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Preliminary development of a brief parent-report gender identity alignment/distress screener for children

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Abstract

This research develops a brief, and preliminary, parent-report screener to assess gender identity alignment/distress in children. The increasing prevalence of children not identifying with their sex at birth, the length and outdated language of existing gender identity measures, and the need to assess gender identity among children (as opposed to adolescent/adult measures) motivate a screener. A survey containing 14 items from existing instruments was administered to a diverse set of 1110 parents of children ages 3–12. Exploratory and confirmatory factor analyses, followed by multiple indicators and multiple causes (MIMIC) modelling, were used to develop a 5-item, unidimensional screener that may assess gender identity alignment/distress. The screener may be suitable to identify children who experience misalignment between their gender and sex assigned at birth and parents or children for whom this misalignment causes distress. These families may benefit from additional resources and conversations between paediatric staff and children about their gender identity, including education for parents, and/or referrals for specialty care. Future research should further streamline and validate this preliminary screener, examine its convergence with gender identity and distress measures and explore including children's perspectives.

KEYWORDS

gender identity, gender non-conforming, screener, sex assigned at birth

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Statement of Contribution

- Increasing numbers of children have an internal sense of gender identity that differs from sex assigned at birth.
- Yet, measuring gender identity in children, particularly young children, is challenging.
- A brief and preliminary gender identity screener, focusing on subjective alignment/distress, was developed to help identify transgender and gender non-conforming children (TGNC);
- Early identification of TGNC children may provide opportunities to connect families to educational resources, support and specialty care when needed.

Our long-term goal is to validate a brief parent-report screener for gender identity in children ages 3–12, suitable for use in healthcare settings, paediatric offices, or to embed in other screening protocols. The preliminary version of this screener, focusing on alignment/distress (defined below), is detailed in this paper. A screener is needed because of the increasing number of children who identify their gender as something different from their sex assigned at birth, or SAB (deMayo et al., 2022) and racial, economic and geographic disparities in access to gender-affirming health care (Goldenberg et al., 2019; Inwards-Breland et al., 2021). The language used to describe such children includes gender expansive, gender non-conforming, gender minority, non-binary and transgender, among others (Deutsch, 2016; Zucker & Lawrence, 2009).

Gender identity is defined as an internal and felt sense of being a boy, girl, both or neither (Diamond, 2020). Mainstream professional associations have established that for some children, gender identity does not align with SAB (American Psychological Association, 2021; Rafferty, 2018; World Professional Association for Transgender Health, 2012). This range of gender identities is increasingly understood as a matter of natural diversity, not pathology; gender identity is recognized as fluid rather than fixed, potentially changing over time (Paine, 2018).

Cisgender children have an internalized sense of gender that aligns with their SAB. Other children have an internalized sense of gender not aligned with their SAB. This could include children who identify with another binary gender category or children who identify as nonbinary and do not identify as either binary gender (Joel et al., 2015; Leibowitz & Telingator, 2012). Only a subset of children whose gender does not align with their SAB eventually want to undergo a social gender transition (e.g., changing their name, pronouns, and gender presentation), and an even smaller subset will transition medically (e.g., cross-sex hormones and/or surgery). It is often unclear what young children will ultimately need (Hidalgo et al., 2013; Rafferty, 2018). Categorizing gender non-conforming children as “persisters” or “desisters” has also come under scrutiny, with researchers and healthcare professionals calling for understanding the complexity of children's gender diversity and the need to honour children's autonomy without dictating children's gender-related needs and wants in the future (Newhook et al., 2018).

Conceptualizing gender identity

Gender identity is an overarching concept that incorporates how a child thinks, feels, and talks about their own gender (Egan & Perry, 2001). Gender identity may manifest as a desire for pronouns or a name different from that given at birth and how they feel and talk about their sexual anatomy. Gender identity research in young children has drawn attention to appearance (e.g., clothing, hair, cosmetics, jewellery) and behaviour (e.g., preferred playmates, toys, roles in imaginary play) as indirect ways to communicate gender identity (Egan & Perry, 2001; Johnson et al., 2004).

Traditionally, children's appearance and behaviour were conceptualized as gender typical (i.e., child assigned female at birth wearing dresses) or gender-atypical (i.e., child assigned male at birth playing

with dolls). Challenges to gender essentialism and fixed, binary notions of gender call into question whether how children express themselves and behave truly reflects internal sense of gender (Hidalgo et al., 2013).

Conceptualizing distress about gender

The Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) describes gender dysphoria as psychological distress resulting from the misalignment between SAB and gender identity. Distress is considered clinically significant when children insist on a gender different from their SAB, express a strong dislike of their sexual anatomy, and/or express a desire for physical sex characteristics that match gender identity (American Psychiatric Association, 2013). Through the minority stress framework, gender dysphoria can be understood as resulting from internalized stigma; rejection; lack of affirmation at school, religious institutions, and healthcare institutions; and experiences of or anticipated discrimination (Delozier et al., 2020; Toomey, 2021).

Parent distress relating to incongruence between their child's SAB and gender identity has not been integrated into understanding children's gender identity - even though parent distress may take the form of lack of support for their child's gender identity which, in turn, may contribute to gender dysphoria, particularly if it serves as a barrier to accessing gender-affirming care. Parent distress can also be understood through the minority stress framework as parents may experience shame, internalized stigma, rejection, lack of affirmation, and discrimination relating to their child's gender identity (Hidalgo & Chen, 2019; Siegel et al., 2022).

Previous measures that assess gender identity in children

Multiple measures of gender identity and gender dysphoria in children have been developed (e.g., Egan & Perry, 2001; Green et al., 2018; Kozee et al., 2012; Martin et al., 2017; Yunger et al., 2004; Zucker et al., 1993), some of which have only been used with small samples, include outdated language and concepts, and lack strong psychometric properties (Bloom et al., 2021). More importantly, these instruments do not include items about parent and child distress. The most widely used parent-report measure, the 16-item Gender Identity Questionnaire for Children (GIQC), which includes questions about expression, behaviour, and gender dysphoria, is known for high cross-national and cross-clinic reliability (Johnson et al., 2004). Yet, this measure has been criticized for relying on outdated references (e.g., G.I. Joe and Barbie toys), stereotypical representations of gender, and a pathological conception of gender nonconformity (Bloom et al., 2021). The Trans Youth Project, the first large-scale, national, longitudinal study of socially transitioned transgender children, uses the GIQC with parents and has children complete picture-based questions to identify peer, clothing, and toy preferences (Gülgöz et al., 2019; Martin et al., 2017). Children are also asked what they feel like they are, with options "boy," "girl," or "something else." Children who choose "something else" are then given the options of "neither," "both," "it changes over time," or "I don't know."

Even with updated wording and scoring system (Hoq et al., 2023), the 16-item GIQC is too long for a brief screening tool and fails to capture parent or child distress. The Trans Youth Project's reliance on showing pictures and asking questions about gender directly with children is feasible as part of a large-scale research study because it can include child interviews without parents present. But, in clinical settings such as paediatric offices, medical staff rarely speak with children without a parent present. The Child Behaviour Checklist (CBCL) is among the only existing instruments with a brief screen for gender identity, asking parents if their children "wish to be of the opposite sex" (Achenbach & Rescorla, 2001; an earlier version also asked if their children "behave like the opposite sex"). This measure is limited because it relies on a traditional binary conception of gender and fails to distinguish gender from SAB. The CBCL may also inadvertently pathologize gender

nonconformity because the question is embedded in a 118-item instrument for identifying emotional and behavioural problems.

Multiple measures of gender dysphoria in children also exist, including the widely used 18-item Utrecht Gender Dysphoria Scale that assesses how a child feels (e.g., happiness, discomfort, distress) about their gender and sexual development (Chen et al., 2023; Natnita et al., 2021; Oshima et al., 2022). Because these measures focus on clinically significant levels of distress, they may equate misalignment with clinically significant distress and thereby pathologize gender expansiveness. However, when viewed along a continuum, *subclinical* levels of distress in children may be informative in assessing gender diversity and families in need of additional support.

It is also important to note that current measures of gender dysphoria do not assess parent distress, and measures globally assessing parent distress do not account for their child's gender identity as a source of that distress (Berry & Jones, 1995). One notable exception: the Perceived Parental Support and Attitudes about Gender Expansiveness for Youth (PAGES-Y) and Parents (PAGES-P) assess parental feelings about their child's gender, including pride, shame, and worry (Hidalgo et al., 2017; Reguitti et al., 2022). These measures were validated and designed for families with TGNC children who had been selected for treatment at a gender clinic. As such, the PAGES items and measures have not been validated with nor calibrated to a broader population. Furthermore, none of the items assess whether parents are concerned about misalignment between their child's SAB and gender. Finally, at 16 items, the PAGES is too long for use as a brief screener.

Developing a brief screening measure of gender identity

The increasing prevalence of children not identifying with SAB, the length of existing gender identity measures, and the need to specifically assess gender identity among children motivate a brief gender identity screener. To create the preliminary version of this screener, we developed an initial item set, adapting items from existing measures and writing new items, as detailed in Table 1. This set of items was then scrutinized via exploratory factor analysis (EFA), confirmatory factor analysis (CFA) and multiple indicators multiple causes (MIMIC) modelling, each with independent subsamples, following best practices in psychometric instrument development (e.g., DeVellis & Thorpe, 2021; Furr, 2017).

METHOD

Participants

Data from this study come from a sample of parents of children ages 3–12 living in the U.S. recruited via Lucid, a survey research firm that maintains a large national online research panel. Using quotas, the sample was designed to approximate the demographic and geographic distribution of the U.S. population. Yet, because our sampling inclusion criteria included being a parent of a child younger than 12 and because women typically assume the primary caregiver role, the sample skewed younger and more female than the broader population. These demographics, along with how they correspond to the U.S. population are detailed in Table 2 for each of the three randomly drawn analytic subsamples; please see Hillier et al. (in press) for further detail regarding the demographic and geographic diversity of the sample.

Procedures

Lucid directed panel participants to an online Qualtrics survey. Our analysis includes responses from 1100 participants who completed our 46-item survey in an average of 6.7 min (median = 4.8 min). If

TABLE 1 Listing of initial items and source.

Variable name, item stem and response options	Item adapted from	Citation
1. Playmates: Who are your child's playmates outside your family? Always or usually boys, always or usually girls, a combination of boys and girls, my child does not play with other children	Gender Identity Questionnaire for Children (GIQC)	Johnson et al. (2004)
2. PlayWithToys: Given the choice, would your child choose to play with action figures, dolls or some combination? Action figures, dolls, some combination.	GIQC	Johnson et al. (2004)
3. TVcharacters: When your child imitates characters from TV or the movies, are they usually girls or women? Boys or men? Some combination?	GIQC	Johnson et al. (2004)
4. PlayingHouseRole: When playing 'house' or 'family', what role does your child usually take? Mother, daughter or other girl/woman roles; father, son or other boy/man roles; some combination	GIQC	Johnson et al. (2004)
5. Cosmetics: How often does your child experiment with wearing cosmetics (make-up) and jewellery? Often, sometimes, never	GIQC	Johnson et al. (2004)
6. WishDiffGender: Has your child ever said to you they <i>wish</i> they were a different gender, like a boy wanting to be a girl?	GIQC	Johnson et al. (2004)
7. AreDifferentGender: Has your child ever said to you they <i>are</i> a different gender?	GIQC	Johnson et al. (2004)
8. Anatomy: Has your child ever said they do not like their sexual anatomy ('private parts')?	GIQC	Johnson et al. (2004)
9. FitGender: How well does your child fit in with other children of the same gender? not at all—very well	Gender typicality	Egan and Perry (2001)
10. Hair: How does your child prefer to wear their hair? Short, medium, long	Item developed by the author	
11. ChildAppearsOthers: How do you think other people would typically describe your child's appearance (hairstyle, clothing, etc.)? Masculine, feminine, gender neutral, sometimes masculine, sometimes feminine	Socially assigned GNC	Wylie et al. (2010)
12. ChildAppearsParent: How would <i>you</i> describe your child's appearance (hairstyle, clothing, etc.)? Masculine, feminine, gender neutral, sometimes masculine, sometimes feminine	Socially assigned GNC	Wylie et al. (2010)
13. ChildDistress: Does thinking or talking about gender cause <i>your child</i> distress?	Gender dysphoria	McGuire et al. (2020)
14. ParentDistress: Does thinking or talking about your child's gender cause <i>you</i> distress?	Gender dysphoria	McGuire et al. (2020)

participants had more than one child between the ages of 3 and 12, they were asked to answer questions based on who had most recently had a birthday. The study protocol was approved by the University of Pennsylvania Institutional Review Board.

TABLE 2 Participant demographics in each phase of analysis.

	Race/ethnicity						
	MENA	AI/AN	AA/PI	B/AA	H/L	WH	Multi
Phase One: EFA	0; 0%	3; 1%	16; 5.33%	44; 14.67%	22; 7.33%	194; 64.67%	21; 7%
Phase Two: CFA	1; .03%	7; 2.33%	19; 6.33%	46; 15.33%	15; 5.00%	193; 64.33%	19; 6.33%
Phase Three: MIMIC	0; 0%	5; 1.00%	32; 6.40%	78; 15.6%	25; 7.00%	324; 64.8%	26; 5.20%
US Population	Unavailable	2.9%	5.8%	12.1%	21.9%	56.9%	3.9%
	Age						
	18–24	25–30	31–39	40–49	50–59	60 and over	
Phase One: EFA	15; 5%	45; 15%	146; 48.67%	73; 24.33%	14; 4.67%	7; 2.33%	
Phase Two: CFA	19; 6.33%	36; 12%	135; 45%	85; 28.33%	17; 5.67%	8; 2.67%	
Phase Three: MIMIC	28; 5.6%	65; 13%	230; 46%	131; 26.2%	36; 7.2%	10; 2%	
US Population ^a	3.4%	8.6%	37.3%	35.8%	15.0%		
	Education						
	<HS	HS	A.S.	B.A./B.S.	Graduate		
Phase One: EFA	15; 5%	88; 29.33%	82; 27.33%	67; 22.33%	48; 16%		
Phase Two: CFA	11; 3.67%	75; 25%	80; 26.67%	80; 26.67%	54; 18%		
Phase Three: MIMIC	26; 5.2%	133; 26.6%	138; 27.6%	114; 22.8%	89; 17.8%		
US Population	8.8%	26.5%	24.3%	42.2%			
	Gender						
	Man	Woman	Nonbinary	Transgender	Something else		
Phase One: EFA	103; 34.33%	197; 65.67%	0; 0%	0; 0%	0; 0%		
Phase Two: CFA	84; 34.33%	211; 70.33%	2; .67%	1; .33%	2; .67%		
Phase Three: MIMIC	162; 32.4%	331; 66.2%	3; 0.6%	1; 0.2%	3; 0.6%		
US Population	45.0%	55.0%	Unavailable	Unavailable	Unavailable		

Note: Phase One (EFA) N = 300; Phase Two (CFA) N = 300; Phase Three (MIMIC) = 500. Each cell contains the N and row proportion (expressed as a percentage).

Abbreviations: <HS, did not finish high school; A.S., associate's degree or some college; AA/PI, Asian American/Pacific Islander; AI/AN, American Indian or Alaskan Native; B.A./B.S., college degree; B/AA, Black/African American; Graduate, graduate degree; H/L, Hispanic/Latino/a; HS, finished high school; MENA, Middle Eastern or North African; Multi, Multiracial; WH, white.

^aData about the U.S. Population came from multiple sources, as no single source had all variables for parents of young children. Gender distribution is based on the 2022 Current Population Survey (CPS) and includes parents who live with their children under age 12 (U.S. Census Bureau, 2022). Age, education and race/ethnicity are based on the 2022 CPS and include parents who live with their children under age 18 (U.S. Census Bureau, 2023). Region is based on 2022 estimates for people of all ages by the U.S. Census Bureau (2023). Place of birth is from the 2021 American Community Survey for adults ages 18–74 (U.S. Census Bureau, American Community Survey, 2022). Race/ethnicity 2020 voting data are from the US Census (2020). Recent estimates of the distribution of parents by sexual orientation and relationship to child were not available. A fuller version of this table was also provided in Hillier et al. (in press).

Measures

Table 1 depicts the content and source for each of the 14 items used in the screener development. We adapted eight items from the GIQC (Elizabeth & Green, 1984). Specifically, we consolidated the ‘boy’ and ‘girl’ versions of the survey. So, for example, rather than asking how often a child plays with ‘girl-type’ dolls, such as ‘Barbie’ or ‘boy-type’ dolls, such as ‘G.I. Joe,’ we asked if, given a choice, their child would prefer to play with action figures, dolls, or some combination. We created one item measuring preference for hairstyle. We adapted a question about gender fit from the Egan & Perry, (2001) measure to assess feelings of gender typicality. The original question asked how often

it was true that they 'don't feel they're just like all the other girls their age'. We asked, 'How well does your child fit in with other children of their same gender?' We adapted two items about how others perceive gender based on the Wylie et al. (2010) measure. The original question asked how other people would describe their appearance, style, or dress with options of very feminine, mostly feminine, somewhat feminine, equally feminine and masculine, somewhat masculine, mostly masculine, or very masculine. We asked how other people and how the parent would describe the child's appearance with options of masculine, feminine, gender neutral, and sometimes masculine, sometimes feminine. We adapted two questions from the Utrecht Gender Dysphoria Scale (UGDS) (McGuire et al., 2020) focused on distress about bodily functions post-puberty ('puberty felt like a betrayal' and 'the bodily functions of my assigned sex are distressing for me'), to ask about distress among children or parents relating to children's gender identity.

Overall, the percentage of missing data in the data was nearly zero (0.06%). Still, analyses accounted for missingness via full information maximum likelihood methods in the factor analytic and MIMIC analyses.

Analytic approach

All data cleaning and analysis was conducted in R, version 3.5.1 (R Foundation for Statistical Computing), including the *tidyr*, *psych*, *psychtools*, *lavaan* and *lavaanPlot* packages. The items, which were dichotomous or 0–2 response ranges, were considered categorical for all analyses. Some items required recoding, in that they asked about gendered patterns of play or appearance that may diverge or converge with child SAB. For example, the *PlayingHouseRole* variable assessed whether the child typically plays female, male or some combination of gendered roles when playing house or family. The gender attributed to that role was compared to the child's SAB, such as children assigned female at birth (AFAB) who typically played female roles were coded as conforming and children who are AFAB who typically played male roles were coded as expansive. R code and more specifics about this recoding can be obtained by contacting the first author; however, no items requiring this recoding were ultimately included in the resulting preliminary screener (detailed below).

Analyses proceeded in three sequential phases, with distinct and randomly drawn subsamples, without replacement (i.e., a participant can only be included in one of these subsamples), to provide requisite power for each phase. Analyses began with an EFA to generate hypotheses about dimensionality ($N=300$), then a CFA to test those hypotheses about factor structure ($N=300$), and concluded with MIMIC models ($N=500$) to identify systematically biased items, in order to obtain the most brief and efficient screener. The sample size for each phase was calibrated to provide the necessary power for EFA (DeVellis & Thorpe, 2021), CFA (Furr, 2017) and MIMIC (Diemer et al., 2024) analyses, particularly given the small number of items.

RESULTS

Exploratory factor analysis

From the larger sample, 300 participants were randomly selected (without replacement) for the first EFA phase. Participant demographics for EFA analyses are detailed in Table 2.

The fourteen items listed in Table 1 were all considered in the EFA. A number of criteria were used to determine the number of factors to retain, including Kaiser's criterion, scree plots, the Very Simple Structure (VSS) function in R's "psych" package, parallel analysis, item loadings, model fit estimates, and substantive plausibility. These criteria suggested that three- and four-factor models should be considered.

Three- and four-factor models were compared, with different extraction methods (e.g., ML, minres, WLSMV). An oblique rotational method (i.e., oblimin) was used in all EFA analyses for factors that were assumed to be correlated. A priori criteria for item loadings were used, with a minimum loading of 0.40 and no cross-loadings within 0.15 (Worthington & Whitaker, 2006). Of these models, a three-factor model, using minres (minimized squared residuals, using ordinary least squares) factor extraction (Revelle, 2022), yielded the most interpretable solution. This model fits the data quite well (RMSEA = 0.04, TLI = 0.97, SRMR = 0.03; see DeVellis & Thorpe, 2021; Furr, 2017) and yielded three substantively plausible factors, which we have named ‘Alignment/Distress’, ‘Appearance’ and ‘Behaviour’. The loading of items measuring alignment and distress onto the same factor diverged from our prior assumption of what factor structure would emerge. Yet, guided by these results, we more fully consider the alignment/distress factor below.

Of the original 14 items, nine were loaded onto three identified factors in an interpretable solution; the other 5 items were removed from further consideration. All EFA item loadings are detailed in Table 3. The three factors were moderately ($r = .42$, Alignment/Distress and Appearance; $r = .35$, Appearance and Behaviour) to weakly ($r = .18$, Alignment/Distress and Behaviour) correlated. One item, ‘PlayingHouseRole’ was retained because its 0.45 loading exceeded the minimum 0.40 criterion, but the magnitude of its loading was relatively weak. This is noted because the PlayingHouseRole variable was

TABLE 3 Exploratory factor analyses ($N = 300$).

Factor and items	Loadings		
	1	2	3
Factor 1: ‘Alignment/distress’			
Anatomy: Has your child ever said they do not like their sexual anatomy (‘private parts’)?	0.85*	−0.04	−0.12
ParentDistress: Does thinking or talking about your child's gender cause you distress?	0.56*	0.03	0.03
ChildDistress: Does thinking or talking about gender cause your child distress?	0.66*	0.06	−0.05
WishDiffGender: Has your child ever said to you they wish they were a different gender, like a boy wanting to be a girl?	0.69*	0.05	0.10
AreDifferentGender: Has your child ever said to you they are a different gender?	0.77*	−0.02	0.10
Factor 2: ‘Appearance’			
ChildAppearsOthers: How do you think other people would typically describe your child's appearance (hairstyle, clothing, etc.)?	−0.01	0.92*	−0.03
ChildAppearsParent: How would you describe your child's appearance (hairstyle, clothing, etc.)?	0.01	0.73*	0.03
Hair: How does your child prefer to wear their hair? (short, medium, long)	0.25	0.33	0.10
FitGender: How well does your child fit in with other children of the same gender?	0.03	0.15	0.16
Factor 3: ‘Behaviour’			
TVcharacters: When your child imitates characters from TV or the movies, are they usually (girls/female, boys/male or some combination)?	−0.03	−0.04	0.79*
PlayingHouseRole: When playing ‘house’ or ‘family,’ what role does your child usually take?	0.21	0.11	0.45*
Playmates: Who are your child's playmates outside your family? (girls/boys/combination)	−0.16	0.06	0.28
Cosmetics: How often does your child experiment with wearing cosmetics (make-up) and jewellery?	0.03	0.11	−0.01
PlayWithToys: Would your child choose to play with action figures, dolls or some combination?	0.12	0.17	0.31

Note: All coefficients standardized.

* $p < .05$.

subjected to further empirical scrutiny with CFA and MIMIC analyses and was ultimately removed at a subsequent analytic phase because it did not perform adequately.

Confirmatory factor analysis

In the next phase, nine items that loaded onto three factors in the EFA were retained and further empirically scrutinized via CFA. A new random subsample, without replacement, of 300 participants was used to cross-validate the initial EFA model with CFA. Participant demographics for the CFA are detailed in Table 2.

Notably, CFA constrains all cross-loadings to zero—an item can load only onto one of the three specified factors and is assumed to have no relationship to other factors in the CFA (Worthington & Whitaker, 2006). For the CFA, the a priori criterion of item loadings greater than 0.40 was used. WLSMV (weighted least squares, mean and variance adjusted) estimation was used for these categorical items. Latent variances were constrained to one and the first item was freely estimated to identify the model. In sum, the aim of the CFA was to cross-validate the factor structure obtained via the EFA, with an independent sample.

The specified CFA model (Table 4) was a strong fit to the data (RMSEA=0.06, CFI=0.99, TLI=0.99, SRMR=0.05) and confirmed the three factors identified in the preceding EFA phase. The three factors were moderately ($r=.62$ for Alignment/Distress and Appearance; $r=.57$ for Appearance and Behaviour; $r=.58$ for Alignment/Distress and Behaviour) correlated. All nine items significantly loaded onto their specified latent construct, with seven of the items at a magnitude greater than 0.90. Of these nine items, five measured the Alignment/Distress factor, and two items measured the Appearance and Behaviour factors (respectively).

TABLE 4 Confirmatory factor analysis (N=300).

Latent variables and observed indicators	Standardized loading	SE	R ²
Factor 1—Alignment/Distress			
Anatomy: Has your child ever said they do not like their sexual anatomy ('private parts')?	0.95*	0.02	.90
Parent Distress: Does thinking or talking about your child's gender cause you distress?	0.87*	0.04	.76
Child Distress: Does thinking or talking about gender cause your child distress?	0.95*	0.02	.90
Wish Different Gender: Has your child ever said to you they wish they were a different gender, like a boy wanting to be a girl?	0.94*	0.03	.88
Are Different Gender: Has your child ever said to you they are a different gender?	0.95*	0.02	.91
Factor 2—Appearance			
Other Child Appearance: How do you think other people would typically describe your child's appearance (hairstyle, clothing, etc.)?	0.91*	0.06	.84
You Child Appearance: How would you describe your child's appearance (hairstyle, clothing, etc.)?	0.91*	0.06	.83
Factor 3—Behaviour			
TVcharacters: When your child imitates characters from TV or the movies, are they usually?	0.53*	0.07	.28
PlayingHouseRole: When playing 'house' or 'family', what role does your child usually take?	0.92*	0.09	.85

Note: All coefficients standardized.

* $p < .05$.

Multiple indicators and multiple causes (MIMIC) analyses

Multiple indicators and multiple causes models tested whether the nine items identified in the CFA were biased against groups of interest. In this case, MIMIC models were employed to examine whether items were biased against children assigned male at birth (AMAB) or against AFAB children. Identifying measurement bias in this way is important to ensure that items on the screener are ‘fair’—function similarly for AMAB and AFAB children—without systematic bias in how items are scaled (Furr, 2017). The MIMIC approach to differential item functioning provides highly similar results to an item response theory (IRT) approach (Diemer et al., 2024).

A new subsample of 500 participants was randomly drawn (without replacement) from the larger data collection, for MIMIC analyses. Participant demographics for the MIMIC phase are detailed in Table 2.

The MIMIC model specifies a CFA, adding an exogenous covariate—in this case, SAB—that first predicts the latent variable, as depicted in Figure 1 (see Diemer et al., 2024, for more background on MIMIC models). This first phase of the MIMIC model tests whether AMAB versus AFAB children have higher latent levels (i.e., means) for each of the three latent constructs, as indicated by a one-way arrow from the SAB covariate to each of the latent constructs. Retaining these paths in the next phase of MIMIC modelling has the effect of equating the latent means across groups when subsequently testing for item bias (Furr, 2017).

The initial MIMIC model fit the data well (RMSEA = 0.06, CFI = 0.99, TLI = 0.99, SRMR = 0.05). AMAB children (the ‘1’ group in the SAB exogenous covariate, the group for whom estimates are interpreted) had higher latent means that approached significance for the Alignment/Distress latent variable (0.09, $p = .18$) and for the Appearance latent variable (0.12, $p = .05$), and similar latent means for the Behaviour latent variable (0.00, $p = .96$). Collectively, this suggests parents of AMAB children had levels of Alignment/Distress that trended higher than parents of AFAB children. However, these latent mean differences are not evidence of measurement bias in the individual items. Specific to these analyses, gendered forms of play that are more salient or common would lead to latent mean differences in the Behaviour latent variable, for example. However, these overall or latent mean differences are controlled away in the subsequent phase of the MIMIC analysis, such that item intercepts should be equivalent (unbiased) after adjusting for latent mean differences (Diemer et al., 2024).

The next phase of the MIMIC model tests whether the exogenous covariate (SAB) predicts individual items; significant relationships are evidence of systematic group bias in the intercept terms. Again, item intercepts should be equivalent across SAB, after adjusting for latent mean differences in the Behaviour latent variable. Intercept bias would indicate a failure to establish scalar invariance, or that the items are scaled in the same way and mean the same thing across groups (Furr, 2017). MIMIC modelling identified two items with systematic bias, depicted in Figure 1. First, the SAB exogenous covariate significantly predicted ($B = -0.15$, $p = .01$) ‘TV characters’, an indicator of the Behaviour latent variable. That is, parents of children AMAB were less likely to report their children engaging in gender-expansive play (i.e., imitating female television or movie characters), even after equating the mean levels of Behaviour for AMAB and AFAB children. Second, the SAB exogenous covariate significantly predicted ($B = 0.24$, $p = .01$) ‘PlayingHouseRole’, an indicator of the Behaviour latent variable. That is, parents of AMAB children were more likely to report their children engaging in gender-expansive play (e.g., acting out female roles while ‘playing house’), even after equating the mean levels of Behaviour for AMAB and AFAB children. These patterns of intercept bias in these two items are concerning, in that parents systematically under- or over-endorsed items based on their child’s SAB. In sum, parents of AMAB children may be more attuned to gender-expansive identification and appearance, as suggested by trending higher latent means for these two latent variables. Further, two Behaviour items exhibited differential item functioning, suggesting parents may under-report on their AMAB children acting out female TV roles yet may over-report their AMAB children acting out female household roles. Importantly, the MIMIC modelling approach does not indicate whether biased items are caused by gendered patterns of recognition (e.g., parents of AMAB children more likely to recognize playing

Exogenous covariate, where 0 = assigned female at birth and 1 = assigned male at birth

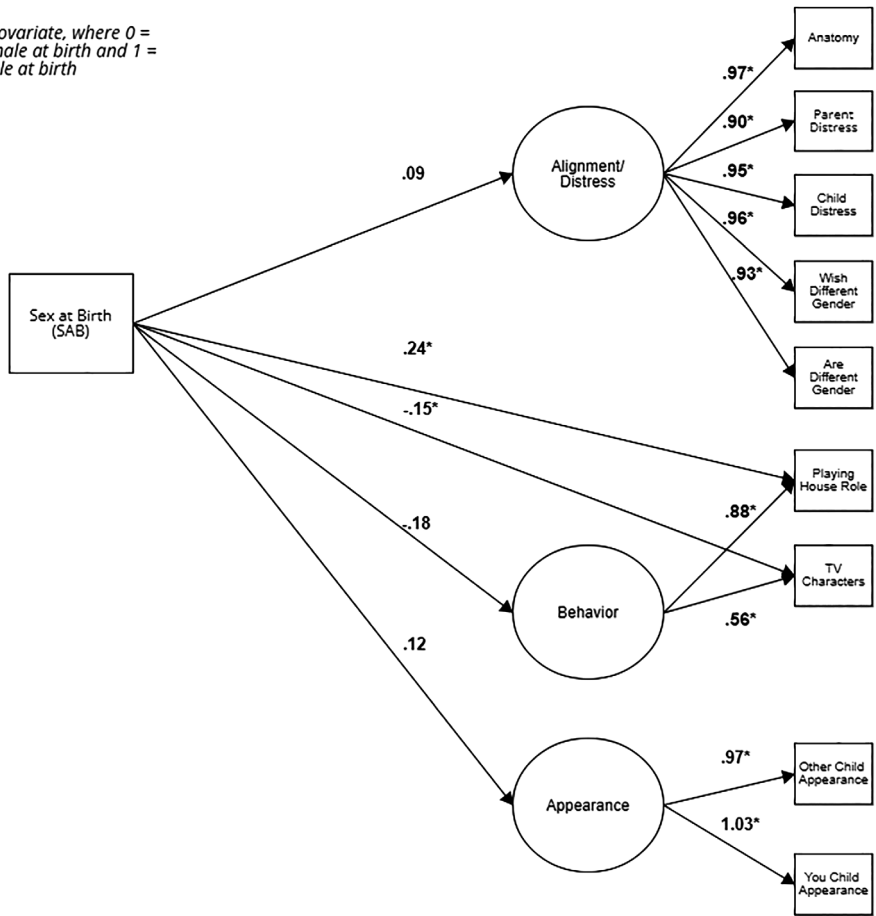


FIGURE 1 Multiple indicator and multiple causes (MIMIC) model. All coefficients are standardized; significant regression paths are denoted with an asterisk. SAB exogenous covariate is coded where child assigned female at birth = 0 and child assigned male at birth = 1. Second path from SAB exogenous covariate to second observed indicator (TV Characters), where $\beta = -.15$, not displayed for clarity.

out female roles), endorsement (e.g., parents of AMAB children more likely to report playing out female roles) or some combination of the two.

However, this approach does provide important evidence arguing against retaining both Behaviour items in the final version of the scale. Further, the PlayingHouseRole variable (which also measures the Behaviour latent variable) demonstrated a weaker magnitude of loading at the previous EFA phase. Because the Behaviour subscale is only comprised of these two items that exhibited bias in the MIMIC analyses, the Behaviour latent variable may not be viable.

Final scale version

General methodological guidelines and these analyses suggest that a one-factor version of this preliminary screener is the most viable and parsimonious. The Appearance and Behaviour subscales are only comprised of two items and thus assess less content in the underlying constructs than a longer subscale (These two-item subscales would also not be identified in a latent variable model; Furr, 2017). Specifically, the PlayingHouseRole item performed poorly in two of these three models and the TV

characters item demonstrated bias against parents of SAB male children in the MIMIC model. These two items comprise the two-item Behaviour subscale and provide evidence against using the Behaviour subscale, because of the flaws in its two items.

The Appearance and Behaviour subscales are carefully detailed above to inform future research and practice, but we cannot recommend using these subscales. Instead, the 5-item Alignment/Distress subscale which withstood psychometric scrutiny across the three phases of analyses, serves as a preliminary gender identity screener. These five items also demonstrated a consistent and relatively homogeneous degree of inter-correlation ($r = .58-.74$).

Screeners serve a crucial role in identifying individuals who may benefit from further evaluation, underscoring the necessity of a scoring mechanism for potential identification. Given that most respondents in our sample did not affirm any of our gender identity alignment/distress screening items, we suggest that any item endorsement (i.e., non-zero scores) should prompt a more in-depth conversation about the child's gender identity—but should not be used to diagnose a child's gender identity over the long term. These discussions should be respectful of the child's autonomy and mindful of the relative fluidity of children's gender identity over time (Newhook et al., 2018). Detailed information about this preliminary screener, including item descriptions and usage guidelines, is available in the User's Guide within the Supplemental Material (Diemer et al., 2024, Data S1).

DISCUSSION

This research aimed to create a preliminary, brief, and efficient gender identity alignment/distress screener. It contributes to the literature in three primary ways. First, psychometric scrutiny establishes the viability of measuring gender identity alignment/distress with this preliminary screener and provides evidence in support of this screener with children, leveraging parent reports. As detailed above, we provisionally recommend a 5-item and unidimensional screener to assess gender identity alignment/distress. This preliminary and parent-report screener provides a developmentally-attuned approach to assess gender identity alignment/distress in children, although it does not directly assess gender identity. While even young children can generally understand their gender identity, communicating it to professionals in the presence of their parents may be intimidating. From a theoretical perspective, the screener assesses perceived SAB/subjective gender *alignment* as well as *distress* secondary to misalignment. The psychometric analyses carried out suggested these items precisely assess this domain with this population. Importantly, this screener does not equate misalignment with clinically significant levels of distress—instead conceptualizing alignment and distress along a continuum.

Second, related work (Hillier et al., [in press](#)) further establishes the widespread acceptability of asking parents about their young children's gender identity. In that work, 87% of respondents indicated that asking questions about their child's gender identity was acceptable. Establishing this acceptability is important because the sensitivity of gender identity might lead some to think that many parents would have reservations about discussing it.

Third, this preliminary 5-item screener may be suitable for use in clinics, schools and other settings that require an efficient, yet precise, assessment tool that may help to identify children for whom SAB and gender do not align and who may benefit from additional resources, including education for parents, and referrals for specialty care. Some parents may endorse misalignment or distress that is developmentally normative, fleeting, or distress related to their child's gender not indicative of misalignment and not necessitating additional services (i.e., 'false positives'). However, this preliminary screener for gender identity alignment/distress is not intended for diagnosing a child as transgender nor for determining a child's long-term and more extensive gender-care needs (Newhook et al., 2018). Further development of this preliminary screener will minimize false positives and false negatives.

The emergence of five items relating to alignment/distress suggests that questions about clothing, hair, make-up, toys, playmates and dress-up (which comprised the second and third subscales) are less helpful in distinguishing children for whom gender and SAB are not aligned. These questions make up a significant part of the GIQC and may have been more relevant in 1984, when the GIQC was developed (Elizabeth & Green, 1984). Over the past 40 years, gender norms have become less rigid—reflected in items exhibiting bias in the MIMIC modelling. Specifically, some forms of gender expansive behaviour were more likely to be endorsed for AMAB (i.e., taking on female roles while playing ‘house’) while other forms were less likely to be endorsed for AMAB (i.e., taking on female roles while acting out television or movie characters). What is understood as systematic bias in these analyses likely reflects meaningful differences in societal gender expectations for children assigned male versus female.

Limitations and future directions

From a practical standpoint, healthcare and education professionals largely rely on parents to report on the gender identity of their young children. However, children may not be able to—or choose not to—disclose all aspects of their gender identity to their parents. Parental perspectives on their child's gender may vary from how children understand their own gender (e.g., parents may be more distressed about gender misalignment than children). Or, parents may choose not to acknowledge gender expansiveness in their children. On the other hand, younger children may not be able or willing to communicate their gendered experiences to their parents. Relatedly, perceptions of gender alignment and distress (the domains measured by the 5-item measure) represent one, but not the totality of, gender identity (Newhook et al., 2018). Despite their affordances, parent reports have limitations to be acknowledged.

Convergent and divergent validity evidence could not be estimated because other measures were not administered, which is a limitation. Specifically, examining how scores on this screener converge with scores on other child and/or parent–child alignment/distress measures is a key direction for future research and would provide important construct validity evidence for the screener. Similarly, this screener likely correlates with measures of child gender identity, which ought to be further examined. Secondly, test–retest reliability estimates were not obtained in this cross-sectional data collection. Given the potential fluidity of children's gender identity, it is crucial to understand that this screener offers a snapshot of gender identity, recognizing these identities may evolve (Newhook et al., 2018). This context also implies that relying on test–retest reliability could yield deceptive insights, as the fluid and changing nature of children's gender identity over time may suggest limited test–retest reliability. These limitations suggest the need to build on this preliminary version to validate a broader, yet brief, screening measure that captures more facets of gender-related misalignment and distress. Assessing gender identity directly within the screener would make it prohibitively long, and including children directly in the assessment would be impractical, likely involving a conversation, not a simple set of items. In future research, parental reports of their children's gender identity (e.g., a binary gender category, gender expansive or transgender) and children's reports of their own gender need to be assessed and compared to measured alignment/distress, to provide convergent validity evidence. Yet, this screener is intentionally not asking parents or children to report gender identity directly because that cannot be done with a few closed-end items.

It may be that alignment, parental distress and child distress would form three distinct factors if enough new items could be written to sufficiently measure each of these proposed domains. Future research should obtain convergent and divergent validity evidence with this new measure and use IRT methods to yield the most streamlined and efficient screener (DeVellis & Thorpe, 2021). If implemented widely, this preliminary screener provides a tool by which to intervene on racial, economic and geographic disparities in access to gender-affirming health care (Inwards-Breland et al., 2021), yet does not directly address these disparities. Relatedly, this paper did not examine racial/ethnic, geographic or other demographic factors that might affect the screener's performance and need to be investigated in

future research. Future research should also consider how children can provide input about their gender in ways that honour their autonomy. In short, this brief, and preliminary, screener is an important step towards these longer-term goals.

CONCLUSION

Recent surveys show the number of adolescents who identify as transgender or non-binary is increasing, but in the absence of measures for children under 12, we have no way to estimate the number of these younger children for whom gender does not align with SAB (deMayo et al., 2022). A brief and preliminary parent-report screener provides an instrument for this as well as identifying families who may benefit from early intervention. Further, this preliminary screener provides a practical approach to capturing gender identity relating to alignment and parent and child distress. Future inquiry should build on this screener by incorporating ways children can contribute their own perspective regarding gender identity, examine the stability of gender identity over time, and test how this screener converges and diverges with other measures.

AUTHOR CONTRIBUTIONS

Matthew A. Diemer: Software; formal analysis; project administration; data curation; methodology; validation; visualization; writing – review and editing; writing – original draft; investigation; conceptualization. **Amy Hillier:** Conceptualization; funding acquisition; writing – original draft; writing – review and editing; resources; investigation; data curation; project administration. **Steven C. Marcus:** Conceptualization; investigation; funding acquisition; writing – original draft; writing – review and editing.

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CONFLICT OF INTEREST STATEMENT

The authors have no conflicts of interest to report.

DATA AVAILABILITY STATEMENT

Research data are not shared.

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SUPPORTING INFORMATION

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