adapted to the lab environment and were low in stress prior to beginning the TSST. Then, adolescents participated in the TSST-Child version

(TSST-C; Buske-Kirschbaum et al. 1997), as described below, which was videotaped. The videotapes were later coded for adolescents' emotion expression, as described below.

*TSST-C*

The TSST-C was performed according to instructions provided by Buske-Kirschbaum and colleagues, except that in this study the adolescent prepared and delivered the speech in the same room (rather than a separate "preparation room"). The Test began when 2 unfamiliar adults (the "judges") entered the laboratory room and told the adolescent that they would have to finish writing a story, and to "make the story as exciting as possible" because they were going to be "competing against other teenagers." The judges gave the adolescent a story stem (used by Buske-Kirschbaum et al. 1997) and then left the room for 5 min while the adolescent prepared the story. The judges then re-entered the room, placed an audio-recorder in front of the adolescent and asked him/her to stand up and recite the story back for 5 min in front of the judges while he/she was videotaped and audio-taped (participants were aware that they were being taped). After the 5-min speech task, the second judge asked the adolescent to remain standing and complete a math task ("subtract the number 13 from 1023 over and over as quickly and accurately as possible") out loud for 5 min in front of the judges. The "judges" were trained research assistants instructed to maintain a neutral expression and not to assist the adolescent during the tasks.

The TSST is one of the most widely used social stress tasks in adults and children/adolescents (Dorn et al. 2003; Kudielka and Kirschbaum 2005). The TSST has been found to elicit a robust emotional arousal response as assessed by self-reported emotion in children and adolescents (Hastings et al. 2007). Furthermore, the speech and math tasks involved in the TSST are similar to events occurring in adolescents' lives at school (Klimes-Dougan et al. 2001) and are a social-evaluative stressor, which may be particularly anxiety-provoking for adolescents (Elkind and Bowen 1979).

## Measures

*Emotion Expressions*

Videotapes of the 10-min TSST-C speech and math task were coded for adolescent emotion expressions following a system developed by the second author based on a system by Cole et al. (1994). The speech and math task were combined together in the coding process, as both are considered to be part of the stress-inducing process (Cărnuţă et al. 2015; Chen et al. 2014; Giles et al. 2014; Polheber and Matchock 2013; Richardson et al. 2014). Trained coders (both male and female) viewed the video-taped tasks and identified each episode (or continuous occurrence, however short or long) of emotion expression. Based on previous research (Banse and Scherer 1996; Ekman and Friesen 1975; Izard 1979), coders analyzed cues including participants' facial expressions, vocalic qualities, and postures to classify emotion expressions (see Table 2 for details on emotion cues). Coders were told to code an expression if one or more of the cues were present. If cues from two different emotions occurred simultaneously, both emotions were coded. Coders then rated the intensity of each emotion displayed on a scale of 1–3. An emotion was considered 'mild' and coded '1' if it was very brief or fleeting, or was extended but still very slight. An emotion was coded as 'moderate' or '2' if there was one clearly expressed 'major cue' of the emotion, but was not fully expressed. Finally, an emotion was considered 'high' and coded '3' if the emotion was fully expressed through more than one

**Table 2** Emotion expression cues

| | Vocal cues | Facial cues | Postural cues |
|---|---|---|---|
| Happiness | Major cues:<br>Voice is light and lilting<br>Pitch often becomes higher and/or louder than during previous vocalizations<br>Includes laughing or giggling<br>Minor cues:<br>Singing<br>Humming in a singsong manner | Major cues:<br>Mouth characterized by slight or broad smiling in which the corners of the mouth are drawn back and upwards<br>Smile may or may not be accompanied by crinkling around the eyes<br>Minor cues:<br>Crinkling around eyes often appears as brightness in the eyes<br>Forehead is smooth<br>Brows may be raised | Major cues:<br>Usually enough tension in the body (i.e. not slumped)<br>Shoulders and chest appear relaxed<br>May jump up or raise their arms in glee, clap their hands with delight, "high five", etc. |
| Sadness | Major cues:<br>Voice is lowered without intention to whisper, often dropping off at the end of the utterance<br>Minor cues:<br>Whining or sighing may indicate sadness, if the whine/sigh meets the other vocal criteria and has NO protesting quality | Major cues:<br>Lip corners may begin to pull down<br>Bottom lip is loose or pushed upward as in a pout<br>Eyes may droop<br>Brow may form an oblique shape (/\)<br>Bulge or furrow may appear in center above brow heads | Major cues:<br>Shoulder and/or body may slump<br>Head may drop down and to the side (as in "giving up")<br>Crying or tearing up |
| Anger | Major cues:<br>Voice is harsh or whiny<br>Conveys protest, irritation, frustration, anger<br>Pitch is often louder and deeper, plosive[a] quality to words spoken<br>Whining or sighing has protest quality | Major cues:<br>Brows sharply lowered and drawn together<br>Vertical wrinkles or bulge between brows<br>Nasal root broadened<br>Eyes narrowed or squinted as in a "hard stare"<br>Jaw clenched or set<br>Mouth squared off if open<br>Lips pressed or tightened if mouth is closed | Major cues:<br>Arms akimbo (fists placed on each hip), finger wagging or jabbing<br>Minor cues:<br>Aggressive behaviors (i.e. punching) |
| Anxiety | Major cues:<br>Voice is strained and conveys stress<br>Tension in the vocal chords makes them constrict in a way that disrupts smoothness of typical speech (speech sounds "shaky")<br>Sounds fearful | Major cues:<br>Brow raised and drawn together<br>Short transverse furrows or thickening in mid-forehead<br>Nasal root narrowed<br>Eyelids may be raised making eyes appear widened (can see more of whites of the eyes)<br>Mouth may be retracted (opened, tense, with lips pulled straight back)<br>Minor cues:<br>Darting glances | Major cues:<br>Hand or foot may move in repeated, fidgeting fashion<br>Minor cues:<br>Shoulders may appear raised<br>Body held stiffly |

**Table 2** continued

| | Vocal cues | Facial cues | Postural cues |
|---|---|---|---|
| Contempt | No vocal cues | Major cues:<br>Upper lip is tightened and slightly raised *on one side only*<br>One brow may be raised slightly higher than the other (other may be slightly lowered) | Major cues:<br>Chin may tilt up slightly, as though the person is "looking down his/her nose" at the other<br>Eye roll<br>Minor cues:<br>Shoulders may lift up and back |
| Shame/ Embarrassment | No vocal cues | Major cues:<br>Gaze down and/or to the side<br>Head turned down and/or away (as if hiding face)<br>Nervous smile (coded shame/happiness)<br>Biting of bottom lip<br>Blushing<br>Minor cues:<br>Lower lips (or both lips) may roll inward | Minor cues:<br>Face or head touch (as if to hide one's face) |

[a] Plosive is a sound made when someone says something with a burst of air

channel (vocal, facial, and/or postural). Total scores (the sum of the intensity ratings for each emotion across the task) were used in analyses. Twenty-five videotapes (14 %) were double-coded, and checked for inter-rater reliability. Inter-rater reliability assessed whether coders agreed on the occurrence of an episode *and* the emotion that was expressed. Percent agreements for emotions ranged from 67 to 89 %, with an average Kappa of .52, which is considered "moderate" (Landis and Koch 1977). For happiness, there was 89 % agreement ($K = .78$); for sadness, there was 71 % agreement ($K = .42$); for anger, there was 84 % agreement ($K = .67$); for anxiety, there was 68 % agreement ($K = .35$); for contempt, there was 67 % agreement ($K = .37$); for shame, there was 82 % agreement ($K = .63$). Due to the low frequency and occurrence of sadness, anxiety, and contempt, the Kappa's for these emotions were low; however, we chose to retain them in the analysis due to the uniqueness of the study and the lack of similar data in the literature.

## Data Analysis

*T* tests were conducted in SPSS to assess gender differences in each emotion expression. Cohen's *d* effect sizes were also calculated using the formula of mean emotion expression level for boys minus mean emotion expression level for girls divided by the pooled standard deviation. Thus, positive Cohen's *d* values indicated boys > girls and negative values indicated girls > boys. Following Hyde (2005), we labeled Cohen's *d* effect sizes of .11–.24 as "small", .25–.34 as "small to medium", .35–.64 as "medium", and .65 and above as "large."

## Results

### Data Inspection and Transformations

Data were examined for normality. One outlier data point (>three standard deviations above the mean) was found for shame/embarrassment and was winsorized to be equal to the next highest value. In addition, all emotion expression data (including the winsorized shame/embarrassment variable) were skewed; therefore, square root transformations for these (SQRT[emotion score + 1]) were used in analyses and presented in tables.

### Gender Differences in Emotion Expressions

Means, standard deviations, and Cohen's $d$ values are shown in Table 3. For happiness expressions, there was a significant gender difference, with girls expressing more happiness than boys [$t(177) = -2.39$, $p = .02$], with a medium effect size ($d = -0.36$). There was not a significant gender difference for sadness [$t(177) = -1.36$, $p = .18$]. However, the pattern of findings did suggest that girls showed higher rates of sadness than boys, with a small effect size of ($d = -0.20$). There was not a significant gender difference for anxiety [$t(177) = 0.76$, $p = .45$) and the effect size was small ($d = 0.11$). There was a significant gender difference for shame/embarrassment expressions, with girls expressing greater levels of shame/embarrassment than boys [$t(177) = -2.83$, $p = .005$] with a medium effect size ($d = -0.42$). The gender difference for anger expression was not significant [$t(177) = 0.98$, $p = .33$]. The effect size was small ($d = 0.15$). There was a significant gender difference in contempt expressions, with girls expressing greater levels of contempt than boys [$t(177) = -2.48$, $p = .01$], with a medium effect size ($d = -0.37$). When the sample was limited to only include only African-Americans, we found the same results as with the whole sample, with gender differences, with girls expressing more happiness [$t(151) = -2.28$, $p = .02$, $d = -0.37$], shame/embarrassment [$t(151) = -3.05$, $p = .003$, $d = -0.49$], and contempt [$t(151) = -2.20$, $p = .03$, $d = -0.36$] than boys.

## Discussion

The present study was the first examination of gender differences in observed emotion expressions in low-income, primarily African-American adolescents, a clinically relevant group given their chronically elevated environmental stress, experience of racism and other adversity, and risk for social-emotional problems. Moreover, this study is unique given that

**Table 3** Expression of emotions by gender

| | Boys $n = 88$ | Girls $n = 91$ | Cohen's $d$ |
|---|---|---|---|
| Happiness: mean (SD) | 3.30 (1.72) | 3.99 (2.15) | −0.36* |
| Sadness: mean (SD) | 1.19 (0.41) | 1.29 (0.60) | −0.20 |
| Anger: mean (SD) | 3.19 (1.59) | 2.97 (1.46) | 0.15 |
| Anxiety: mean (SD) | 2.19 (1.40) | 2.04 (1.17) | 0.11 |
| Contempt: mean (SD) | 1.11 (0.30) | 1.26 (0.51) | −0.37* |
| Shame: mean (SD) | 1.60 (1.05) | 2.10 (1.31) | −0.42** |

* $p < .05$; ** $p < .01$

the sample was placed in an acutely stressful situation. Our findings indicated that this group showed gender differences in emotion expression consistent with mainstream gender roles for happiness and shame/embarrassment, but showed gender-role inconsistent patterns for contempt expressions.

Consistent with findings for middle-income European American youth, low-income largely African-American girls in our study expressed more happiness than boys, even under the stressful situation. It is notable that girls expressed happiness more than boys in this uncomfortable and stressful situation in front of unfamiliar adult experimenters. It has been noted that Western culture expects girls and women to smile more than boys and men, especially in uncomfortable social situations, and this may be a way for girls to address their unease or to appease others in the situation or it may be due to a tendency for girls to show nervous giggling and laughter when in anxiety-provoking situations (Hall and Halberstadt 1986; LaFrance et al. 2003). Researchers have argued that this tendency may be problematic for girls, and it has been associated with behavior problems in young girls (Cole et al. 1994). Thus, it is of interest that this particular gender difference may extend into youth from lower-income families, a group who experience higher levels of chronic stress.

Also consistent with cultural gender roles, we found that low-income girls showed greater shame/embarrassment expressions than boys in the social stressor, although girls and boys did not differ in their expression of the other internalizing emotions (sadness and anxiety). Notably, in their analysis of emotion socialization of low-income ethnic minority adolescents, O'Neal and Magai (2005) found the only gender difference in emotion socialization was for shame, with low-income parents rewarding shame more for girls than for boys. And, in Chaplin and Aldao's (2013) meta-analysis, of all the individual internalizing emotions, shame showed the strongest gender difference with girls higher than boys ($g = -0.56$). Shame has been linked to higher levels of self-blame, attempts to reduce painful feelings, and increased internalizing symptoms, such as anxiety and depression (Ferguson et al. 1999, 2000; Hyde et al. 2008), symptoms that are more common for girls than boys (Angold et al. 1998; Costello et al. 2003; Wichstrom 1999). These implications may be exacerbated for this low-income, higher-stress cohort, given that stress may interact with predispositions to lead to higher rates of internalizing disorders, such as depression and anxiety (Abramson et al. 1989). In contrast to our current findings, a meta-analysis by Else-Quest et al. (2012) with adults found that gender differences in self-reported shame experiences were present for European-Americans, but were not statistically significant for other ethnic groups. Thus, although we found African-American girls to show greater shame/embarrassment expressions than boys outwardly, internal experience of shame may not show gender differences for adult African-Americans. In addition to shame, our variable also captured embarrassment expressions and past research has suggested that girls may be more likely than boys to show embarrassment expressions (such as embarrassed or nervous giggling) in anxiety-provoking situations (Hall and Halberstadt 1986). Further research should explore the developmental trajectories of gender differences in experience and expression of emotion in diverse groups to better understand whether this pattern is due to developmental, experience/expression distinctions, or other factors.

Finally, we observed that there was no significant difference in expressed anger between boys and girls; moreover, girls actually expressed more contempt (another externalizing-type emotion) than boys. This finding is contrary to gender roles for boys to express greater externalizing emotions than girls and with previous research finding greater externalizing expressions (especially anger) for boys than girls in early and middle childhood (e.g.,

Chaplin and Aldao 2013). The pattern of girls showing equal anger and higher contempt than boys in our study may be related to their low-income environment: working-class and low-income families may socialize their daughters to appear tougher to protect themselves, thus resulting in higher displays of anger and contempt among low-income girls (Brown 1998; Eisenberg 1999; Miller and Sperry 1987).

However, the pattern of girls showing equal or higher externalizing emotion expressions than boys may also be due to developmental factors, given that the few studies of middle-class adolescent emotion expressions also generally find equal or greater externalizing expressions (mostly for anger) during adolescence (Becker-Stoll et al. 2001; Eisenberg et al. 2008; Safyer and Hauser 1994; Sheeber et al. 1997, 2009; Zimmermann et al. 2001). More work is needed on adolescence, but this trend may indicate a developmental progression for externalizing emotion expression, with girls showing less externalizing emotions in childhood but more in adolescence.

Another possibility of the heighted expression of anger and contempt in girls is contextual; notably emotions were observed in an interpersonal context in which youth were being "judged" by unfamiliar adults. Fischer and Roseman (2007) argue that anger is a short-lived emotion "aimed at attacking the other person in order to gain a better outcome[,]" while the purpose of contempt is to "exclude the other person from one's social network" (p. 103). Given the setting of the TSST, the display of anger could serve the purpose to be scored better on the task by the judges, resulting in girls expressing just as much anger as boys. When this attempt fails, girls may be more tempted to shun or exclude the judges by expressing contempt, even more so because they only received neutral responses from the judges. From research on bullying, we know girls to be more likely than boys to be non-verbally aggressive, and express higher levels of contempt and disgust when socially isolating others (Underwood 2004). Girls also experienced more shame than boys, which may have resulted in "humiliated fury" leading girls to express more of these externalizing emotions (Thomaes et al. 2011).

It is interesting that girls in our study showed higher contempt than boys, but did not differ from boys in anger expressions and showed greater happiness and shame expressions than boys. In other words, the main gender-role inconsistent finding for the low-income minority youth in our study was for girls' higher expression of contempt than boys'. Perhaps adolescent girls feel more comfortable expressing contempt because contempt is a more subtle form of externalizing emotion and is consistent with girls' tendency to use more social/relational forms of aggression than boys (Crick and Grotpeter 1995) and that this is true of low-income minority girls too.

## Conclusions

In sum, this study was the first to examine gender differences in observed emotion expressions in low-income, ethnic minority urban adolescents, an important group at a critical developmental period for emotion. The primary limitation of this study is the low percentage agreement between coders for emotions of sadness, anxiety, and contempt, which is primarily a result of low frequency and occurrence. We present the data due to the importance of examining these emotion expressions in this under-studied sample. However, we recognize that there is some measurement error in these emotions, which could decrease our ability to see gender differences, although despite this we did find interesting gender differences. Our study is also limited in that we could not disentangle whether

findings are driven by SES, urban setting, ethnicity, developmental period, or whether they were driven by the particular acute stress situation in which youth were observed. Future research on emotion expression on low-income adolescents with larger samples including a range of ethnicities and settings (urban, rural) would be useful as well as research observing youth in a variety of contexts, including both stressful and non-stressful contexts. Additionally, due to the use of the laboratory TSST stress test, our findings may only be generalizable to youth in acute stress contexts. However, our study provides important initial evidence that low-income ethnic minority adolescents showed gender-role consistent patterns of positive emotion expression (girls > boys) and shame expressions (girls > boys), but showed gender-role inconsistent expressions for contempt, with girls greater than boys. Our findings of greater contempt expressions in girls than boys in this highly stressed group may have implications for their development of psychological outcomes, such as lower levels of happiness and social isolation (Crowley 2013; Crowley and Knowles 2014).

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