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Transsexual subtypes: Clinical and theoretical significance

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Abstract

The present study was designed to investigate whether transsexuals can be validly subdivided into subtypes on the basis of sexual orientation, and whether differences between subtypes of transsexuals are similar for male-to-female (MF) and female-to-male transsexuals (FMs). Within a large transsexual sample ($n = 187$), homosexual and nonhomosexual subjects were compared on a number of characteristics before the start of treatment. Differences within MF and FM groups were also investigated. Homosexual transsexuals were found to be younger when applying for sex reassignment, reported a stronger cross-gender identity in childhood, had a more convincing cross-gender appearance, and functioned psychologically better than nonhomosexual transsexuals. Moreover, a lower percentage of the homosexual transsexuals reported being (or having been) married and sexually aroused while cross-dressing. The pattern of findings was different for MFs and FMs. No differences between homosexuals and nonhomosexuals were found in height, weight, or body mass index. A distinction between subtypes of transsexuals on the basis of sexual orientation seems theoretically and clinically meaningful. The results support the notion that in the two groups different factors influence the decision to apply for sex reassignment. The more vulnerable nonhomosexual transsexuals may particularly benefit from additional professional guidance before and/or during treatment.
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1. Introduction

Since the first classification of (male) habitual or persistent "cross-dressers" (Hirschfeld, 1918) in homosexuals, heterosexuals, and bisexuals, many other divisions have been proposed (Blanchard,

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1989a). In the present study, the terms "homosexual" and "heterosexual" refer to erotic attraction to members of the same or the opposite biological sex, respectively. Although the names and the number of subtypes in various studies (for an overview, see Blanchard, 1989a; Burns et al., 1990; Johnson and Hunt, 1990; Landén et al., 1998) differed, a homosexual subtype was more consistently labeled than any other category of transsexual. On the basis of three studies, consisting of male transsexuals only, Blanchard proposed that there are only two fundamentally different types of transsexualism: homosexual and nonhomosexual (Blanchard, 1985, 1988, 1989b). In contrast with the homosexual transsexuals, several nonhomosexual subgroups were more likely to be sexually aroused by the thought or image of themselves as women, which may be characterized as "autogynephilic gender dysphoria" (Blanchard, 1989b). Other differences were that only a minority of the homosexual male-to-female transsexuals (MFs) reported a history of erotic arousal while being cross-dressed, that homosexuals were younger at initial presentation and that they reported more childhood femininity. Homosexual males were also less likely to regret sex reassignment (SR) than nonhomosexual males (Blanchard et al., 1989; but see Lawrence, 2003). A few physical differences between the subtypes have also been found. Compared with nonhomosexual MFs, homosexual MFs have been found to be shorter, lighter, and lighter in proportion to their height. Homosexual transsexuals were also observed to be shorter than men in the general population, whereas nonhomosexual transsexuals were similar in height (Blanchard et al., 1995). These physical differences could be a reflection of an earlier onset of puberty in homosexual transsexuals than in nonhomosexual transsexuals.

Until recently, most studies have been conducted with MFs. To our knowledge, only one study compared small numbers of female-to-male homosexual transsexuals [i.e., 21 homosexual female-to-male transsexuals (FMs) and 17 nonhomosexual FMs; Chivers and Bailey, 2000]. The homosexual FMs were found to be more masculine-oriented than the nonhomosexual FMs. Specifically, homosexual FMs had been more cross-gendered in childhood and preferred more feminine partners. With regard to sexuality, they experienced greater sexual rather than emotional

jealousy, were more sexually assertive, had more sexual partners, and had more interest in visual sexual stimuli than the nonhomosexual FMs. With respect to treatment, they had a stronger desire for phalloplasty.

The findings so far suggest that there are indeed two subtypes of male transsexuals, who come to their wish for SR in different ways. An indication that (male) homosexual and nonhomosexual transsexualism may have different etiologies comes from research on birth order and sibling sex ratio (for a review, see Blanchard, 2001). It has been shown that, in males, sexual orientation and the number of older brothers are correlated, whereas the number of older sisters was unrelated to sexual orientation. Also, homosexual MFs have an excess of older brothers, whereas nonhomosexual MFs do not manifest any excess of older brothers. Blanchard (1997, 2001) has attributed the effect to the progressive immunization of mothers to Y-linked minor histocompatibility antigens. He supposed that the mothers' antibodies cross the placental barrier, enter the fetal brain, and impede the sexual differentiation of the brain in the male-typical direction. As each succeeding male fetus increases the strength of the maternal immunization, the probability of homosexuality increases in later born sons.

Findings on birth order effects and sibling sex ratios in adult women are more mixed and, until now, no evidence in support of etiological differences between homosexual and nonhomosexual FMs has been found. On the basis of the findings described above, it is likely that subtypes of transsexuals develop along different lines. These subtypes of transsexualism might descend from different etiologies and could also be different for males and females. Therefore, the main purpose of the present study, using a large sample of transsexual subjects, was (a) to identify differences between the homosexual and nonhomosexual transsexuals to examine the existence of different developmental routes, and (b) to investigate whether these differences between homosexual and nonhomosexual transsexuals are similar for MFs and FMs.

In line with results from previous studies, we expected that nonhomosexual transsexuals would have had a less cross-gendered childhood, report more sexual arousal while being cross-dressed between 12 and 18 years, and apply for SR later than the

homosexual group. As a consequence of their less extreme cross-gendered behavior at earlier ages, which may be a reflection of a less extreme cross-gender identity, we also expected more of them to be or to have been married. For homosexual transsexual males, we expected a lower height, weight, and body mass index.

Secondly, we expected that less extreme cross-gendered behavior, appearance, and preference at younger ages would result in a less typical transsexual picture in the nonhomosexual subtype: less gender dysphoria, and less aversion of one's sex characteristics. Furthermore, and in line with the hypothesis of a stronger "opposite sex blue-print" in homosexual transsexuals, we expected this subgroup to be equipped with a physical appearance that already better matched the desired gender. Next, the combination of an earlier and more fixed cross-gender identity and a more favorable physical appearance in the homosexual subtype was expected to result in an earlier application for SR and in better psychological and emotional functioning.

Finally, we expected that more-or-less similar subtype differences would be observed in male and female transsexuals. To our knowledge, this study is the first to investigate gender dysphoria, body dissatisfaction, psychological functioning and physical appearance in subgroups of MFs and FMs.

2. Methods

2.1. Subjects

A group of 196 consecutive patients, who had applied and were considered eligible for SR at University Medical Center Utrecht (UMCU) or at the Gender Clinic at the VU University Medical Center in Amsterdam (VUMC), completed SR, and agreed to participate in the study. This study focused on pretreatment differences between homosexual and nonhomosexual transsexuals, who all had completed SR. From 187 patients we gathered complete sets of pretest data. On the basis of self-reported sexual preference, 113 of the 187 patients were classified with a homosexual preference (61 MFs and 52 FMs) and the other 74 with a nonhomosexual preference (52 MFs and 22 FMs).

2.2. Procedure

After agreement to participate, an interview and testing session were arranged shortly after application. Each session took 2 to 3 h. Appointments for an interview and testing were usually made at the VUMC. If a UMCU patient considered it to be more convenient, an appointment was made at UMCU. Researchers who were not clinically involved interviewed the subjects. The Ethics Committees of UMCU and VUMC approved the study.

2.3. Instruments

2.3.1. Biographical Questionnaire for Transsexuals (Biografische Vragenlijst voor Transseksuelen or BVT)

Sexual preference was obtained from a semi-structured interview, the BVT (Doorn et al., 1994). Self-report of the subject on the item "What is your current sexual preference?" was applied to classify the applicant into the homosexual or nonhomosexual group. Blanchard (1985, 1988) found support for his suggestion that there are only two fundamentally different types of transsexualism, homosexual and nonhomosexual, in which the bisexual and the asexual transsexual are classified with the heterosexual, i.e., nonhomosexual, type because they are akin to one another and different from the homosexual type. We therefore also included subjects who exclusively reported a homosexual preference in the homosexual transsexual group, and subjects who reported an asexual, heterosexual, and/or bisexual preference in the nonhomosexual transsexual group.

The item "Have you ever been sexually aroused while cross-dressing between 12 and 18 years" was used to indicate sexual arousal while being cross-dressed in adolescence. Response categories were as follows: 0, not applicable; 1, always; 2, often; 3, sometimes; and 4, never.

2.3.2. Gender Identity Disorder in Childhood Scale (GIDICS)

The GIDICS was constructed from the BVT to measure the self-reported presence of GID symptoms in childhood. The scale consisted of 11 items. Cronbach's alpha coefficient was calculated based on the data of 312 participants: 0.81 (for details, see Smith

et al., 2005). The items concerned strong wishes to be of the opposite sex in early childhood, cross-gender appearance in childhood, cross-dressing, play and peer preference, and cross-gender behavior in general, as a child. Because there were differences in the numbers of response categories and some response categories referred to quantitative aspects of certain behaviors (frequencies), whereas others referred to qualitative aspects (e.g., presence of certain cross-gendered behaviors), we dichotomized the answers to these questions. Thus, the total score could range from 0 to 11, with higher scores indicating the presence of more GID symptoms in childhood. The BVT was further used to gather other background data at assessment, such as age at application and marital status.

2.3.3. Height, weight, and body mass index

Height, weight, and body mass index (BMI) at assessment were extracted from medical files. Height was measured in centimeters, and weight in kilograms. Standard BMI is calculated by dividing weight by height-squared.

2.3.4. Gender dysphoria

Gender dysphoria was measured with the Utrecht Gender Dysphoria Scale (UGS), consisting of 12 items on which the subject rated his/her agreement on a 5-point scale. The higher the score, the more gender dysphoria was indicated (for psychometric data, see Cohen-Kettenis and van Goozen, 1997).

2.3.5. Body dissatisfaction

A Body Image Scale (BIS) (Lindgren and Pauly, 1975), which had been adapted for a Dutch sample, was used (Kuiper, 1991). The scale consists of 30 items divided into three subscales: sexual characteristics, secondary sexual characteristics, and neutral characteristics, with higher scores representing more dissatisfaction.

2.3.6. Physical appearance

On the 14-item Appraisal of Appearance Inventory (AAI), three independent observers (the diagnostician, a nurse on the gender team, and the researcher) rated their subjective appraisal of the appearance of the subject on a 5-point scale of gender (in)compatibility. The 14 physical characteristics that were appraised were: hair, facial hair, larynx, voice, figure, height,

skin, hands/feet, muscularity, chin, nose, jaw, speech, and gestures/movement. Only the diagnostician might have been aware of the sexual orientation when rating the subject. Higher scores represent an appearance that is more incompatible with the new gender. Intraclass correlation coefficients between the three observers for each of the 14 items ranged from 0.68 to 0.79.

2.3.7. Psychological functioning

The Dutch Short Minnesota Multiphasic Personality Inventory (NVM) (Luteyn et al., 1980) is an 83-item shortened Dutch version of the Minnesota Multiphasic Personality Inventory (MMPI), measuring the following five concepts: Negativism, Somatization, Shyness, Psychopathology, and Extroversion. Higher scores indicate more psychological dysfunction on the first four scales but less on Extroversion.

The Dutch version of the Symptom Checklist (SCL-90) (Arrindell and Ettema, 1986) is a 90-item inventory inquiring about the presence of various complaints in the week prior to the interview. Subscales are Agoraphobia, Anxiety, Depression, Somatization, Obsession/Compulsion, Suspicion, Hostility, Sleeping problems, and Psychoneuroticism; a total score of the subscales is taken as an indicator of overall psychopathology. Both the NVM and the SCL-90 have good psychometric properties.

2.3.8. Intelligence

Because intelligence could be related to the level of psychological functioning of the participants, the Dutch versions of the Wechsler scales, which are the Wechsler Intelligence Scale for Children-Revised (WISC-R; Vandersteene et al., 1986) and the Wechsler Adult Intelligence Scale (WAIS; Stinissen et al., 1970), were administered to measure IQ.

2.3.9. Psychological Problems in Parents

We constructed a list of Psychological Problems in Parents (PPP) because the presence of psychopathology in parents could affect the level of psychological functioning of our subjects. All participants were asked to indicate if their parents had ever suffered from one or more of the following eight psychological symptoms or problems: depression, alcohol abuse, severe anxiety, obsessions, aggressive behavior, hallucinations, drugs abuse, and strong feelings of insecurity. The items contained the following four

response categories: (1) no, neither parent; (2) yes, father; (3) yes, mother; (4) yes, both. Three separate sum scores were calculated: for presence of psychological problems in father, in mother, and in both. Total scores ranged from 0 to 8 for each of these three answering categories, with higher scores indicating more problems.

2.4. Statistical analysis

To determine differences between the homosexual and nonhomosexual transsexuals, the pretest data of the two groups were compared with univariate or multivariate analysis of variance (ANOVA) for ratio or interval data. To replicate the findings concerning height, weight, and BMI, we used analysis of covariance (ANCOVA), with age and age-squared as covariates for weight and BMI, and Independent Samples *t*-test for height (Blanchard et al., 1995).

Because these data were collected in another study, with a partially overlapping sample of subjects, we only had data of 162 subjects: 96 homosexual (54 MF and 42 FM), and 66 nonhomosexual (45 MF and 21 FM) transsexuals. Multivariate analyses of covariance (MANCOVAs) were used for the NVM scores, with IQ scores as covariates, because IQ and NVM scores were correlated. For practical reasons, we were not able to measure IQ in the very beginning of the study, so we only had 144 IQ scores, reducing the NVM pretest data to 141. Nominal or ordinal data were analyzed per item by means of chi-square test, reported in the text as χ^2 scores, or Mann–Whitney *U* test, reported as standardized *Z* scores, respectively.

To examine whether the presence of psychopathology in parents affected the level of psychological functioning of our subjects, we calculated Pearson's correlations between each of the three sum scores of psychological problems in parents and each of the 14

Table 1
Scores of homosexual and nonhomosexual MFs and FMs on: gender identity disorder (GID) in childhood, age, gender dysphoria (UGS), body dissatisfaction (BIS), physical appraisal (AAI), psychological functioning (NMV and SCL-90)

Test	H/MF[a] Mean	H/MF S.D.	NH/MF Mean	NH/MF S.D.	H/FM Mean	H/FM S.D.	NH/FM Mean	NH/FM S.D.	*F* Group	*F* Sex	*F* G × S[b]
GID in childhood	5.6	2.4	3.1	2.3	7.2	2.5	5.4	2.4	31.3****	26.8****	1.0
Age at application	28.3	10.8	36.8	11.5	24.4	8.4	23.8	6.2	6.3**	28.5****	8.2***
Gender dysphoria	53.8	5.8	51.6	9.1	56.8	4.0	57.8	2.9	0.4	21.0****	2.3
Body dissatisfaction											
Primary	17.7	3.6	18.3	2.1	18.4	2.3	17.3	2.7	0.3	0.2	3.8
Secondary	31.7	7.9	35.7	6.7	33.5	6.6	34.7	6.1	5.0	0.1	1.6
Neutral	43.8	10.2	49.1	9.9	43.6	8.3	44.9	6.5	4.6	2.1	1.7
Physical appearance	42.1	10.2	50.2	7.1	39.5	6.1	41.9	5.0	17.9****	19.2****	5.3**
Negativism	21.1	7.5	21.5	8.6	23.0	7.1	26.5	7.3	0.4	4.9**	1.8
Somatization	8.2	6.7	9.0	6.4	6.9	7.5	12.1	9.6	9.8**	1.0	2.3
Shyness	15.9	8.7	15.7	8.6	9.7	7.7	16.7	9.1	3.8*	3.1*	5.9**
Psychopathology	3.3	3.1	3.0	3.1	3.0	2.6	3.4	3.3	1.0	0.3	0.2
Extroversion	15.1	6.2	12.0	5.9	17.0	6.0	14.4	7.3	3.6*	5.0**	0.1
Psychoneuroticism	145.5	47.6	142.1	39.6	133.9	36.5	166.2	48.7	4.5**	0.9	6.9***
Anxiety	15.7	6.5	15.2	5.5	14.1	5.3	17.7	5.4	2.9	0.3	5.1
Agoraphobia	9.7	3.9	9.4	4.2	8.6	3.4	10.5	3.0	1.5	0.1	3.4
Depression	29.7	11.9	28.8	10.7	27.0	10.6	35.4	14.4	4.1	1.1	6.4
Somatization	16.8	6.2	17.6	6.4	16.8	6.1	21.3	8.3	6.4	3.2*	3.2
Obsession/compulsion	15.7	6.2	15.6	5.8	15.0	5.3	17.9	6.9	2.0	0.7	2.4
Sensitivity	30.0	9.9	28.9	9.6	25.9	7.3	31.8	10.9	2.5	0.2	5.6
Hostility	8.2	3.0	7.4	2.2	8.1	2.8	10.2	4.5	2.1	8.4***	9.3
Sleeping problems	5.2	2.7	5.6	3.2	4.8	2.4	6.6	3.7	5.4	0.4	2.2

Number of subjects: Age: 187, GID in childhood: 180, UGS: 184, AAI: 185, BIS: 178, NVM: 140, SCL-90: 183.
*$P<0.10$, **$P<0.05$, ***$P<0.01$, ****$P<0.001$.
[a] H=homosexual, NH=nonhomosexual, MF=male-to-females, FM=female-to-males.
[b] G × S=Group by Sex.

scales measuring psychological functioning with the NVM and SCL-90.

To investigate whether the results were similar or different for MFs and FMs, univariate and multivariate AN(C)OVAs were executed with "Group" (homosexuals vs. nonhomosexuals) and "Sex" (MF vs. FM) as independent between-subjects factors. Results and P values of MANOVAs are only reported in the text, whereas results and P values of ANOVAs are also presented in Table 1.

3. Results

3.1. GID symptoms in childhood

The homosexual group reported more ($P < 0.001$) GID symptoms in childhood than the nonhomosexual group. As a group, the FMs also reported more GID symptoms in childhood than the MFs ($P < 0.001$) (Table 1).

3.2. Sexual arousal, age at application, and marital status

Between 12 and 18 years, the homosexual transsexuals had experienced sexual arousal while cross-dressing significantly less often ($Z = -3.4$, $P = 0.0007$) than the nonhomosexual transsexuals (Table 2). When comparisons were made within the sexes, the homosexual MFs were significantly less often sexually aroused while cross-dressing between 12 and 18 years than the nonhomosexual MFs ($Z = -3.0$, $P = 0.0026$), whereas no such differences were found between homosexual and nonhomosexual FMs ($Z = -0.04$, $P = 0.69$). As expected, as a group, the FMs were

significantly less often sexually aroused while cross-dressing than the MFs ($Z = -5.0$, $P < 0.0001$).

The homosexual group applied for SR at a younger age than the nonhomosexual group ($P = 0.013$). A main sex effect was found, with FMs applying for SR earlier than MFs ($P < 0.001$). This difference can be primarily attributed to the nonhomosexual MFs, who were much older than the other subgroups, contributing to an interaction effect ($P = 0.005$).

A significantly lower percentage of the homosexual group (20.4%, $n = 23$) than the nonhomosexual group (34.2%, $n = 25$) was or had been married ($\chi^2 = 4.5$, $P = 0.034$). Fewer FMs (14.9%, $n = 11$) than MFs (33.0%, $n = 37$) were or had been married ($\chi^2 = 7.7$, $P = 0.006$). When comparisons were made within each sex, a significant difference was found in the MF group ($n = 112$), with fewer homosexual (21.3%, $n = 13$) than nonhomosexual (47.1%, $n = 24$) MFs being (or having been) married ($\chi^2 = 8.3$, $P = 0.004$), but no differences were found between the homosexual (19.2%, $n = 10$) and nonhomosexual (4.5%, $n = 1$) FMs ($n = 74$) with a history of marriage ($\chi^2 = 2.6$, $P = 0.10$).

3.3. Height, weight, and BMI

No differences were found between homosexual and nonhomosexual transsexuals in height (homosexual mean = 173, S.D. = 8.4; nonhomosexual mean = 175, S.D. = 7.7), weight (homosexual mean = 68.8, S.D. = 12.8; nonhomosexual mean = 69.7, S.D. = 10.5), or BMI (homosexual mean = 23.0, S.D. = 4.5; nonhomosexual mean = 22.9, S.D. = 3.3), or between these two subtypes within MFs or FMs. As expected, differences between the sexes were significant, with the FMs being shorter (mean = 167, S.D. = 6.8) than the

Table 2
Sexual arousal while cross-dressing

	H MFs[a] (%)	n	NH MFs (%)	n	H FMs (%)	n	NH FMs (%)	n
NA[b]	3.3	2	3.8	2	7.7	4	9.1	2
Always	3.3	2	5.8	3				
Often	8.2	5	11.5	6	1.9	1		
Sometimes	18.0	11	36.5	19	5.8	3	4.5	1
Never	65.6	40	30.8	16	78.8	41	72.7	16
Missing	1.6	1	11.5	6	5.8	3	13.6	3
Total	100	61	100	52	100	52	100	22

[a] H=homosexual, NH=nonhomosexual, MFs=male-to-females, FMs=female-to-males.
[b] NA=not applicable.

MFs (mean=178, S.D.=6.0) ($P<0.001$), and with a higher BMI (mean=23.9, S.D.=4.8) than the MFs (mean=22.4, S.D.=3.4) ($P=0.002$).

3.4. Gender dysphoria

No difference was found between the homosexual and the nonhomosexual group in the intensity of gender dysphoria. The FMs, however, reported a stronger sense of gender dysphoria than the MFs ($P<0.001$).

3.5. Body dissatisfaction

Multivariate analyses showed no difference between the homosexual ($n=107$) and the nonhomosexual ($n=71$) group on the BIS [F (3, 172)=2.08, $P=0.10$], signifying an equal sense of body dissatisfaction within the groups. No differences were found between the sexes (108 MFs, 70 FMs) either [F (3,172)=2.34, $P=0.08$].

3.6. Physical appearance

The homosexuals scored lower on the AAI than the nonhomosexuals ($P<0.001$), indicating that according to observers, before treatment their appearance was more compatible with the new, desired gender. As a group, the FMs' appearance was considered to match the new gender better than that of the MFs as well ($P<0.001$). Similar to the results of age at pretest, the high (unfavorable) scores of the nonhomosexual MFs contributed to an interaction effect ($P<0.022$).

3.7. Psychological functioning

The homosexual group scored lower than the nonhomosexual group on the MANOVA NVM (79 homosexuals, 61 nonhomosexuals) [F (5, 131)=2.72, $P=0.022$] and on the ANOVA SCL-90 scale Psychoneuroticism (109 homosexuals, 74 nonhomosexuals), which is the total score of all SCL-90 subscales ($P=0.035$). Both results reflect fewer psychological problems in the homosexual group. Univariate analyses of the NVM revealed a more favorable score of the homosexual group on the Somatization scale. P values<0.10 were found on the Shyness ($P=0.052$)

and Extroversion ($P=0.059$) scales, again, indicating more favorable scores in the homosexual group.

Differences between the sexes were also found. The FMs scored higher on the MANOVA for the NVM (79 MFs, 61 FMs) [F (5, 131)=2.63, $P=0.027$] as well as on the MANOVA SCL-90 (110 MFs, 73 FMs) [F (8, 172)=2.18, $P=0.032$]. Finally, an interaction effect ($P<0.009$) was found on the ANOVA for the SCL-90 Psychoneuroticism scale, due to a lower score of the homosexual FMs and a higher score of the nonhomosexual FMs compared with their MF counterparts.

3.8. Intelligence

The homosexual group's mean IQ score (111.2; SD=16.9; $n=82$) was lower ($P<0.001$) than that of the nonhomosexual group (mean=122.3, S.D.=17.3, $n=61$). There were no differences in IQ scores between the sexes (81 MFs, 62 FMs). Mean scores for the different transsexual subgroups were 107.3 (S.D.=14.3) for the MF homosexuals ($n=39$), 121.7 (S.D.=17.2) for the MF nonhomosexuals ($n=42$), 114.8 (S.D.=18.4) for the FM homosexuals ($n=43$), and 123.7 (S.D.=17.8) for the FM nonhomosexuals ($n=19$).

3.9. Psychological problems in parents

The percentage (7.1%, $n=8$) of the homosexual group ($n=113$) who reported that both parents had suffered from one or two symptoms was lower ($\chi^2=3.9$, $P=0.048$) than that (16.2%, $n=12$) of the nonhomosexual group ($n=74$) who reported that both parents had suffered from one to three symptoms of the PPP list. It is not likely that the difference is related to differences in growing up with one or two parents, as the groups were similar in this respect. The highest significant correlation found was between psychological problems in both parents and the Negativism scale of the NVM: 0.20 ($P=0.006$, $n=182$).

No differences were found between the homosexual group and the nonhomosexual group in the degree to which they reported only their father or only their mother had suffered from psychological symptoms. Finally, no differences were found between the sexes (113 MFs, 74 FMs) on any of the three measured variables.

4. Discussion

One of the two purposes of the present study was to replicate and extend the evidence of the existence of different developmental routes in homosexual and nonhomosexual transsexuals. In this study the two subtypes were indeed found to differ on many characteristics. Replicating some of the previously observed differences, we found that compared with nonhomosexual transsexuals, homosexual transsexuals reported more cross-gendered behavior, appearance and preference in childhood, and they reported less sexual arousal while cross-dressing in adolescence, applied for SR at a younger age, and fewer were (or had been) married. Unlike Blanchard et al. (1995), we found no differences in height, weight or BMI.

Contrary to our expectations, we found the homosexual group not to be different from the nonhomosexual group in the extent of gender dysphoria and body dissatisfaction at application. Despite a less extreme cross-gendered childhood, the nonhomosexuals seemed to suffer no less from their situation than the homosexuals, while having an equally strong aversion to their sex characteristics when they applied for SR. As expected, the homosexual transsexuals' appearance already better matched the new, desired gender, and they functioned better psychologically than the nonhomosexual group.

Thus, our data largely support the idea that homosexual and nonhomosexual transsexuals are different subtypes with distinct characteristics. These characteristics suggest that routes leading to a request for SR are not identical because they reflect different etiologies.

The second purpose of the study was to examine whether a pattern of differences between homosexual and nonhomosexual transsexuals would be comparable for MFs and FMs. Our findings indicate that this was only partly the case, suggesting that nonhomosexual transsexualism develops differently for men and women.

A notable difference between the MFs and FMs was the finding that the homosexual MFs applied for SR earlier than the nonhomosexual MFs, whereas no difference was found in age at application between the two FM groups. The considerable age difference between the MF groups may indicate that the decision to apply for SR is influenced by different factors.

Although the gender dysphoria of the nonhomosexual MFs may already have been present in childhood, it is possible that their dysphoria increases over time and does not reach a critical level until later in life. From our data it is not clear when this critical gender-dysphoric level is reached, as external factors may also influence the decision to start or delay treatment (see below). Of course, other factors may explain the nonhomosexuals' later application age. First, Blanchard (1994) found that the more times a nonhomosexual MF has been married and has fathered children, the older he is likely to be when attending a gender clinic. Our data confirm that more nonhomosexual male transsexuals reported a history of marriage. Second, it is possible that at least in adolescence, the nonhomosexuals have some ambivalence about their genitalia. The pleasurable sensations they experience when sexually aroused while cross-dressing (perhaps in response to 'autogynephilic' fantasies) could be so rewarding that, for some time, these override the dissatisfaction about their genitals. For them, the loss of this source of pleasure may complicate and delay their request for SR compared with the homosexual MFs, who rarely experience any pleasure from their male bodies. Third, the more masculine appearance (according to observers) of the nonhomosexual MFs may increase their hesitance to start living permanently as a woman. Naturally, combinations of the above factors may also explain the later application for SR. The various reasons for the late application of nonhomosexual MFs may reflect an underlying etiological factor that influences their appearance, their more gender-typical childhood, and their sexual arousal patterns.

Unlike their male counterparts, nonhomosexual FMs appear to suffer so strongly from their gender dysphoria that they apply for SR in young adulthood, despite their less extreme childhood cross-genderedness compared with homosexual FMs. As sexual arousal while wearing men's clothes is almost absent in adolescence, other factors must contribute to the development of their SR wish. Our data show higher levels of gender dysphoria in both FM groups than in the two MF groups, but they do not provide indications of what those other factors might be. It is of interest, though, that a few FMs reported to have been sexually aroused in adolescence when dressing in male cloths, as this has never been reported before. Furthermore, the more favorably appraised appearance in both FM

groups probably facilitates living in the opposite sex role, increasing the chances of and possibly explaining a similar age at application for SR.

A clear difference between the FM groups was found with respect to their psychological functioning. Nonhomosexual FMs appeared to have significantly more psychological problems than homosexual FMs, whereas in this respect the MF groups were alike. Our data therefore suggest that the route to SR is likely to be more troublesome for nonhomosexual than for homosexual FMs.

Parental psychopathology may be one complicating environmental factor, as we found some differences between homosexual and nonhomosexual groups in numbers of both parents having psychological problems. However, the percentages that were reported do not explain the high level of psychological distress in the nonhomosexual FM group nor were parental and transsexual psychopathology correlated. It should, however, be mentioned that the data on parental psychopathology may not be very reliable, as they were based on retrospective reports of the transsexuals. An alternative explanation is that non-homosexual FMs are psychologically more vulnerable than homosexual FMs. Evidently, this possibility needs to be further investigated.

Although observers judged the ability to pass in the new role to be different for the homosexual and nonhomosexual group, we did not find differences between the groups in objective physical characteristics, such as height, weight and BMI. It is quite possible that femininity and masculinity in appearance are independent of these characteristics. However, we expected that at least (extreme) tallness or shortness would contribute to a masculine or feminine impression, and we found clear sex differences in height and BMI. It is also possible that our homosexual and nonhomosexual samples were too small to detect such differences.

From our findings a picture appears of homosexual transsexuals exhibiting a considerable cross-gender-edness from early childhood onwards. Their cross-gendered behavior, appearance and preference persist into adolescence, without much sexual arousal associated with cross-dressing. They are very gender-dysphoric adolescents and adults with a strong aversion of their sex organs, seeking SR in young adulthood or even earlier to fulfill their feelings of

belonging to the opposite sex. Marriage is relatively rare. Characteristics of this group are very similar to the so-called 'core transsexuals' (Burns et al., 1990), who also have fewer post-SR regrets than non-core transsexuals (Landén et al., 1998).

The picture of nonhomosexual MFs is a different one. They have been relatively masculine boys, and may not have been very gender dysphoric in childhood. In adolescence, sexual arousal during cross-dressing, perhaps related to the image of themselves as women (Blanchard, 1989b), is relatively common. They often become confused youngsters because their sexual attraction to (images of) women and their pleasurable genital sensations as a consequence of their arousal seem to contradict their wish to be a woman. In the hope that their internal conflicts will resolve when living a traditional man's life, some marry. However, when the gender dysphoria does not disappear or even increases and when their attempts to live in the male role remain unsuccessful, they ultimately decide to apply for SR.

Nonhomosexual FMs may have been girls with neutral interests or with some tomboy characteristics. For unknown reasons they may have developed serious psychological problems despite their higher than average intellectual abilities. They experience strong gender dysphoria in adolescence leading them to seek SR in young adulthood. Following the findings of Chivers and Bailey (2000), one would expect them to be less stereotypically masculine in their sexuality. Perhaps in nonhomosexual FMs rejection of the female role is stronger than attraction to the male role. As we have only examined some factors that could differentiate between the FM groups, other still unknown factors may play a more important role in the diversity of FM transsexuals.

An important limitation of our study involves the measurement of sexual orientation by self-identification only, casting doubt on the nature and stability of the concept we aimed to measure. Assuming that most of the subjects, who were adults, arrived at a truthful report of their sexual orientation while being interviewed, we come to the following conclusions: Homosexual and nonhomosexual transsexuals appear to differ from each other in many ways, and the pattern of differences is not comparable in the MF and FM groups. The different manifestations of homosexual and nonhomosexual subtypes of transsexualism

could reflect different etiologies. The results of this study clearly call for further studies, which should also address the possible neurodevelopmental basis for the diagnostic subcategories of transsexualism.

The nonhomosexual FMs, who appear to be psychologically more vulnerable than the homosexual FMs, as well as the nonhomosexual MFs, who generally have a less favorable appearance, have lived in the male role for a longer time and could therefore have encountered more social problems, need special attention during treatment. Whether the differences in psychological vulnerability between the FM subtypes will remain, intensify, or diminish after SR needs to be investigated in prospective follow-up studies. We are currently analyzing the results of such a study. The outcomes of this investigation will be vital in specifying the potential clinical implications for homosexual and nonhomosexual transsexuals during and after SR.

Acknowledgments

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