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ORIGINAL CONTRIBUTION

Separation anxiety and gender variance in a community sample of children

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Abstract

In clinical child and retrospective adult samples, childhood gender variance (GV; i.e., cross-gender behaviour) has been associated with separation anxiety (SA; i.e., distress related to separation from attachment figures) in males. This study examined GV and SA in a nonclinical sample of 892 boys and 933 girls aged 6–12 years via parent-reports. Parental factors (i.e., parenting style, parent–child relationship, willingness to serve as an attachment figure, attitudes towards gender stereotypes in children) were examined as potential moderators. GV predicted SA in boys, even when statistically controlling for general psychopathology and demographic variables. Authoritative parenting, closeness in the parent–child relationship, willingness to serve as an attachment figure, and liberal attitudes towards gender stereotypes in children moderated the association between GV and SA in both boys and girls. Thus, SA may be a unique internalizing problem related to GV in boys in nonclinical samples and influenced by a variety of parental factors.

Keywords Separation anxiety · Gender variance · Children · Parenting styles · Parental attitudes · Parent–child relationship

Introduction

In children, gender variance (GV) is characterized by gender-"atypical" behaviour and interests in domains such as toy, activity, playmate, self-identification, and clothing and hairstyle preferences [1]. Prior literature has employed a variety of measures to examine GV and its correlates in nonclinical community child samples. Relatively few studies have employed self-report measures designed to gauge children's gender expression by asking them to rate, for example, their felt gender-"(a)typicality" and contentment with gender assignment [2], or their perceived similarity to other boys and girls in domains such as activity, playmate, and appearance preferences [3]. More commonly, GV is measured via parent-report using, for example, the "wishes to be of opposite sex" and "behaves like opposite sex" items from the Child Behaviour Checklist (CBCL) [4–6], or, less often, measures that are psychometrically validated and comprehensive in terms of capturing the various domains of GV [7].

GV can be considered comparable, although not equivalent, to gender dysphoria (GD) [1, 7]. GD, formerly gender identity disorder (GID), is a clinical diagnosis defined by marked GV that is accompanied by distress related to an incongruence between one's birth-assigned vs. experienced gender identity [8]. Among children clinic-referred for GD/GID, previous research indicated elevated emotional and behavioural problems on screening measures such as the CBCL [4] (for review see [9]). A study employing a structured parent-report diagnostic interview schedule based on the Diagnostic and Statistical Manual of Mental Disorders (DSM) found that 23% experienced externalizing problems and 37% experienced internalizing problems, with 31% specifically experiencing anxiety [10].

Similarly, GV in nonclinical community samples of children and youth has been associated with lower psychological well-being, as measured by parent-reports [6, 7] and child and youth self-reports (e.g., [2, 3, 11]). van Beijsterveldt et al. [6] examined twins where GV (i.e., cross-gender behaviour and wishes) and behavioural and emotional problems were reported by parents using the CBCL. In boys and

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girls, GV was associated positively with internalizing and externalizing problems. van der Miesen et al. [7] examined both the CBCL cross-sex wishes item and the Gender Identity Questionnaire for Children (GIQC) [12], a more comprehensive measure of GV, to predict clinical-range CBCL problems; the CBCL cross-sex wishes item predicted a greater rate of clinical-range externalizing problems in girls, and increases in GV on the GIQC were associated with increased rates of clinical-range total, internalizing, and externalizing problems in boys. Similarly, using child self-reports, GV and pressure to conform to gender norms were associated with elevated internalizing problems in children [2], and perceived similarity to children of the opposite-birth-sex was associated with poorer social adjustment and lower global self-esteem [3]. In LGBTQ adolescents and young adults, GV was associated with lower psychological well-being [11].

Although numerous studies indicated GD and GV are associated with elevated behavioural and emotional problems in children and youth, a handful of studies spanning several decades have raised the possibility that separation anxiety (SA) is a unique internalizing problem among children showing GV. Separation anxiety disorder (SAD) is defined as distress related to separation from an attachment figure, typically a parent [8], and has a population prevalence rate estimated at 4.1% in North America [13], with a higher prevalence rate in girls (5.64% in girls and 2.56% in boys; for details, see [14]). Two earlier studies focusing on SA in specialty child gender identity services reported that SA is common among birth-assigned males with a clinical diagnosis of GID [15, 16]. Coates and Person [15] reported that among 25 birth-assigned male children diagnosed with GID, 60% also met the diagnostic criteria for SAD. Similarly, Zucker et al. [16] found that birth-assigned male children who met the complete diagnostic criteria for GID had elevated levels of SA compared to those who did not meet the complete diagnostic criteria for GID. Using a liberal criterion for defining SAD (i.e., parental endorsement of "Sometimes" or "Yes" to at least three criteria for diagnosis of SAD), 64.4% diagnosed with GID met the criteria for SAD, whereas only 38.1% subthreshold for a GID diagnosis met the criteria for SAD. Thus, the more gender-variant birth-assigned male children (i.e., those who met criteria for GID diagnosis) had elevated SA. In another clinical study, Wallien et al. [10] reported that in a sample of Dutch children diagnosed with GID, 5.8% of birth-assigned males and 5.9% of birth-assigned females met the criteria for SAD; this rate of SAD among the Dutch birth-assigned males with GID could also be considered to be elevated if compared to the rate for North American boys cited above.[1]

Most recently, VanderLaan et al. [14] found elevated SA among gender-referred birth-assigned male children using liberal and conservative criteria as in Zucker et al. [16]. Specifically, 55.8% met the liberal criterion and 5.3% met the conservative criterion for SAD; these rates were significantly greater than the population prevalence rate of SAD in boys. Additionally, a parent-report measure of GV was associated with elevated SA; however, this association appeared to overlap with the general pattern of elevated internalizing problems and peer problems (i.e., the GV-SA association was no longer significant when internalizing problems and peer problems were statistically controlled). As such, VanderLaan et al.'s [14] findings suggested that GV is commonly associated with elevated SA in gender-referred birth-assigned male children, but it also casts possible doubt on whether SA is uniquely related to GV relative to other internalizing problems.

In addition, retrospective studies of males who exhibited marked femininity as children and androphilia (i.e., sexual attraction to men) as adults are relevant. Such studies are relevant because longitudinal research has shown the majority of children with GD report same-sex attraction in adolescence and adulthood [17]. Similarly, in nonclinical samples, childhood GV is associated with same-sex sexual orientation in adolescence and adulthood [18, 19]. Given that children who exhibit GD or GV appear more likely to be same-sex attracted later in development, same-sex attracted adults in the general population who showed marked GV in childhood may provide insight regarding whether GV and SA are associated beyond clinical samples.

To date, such retrospective studies have been cross-cultural in scope and focused on non-Western birth-assigned males who are markedly feminine members of 'third' gender categories distinct from 'men' and 'women' as well as on Canadian men and women of varying sexual orientations. Vasey et al. [20] reported that members of the Samoan third gender, *fa'afafine*, recalled more childhood SA than Samoan men and women. Similarly, Gómez et al. [21] reported that members of the Mexican Istmo Zapotec third gender, *muxes*, recalled more SA in childhood than men, but similar levels of recalled SA relative to women. Likewise, in a Canadian sample, VanderLaan et al. [22] found that gay men who

[1] Wallien et al. [10] did not report a control sample to compare rates of diagnoses, nor are there data available on the prevalence of SAD among boys and girls in the Dutch population. We used the binomial test to compare Wallien et al.'s [10] sample to the North American population estimates of SAD rates among girls (5.64%) and boys (2.56%), respectively [13]. The rate of SAD among the Dutch birth-assigned males with GID (5.8%) was marginally elevated compared to North American boys, $z = 1.92$, two-tailed $p = 0.055$. This elevation may similarly suggest SAD is elevated among birth-assigned males who experience GID/GD. None of the other Dutch GID group comparisons to these North American estimates were statistically or marginally significant, all $z < 1.23$, all two-tailed $p > 0.22$.

recalled more childhood GV also recalled significantly more childhood SA compared to heterosexual men, but not compared to women. VanderLaan et al. [22] found no association between recalled childhood GV and SA in women; however, another Canadian study by Petterson et al. [23] found that lesbian women, who also tend to recall elevated childhood GV [24], reported the highest level of recalled childhood SA compared to gay men and heterosexual men and women, providing some support for a possible GV-SA association in girls. Additionally, Petterson et al. [23] factor analyzed DSM-based internalizing symptoms in a sample of heterosexual and homosexual men and women and found evidence of separate factors for recalled childhood SA vs. depression and anxiety more generally. Thus, this retrospective literature suggests GV and SA are associated in males beyond clinical settings as well as cross-culturally. The Petterson et al. [23] study in particular indicates SA may also be associated with increased GV in girls, and that SA may be unique relative to other internalizing problems.

These clinical and nonclinical, cross-cultural literatures raise the question of what factor(s) might underpin the association between GV and SA in birth-assigned male children—and possibly birth-assigned female children. Given that SA is germane to the child–parent relationship, it seems plausible that parental factors might play some role. Parental factors such as psychological flexibility in parenting, adaptive parenting [25] and satisfaction in the parent–child relationship [26] have been associated with general psychological well-being among children and youth. A meta-analysis reported that higher child anxiety is associated with parental rejection and greater parental control, especially low levels of autonomy granting and excessive over-involvement, while parenting that is warm and low on withdrawal and aversiveness is associated with less child anxiety [27]. Literature reviews on childhood SA in particular have suggested that parental influences include parental rejection and criticism, overprotective parenting, controlling and intrusive parenting, family conflict, general parental distress, and parental internalizing problems [28, 29]. Children who exhibit GV experience elevated mental health risk [2, 6, 11] and often face additional stressors such as peer rejection and ostracism [30], further highlighting the importance of considering parental factors, which might serve as protective or risk factors in relation to SA among gender-variant children. Key parental factors considered here are those implicated in the reviews of the child literature on anxiety as well as in prior literature relevant to childhood GV and psychological well-being: parenting styles, parental gender role attitudes, parental willingness to provide a secure base for the child, and closeness in parent–child relations.

Regarding parenting styles, childhood GV, and psychological well-being, insights have been provided by retrospective research with adults as well as by studies of children and youth. Alanko et al. [31] reported a retrospective study of Finnish adults contacted through a national twin registry. Participants reported on their recalled childhood GV and their parents' parenting styles, which were examined as two factors labelled "coldness" and "over-controlling". The study found an association between recalled childhood GV and adulthood psychopathology (i.e., depression, anxiety, somatization) that was moderated by over-controlling parenting in both men and women, and moderated by parental coldness in men only.

Parental acceptance of cross-gender behaviour and felt pressure to conform to gender norms also appears to be important in the psychological well-being of gender-variant children [2, 32]. van Beusekom et al. [32] examined a sample of Dutch secondary school students who reported, by means of a paper questionnaire, on their level of same-sex attraction, level of GV, psychological distress, and perceived parental acceptance. Perceived paternal acceptance moderated the association between GV and psychological distress in boys; however, maternal acceptance moderated the association between same-sex attraction and psychological distress in girls [32]. Similarly, Yunger et al. [2] conducted a longitudinal study on children in grades three to seven enrolled in a state school. The children self-reported on several measures including their gender typicality and felt pressure to conform to gender norms from parents, peers and themselves. Felt pressure to conform to gender norms was associated with increased internalizing problems the following year, with the largest impact being on the more gender-variant youth [2]. Indeed, stigmatization in general appears to mediate the relationship between GV and psychological well-being in youth [11] while it has been suggested that therapeutic strategies centering on increased parental acceptance might be important for decreasing anxiety in youth experiencing GD [33].

A parent who provides a secure base facilitates the development of secure attachment in childhood [34] and, thus, can be regarded as key for a secure attachment to develop. Insecure attachment is correlated with psychopathology in children, particularly anxiety [35, 36], and has been negatively associated with gender typicality and gender contentedness as well as positively associated with felt pressure for gender differentiation [37]. The degree of parent–child closeness also affects psychological well-being; a negative parent–child relationship has been associated with elevated adulthood traits of anxiety and depression [38], parental closeness has been identified as a protective factor lowering suicidality in boys and girls [39], and greater communication between mothers and sons is associated with reduced anxiety in the child [40]. In line with these findings, birth-assigned females who experience GD receive less social support compared to controls [41] and, thus, fostering a positive parent–child relationship characterized by closeness and support has been emphasized as important to promote

psychological well-being in youth who experience GD [42]. As such, a secure parental base and a close parent–child relationship may ameliorate elevated SA among gender-variant children.

Following from the literature described above, the present study examined GV and SA in a large, nonclinical sample of children 6–12 years old via parent-reports to address four issues:

1. Can previous clinical findings be extended to a nonclinical child sample? Presently, the only nonclinical studies in this area were retrospective studies of nonclinical adult samples [20–23]. It has been noted that memory distortion or recall bias is a limitation of such retrospective research [43]. Thus, examining a nonclinical sample of children via parent-reports would provide more clarity about whether GV and SA are associated in nonclinical child populations. Further, doing so would inform whether elevated SA in birth-assigned males with GD might be related more to the general pattern of GV they exhibit, rather than the distress they experience in relation to their gender identity.
2. Is the association between SA and GV present in girls? To date, no clinical studies specifically examined the association between SA and GD in birth-assigned females and research has been limited in nonclinical samples. It is possible the pattern for girls parallels that found previously for feminine males [14–16, 20–22] and lesbian women [23] such that SA will be elevated in those who show GV. Alternatively, given that SA appears to be elevated among feminine males and shows female-biased population prevalence rates [13], gender-variant girls—who are more masculine—may show less SA.
3. Is SA a unique internalizing problem associated with GV? VanderLaan et al. [14] examined this question in a clinical sample of gender-referred birth-assigned males and reported that SA appeared to be part of a more general pattern of internalizing problems associated with GV. In contrast, Petterson et al. [23] found SA belonged to its own factor, with indicators of other anxiety or depressive disorders belonging to a separate factor in a recall study of adults of varying sexual orientations. Given this distinction, SA might be a unique internalizing problem among gender-variant children. To provide further clarity, this study examined whether an association between SA and GV existed after statistically controlling for internalizing problems.
4. Do parental factors moderate the association between SA and GV in children? Despite the potential relevance of parental factors, no research has yet examined childhood SA and GV in relation to parenting style, parental attitudes towards gender stereotypes, parental willingness to serve as a secure base, or the quality of the parent–child relationship. Determining which parental factors alleviate or contribute to SA among gender-variant children may provide important insight into improving their psychological well-being.

Method

Participants

Participants were recruited via online advertisements (i.e., Facebook, Kijiji and Craigslist). In addition, various parent and child organizations across Canada were contacted via email and asked to distribute paper and/or online advertisements to their members (e.g., camps for children, parent support groups, community centres for children). All advertisements promoted the study as investigating psychological well-being and gender expression in children. Participants were required to be over the age of 18 years, the primary caregiver of a child aged 6–12 years, and proficient in English. The online survey was hosted on Qualtrics, a private software company. Prior to completing the online questionnaire, informed consent was obtained from all individual participants included in the study in accordance with procedures approved by the University of Toronto Research Ethics Board.

The majority of participants were recruited via Facebook advertisements, comprising 97.27% of the total sample. Overall, the Facebook advertisement campaign reached 182,887 people, with 6410 people clicking the advertisement and 2457 people completing the survey. Of the remaining recruitment methods employed, 33 participants (1.31%) were recruited via Kijiji or Craigslist, 27 (1.07%) were recruited by word of mouth and 9 (0.36%) were recruited from an organization or local advertisement. Of these 2526 participants, 2268 completed the information necessary for data analysis in the present study (i.e., child's age, gender, SA, GV). To focus on SA in a nonclinical sample, the present sample was limited to parent-reports of children who had not received any mental health diagnoses. Additionally, all duplicate entries for the same child were identified and removed by comparing multiple entries from the same IP Address on core variables (e.g., age, gender) to determine whether reports from the same IP Address pertained to different children. Doing so resulted in a final sample size of $N = 1825$ (933 girls; 892 boys).

Measures

Descriptive statistics for the demographic variables, according to gender, are shown in Table 1. Descriptive statistics for the focal variables, according to gender, are shown in

Table 1 Descriptive statistics for demographic variables

Variable	Boys	Girls	Total	t or χ^2	p value[a]
Age (in years)				0.07	0.94
M	8.69	8.70	8.69		
SD	1.99	1.94	1.97		
n	892	933	1825		
School performance[b]				− 2.90	0.004
M	3.29	3.38	3.34		
SD	0.61	0.58	0.59		
n	799	838	1637		
Annual income, *n* (%)				− 6.83	0.23
< $23,999	87 (9.8)	87 (9.4)	174 (9.6)		
$24,000–$49,999	161 (18.1)	208 (22.4)	369 (20.3)		
$50,000–$79,999	205 (23.1)	205 (22.1)	410 (22.6)		
$80,000–$124,999	249 (28.0)	234 (25.2)	483 (26.6)		
> $125,000	159 (17.9)	158 (17.0)	317 (17.4)		
Unknown	28 (3.1)	37 (4.0)	65 (3.6)		
Parent's marital status, *n* (%)				0.07	0.79
Married/common-law	693 (77.7)	720 (77.2)	1413 (77.4)		
Other	199 (22.3)	213 (22.8)	412 (22.6)		
Area type, *n* (%)				3.18	0.20
Urban	279 (31.5)	298 (32.0)	577 (31.8)		
Suburban	363 (40.9)	408 (43.9)	771 (42.4)		
Rural	245 (27.6)	224 (24.1)	469 (25.8)		
Geographic region, *n* (%)				2.50	0.64
Ontario	493 (55.4)	527 (56.7)	1020 (56)		
Quebec	31 (3.5)	25 (2.7)	56 (3.1)		
Eastern Canada	88 (9.9)	93 (10)	181 (9.9)		
Western/Northern Canada	278 (31.3)	285 (30.6)	563 (30.9)		
Ethnicity, *n* (%)				7.17	0.62
European Canadian	509 (57.8)	503 (54.3)	1012 (56.0)		
South Asian	25 (2.8)	20 (2.2)	45 (2.5)		
East Asian	9 (1.0)	16 (1.7)	25 (1.4)		
African	3 (0.3)	3 (0.3)	6 (0.3)		
Latin	6 (0.7)	9 (1.0)	15 (0.8)		
Caribbean	14 (1.6)	10 (1.1)	24 (1.3)		
Aboriginal	38 (4.3)	50 (5.4)	88 (4.9)		
Arab	4 (0.5)	5 (0.5)	9 (0.5)		
Other	108 (12.3)	115 (12.4)	223 (12.3)		
Multiple	165 (18.7)	195 (21.1)	360 (19.9)		
Religion, *n* (%)				5.50	0.79
Roman Catholic	172 (19.4)	171 (18.3)	343 (18.8)		
Protestant	57 (6.4)	68 (7.3)	125 (6.9)		
Christian	224 (25.2)	233 (25.0)	457 (25.1)		
Muslim	21 (2.4)	27 (2.9)	48 (2.6)		
Jewish	7 (0.8)	13 (1.4)	20 (1.1)		
Buddhist	6 (0.7)	5 (0.5)	11 (0.6)		
Hindu	6 (0.7)	10 (1.1)	16 (0.9)		
Sikh	3 (0.3)	3 (0.3)	6 (0.3)		
No religion	332 (37.4)	354 (37.9)	686 (37.7)		
Other	60 (6.8)	49 (5.3)	109 (6.0)		

M mean, *SD* standard deviation

[a]Results of independent samples *t* tests (means) or Chi squared tests (counts) comparing the boys and the girls

[b]School performance is the average numerical level performance (i.e., $D=1$ to $A=4$) in math, science, English, social science, and language studies

Table 2 Descriptive statistics for focal variables

Variable		Boys	Girls	*t* value	*p* value[1]
Gender variance	Mean (SD)	1.96 (0.37)	2.10 (0.40)	− 7.68	< 0.001
	n	892	933		
Separation anxiety	Mean (SD)	2.22 (2.29)	2.43 (2.51)	− 1.84	0.07
	n	892	933		
Authoritative parenting style	Mean (SD)	4.23 (0.47)	4.20 (0.48)	1.03	0.31
	n	769	816		
Authoritarian parenting style	Mean (SD)	1.64 (0.44)	1.61 (0.41)	1.28	0.20
	n	769	816		
Permissive parenting style	Mean (SD)	2.02 (0.64)	2.03 (0.64)	− 0.21	0.83
	n	769	816		
Conflict in parent–child relationship	Mean (SD)	17.23 (6.28)	17.21 (6.35)	0.07	0.94
	n	783	831		
Closeness in parent–child relationship	Mean (SD)	32.21 (3.00)	32.47 (2.85)	− 1.80	0.07
	n	783	831		
Parental willingness to serve as a secure base	Mean (SD)	6.04 (0.66)	6.06 (0.63)	− 0.59	0.56
	n	787	840		
Parental attitudes towards gender stereotypes	Mean (SD)	85.73 (8.05)	85.84 (8.00)	− 0.29	0.77
	n	798	850		
Peer problems	Mean (SD)	0.19 (0.34)	0.15 (0.29)	2.75	0.006
	n	879	906		
Internalizing problems	Mean (SD)	52.56 (10.58)	51.71 (10.52)	1.67	0.09
	n	839	882		
Externalizing problems	Mean (SD)	50.45 (10.51)	49.27 (10.12)	2.37	0.02
	n	839	882		

Gender variance = GIQC score, separation anxiety = SAI weighted mean sum score, authoritative parenting style = PSDQ-SF authoritative subscale, authoritarian parenting style = PSDQ-SF authoritarian subscale, permissive parenting style = PSDQ-SF permissive subscale, conflict in parent–child relationship = CPRS-SF conflict subscale, closeness in parent–child relationship = CPRS-SF closeness subscale, parental willingness to serve as a secure base = CRPR-SF, parental attitudes towards gender stereotypes = CRSRAS, peer problems = CBCL peer problems subscale, internalizing problems = CBCL internalizing *T* score, externalizing problems = CBCL externalizing *T* score

Table 2. Independent samples *t* tests or Chi squared tests were performed to identify any differences between boys and girls on the demographic (Table 1) and focal variables (Table 2).

Demographic questions

Parents were asked to report their marital status, the family's annual income, the family's predominant religious background, and their current geographical location of residence in Canada (i.e., Northern Canada, Eastern Canada, Western Canada, Ontario, and Quebec). Questions regarding the child included their average school performance (i.e., the average of reported grade performance, ranging from a letter grade of D [coded as 1] to a letter grade of A [coded as 4], in math, science, English, social science, and language studies, respectively), age (in years), and ethnicity. There was a significant difference between boys and girls for average school performance, with girls performing better on average than boys.

Separation anxiety interview (SAI)

The SAI [16] is a parent-report measure designed to assess traits associated with SAD expressed in the last 6–12 months. It is composed of 21 items (e.g., "Does your child worry in an unrealistic way about something harmful happening to you?") categorized into 9 domains that correspond to the DSM criteria for SAD (for details on changes to the SAD diagnostic criteria across different versions of the DSM, see VanderLaan et al. [14]). The 21 items were answered on a 3-point scale (0 = never, 1 = sometimes, and 2 = always). A mean score was calculated for each of the nine domains (i.e., for each domain, the item scores were summed and divided by the total number of items in that particular domain). Subsequently, a weighted mean sum score for the entire scale was calculated for each child as the sum of the mean scores from the nine domains. The Cronbach's alpha value for the current sample was 0.81.

Gender identity questionnaire for children (GIQC)

The GIQC [12] is a parent-report measure designed to assess GV in children. It involves rating 16 items (e.g., "The child plays with girl-type dolls, such as 'Barbie'") on a 5-point scale, with lower scores being associated with more GV and higher scores with more gender conformity. Items were scored separately for boys and girls. For ease of interpretation, we reversed the GIQC scores for analysis such that higher scores indicated more GV. As per Johnson et al. [12], items 8 and 16 of the GIQC were excluded, and a mean score was calculated based on the remaining 14 items. The Cronbach's alpha for the current sample was 0.78 for parent-reports of boys and 0.68 for parent-reports of girls. There was a significant difference between boys and girls for mean GIQC score, with girls scoring higher (i.e., more gender-variant) than boys.

The child–parent relationship scale, short-form (CPRS-SF)

The CPRS-SF [44, 45] is a parent-report measure designed to assess the child–parent relationship, divided into two subscales: (1) closeness (7 items; e.g., "My child is uncomfortable with physical affection or touch from me"), and (2) conflict (8 items; e.g., "My child's feelings toward me can be unpredictable or can change suddenly"). The two subscales have been found to have a relatively low correlation, suggesting they each assess unique aspects of the parent–child relationship [44]. Maternal and paternal reports are relatively stable over the course of early childhood [44]. The CPRS-SF has a 5-point response scale (1 = definitely does not apply to 5 = definitely applies). A sum score was calculated for the items on the closeness and conflict subscales, respectively. Cronbach's alphas for the current sample were 0.73 for the closeness subscale and 0.84 for the conflict subscale.

The child rearing practices report, short-form (CRPR-SF)

The CRPR-SF [46, 47] is a parent-report measure designed to assess whether the parent provides a secure base for the child by engaging in behaviours that lend themselves to the child forming a secure attachment. This scale is composed of ten items (e.g., "I encourage my child to talk about his/her troubles") measured on a 7-point scale (1 = most undescriptive for me to 7 = most descriptive for me). A mean score was calculated, with higher scores indicating more of a willingness to serve as an attachment figure for the child. The Cronbach's alpha value for the current sample was 0.74.

Parenting styles and dimensions questionnaire, short-form (PSDQ-SF)

The PSDQ-SF [48] is a 32-item parent-report scale comprised of 3 subscales designed to assess authoritative parenting (15 items; e.g., "I give comfort and understanding when my child is upset"), authoritarian parenting (12 items; e.g., "I use physical punishment as a way of disciplining my child") and permissive parenting (5 items; e.g., "I state punishments to my child and do not actually do them"), respectively. The items were answered on a 5-point scale (1 = never to 5 = always). A mean score was calculated for each of the three subscales. The Cronbach's alpha values for the current sample were 0.86 for the authoritative subscale, 0.81 for the authoritarian subscale, and 0.72 for the permissive subscale.

Child-rearing sex-role attitude scale, adapted version (CRSRAS)

The CRSRAS [49] is a 19-item (e.g., "I would buy my son a doll") parent-report scale designed to assess parental beliefs about gender stereotypic and counter-stereotypic behaviour in children measured on a 5-point scale (1 = strongly disagree to 5 = strongly agree). A sum score was calculated for the 19 items, with lower scores indicating more traditional attitudes towards gendered behaviour in children. The Cronbach's alpha value for the current sample was 0.84.

Child behaviour checklist (CBCL)

The CBCL [4] is a parent-report questionnaire used to measure general psychopathology among children aged 6–18 years. Items are rated on a 3-point Likert scale (0 = not true, 1 = somewhat or sometimes true, and 2 = very true or often true). The CBCL consists of 113 items and has two broad-band factors: (1) internalizing problems (i.e., emotional problems) and (2) externalizing problems (i.e., behavioural problems). Cronbach's alpha values for the internalizing and externalizing subscales are reported as 0.90 and 0.94, respectively [50]. For each subscale, *T* scores were calculated by converting the raw scores into standardized scores through comparison with nonclinical samples of the relevant age group. A peer problems subscale score was generated using three items (i.e., items 25, 38, and 48) from the CBCL, not already included in the internalizing and externalizing scales [51]. Item 25 states "Doesn't get along with other kids", item 38 states "Gets teased a lot", and item 48 states "Not liked by other kids". A sum score for these three items was generated to serve as the peer problem subscale. The Cronbach's alpha value for this subscale in the present sample was 0.68. On average, boys showed significantly more peer problems than girls on this measure (Table 2).

Statistical analyses

Correlation analyses assessed zero-order associations among study variables. Spearman's rho was used for correlations where one or both of the variables were rank-order and point-biserial correlation coefficients were used when one variable was dichotomous and the other variable was continuous. Pearson's *r* was used for all other correlations. The association between scores on the GIQC and the SAI differed by gender (see details below). Thus, subsequent multiple regression analyses were conducted separately for boys and girls. Several variables that were significantly associated with the SAI and/or have been shown to be associated with SA in previous studies (i.e., age, annual income, average school performance, marital status, and CBCL scores) were included in the regression models as control variables. Parental variables and the GIQC were entered next, constituting a main effect block. Interaction effects between the parental measures and the GIQC were sequentially added to the model and removed, subsequent to the control variable and main effect blocks. This method of investigating the interaction effects was employed because the interaction terms were highly correlated with one another due to the necessary inclusion of the GIQC score in the calculation of each interaction term; thus, entering the interaction terms into separate models avoided the issue of multicollinearity. All continuous predictor variables were standardized prior to analyses, separately by gender. In the case of missing data, the data were excluded pair wise. The critical alpha value was set at 0.05 for all the analyses.

Results

Correlation analyses

Correlations between demographic variables, peer problems, internalizing problems, externalizing problems, parental factors, GV, and SA for boys and girls, respectively, are shown in Table 3. The main correlations of interest were those pertaining to the focal variables of GV and SA. In both boys and girls, SA was significantly positively associated with authoritarian parenting style, permissive parenting style, conflict in the parent–child relationship, peer problems, internalizing problems, and externalizing problems. In both boys and girls, SA was significantly negatively associated with age, annual income, marital status, average school performance, and closeness in the parent–child relationship. In girls only, SA was significantly negatively associated with parental willingness to serve as a secure base.

In both boys and girls, GV was significantly positively associated with parental attitudes towards gender stereotypes. In boys only, GV was significantly positively associated with SA, peer problems, internalizing problems, and externalizing problems; however, GV was significantly negatively associated with age and annual income. In girls only, GV was significantly positively associated with age; however, GV was significantly negatively associated with average school performance.

Separation anxiety and gender variance in boys and girls

A multiple regression analysis was conducted for the entire sample, with SA as the outcome variable. Step 1 included the demographic control variables (i.e., age, marital status, school performance, and annual income), peer problems, internalizing problems, and externalizing problems as predictor variables. Step 2 included GV and the interaction term between GV and gender. Gender moderated the association between GV and SA, $B = -0.15$, SE = .05, $\beta = -0.06$, $p < 0.01$. Thus, further regression analyses predicting SA were conducted for boys and girls separately.

Multiple regression analyses for boys

Table 4 shows the results of the multiple regression analyses with SA as the outcome variable for boys. Step 1 included the demographic control variables (i.e., age, marital status, school performance, and annual income), peer problems, internalizing problems, and externalizing problems as predictor variables. Average school performance, age, marital status, peer problems, and internalizing problems were significant predictors in the model. Boys scored higher for SA when they performed more poorly in school, were younger, when their parent had a marital status of "other", when they had more peer problems, and when they had more internalizing problems.

Step 2 included the parental factors (i.e., parenting styles, closeness in the parent–child relationship, conflict in the parent–child relationship, parental willingness to serve as a secure base, and parental attitudes towards gender stereotypes) and GV as predictor variables. Authoritative parenting style, permissive parenting style, and GV were significant predictors in the model. Boys scored higher for SA when their parent had a more authoritative parenting style, a more permissive parenting style, and reported more GV in their child.

Step 3 examined interactions between GV and each of the parental factors. Each interaction term was entered on its own to avoid multicollinearity. There was a significant interaction effect for GV by authoritative parenting style, GV by permissive parenting style, GV by closeness in the parent–child relationship, GV by parental willingness to serve as a secure base, and GV by parental attitudes towards gender stereotypes. Boys who were more gender-variant had

Table 3 Correlations among study variables for boys (above diagonal) and girls (below diagonal)

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Gender variance	–	0.16***	− 0.09**	−0.10**	− 0.04	0.02	0.01	0.01	− 0.01	0.04	− 0.05	0.02	0.22***	0.18***	0.12**	0.16***
2. Separation anxiety	− 0.04	–	− 0.16***	− 0.16***	− 0.14***	− 0.17***	0.00	0.08*	0.20***	0.25***	− 0.08*	− 0.04	0.04	0.32***	0.54***	0.37***
3. Age	0.07*	− 0.11***	–	0.03	0.00	− 0.11**	− 0.04	0.037	− 0.03	− 0.02	− 0.10**	− 0.03	0.00	0.09**	0.04	− 0.11**
4. Annual income[a]	− 0.03	− 0.11***	0.02	–	0.37***	0.21***	0.09*	− 0.00	− 0.09**	− 0.04	0.07*	− 0.04	0.11**	− 0.16***	− 0.10**	0.12**
5. Marital status	− 0.04	− 0.08*	− 0.10**	0.37***	–	0.05	0.01	0.12**	.01	− 0.01	0.02	− 0.10**	− 0.04	− 0.07*	− 0.09*	− 0.05
6. School performance	− 0.07*	− 0.12***	− 0.09**	0.17***	0.14***	–	0.11**	− 0.08*	− 0.09*	− 0.19***	0.10**	0.10**	0.04	− 0.19***	− 0.13***	− 0.21***
7. Authoritative parenting style	0.03	0.00	− 0.05	0.06	0.04	0.11**	–	− 0.42***	− 0.28***	− 0.38***	0.50***	0.49***	0.32***	− 0.11**	− 0.17***	− 0.23***
8. Authoritarian parenting style	− 0.03	0.16***	− 0.09*	− 0.06	0.05	− 0.09*	− 0.39***	–	0.55***	0.56***	− 0.38***	− 0.62***	− 0.25***	0.16***	0.23***	0.39***
9. Permissive parenting style	− 0.02	0.18***	− 0.05	− 0.12***	− 0.01	− 0.13***	− 0.18***	0.48***	–	0.42***	− 0.27***	− 0.35***	− 0.17***	0.16***	0.22***	0.33***
10. Conflict in parent–child relationship	− 0.02	0.28***	− 0.07*	− 0.053	− 0.03	− 0.09*	− 0.28***	0.51***	0.39***	–	− 0.49***	− 0.61***	− 0.13***	0.29***	0.39***	0.68***
11. Closeness in parent–child relationship	− 0.07*	− 0.10**	− 0.06	0.031	− 0.01	0.14***	0.46***	− 0.34***	− 0.28***	− 0.41***	–	0.50***	0.20***	− 0.24**	− 0.25**	− 0.32**
12. Parental willingness to serve as a secure base	− 0.02	− 0.14***	0.07*	− 0.055	− 0.05	0.09*	0.43***	− 0.58***	− 0.31***	− 0.64***	0.48***	–	0.25***	− 0.21***	− 0.21***	− 0.39***
13. Parental attitudes towards gender stereotypes	0.11**	− 0.04	− 0.01	0.10**	− 0.05	0.03	0.33***	− 0.23***	− 0.13***	− 0.09*	0.24***	0.20***	–	0.00	0.03	− 0.01
14. Peer problems	0.01	0.33***	0.10**	− 0.08*	− 0.03	− 0.20***	− 0.08*	0.17**	0.15***	0.26***	− 0.19***	− 0.22***	− 0.10**	–	0.46***	0.43***
15. Internalizing problems	− 0.02	0.62***	0.02	− 0.06	− 0.05	− 0.11**	− 0.10**	0.26***	0.22***	0.44***	− 0.24***	− 0.29***	− 0.02	0.42***	–	0.55***
16. Externalizing problems	− 0.03	0.41***	− 0.10**	− 0.12***	− 0.08*	− 0.20***	− 0.20***	0.38***	0.30***	0.63***	− 0.31***	− 0.45***	− 0.03	0.43***	0.61***	–

[a]Spearman's *rho* used as correlation coefficient

*$p < 0.05$, **$p < 0.01$, and ***$p < 0.001$

Gender variance = GIQC score, separation anxiety = SAI weighted mean sum score, authoritative parenting style = PSDQ-SF authoritative subscale, authoritarian parenting style = PSDQ-SF authoritarian subscale, permissive parenting style = PSDQ-SF permissive subscale, conflict in parent–child relationship = CPRS-SF conflict subscale, closeness in parent–child relationship = CPRS-SF closeness subscale, parental willingness to serve as a secure Base = CRPR-SF, parental attitudes towards gender stereotypes = CRSRAS, peer problems = CBCL peer problems subscale, internalizing problems = CBCL internalizing *T* score¸ externalizing problems = CBCL externalizing *T* score

lower levels of SA when they had a more authoritative parent, more closeness in the parent–child relationship, a parent who was more willing to serve as a secure base, and a parent with more liberal attitudes towards gender stereotypes in children.

Multiple regression analyses for girls

Table 4 shows the multiple regression analyses with SA as the outcome variable for girls. Step 1 included demographic control variables (i.e., age, marital status, school performance, and annual income), peer problems, internalizing problems, and externalizing problems as predictors. Age, internalizing problems, and peer problems were significant predictors in the model. Girls scored higher for SA when they were younger, when they had more internalizing problems, and when they had more peer problems.

Step 2 included the parental factors (i.e., parenting styles, closeness in the parent–child relationship, conflict in the parent–child relationship, parental willingness to serve as a secure base, and parental attitudes towards gender stereotypes) and GV as predictor variables. None of these variables were significant predictors.

Step 3 examined interactions between GV and each of the parental factors. Each interaction term was entered on its own to avoid multicollinearity. There were significant interaction effects for GV by authoritative parenting style, GV by closeness in the parent–child relationship, GV by parental willingness to serve as a secure base, and GV by parental attitudes towards gender stereotypes. Girls who were more gender-variant had lower levels of SA when they had a more authoritative parent, more closeness in the parent–child relationship, a parent who was more willing to serve as a secure base, and a parent with more liberal attitudes towards gender stereotypes in children.

Discussion

The present study found an association between GV and SA in a nonclinical sample of boys, but not among a nonclinical sample of girls. This finding regarding boys is consistent with cross-cultural studies that found positive associations between recalled childhood GV and SA in nonclinical samples of feminine androphilic males from Canada [22], Samoa [20], and the Istmo Zapotec region of Mexico [21]. As such, it seems unlikely the findings of these retrospective studies were due to memory distortion. In addition, the GV-SA association in the current nonclinical sample of boys is consistent with reports of elevated levels of SA among clinical samples of GD-referred birth-assigned males [14–16]. The consistency in findings across studies suggests this association is not limited to clinical populations.

Separation anxiety and internalizing problems

This study was the first to suggest that SA is associated with GV among boys above and beyond internalizing problems more generally. As one would expect given SA is a type of internalizing problem, CBCL internalizing problems were positively associated with SA in both boys and girls; however, the association between GV and SA in boys remained significant even when statistically controlling for CBCL internalizing problems—as well as when statistically controlling for CBCL externalizing and peer problems. These findings contrast with those of VanderLaan et al. [14], who were not able to distinguish SA from the more general pattern of elevated internalizing problems in a clinical sample of GD-referred birth-assigned male children. One possible reason for the discrepancy in findings is that the sample size in the VanderLaan et al. [14] study was relatively small ($n = 360$) compared with that of the current study ($n = 892$). It is possible, then, that the lack of significant findings regarding a link between GV and SA in VanderLaan et al.'s [14] clinical sample when controlling for other internalizing problems might have been due to insufficient statistical power. Another consideration is that children in nonclinical samples likely experience fewer internalizing problems than children in clinical samples by virtue of the different recruitment methods. As such, among nonclinical as compared to clinical samples, SA might "stand out" more readily from the background internalizing profile. If so, one might expect that among birth-assigned males clinic-referred for GD, SA could often still be evident among those cases who show few internalizing problems in other domains.

A role for feminine gender role expression in influencing separation anxiety?

The present study suggests SA is a unique internalizing problem associated with GV and SA in boys. One possible explanation for this association is based on the observation that SA is a more female-typical characteristic. Indeed, SAD is more common among girls than boys [13], and although there was no significant difference in levels of SA between boys and girls in the present sample, there was a trend towards more SA in girls. Gender-variant boys display more feminine-typed traits (e.g., feminine play preferences) and, thus, may possess aspects of femininity that predispose them to SA. It remains unclear, however, whether feminine traits do in fact underlie SA and, if so, which feminine traits and why.

The present data concerning girls challenge, to some extent, the hypothesis that childhood SA is associated with femininity. Gender-variant girls adopt more masculine-typed traits. As such, this hypothesis would lead one to expect them to experience less SA. Yet, this study found no

Table 4 Multiple linear regression predicting separation anxiety in boys and girls

	Boys					Girls				
	B	SE	*β*	*t* value	*p* value	*B*	SE	*β*	*t* value	*p* value
Step 1: control variables										
Age (in years)	− 0.45	0.07	− 0.20	− 6.20	<.001	− 0.36	0.08	− 0.14	− 4.72	< 0.001
Average school performance	− 0.25	0.08	− 0.10	− 3.14	0.002	− 0.11	0.09	− 0.04	− 1.33	0.19
Marital status	− 0.46	0.17	− 0.08	− 2.71	0.007	− 0.33	0.17	− 0.06	− 1.90	0.06
Annual income	0.00	0.00	− 0.01	− 0.35	0.72	0.00	0.00	− 0.04	− 1.49	0.14
Peer problems	0.21	0.10	0.08	2.07	0.04	0.27	0.10	0.09	2.71	0.007
Internalizing problems	0.10	0.01	0.48	12.30	< 0.001	0.14	0.01	0.58	15.54	< 0.001
Externalizing problems	0.01	0.01	0.03	0.84	0.40	0.00	0.01	0.00	− 0.09	0.93
Step 2: parental variables and gender variance										
Authoritative parenting style	0.21	0.09	0.09	2.36	0.02	0.17	0.09	0.07	1.90	0.06
Authoritarian parenting style	− 0.15	0.10	− 0.07	− 1.47	0.14	− 0.03	0.10	− 0.01	− 0.27	0.79
Permissive parenting style	0.30	0.09	0.13	3.44	0.001	0.11	0.09	0.04	1.24	0.21
Conflict in parent–child relationship	0.20	0.13	0.08	1.61	0.11	0.09	0.12	0.03	0.76	0.45
Closeness in parent–child relationship	0.06	0.10	0.03	0.65	0.52	0.08	0.09	0.03	0.85	0.40
Parental willingness to serve as a secure base	0.21	0.11	0.09	1.90	0.06	0.15	0.12	0.06	1.40	0.16
Parental attitudes towards gender stereotypes	− 0.07	.08	− 0.03	− 0.85	0.40	− 0.15	0.08	− 0.06	− 1.92	0.06
Gender variance	0.18	0.07	0.08	2.43	0.02	− 0.04	0.07	− 0.02	− 0.52	0.60
Step 3: interactions[a]										
Gender variance by authoritative parenting style	− 3.30	0.92	− 1.45	− 3.60	0.001	− 1.83	0.80	− 0.72	− 2.29	0.02
Gender variance by authoritarian parenting style	0.06	0.42	0.03	0.15	0.88	0.22	0.39	0.09	0.57	0.57
Gender variance by permissive parenting style	− 1.03	0.51	− 0.45	− 2.04	0.04	0.02	0.40	0.01	0.05	0.96
Gender variance by conflict in parent–child relationship	0.03	0.47	0.01	0.05	0.96	0.28	0.43	0.10	0.64	0.53
Gender variance by closeness in parent–child relationship	− 9.87	1.85	− 4.28	− 5.33	< 0.001	− 3.41	0.85	− 1.34	− 4.01	< 0.001
Gender variance by parental willingness to serve as a secure base	− 3.95	.90	− 1.71	− 4.39	< 0.001	− 1.48	0.67	− 0.59	− 2.19	0.03
Gender variance by parental attitudes towards gender stereotypes	− 9.49	1.23	− 4.16	− 7.73	< 0.001	− 2.87	0.79	− 1.14	− 3.66	< 0.001

[a]Interaction terms were entered into the model individually to avoid multicollinearity

Gender variance = GIQC score, separation anxiety = SAI weighted mean sum score, authoritative parenting style = PSDQ-SF authoritative subscale, authoritarian parenting style = PSDQ-SF authoritarian subscale, permissive parenting style = PSDQ-SF permissive subscale, conflict in parent–child relationship = CPRS-SF conflict subscale, closeness in parent–child relationship = CPRS-SF closeness subscale, parental willingness to serve as a secure base = CRPR-SF, parental attitudes towards gender stereotypes = CRSRAS, peer problems = CBCL peer problems subscale, internalizing problems = CBCL internalizing *T* score, externalizing problems = CBCL externalizing *T* score

significant association between SA and GV in girls. The lack of a GV-SA association in girls is somewhat inconsistent with the study by Petterson et al. [23], who found that lesbians—who generally reported higher levels of GV in childhood—had elevated levels of SA. That said, Petterson et al. [23] did not find correlations between recalled childhood SA and GV among lesbians at the level of individual differences. The majority of data on this issue, then, indicate a lack of an association between gender expression and SA in girls. Thus, it seems that for any hypotheses regarding the role of feminine childhood gender role expression in influencing SA to be tenable, they would have to explain why gender role expression should be relevant for boys but not for girls.

Alternatively, highly gender-typical boys appear to be distinct from girls and gender-variant boys. Levels of masculinity typical of boys may be associated with less SA, possibly due to one or more factors. For example, gender-typical boys may receive differential parental and caregiver treatment based upon their gender and gender expression. In contrast, all girls may be perceived as feminine and treated accordingly regardless of gender expression while gender-variant boys may be perceived as distinct from other boys if they do not exhibit masculine-typed traits. Gender-variant boys may then be treated by parents in a more feminine-typical manner, resulting in female-typical emotional expression and SA. Also, gender-typical boys may be encouraged more so to seek comfort beyond their attachment figure, leading to greater emotional ease when separated from attachment figures. Future research should evaluate these possibilities.

Separation anxiety and parent-related factors

A number of parental factors were examined to assess their potential influence on SA in boys and girls. In terms of main effects, most parenting variables were not significantly related to SA. The exceptions were authoritative and permissive parenting styles (i.e., warm parenting styles), which were associated with elevated SA among boys. Due to the correlational nature of these data, the direction of the relationship between warm parenting styles and SA in boys is unclear. It may be that boys who experience distress upon separation from their parents elicit warm and supportive parental reactions. On the other hand, warm parental behaviour might contribute to SA in boys (e.g., by making proximity normative and, thus, instances of separation unfamiliar and distressing). In girls, however, parenting styles and SA showed no associations. One explanation for this gender difference could relate to findings that girls typically receive more warm parenting while boys are shown less affection [52]. As such, perhaps boys do tend to receive warm responses from their parents more so only when showing psychological distress.

The association of GV and SA appeared to be moderated by several parental factors. These effects were found in both boys and girls, suggesting that although girls do not differ in their levels of SA purely as a function of their degree of gender (a)typicality, gender expression in conjunction with parental factors is relevant to SA in girls. For gender-variant boys and girls, warm parenting styles (i.e., authoritative for boys and girls; permissive for boys) appeared to be a protective factor in relation to SA. Alanko et al. [31] found that adults who recalled more childhood GV and more cold and over-controlling parents experienced more adulthood psychopathology. Interestingly, cold and over-controlling parents (i.e., an authoritarian parenting style) were not a SA risk factor for gender-variant children in the current study. Instead, risk for SA among gender-variant children appeared to be related more so to the relative absence of parenting style that is warm (i.e., authoritative and permissive for boys) or warm and controlling (i.e., authoritative for boys and girls). That said, Alanko et al. [31] examined the moderating influence of parenting styles on the association between childhood GV and adulthood psychopathology; thus, different patterns might exist for childhood vs. adulthood psychological adjustment. Also, it may be that SA is to some extent unique from other forms of psychopathology and, therefore, may be impacted by parenting styles in a unique manner.

Closeness in the parent–child relationship also appeared to protect gender-variant children in regards to SA. However, the lack of main effects of closeness in the parent–child relationship on boys' and girls' levels of SA was inconsistent with previous literature suggesting that children who have a closer relationship with their parents have improved psychological well-being [39, 40]. It might be the case that gender-variant boys and girls are particularly sensitive to and in need of a close parental figure to provide a sense of emotional support. Fostering closeness in the parent–child relationship is a method that has already been recommended to increase the psychological well-being of gender-variant children [42], and the results of the current study further suggest that encouraging parent–child closeness may be a particularly important strategy for reducing SA among gender-variant children.

For gender-variant boys and girls, parental willingness to serve as an attachment figure appeared to be a protective factor in relation to SA. Gender-variant children may, therefore, be particularly sensitive to the attachment environment. Parents who are more willing to serve as an attachment figure can be inferred to be more likely to foster secure attachment; thus, the underlying construct driving the effect may in fact be a secure attachment style. These results are consistent with previous studies that found insecure attachment is associated with anxiety [35, 36] and gender atypicality in children [37].

Lastly, liberal parental attitudes towards gender stereotypes in children appeared to protect against SA in gender-variant children. This finding is consistent with previous literature suggesting that parental acceptance of cross-gender behaviour is important for the psychological well-being of gender-variant children, particularly with regard to internalizing problems [2, 32]. Moreover, the results provide further evidence for the potential effectiveness of interventions focused on increasing parental acceptance for children with high levels of GV, which have previously been suggested to decrease anxiety [33].

Clinical implications

This study provides potentially important information for clinicians. Recognizing that SA can be a unique internalizing problem for gender-variant birth-assigned male children may allow clinicians to be more attentive to and, thus, better identify symptomology of SA in this population. As such, psychological well-being may be improved via increased clinical attention to possible SA in particular, as opposed to a more general focus on internalizing problems. Additionally, the present study identified several parental variables that may serve as protective factors in relation to SA in both gender-variant birth-assigned males and females. For gender-variant children experiencing SA, psychological well-being might be promoted by encouraging their parents to focus on providing a secure base for the child, using a warm yet controlling parenting approach, encouraging a close relationship with the child, and encouraging the parent to hold liberal attitudes towards GV. Further research is needed, however, to determine the utility of these approaches.

Limitations

Regarding the use of parent-reports, parents are more likely to respond with positive self-evaluations and evaluations of their children [53]. Parents willing to complete a survey about their child's psychological well-being may differ from those who were not in ways relevant to the study outcomes (e.g., they may be more concerned about their child's mental health). Also, this study relied primarily on maternal reports. Some research has suggested that mothers and fathers have different impacts. For example, in their study of adults, Alanko et al. [31] found that the parenting styles of parents who were of the same sex as the participants had a greater moderating influence on the association between recalled childhood GV and psychopathology in adulthood. Similarly, van Beusekom et al. [32] found that same sex, compared to opposite sex, parental acceptance had a more profound impact on the association between GV and psychological distress and social anxiety in youth. As such, future research might benefit from considering potentially more objective measures of psychological well-being and from considering the potentially respective influences of mothers and fathers. Additionally, the current data lack clinically diagnostic information and, therefore, whether they generalize to clinical settings is equivocal. It is also important to note that due to the correlational nature of the present data, it is not possible to determine causality. Thus, it is unclear whether GV leads to SA, SA leads to GV, or they develop simultaneously in boys due to some factor(s) not considered here. In this regard, longitudinal studies would be helpful.

Summary

In nonclinical populations, SA appears to be linked to GV among boys, but not girls. The GV-SA association in boys exists even when controlling for internalizing problems, suggesting some aspect of SA is uniquely associated with GV. Several parental variables were identified as potential protective factors against SA for gender-variant boys and girls. These include authoritative parenting, willingness to serve as an attachment figure, closeness in the parent–child relationship, and liberal attitudes towards gender stereotypes in children. Thus, screening for SA may be important and several parental factors may be relevant to alleviating SA in gender-variant children.

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Compliance with ethical standards

Conflict of interest The authors declare they have no conflict of interest.

Research involving human participants All the procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. This article does not contain any studies with animals performed by any of the authors.

Informed consent Informed consent was obtained from all individual participants included in the study.

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