

**A Multidimensional Approach to Gender Identity Assessment in Patients with Differences
of Sex Development (DSD) – Supplementary Materials**

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Supplementary Table 1. Patients' diagnosis (or genital/anatomic phenotype).

DSD Category	Gender of rearing	DSD Diagnosis	n	%	
46,XY DSD	Girl	complete androgen insensitivity syndrome	7	10	
		complete gonadal dysgenesis (CGD; MAP3K1-related)	4	6	
		CGD (SRY-related)	1	1	
		CGD (unspecified)	5	7	
		17-beta hydroxysteroid dehydrogenase 3 deficiency	2	3	
		partial androgen insensitivity syndrome (PAIS)	2	3	
		partial gonadal dysgenesis	3	4	
	Boy	17-beta hydroxysteroid dehydrogenase 3 deficiency	1	1	
		anorchia	1	1	
		proximal hypospadias	5	7	
		partial androgen insensitivity syndrome ^b	2	3	
		anorectal malformation: cloacal exstrophy	3	4	
		Subtotal	36	50.0	
	46,XX DSD	Girl	Mayer-Rokitansky-Küster-Hauser syndrome	2	3
			primary ovarian failure	1	1
anorectal malformation: cloacal exstrophy			5	7	
OHVIRA ^c			1	1	
VACTERL ^d			2	3	
21-OH congenital adrenal hyperplasia			12	17	
ovotesticular DSD		2	3		
Boy		testicular DSD (dup SOX9)	1	1	
		Subtotal	26	36.1	
Sex Chromosome DSD^a		Girl	isodicentric Y chromosome	1	1
	partial gonadal dysgenesis		4	6	
	Boy	isodicentric Y chromosome	1	1	
		mixed gonadal dysgenesis	2	3	
		Klinefelter syndrome	2	3	
	Subtotal	10	13.9		

^a 45,X/46,XY; 45,X/46,Xidic(Y); 47,XXY; 48,XXXY

^b The karyotype for one patient with PAIS was 47,XYY, but this was noted by the geneticist as not etiologically responsible for the DSD. The patient is therefore classified as 46,XY DSD

^c OHVIRA (Obstructed Hemi-Vagina with Ipsilateral Renal Agenesis); ^d VACTERL (Vertebral defects, Anal atresia, Cardiac defects, Brachioesophageal fistula, Renal anomalies, and Limb abnormalities)

Supplementary Table 2. Age at and interval between initial questionnaire administration.

SPP version		Age at SPP			Age at MGIS ³			Age at BIS ⁴		
		<i>n</i>	M (yrs)	SD	<i>n</i>	M (yrs)	SD	<i>n</i>	M (yrs)	SD
Girl	Child ¹	22	11.06	1.26	24	10.95	1.33	44	13.63	2.62
	Adolescent ²	21	15.84	1.37	30	15.48	2.15			
Boy	Child	10	10.56	1.68	12	10.51	1.66	13	13.17	1.83
	Adolescent	5	15.16	1.98	6	14.95	1.93			

		Interval (days) between completion of MGIS and SPP			Interval (days) between completion of MGIS and BIS				
		<i>n</i>	M (yrs)	SD	<i>n</i>	M (yrs)	SD		
Girl	Child	22	31.41	133.89	Girl	Child	18	76.17	171.36
	Adolescent	21	37.76	316.74		Adolescent	26	17.88	87.18
Boy	Child	10	15.50	246.60	Boy	Child	7	381.57	688.63
	Adolescent	5	42.60	85.55		Adolescent	6	172.83	423.35

SPP, Self-Perception Profile; MGIS, Multidimensional Gender Identity Scale; BIS, Body Image Scale

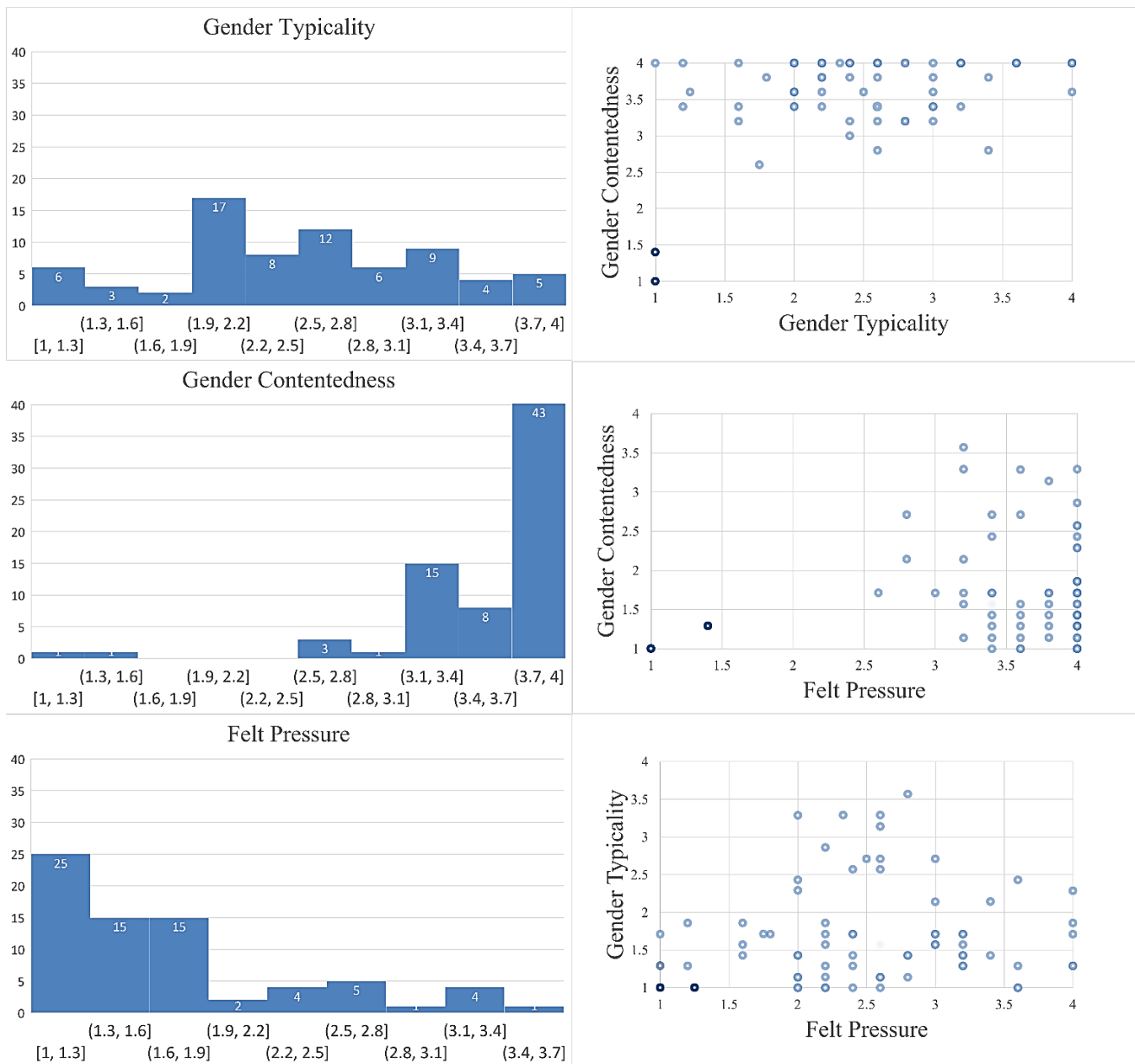
¹ Child version of SPP is administered to those 8-13 yrs

² Adolescent version of SPP is administered to those 14+ yrs

³ MGIS is administered to those older than 8 years old

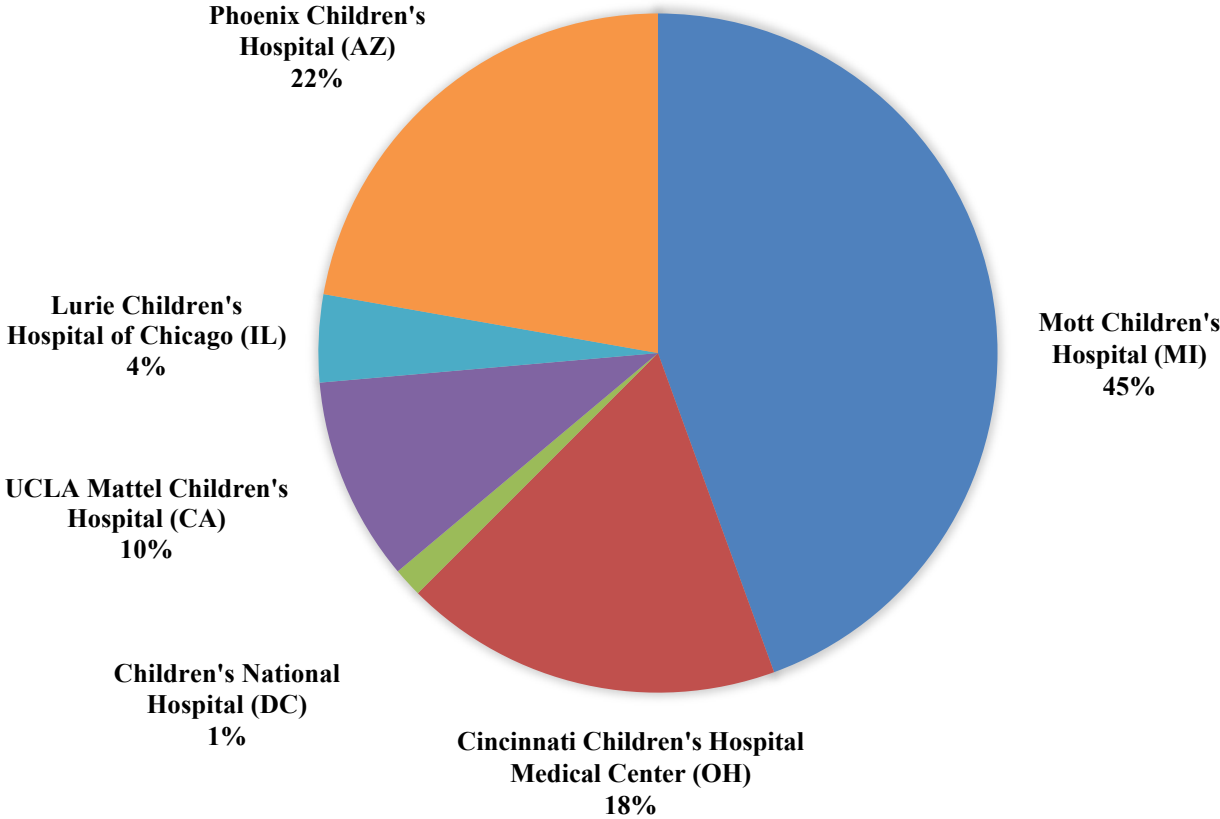
⁴ BIS is administered to girls 10+ yrs and boys 13+ yrs

Supplementary Figure 1. Distribution of Multidimensional Gender Identity Scale (MGIS) scores and intercorrelations.



Graphs on left illustrate the distribution of scores and graphs on right the correlation among MGIS dimensions. No significant correlation between any two MGIS dimensions could be found after removing two patients with extreme outlier scores on Gender Contentedness (colored dots).

Supplementary Figure 2. Distribution of patients based on the referral sites (total n = 72).



Multidimensional Gender Identity Scale (MGIS)
Version in use by the Differences of Sex Development Translational Research Network
NIH R01 HD093450

The self-report MGIS, as initially described by Egan and Perry (2001), is a 30-item questionnaire measuring four dimensions of gender identity for children and adolescents aged 8 (Bos & Sandfort, 2010) through young adulthood (Baiocco et al., 2021): *Gender Typicality* (6 items) reflects the degree to which a person believes their behaviors and interests are typical of their same-gender peers; *Gender Contentedness* (6 items) measures the degree to which a person is content with their gender of rearing; and *Felt Pressure for Gender Conformity* (10 items) reflects the degree of social pressure a person feels to conform to gender stereotypes and to avoid gender-nonconforming interests and behaviors. Other subscales have been used to test particular hypotheses regarding the dimensionality of gender identity, for example, *Intergroup Bias Scale* (8 items) which measures the degree to which children are more likely to attribute positive qualities and less likely to attribute negative qualities to their own sex than to the other sex.

There is no definitive version of the MGIS and the subscales selected by the DSD Translational Research Network (DSD-TRN, <https://dsdtrn.org/>) was based on the clinical literature on gender development in DSD and the collective experience of the mental health providers comprising the DSD-TRN Psychosocial Workgroup. Finally, the selection of items within scales was guided by communications with the questionnaire developer (D. G. Perry, personal communications, February 2013). The child (8-12 years) and adolescent (13-18 years) versions each consist of 17 items: Gender Typicality (5 items), Gender Contentedness (5 items), and Felt Pressure (7 items). Scores for each subscale represent the mean of items rated on 4-point scales. Higher scores on Gender Typicality and Gender Contentedness reflect self-perceptions of higher gender typicality and gender contentedness, respectively, whereas higher Felt Pressure scores reflect greater felt pressure for gender conformity from adults or peers. The midpoint for all MGIS scales is 2.5 (e.g., the midpoint between perceiving oneself as typical or atypical of one's gender). Both child and adolescent versions of the modified MGIS have 2 forms, one for youth assigned as boys at birth and one for those assigned as girls at birth – items are worded according to the gender of the person completing it but are otherwise identical. In our clinics, patients are administered the MGIS matching the gender assigned at birth or the gender they identify as at the time of the clinic visit.

SCORING

Scoring MGIS (for both child and adolescent version):

1- Reverse the score for the following items:

Part one:

Item 1: (1=4) (2=3) (3=2) (4=1)

Item 2: (1=4) (2=3) (3=2) (4=1)

Item 3: (1=4) (2=3) (3=2) (4=1)

Item 6: (1=4) (2=3) (3=2) (4=1)

Item 7: (1=4) (2=3) (3=2) (4=1)

Item 8: (1=4) (2=3) (3=2) (4=1)

Item 10: (1=4) (2=3) (3=2) (4=1)

Part two:

Item 6: (1=4) (2=3) (3=2) (4=1)

2- Each dimension is determined via computing the mean of following items:

Items from part 1:

Gender Typicality: $([\text{Reversed item 1}] + [\text{Reversed item 3}] + [\text{Item 5}] + [\text{Reversed item 7}] + [\text{Reversed item 8}]) / 5$

Gender Contentedness: $([\text{Reversed item 2}] + [\text{Item 4}] + [\text{Reversed item 6}] + [\text{Item 9}] + [\text{Reversed item 10}]) / 5$

Items from part 2:

Felt Pressure: $([\text{item 1}] + [\text{item 5}] + [\text{Reversed item 6}] + [\text{Item 7}]) / 7$

References

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DSD-TRN: Improving health for people living with DSD

Patient Name: _____

Patient ID: _____

Today's date (mm/dd/yyyy): ____/____/____

What I am Like for Girls Ages 8-12, part 1

Directions: This questionnaire contains some statements that describe things about people, such as who they are, what they like to do, and how they feel about various things. As you can see from the top of your sheet where it says, "What I Am Like," we are interested in what you are like, what kind of person you are. There is no right or wrong answer.

First let me explain how these questions work with this practice question:

Practice	Some people are good at playing cards	BUT	Other people aren't good at playing cards.
	Very true for me	Sort of true for me	Sort of true for me Very true for me

This question talks about two kinds of people, and we want to know which people are most like you.

- So, what I want you to decide first is whether you are more like the people on the left side who are good at playing cards or are you more like the people on the right side who aren't good at playing cards. Don't mark anything yet, but first decide which kind of person is most like you and go to that side of the sentence. Circle that side of the question before moving on.
- Now, the second thing I want you to think about, now that you have decided which kind of person is most like you, is to decide whether that is only sort of true for you, or very true for you. If it's only sort of true for you, then circle "sort of true for me"; if it's very true for you, then circle "very true for me".
- For each question, you only make two circles: The group of people you are most like (right or left side) then how true it is for you under that statement. Sometimes it will be on one side of the page, and other times it may be on the other side of the page. You can only circle one statement about how true it is for you per question. You don't circle one on both sides, just the one side most like you.

Practice	Some people are good at playing cards	BUT	Other people aren't good at playing cards.
	Very true for me	Sort of true for me	Sort of true for me Very true for me

In this practice item, the circle shows that the person who filled it out thinks that they are good at playing cards because "Some people are good at playing cards" was circled. The second circle around "very true for me" means that it is very true that they feel they are good at playing cards. You might choose a different answer for yourself.

- OK, that one was just for practice. Now we have some more questions. For each question, make two circles. Circle the statement you agree more with and then circle if it is very true or sort of true for you. It is very important that you answer each question honestly.

Now it's your turn:

1.	Some girls have the same interests that other girls have Very true for me Sort of true for me	BUT	Other girls <u>don't</u> have the same interests that other girls have. Sort of true for me Very true for me
2.	Some girls feel lucky that they are a girl Very true for me Sort of true for me	BUT	Other girls don't feel lucky that they are a girl. Sort of true for me Very true for me
3.	Some girls feel that the things they like to do in their spare time are <u>similar</u> to what most girls like to do in their spare time Very true for me Sort of true for me	BUT	Other girls feel that the things they like to do in their spare time are <u>different</u> from what most girls like to do in their spare time. Sort of true for me Very true for me
4.	Some girls don't like being a girl Very true for me Sort of true for me	BUT	Other girls don't mind being a girl. Sort of true for me Very true for me
5.	Some girls feel they are <u>different</u> from other girls Very true for me Sort of true for me	BUT	Other girls feel they are <u>similar</u> to other girls. Sort of true for me Very true for me
6.	Some girls are glad they'll grow up to be a woman Very true for me Sort of true for me	BUT	Other girls wish they could grow up to be a man. Sort of true for me Very true for me
7.	Some girls have the same feelings that other girls have Very true for me Sort of true for me	BUT	Other girls <u>don't</u> have the same feelings that other girls have. Sort of true for me Very true for me
8.	Some girls like to play with the same toys that other girls do. Very true for me Sort of true for me	BUT	Other girls <u>don't</u> like to play with the same toys that other girls do. Sort of true for me Very true for me
9.	Some girls wish they didn't have to be a girl all their life Very true for me Sort of true for me	BUT	Other girls are glad they'll be a girl all their life. Sort of true for me Very true for me
10.	Some girls are happy that they were born a girl Very true for me Sort of true for me	BUT	Other girls are not happy they were born a girl. Sort of true for me Very true for me

What I am Like for Girls

Ages 8-12, part 2

Directions: This questionnaire contains some statements about how you, your parents, or your friends might feel about some things that concern you. Again, there are no right or wrong answers.

First let me explain how these questions work with this practice question:

Practice	My parents would get upset if I didn't do well in school.	Not at all true for me	A little true for me	Pretty true for me	Very true for me
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In this practice item, the circle shows that the person who filled it out thinks that it is pretty true for them that their parents would get upset if they did not do well in school. You might choose a different answer for yourself.

Now, your job is to circle how true each statement below is for you. You have four choices. Please circle the one closest to how true that statement is for you.

1. The girls I know would be upset if I wanted to play with boys' toys.	Not at all true for me	A little true for me	Pretty true for me	Very true for me
2. My parents would be upset if they saw me acting like a boy.	Not at all true for me	A little true for me	Pretty true for me	Very true for me
3. I think it would be wrong for me to play with boys' toys or do boys' activities.	Not at all true for me	A little true for me	Pretty true for me	Very true for me
4. The girls I know wouldn't like it if I wanted to learn an activity that boys usually do.	Not at all true for me	A little true for me	Pretty true for me	Very true for me
5. I wouldn't like myself if I heard myself talking or laughing like a boy.	Not at all true for me	A little true for me	Pretty true for me	Very true for me
6. I would still like myself if I saw myself acting like a boy.	Not at all true for me	A little true for me	Pretty true for me	Very true for me
7. My parents wouldn't like it if I wanted to learn an activity that only boys do.	Not at all true for me	A little true for me	Pretty true for me	Very true for me



DSD-TRN: Improving health for people living with DSD

Patient Name: _____

Patient ID: _____

Today's date (mm/dd/yyyy): ____/____/____

What I am Like for Girls Ages 13-18, part 1

Directions: This questionnaire contains some statements that describe things about people, such as who they are, what they like to do, and how they feel about various things. As you can see from the top of your sheet where it says, "What I Am Like," we are interested in what you are like, what kind of person you are. There is no right or wrong answer.

First let me explain how these questions work with this practice question:

Practice	Some people are good at playing cards	BUT	Other people aren't good at playing cards.
Practice	Very true for me	Sort of true for me	Sort of true for me Very true for me

This question talks about two kinds of people, and we want to know which people are most like you.

1. So, what I want you to decide first is whether you are more like the people on the left side who are good at playing cards or are you more like the people on the right side who aren't good at playing cards. Don't mark anything yet, but first decide which kind of person is most like you and go to that side of the sentence. Circle that side of the question before moving on.
2. Now, the second thing I want you to think about, now that you have decided which kind of person is most like you, is to decide whether that is only sort of true for you, or very true for you. If it's only sort of true for you, then circle "sort of true for me"; if it's very true for you, then circle "very true for me".
3. For each question, you only make two circles: The group of people you are most like (right or left side) then how true it is for you under that statement. Sometimes it will be on one side of the page, and other times it may be on the other side of the page. You can only circle one statement about how true it is for you per question. You don't circle one on both sides, just the one side most like you.

Practice	Some people are good at playing cards	BUT	Other people aren't good at playing cards.
Practice	Very true for me	Sort of true for me	Sort of true for me Very true for me

In this practice item, the circle shows that the person who filled it out thinks that they are good at playing cards because "Some people are good at playing cards" was circled. The second circle around "very true for me" means that it is very true that they feel they are good at playing cards. You might choose a different answer for yourself.

4. OK, that one was just for practice. Now we have some more questions. For each question, make two circles. Circle the statement you agree more with and then circle if it is very true or sort of true for you. It is very important that you answer each question honestly.

Now it's your turn:

1.	Some girls have the same interests that other girls have Very true for me Sort of true for me	BUT	Other girls <u>don't</u> have the same interests that other girls have. Sort of true for me Very true for me
2.	Some girls feel lucky that they are a girl Very true for me Sort of true for me	BUT	Other girls don't feel lucky that they are a girl. Sort of true for me Very true for me
3.	Some girls feel that the things they like to do in their spare time are <u>similar</u> to what most girls like to do in their spare time Very true for me Sort of true for me	BUT	Other girls feel that the things they like to do in their spare time are <u>different</u> from what most girls like to do in their spare time. Sort of true for me Very true for me
4.	Some girls don't like being a girl Very true for me Sort of true for me	BUT	Other girls don't mind being a girl. Sort of true for me Very true for me
5.	Some girls feel they are <u>different</u> from other girls Very true for me Sort of true for me	BUT	Other girls feel they are <u>similar</u> to other girls. Sort of true for me Very true for me
6.	Some girls are glad they'll grow up to be a woman Very true for me Sort of true for me	BUT	Other girls wish they could grow up to be a man. Sort of true for me Very true for me
7.	Some girls have the same feelings that other girls have Very true for me Sort of true for me	BUT	Other girls <u>don't</u> have the same feelings that other girls have. Sort of true for me Very true for me
8.	Some girls like to do the same things as other girls in their free time Very true for me Sort of true for me	BUT	Other girls <u>don't</u> like to do the same things as other girls in their free time. Sort of true for me Very true for me
9.	Some girls wish they didn't have to be a girl all their life Very true for me Sort of true for me	BUT	Other girls are glad they'll be a girl all their life. Sort of true for me Very true for me
10.	Some girls are happy that they were born a girl Very true for me Sort of true for me	BUT	Other girls are not happy they were born a girl. Sort of true for me Very true for me

What I am Like for Girls Ages 13-18, part 2

Directions: This questionnaire contains some statements about how you, your parents, or your friends might feel about some things that concern you. Again, there are no right or wrong answers.

First let me explain how these questions work with this practice question:

Practice	My parents would get upset if I didn't do well in school.	Not at all true for me	A little true for me	Pretty true for me	Very true for me
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In this practice item, the circle shows that the person who filled it out thinks that it is pretty true for them that their parents would get upset if they did not do well in school. You might choose a different answer for yourself.

Now, your job is to circle how true each statement below is for you. You have four choices. Please circle the one closest to how true that statement is for you.

1. The girls I know would be upset if I wanted to do what boys like to do for fun in my free time.	Not at all true for me	A little true for me	Pretty true for me	Very true for me
2. My parents would be upset if they saw me acting like a boy.	Not at all true for me	A little true for me	Pretty true for me	Very true for me
3. I think it would be wrong for me to do boys' activities in my free time.	Not at all true for me	A little true for me	Pretty true for me	Very true for me
4. The girls I know wouldn't like it if I wanted to learn an activity that boys usually do.	Not at all true for me	A little true for me	Pretty true for me	Very true for me
5. I wouldn't like myself if I heard myself talking or laughing like a boy.	Not at all true for me	A little true for me	Pretty true for me	Very true for me
6. I would still like myself if I saw myself acting like a boy.	Not at all true for me	A little true for me	Pretty true for me	Very true for me
7. My parents wouldn't like it if I wanted to learn an activity that only boys do.	Not at all true for me	A little true for me	Pretty true for me	Very true for me