# The Recalled Childhood Gender Questionnaire-Revised: A Psychometric Analysis in a Sample of Women with Congenital Adrenal Hyperplasia

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*We administered the 18-item Recalled Childhood Gender Questionnaire-Revised (RCGQ-R), female version, to 147 adult women with congenital adrenal hyperplasia (CAH) representing three different degrees of prenatal androgenization due to 21-hydroxylase deficiency and to non-CAH controls. A principal components analysis generated 3 components accounting for 46%, 9%, and 6% of the variance, respectively. Corresponding unit-weighted scales (high scores = feminine) were labeled* Gender Role *(13 items; Cronbach* $\alpha = .91$*),* Physical Activity *(3 items;* $\alpha = .64$*), and* Cross-Gender Desire *(2 items;* $\alpha = .47$*). Discriminant validity was demonstrated in terms of highly significant comparisons across the 4 groups. We concluded that the first 2 RCGQ-R scales show good psychometric qualities, but that the third scale needs to be evaluated further in a sample that includes women with gender identity disorder.*

The clinical psychological evaluation for gender development of adolescent and adult individuals with conditions such as gender identity disorder or somatic intersexuality includes a systematic review of gender role behavior and gender identity in childhood. In patients with acute gender problems, the findings may have significant implications for decisions such as the prescription of puberty-blocking medications to decrease the pressure of ego-dystonic maturational somatic changes (Cohen-Kettenis & Pfäfflin, 2003) or the initiation of steps toward gender reassignment as described in the Standards of Care for Gender Identity Disorders (Meyer et al., 2001). Similarly, long-term follow-up research on these rare disorders includes the examination - retrospectively as well as prospectively - of the assumed continuity of gender-development trajectories, which underlies the clinical approach, as a function of biological and social variables.

Of the few behaviorally-oriented interviews and questionnaires available for these purposes (Zucker, 2005), only one written self-report instrument has been developed that grew directly out of work with gender-atypical children and the critical diagnostic criteria for childhood gender identity disorder of DSM-IV (American Psychiatric Association, 1994). In the 1990s, the Toronto group developed a 22-item Recalled Childhood Gender Identity Scale (Mitchell & Zucker, 1991; Zucker & Mitchell, 2002), which was later re-named the Recalled Childhood Gender Identity/Gender Role Questionnaire (Zucker et al., in press). This self-report questionnaire focuses on gender-related behaviors that are part of the clinical picture of gender identity disorder of childhood and includes items that were anticipated to yield sex differences or within-sex variation as a function of some other marker variable, such as sexual orientation (Mitchell & Zucker). Factor analysis and scale construction were based on adult convenience samples of non-intersex persons.

Recently, a small working party, the Research Protocol Work Group of the North American Task Force on Intersexuality, modified the original questionnaire by eliminating or replacing several items that did not differentiate between men and women or generated many missing responses, and by simplifying and homogenizing the wording of others. The result was an 18-item questionnaire draft, the Recalled Childhood Gender Questionnaire-Revised (RCGQ-R; available from the third author, KJZ). Our purpose in the current study was to examine the internal structure of the revised item set, to derive scales, and

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to present their psychometric characteristics in an adult population of 46,XX individuals with congenital adrenal hyperplasia (CAH).

CAH denotes a family of disorders of sex development (DSD) due to varying degrees of prenatal and postnatal production of adrenal androgens as a result of genetic deficiencies of one of several enzymes involved in adrenal steroidogenesis (New, 2003). The most common type of CAH is 21-hydroxylase deficiency, within which three severity subtypes are distinguished: Saltwasters (SW), the most severe subtype, in which the enzyme deficiency causes deficiencies of both glucocorticoid (glucose-regulating) and mineralocorticoid (sodium-regulating) hormones; simple virilizers (SV), with moderate deficiencies of glucocorticoids; and the mildest subtype, non-classical (NC), late-onset CAH. The degree of hyperandrogenemia increases with syndrome severity and is assumed to underlie not only the somatic masculinization/virilization seen in 46,XX individuals with CAH, but also the behavioral masculinization, which has been studied at several stages of development in the two more severe subtypes (Meyer-Bahlburg, 2001) and found to be associated with an increased rate of patient-initiated gender change to male (Dessens, Slijper, & Drop, 2005). A well-designed instrument for the retrospective assessment of gender-related behavior in childhood is expected to be sensitive enough to detect differences between these subtypes.

## Method

The revised 18-item RCGQ-R in its female version was added to a comprehensive protocol (Meyer-Bahlburg et al., 2003) of a long-term follow-up project of adult women representing the major variants of congenital adrenal hyperplasia (CAH) due to 21-hydroxylase deficiency and non-CAH controls. The project was designed to assess long-term outcome in terms of gender development, sexual behavior, psychiatric symptomatology and diagnosis, and related domains. The project was approved by the pertinent Institutional Review Boards, and all participants gave written informed consent.

The final sample that received the RCGQ-R in written form was comprised of 147 adult women representing four different degrees of prenatal androgenization. In order of clinical severity, the sample included 27 women of the most masculinizing salt-wasting (SW) form, 20 with the simple virilizing (SV) form, 76 with the nonclassical (NC) form, and 24 non-CAH controls (CO; CAH women's sisters and female cousins). All women were recruited through one specialty clinic in the northeastern U.S. Demographic characteristics are presented in Table 1. The resulting RCGQ-R item scores underwent standard scale construction procedures, using SPSS for Windows Release 13.0.1 (Dec. 12, 2004).

## Results

A principal components analysis of the 18 items generated three components with eigenvalues above 1.0, which accounted for 46%, 9%, and 6% of the variance respectively, or 62% altogether. Figure 1 presents the scree plot. After varimax rotation with Kaiser normalization (Table 2), the first component included 13 items with loadings ranging from .52 to .77 (median .70); the second component included three items with loadings ranging from .64 to .78 (median .73); and the third component included two items (#17, "I had the desire to be a boy" .70, and #18 "I would tell others that I wanted to be a boy," .80). On the basis of the item content, the three corresponding unit-weighted scales were labeled *Gender Role* (13 items; Cronbach $\alpha$ = .91), *Physical Activity* (3 items; $\alpha$ = .64), and *Cross-Gender Desire* (2 items; $\alpha$ = .47). All items were also summed up to a Total scale (18 items; $\alpha$ = .90). Item coding for all scales was arranged so that high scale scores indicated femininity.

Two sample items for the Gender Role scale are #01 "As a child, my favorite playmates were (a) almost always boys, (b) usually more boys than girls, (c) boys and girls

**Table 1. Demographic Characteristics of CAH Subgroups and Controls**

| Variable | Groups | | | | *p* | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | SW | SV | NC | CO | Four groups | SW vs. SV | SW vs. NC | SW vs. CO | SV vs. NC | SV vs. CO | NV vs. CO |
| *N* | 27 | 20 | 76 | 24 | | | | | | | |
| Ethnicity | | | | | | | | | | | |
| White (*n*) | 22 | 18 | 71 | 22 | | | | | | | |
| Hispanic (*n*) | 3 | 1 | 5 | 2 | | | | | | | |
| African American (*n*) | 2 | 1 | 0 | 0 | | | | | | | |
| % White | 82% | 90% | 93% | 92% | ns | ns | ns | ns | ns | ns | ns |
| Age, *M* (in years) | 28.1 | 33.6 | 33.2 | 34.7 | * | * | * | * | ns | ns | ns |
| Range | 18-51 | 18-51 | 18-61 | 19-51 | | | | | | | |
| SES (Hollingshead): | | | | | | | | | | | |
| Father's education, *M* | 5.6 | 4.3 | 5.7 | 5.7 | * | ** | ns | ns | *** | * | ns |
| Mother's education, *M* | 5.7 | 4.3 | 5.6 | 5.2 | * | ** | ns | ns | ** | ns | ns |
| Subject's education, *M* | 5.4 | 5.7 | 6.0 | 6.0 | ns | ns | * | (*) | ns | ns | ns |

*Note*. Statistical tests: For continuous variables, t-test and ANOVA; for binary variables, Chi-square. M = mean; SES = socioeconomic status.
(*)$p < .10$ *$p < .05$ **$p < .01$ ***$p < .001$

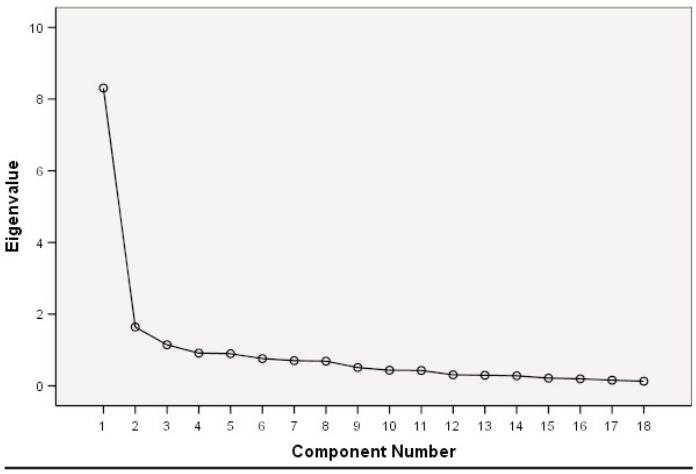
**Table 2. Varimax-Rotated Component Matrix**

| Item | | Component 1 | 2 | 3 |
|---|---|---|---|---|
| 14. | Frequency of hating feminine clothing | .77 | .21 | .16 |
| 3. | Favorite toys and games | .77 | .33 | .24 |
| 12. | Felt masculine versus feminine | .77 | .30 | .21 |
| 1. | Gender of favorite playmates | .75 | .14 | .25 |
| 2. | Gender of best friend | .74 | -.11 | .09 |
| 7. | Frequency of cosmetics and jewelry use | -.72 | -.16 | .01 |
| 13. | Gender of hair-style and clothing | -.70 | -.05 | -.04 |
| 8. | Gender of admired or imitated TV/movie characters | -.67 | -.39 | -.21 |
| 15. | Degree of reputation as tomboy | .62 | .51 | .26 |
| 4. | Frequency of baby doll play | -.61 | -.43 | -.12 |
| 11. | Gender of dress-up play | .57 | .20 | .51 |
| 16. | Frequency of feeling good about being a girl | -.56 | .13 | -.38 |
| 10. | Gender of pretend play | .52 | .30 | .44 |
| 6. | Enjoyment of athletics/body contact sports | .20 | .78 | .06 |
| 5. | Physical activity level | -.12 | .73 | .05 |
| 9. | Enjoyment of rough play | .30 | .64 | .15 |
| 18. | Frequency of telling others of desire to be a boy | -.06 | .12 | .80 |
| 17. | Frequency of the desire to be a boy | .49 | .09 | .70 |

equally, (d) usually more girls than boys, (e) almost always girls, or (f) I did not play with other children" and #14 (As a child, I (a) almost always hated ..., (b) usually hated ..., (c) sometimes hated ..., (d) rarely hated ..., or (e) almost never hated wearing dresses and other 'feminine' clothes." A sample item for the Physical Activity scale is #06 "As a child, I enjoyed athletics and body contact sports (a) very much, (b) much, (c) somewhat, (d) little, or (e) not at all." A sample item for the Cross-Gender Desire scale is #17 "As a child, I had the desire to be a boy (a) almost always, (b) frequently, (c) sometimes, (d) rarely, or (e) never."

As we argued in the introduction, the new questionnaire scales should be sensitive to differences between CAH women and controls and among CAH variants. Thus, significant gender-related differences between the four subgroups can be taken as an indication of discriminant validity. We compared the four subgroups by ANOVA, followed by *t*-tests between all possible pairs of groups. The *t*-test was replaced by regression analysis adjusting for potentially confounding demographic variables if the demographic variable was significantly associated with the dependent variable among the control subjects, and if the groups being compared significantly differed in that demographic variable. Of the demographic variables, age, mean parental education, or ethnicity (White/non-White), only mean parental education correlated within the control group with any of the RCGQ-R scales, namely Physical Activity, and control of potentially confounding demographic variables was limited to this scale.

**Figure 1. Scree plot of the principal components analysis.**




As Table 3 shows, the group means decreased in femininity with increasing prenatal androgenization, as expected (although not always significantly so). The control group had the highest means, and the SW group had the lowest. For the Cross-Gender Desire scale, this finding was limited to the most androgenized (SW) group, due to the overall low rate of cross-gender wishes. The effect sizes (Cohen's *d*) for the difference between the SW group and the control group were 2.37 for Gender Role, 0.84 for Physical Activity, 0.62 for Cross-Gender Desire, 0.94 for item #17, 0.04 for item #18, and 2.03 for the total scale. The effect sizes for the differences between the other subgroups and the controls (not shown) were considerably lower.

## Discussion

In its shortened and revised form, the RCGQ-R provides a very robust Gender Role factor and a small but still reasonably consistent Physical Activity factor. These first two components are clearly suitable for use as unit-weighted scales. By contrast, the Cross-Gender Desire factor has an unsatisfactory $\alpha$, probably because few, if any, of the women in this sample had a definitive cross-gender desire during childhood. In samples of CAH women, women with gender dysphoria/gender change are

**Table 3. Means (Standard Deviations) of Scale Scores in CAH Subgroups and Controls**

| Variable | Group | | | | *p* | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | SW | SV | NC | CO | Four Groups | SW vs SV | SW vs NC | SW vs CO | SV vs NC | SV vs CO | NC vs CO |
| Gender role | 2.72(0.89) | 3.79(0.78) | 4.02(0.61) | 4.26(0.65) | .000 | .000 | .000 | .000 | ns | .033 | .088 |
| Physical activity | 2.52(0.71) | 2.78(0.87) | 3.10(0.81) | 3.21(0.82) | .009 | ns | .001 | .002 | ns | .032 | ns |
| Cross-gender desire | 4.37(0.61) | 4.82(0.34) | 4.77(0.42) | 4.72(0.56) | .002 | .003 | .004 | .044 | ns | ns | ns |
| 17. Desire to be a boy | 3.93(1.04) | 4.63(0.68) | 4.67(0.62) | 4.61(0.72) | .000 | .013 | .001 | .011 | ns | ns | ns |
| 18. Shared desire to be a boy | 4.81(0.40) | 5.00(0.00) | 4.87(0.38) | 4.83(0.49) | ns | .022 | ns | ns | .003 | ns | ns |
| Total | 2.87(0.72) | 3.73(0.60) | 3.94(0.53) | 4.13(0.62) | .000 | .000 | .000 | .000 | ns | .035 | ns |

*Note.* Statistical tests: ANOVA and *t*-tests.

uncommon (at the most about 5%; Dessens, Slijper, & Drop, 2005). On the basis of our clinical experience, we expect that the two constituent cross-gender items will perform well with individuals who have a history of marked childhood gender dysphoria. Therefore, we find it appropriate to retain the third scale for the time being, but recommend also analyzing findings on its two items separately. The total scale does not perform better than the Gender Role scale; its $\alpha$ was slightly lower (.90 versus .91). Thus, the current data set does not support retention of the total scale.

Our first factor approximates a general gender factor and thereby resembles the first factor found by Zucker et al. (in press) in a much larger sample of (non-intersex) adults, although our factor represents a more substantial portion of the total variance. Their only other factor indexed "relative identification with mother versus father," based on four items that were dropped from the revised form, because of insufficient sex-discriminant power of the individual items.

Given the modest sample sizes, the results of the discriminant validity test are surprisingly strong, with very large effect sizes for the comparison of SW and control women. Since the individual items discriminate well between the sexes when response-scale direction is adjusted as appropriate for gender-specific wording changes (e.g., Mitchell & Zucker, 1991), we can expect the scales will do the same.

We conclude that the RCGQ-R provides two consistent and valid scales for the retrospective assessment of childhood gender behavior and a third scale related to the desire to change gender that needs further evaluation in a sample including individuals with a history of gender identity disorder.

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