



Childhood Gender Nonconformity and Children's Past-Life Memories

Journal:	<i>International Journal of Sexual Health</i>
Manuscript ID	WIJS-2018-1889.R1
Manuscript Type:	Original Article
Keywords:	Gender nonconformity, Gender Identity, Children, Adolescents, Reincarnation memories

SCHOLARONE[™]
Manuscripts

ABSTRACT

Objectives

This study examines childhood gender non-conformity (GNC) in conjunction with the phenomenon in which young children describe memories of a purported previous life.

Methods

In a case-control study of 469 children reporting past-life memories, we used logistic regression to examine predictors of GNC, measured by documented gender nonconforming behaviors.

Results

Children who remembered a life involving a different natal sex were much more likely to exhibit GNC than children who remembered a same-sex life.

Conclusions

After exploring potential explanations, we conclude that past-life memories represent a novel factor that may be associated with the development of GNC.

INTRODUCTION

Despite individual variation within sexes, from an early age boys and girls tend to show differences in behavior, manifesting as divergent preferences for toys, play activities, and playmates (Campbell, Shirley, & Caygill, 2002; Golombok, Rust, Zervoulis, Golding, & Hines, 2012; Hines, 2010). By the age of three and even earlier, girls, on average, show more interest in playing with dolls, doll houses, and tea sets and engaging in cooperative play, while boys prefer to play with trucks, trains, and toy guns and engage in more rough-and-tumble play (Maccoby & Jacklin, 1987; O'Brien & Huston, 1985; Pasterski et al., 2007; Pitcher & Shultz, 1983; Ruble, Martin, & Berenbaum, 2006; Servin, Bohlin, & Berlin, 1999; Todd et al., 2017; Weisgram, Fulcher, & Dinella, 2014). Such sex-typed toy preferences have been observed even in groups of children as young as 9 to 17 months, before the age when gendered identity is usually demonstrated (Todd, Barry, & Thommessen, 2016). In addition, by the age of 3, most children tend to prefer playmates of the same sex (LaFreniere, Strayor, & Gauthier, 1984; Martin & Fabes, 2001; Zucker, 2005). Such sex-typed behaviors tend to increase as children grow and be stable even through adolescence (Golombok et al., 2012; Martin & Fabes, 2001). However, changes in findings have been seen across time, with both boys and girls but particularly with girls, who have played significantly less with both female-typed toys and male-typed toys in the more recent studies, which may relate to increased efforts by some parents and educators to promote more gender-neutral play (Todd et al., 2017).

While, on average, boys and girls tend to engage in sex-typed behaviors, some children exhibit considerable departures from such tendencies, which is known as gender nonconformity

1
2
3 (GNC). GNC is non-pathological, and prevalence estimates suggest that, by age 7, as much as
4
5 3.2% of boys and 5.2% of girls exhibit gender nonconforming behaviors (van Beijsterveldt,
6
7 Hudziak, & Boomsma, 2006). In this paper, we focus on GNC in childhood and present a novel
8
9 factor potentially associated with the development of GNC.
10
11
12
13

14 **Etiology of gender nonconformity**

15
16
17
18
19 The etiology of individual differences in GNC has been investigated in a number of twin
20
21 studies, which have shed light on the relative contributions of genetic and environmental factors
22
23 to this trait. Despite variations in methodology (including differences in genetic models tested as
24
25 well as tools for assessing GNC) and samples (including different ages and geographic sources
26
27 of the twin samples), results have been somewhat consistent across studies (Alanko et al., 2010;
28
29 Bailey, Dunne, & Martin, 2000; Knafo, Iervolino, & Plomin, 2005; van Beijsterveldt, Hudziak,
30
31 & Boomsma, 2006). For girls, there is a significant genetic contribution, with minimal
32
33 contribution from the environment shared between twins. For boys, the evidence is less
34
35 consistent, with some studies suggesting that both genetic and the shared environment factors
36
37 significantly contribute to the variability in GNC (Iervolino, Hines, Golombok, Rust, & Plomin,
38
39 2005; Knafo et al., 2005), and other studies pointing to a primarily genetic contribution, similar
40
41 to that in girls (Bailey et al., 2000; van Beijsterveldt et al., 2006). Although the evidence for both
42
43 genetic and environmental influences on variability in GNC is strong, the precise nature of these
44
45 factors remains to be elucidated. Shared environmental factors may include social factors such as
46
47 parenting style or parent-child interactions (Alanko et al., 2009; Landolt et al., 2004) or
48
49
50
51
52
53
54
55
56
57
58
59
60

1
2
3 biological factors such as prenatal testosterone exposure, which has shown a robust effect on the
4 development of sex-typed behaviors (for a review, see Hines, 2010).
5
6

7
8 Here we consider a previously unexplored factor (also occurring in childhood) that may
9 influence variability in GNC, and which cannot readily be categorized as either genetic or
10 environmental.
11
12
13
14

15 16 17 18 **Cases of the Reincarnation Type** 19

20
21 The phenomenon of children claiming to remember a “previous life” occurs in many
22 countries around the world (Stevenson, 2001). For the past fifty years, researchers have
23 systematically collected, studied, and reported in the literature such cases under the term “cases
24 of the reincarnation type” (CORTs), and have found common features among them. These
25 children start talking spontaneously about a life as another individual (referred to as the
26 “previous personality” or PP), typically beginning around the age of two to five and ending by
27 the age of six to eight. In some cases, the details provided by the child about the PP are so
28 specific that they allow for the identification of a deceased person who closely matches the
29 account of the child. Sometimes these cases include additional features beyond the child’s verbal
30 statements, such as the child being born with birthmarks or birth defects corresponding to fatal
31 wounds on the PP (Stevenson, 1997), or the child exhibiting behaviors, preferences, or phobias
32 related to the PP (Stevenson, 1990). One interesting feature highlighted in previous published
33 case reports occurs when the child remembers a life as a member of a different sex. Many of
34 these children exhibit various gender-nonconforming behaviors (Stevenson, 1977b; Tucker &
35 Keil, 2001). In this paper, we systematically explore the association between “sex-change” cases
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

1
2
3 of the reincarnation type in childhood and exhibited gender nonconformity across our entire
4 collection of cases, and we discuss potential explanations for our findings.
5
6
7
8
9

10 **METHODS**

11 **CORT Database**

12
13
14
15
16
17 More than 2,200 cases of the reincarnation type from various countries have been
18 investigated and documented by the University of Virginia Division of Perceptual Studies
19 according to an investigational protocol developed by Stevenson (1977a). Once a new case is
20 identified, a trained investigator conducts thorough interviews with the child and his/her parents
21 and closest relatives who serve as firsthand informants for the specifics of each case. The goal of
22 these investigations is to evaluate systematically the evidence for different explanations of each
23 case, including those of an anomalous nature. To standardize the collection of evidence across
24 cases and investigators, the investigators use a Registration Form that includes a checklist of
25 salient features of CORTs to guide the interviews. All interviewed informants provide informed
26 consent and child participants provide assent, and the study is approved by the University's
27 Institutional Review Board for Social and Behavioral Sciences.
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45

46 Following this evidence-gathering stage, each case is numerically coded by trained
47 coders into 208 variables pertaining to the case (from information provided in the Registration
48 Form and the investigator's notes), and entered into an SPSS 24 database. Variables encode,
49 among others, demographics of the individual and the PP, additional features of the case such as
50 presence of unusual birthmarks or behaviors associated with the PP, and timeline of development
51
52
53
54
55
56
57

1
2
3 of the case. Specific variables used in this study are described below. The aggregate database has
4
5 previously been used to explore salient characteristics across multiple cases in an effort to
6
7 elucidate processes underlying this phenomenon (Sharma & Tucker, 2004; Stevenson &
8
9 Haraldsson, 2003; Tucker, 2000).

10
11
12 We refer to children's experiences, statements, and behaviors that pertain to the previous
13
14 individual as "past-life" memories, as we are not attempting here to determine the etiology of
15
16 this phenomenon. However, for ease of language, we shall omit the quotation marks in the
17
18 remainder of this article.
19
20
21
22
23
24

25 **Participants and Data**

26
27
28 Our study sample was pulled from this large database of cases of children who claim to
29
30 remember previous lives. Specifically, we identified 469 cases (21.0% out of our total database
31
32 of 2,238 cases) for which the following information is available: sex of subject, sex of claimed
33
34 "previous personality" (PP), and information about whether subject exhibits gender non-
35
36 conforming behaviors. Cases used in this study come from a total of 23 countries, including Sri
37
38 Lanka (29% of total sample), Turkey (27%), India (10%), Myanmar (10%), the United States
39
40 (10%), Thailand, Lebanon, Canada, and Brazil (the latter four each constituting less than 3% of
41
42 the sample), most of which have a cultural belief in reincarnation. The average age at which
43
44 subjects began speaking about a PP was $M = 2.77$ years, $SD = 1.35$, with the oldest age being 12.
45
46 Within this sample, cases where the subject and the related PP were of different sex were defined
47
48 as "sex-change cases" (107, 22.8%), while the remaining cases were defined as "same-sex cases"
49
50 (362, 77.2%). Information about GNC was extracted from field notes of the investigator and/or
51
52 narratives of subjects or family members, and was coded dichotomously as positive (107, 22.8%)
53
54
55
56
57
58
59
60

1
2
3 or negative (362, 77.2%). Gender nonconforming behaviors in the cases included wearing
4 clothes/hairstyles or engaging in play more typical of the non-natal sex (or reluctance to engage
5 in sex-typical play or have same-sex playmates) and gender dysphoria or transgender
6 identification (Stevenson, 1977b; Tucker & Keil, 2001). This variable in our database asks,
7
8 “Does S[subject] exhibit behavior related to that of the opposite sex?” This is similar to two items
9
10 in the Child Behavior Checklist, a standardized parent-reported behavioral questionnaire
11
12 (Achenbach & Edelbrock, 1981); specifically, items 5 and 110 (“behaves like opposite sex” and
13
14 “wishes to be of opposite sex,” respectively) have previously been used as indicators of
15
16 childhood gender nonconformity (Steensma, van der Ende, Verhulst, & Cohen-Kettenis, 2013;
17
18 van Beijsterveldt, Hudziak, & Boomsma, 2006).

19
20
21
22
23
24
25
26 It is important to note that our data collection has spanned decades and different cultures,
27
28 and during that time scientific and societal focus has shifted from viewing gender as a binary of
29
30 either male or female to a more fluid gender continuum. These historical and cultural norms have
31
32 accordingly influenced both the “opposite sex” terminology used in our CORT codebook, as well
33
34 as perceptions of what constitutes gender nonconforming behavior. However, instructions in our
35
36 coding manual specifically state that any determination of such behaviors is to be made based on
37
38 criteria specific to the culture and time. As such, despite variability in shifting gender norms, our
39
40 indicator of GNC is still compatible with the latest guidelines, which view gender nonconformity
41
42 as gender expression or identity that differs from normative ones “in a given culture and
43
44 historical period” (Coleman et al., 2012).

51 52 **Statistical Analysis**

1
2
3 We performed a case-control analysis to investigate factors that may be associated with
4 GNC in CORT subjects. In this observational design, individuals were classified based on the
5 presence or absence of gender nonconforming behaviors, and the “exposure” to a potential
6 influential factor was then compared between the two groups. For the main factor of interest
7 (reported sex-change memories), the association is first presented in a contingency table and was
8 assessed for significance using the chi-squared test. In addition, we used logistic regression
9 models predicting the outcome of interest (GNC) as the dependent variable, from various factors
10 and confounds (treated as independent variables in the models). Initially, each independent
11 variable was considered in a separate univariate model predicting the outcome. If an individual
12 variable reached level of significance of 0.10 or below, it was subsequently included in a
13 multiple logistic regression model, simultaneously including (and controlling for) all predictors
14 with $p \leq 0.10$. Thus, the p-values obtained from multiple regression models show statistical
15 significance for each variable after adjusting for all other variables in the model. For categorical
16 variables, one category was chosen as a ‘reference’ category, and comparisons for all other
17 categories against the reference are reported. We used Bonferroni corrections to control the Type
18 I error in 12 univariate regressions, where the Bonferroni significant p-value was set at 0.004
19 (0.05/12). In addition to univariate and multivariate analyses in the full sample, we conducted a
20 control analysis in a subset of the CORTs where the statements of the child have been found to
21 match to a high degree details of the life of an actual deceased person. The purpose of this
22 additional analysis was to limit the possibility that the “memories” reported by children are due
23 to fantasy, by focusing only on cases with verifiable statements.
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50

51
52 In both univariate and multivariate analyses, the strength of association between a factor
53 and the outcome of interest was expressed as an odds ratio (*OR*) and its corresponding 95%
54
55
56
57

1
2
3 confidence interval (CI). In this context, the *OR* describes the odds that GNC is reported in
4 subjects with sex-change past-life memories, compared to the odds in subjects with same-sex
5 past-life memories. An *OR* of 1 indicates no effect, such that, for categorical factors, GNC is not
6 more likely in either of the categories being compared, while values greater or less than 1
7 indicate that the category of interest is associated with higher or lower odds of the outcome,
8 respectively.
9

10
11
12 In uncorrected analyses, a p-value was taken as significant if ≤ 0.05 . All statistical
13 analyses were conducted in SPSS 24.
14
15

16 17 18 19 20 21 22 23 24 **Predictor Variables Included in Analysis**

25
26
27 In addition to sex-change vs. same-sex past-life memories, we considered additional
28 explanatory and confounding variables in predicting GNC. Among those were demographic and
29 developmental factors, such as natal sex of subject, age at first speaking in coherent phrases, and
30 age at first speaking about the PP.
31
32
33
34
35
36

37
38 Furthermore, we considered factors which are proxies for the “depth” and salience of the
39 memories, such as presence of emotion during the recall of the past-life memories and an overall
40 scale measuring the extent of a possible anomalous explanation of each case, where a higher
41 score indicates stronger evidence for an anomalous explanation. This “strength-of-case scale”
42 (Tucker, 2000) includes four categories of factors: birthmarks and birth defects, behaviors
43 deemed to relate to the PP, type and number of verified statements made by the child about the
44 PP, and extent of social and physical proximity between the subject and the PP. While normally
45 included in the scale, for the purposes of this analysis, the variable coding for gender-
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

1
2
3 **nonconforming** behaviors was excluded from the calculation since we were specifically
4
5 interested in the factors that explain these behaviors.
6
7

8
9 We also considered confounding factors that may shape expectations about the claims of
10 the child, including initial parental attitudes towards the child's claims (coded as "encouraging or
11 positive" versus "negative or neutral"). In addition, in certain cases (113, 22% of total) the PP
12 and the child are from the same family (i.e., the PP was a relative who passed away before the
13 child was born). Relatedly, in some cases family members have an "announcing dream" in which
14 they are informed about the future identity of the child, and sometimes specifically by a deceased
15 relative who claims that he/she will reincarnate as the child. Although cases in our collection
16 span a large number of countries, Myanmar (or Burma) is unique in that it is the only country
17 where the majority of cases show gender nonconforming behaviors, and about half of all
18 Burmese CORTs occurred in the same family. Thus, we included an indicator variable for cases
19 from Myanmar as a possible confound in explaining GNC in our sample. Finally, we considered
20 the presence of birthmarks related to the PP as a confound of expectations in CORTs, since they
21 may lead a family to associate the child with a particular individual who died with a similar
22 wound.
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40

41 Although not directly included as a predictor variable, we also considered the effect of
42 verifiability of children's statements on the relationship between "sex-change" vs. "same-sex"
43 CORTs and GNC. Accordingly, we conducted analyses in a subset of data consisting of "solved"
44 cases where the details provided by the child on the PP are rich and sufficient to identify a
45 particular deceased person who corresponds to the description. Some such cases may also
46 include controlled tests of recognition in which the child is presented with multiple-choice
47 options of objects or individuals from the PP's life that were previously unknown to the child.
48
49
50
51
52
53
54
55
56
57
58
59
60

RESULTS

Descriptive statistics of demographics and analysis variables for our full sample, as well as for two reduced samples used in sensitivity analyses, are presented in Table 1.

The association between type of past-life memories and gender nonconformity was highly statistically significant, with sex-change memories associated with much higher odds of GNC compared to same-sex memories ($OR = 66.50$, $CI: [34.74, 127.31]$; Table 2). Eighty percent of subjects with sex-change memories exhibited gender nonconformity, compared to only 5.8% of subjects with same-sex memories.

The various factors that could be potential predictors of gender nonconformity were each considered in a univariate regression analysis. Consistent with results from the contingency table analysis above, reported sex-change memories were independently a significant predictor of GNC ($OR = 66.50$, $CI: [34.74, 127.31]$; Table 3). Other factors associated with higher odds of GNC included: natal female subject ($OR = 3.06$, $CI: [1.93, 4.86]$), subject showing emotion during recall of past life ($OR = 2.17$, $CI: [1.26, 3.74]$), a positive maternal attitude towards claims ($OR = 2.35$, $CI: [1.17, 4.70]$), and subjects from Myanmar compared to subjects from other countries ($OR = 12.08$, $CI: [6.19, 23.61]$). In addition, the child and PP being from same family was marginally significant in predicting GNC ($OR = 1.63$, $CI: [0.98, 2.70]$). After Bonferroni corrections, only sex-change memories, female natal sex, and subjects from Myanmar remained significant predictors of GNC.

All of the predictors that were significant at alpha 0.10 (uncorrected) on univariate analysis were then included in a multivariate analysis (Table 4). The result was that only sex-

1
2
3 change memories remained significantly associated with GNC, controlling for all other variables
4
5 in the model ($OR = 67.54$, $CI: [22.70, 200.93]$). Based on these results and the OR s in both
6
7 univariate and multivariate regression models, sex-change memories are an overwhelmingly
8
9 stronger predictor of GNC compared to other factors assessed in this analysis.
10
11
12

13 To address the possibility that the association between “sex-change” memories and GNC
14
15 is due to the child’s statements being pure fantasy, we conducted additional analyses in two
16
17 samples of cases in which the child’s statements have been found to correspond to the life of an
18
19 actual deceased person. The first sample consisted of 296 such “solved” cases and the second
20
21 sample consisted of 202 “solved” cases while excluding cases occurring in the same family. In
22
23 the first sample, 81.3% ($n = 61$) of subjects with sex-change memories exhibited GNC,
24
25 compared to only 5.9% ($n = 13$) of subjects with same-sex memories, and type of case (“sex-
26
27 change” vs. “same-sex”) achieved an OR of 69.71 ($CI: [31.11, 156.25]$) in predicting GNC
28
29 (Table 5). In the second sample, 83.7% ($n = 36$) of subjects with sex-change memories exhibited
30
31 GNC, compared to only 5.7% ($n = 9$) of subjects with same-sex memories, and type of case
32
33 achieved an OR of 85.71 ($CI: [29.92, 245.57]$) in predicting GNC (Table 5). These effects are
34
35 very similar to those obtained in the univariate analysis in the full sample (Tables 2 and 3). The
36
37 multivariate analyses, although not reported here, similarly revealed that type of case was the
38
39 strongest predictor of GNC in the control samples as well.
40
41
42
43
44
45
46
47
48
49

50 51 52 53 54 55 56 57 58 59 60

Our study demonstrates that among children who describe memories of a past life, a strong association exists between gender nonconformity and memories of a life as a member of a

1
2
3 different sex. It is unclear whether one causes the other or if they travel together as two parts of
4
5 one overall process.
6

7
8 To explore the question of whether the presence of GNC can lead a child to report past-
9
10 life memories, we considered scenarios in which parents, believing in reincarnation, would be
11
12 most likely to interpret GNC as an indication that a child had a past life as a member of a
13
14 different sex. These would include situations in which a family member of a different sex has
15
16 recently died, ones in which a child is born with birthmarks that are similar to fatal injuries that a
17
18 family member or acquaintance of a different sex recently suffered, and ones in which a parent
19
20 dreamed during a pregnancy that a different sex family member announced a plan to return as the
21
22 baby. In these circumstances, parents might identify the child as being the previous person
23
24 reborn and might thereby induce false memories of that person's life in the child. We found,
25
26 however, that GNC does not show a significant association with birthmarks or announcing
27
28 dreams. Likewise, the association with the child being from the same family as the previous
29
30 personality did not remain significant when other factors were controlled for in the multivariate
31
32 analysis. Similarly, a positive maternal attitude towards the child's past-life memories was
33
34 associated with GNC, raising the possibility that such mothers might encourage a past-life
35
36 explanation for the GNC, but this association was no longer significant after accounting for other
37
38 factors. Thus, we found no association between gender nonconformity and circumstances in
39
40 which GNC itself would be most likely to lead to the creation of past-life memories.
41
42
43
44
45
46

47 The possibility that children's past-life statements may be fantasies independent of any
48
49 parental influence merits further attention as well. Can pre-existing GNC lead a child to report
50
51 past-life memories specifically as a member of a different sex, as if playing out gender
52
53 nonconforming tendencies in fantasy? Several points argue against this possibility. First,
54
55
56
57

1
2
3 although it is impossible to rule out that in some of these cases the child's statements and
4
5 behaviors may be rooted in fantasy, in more than half of our cases the idiosyncratic details of the
6
7 past life have been found to match the life of an actual deceased individual. When limiting our
8
9 analysis to such cases only, we find an equally strong association between GNC and memories of
10
11 a life as a member of a different sex. In addition, as has been previously documented (Tucker,
12
13 2008), a high percentage of reported deaths in our CORTs are due to violent causes such as
14
15 accidents, homicide, suicide, and drowning (70% in the full sample and 63% in children
16
17 exhibiting GNC). As the details of these deaths are often remembered and re-lived by the
18
19 children, sometimes leading to traumatization (Haraldsson, 2003), it appears unlikely that a child
20
21 would conjure up a fantasy of a life that ended violently.
22
23
24
25

26 It is also true that some evidence suggests that individuals who report past-life memories
27
28 may be more prone to false memories compared to control subjects of similar age and education,
29
30 as measured by false recall and recognition in an experimental task (Meyersburg, Bogdan, Gallo,
31
32 & McNally, 2009). However, the samples and types of reported past-life memories differ
33
34 considerably between the study of Meyersburg and colleagues and the CORT phenomenon
35
36 discussed in this paper. CORTs are typically characterized by spontaneously reported, and often
37
38 verifiable, memories in young children, and these memories are occasionally accompanied by
39
40 birthmarks, birth defects, and phobias related to the purported previous life. Conversely, the
41
42 sample in Meyersburg et al. (2009) consisted entirely of adults, with unverified past-life
43
44 memories of a heterogeneous origin, including memories "recovered" through hypnotic
45
46 regression, which may be inherently influenced by suggestibility. In fact, when specifically
47
48 examining cases of spontaneous past-life memories in childhood, across two cultures,
49
50 Haraldsson (1995, 1997, 2003) found that these children were no more suggestible than age- and
51
52
53
54
55
56
57
58
59
60

1
2
3 sex-matched controls. In addition, in at least one of the samples, children whose memories were
4
5 verified were less suggestible than both the control group and children with unverified, i.e.,
6
7 “unsolved” memories (Haraldsson, 1997). Taken together, these considerations lead us to doubt
8
9 that false memories alone, or predominantly, can fully explain the past-life reports in children
10
11 with gender nonconformity.
12
13

14
15 So far we have addressed scenarios in which gender nonconformity might cause a child
16
17 to report past-life memories or to report memories specifically of a life as a member of a
18
19 **different sex**. Can the reverse be true: can past-life memories lead to gender nonconformity?
20
21 That is a more complex question. Stevenson and Keil (2001) argued that in addition to genetics
22
23 and environmental influences, previous lives may be a third factor that shapes personality
24
25 development. Our study may offer some support for such a possibility.
26
27
28
29
30

31 **Limitations**

32
33 Certain limitations of our study should be noted. First, the level of evidence of the
34
35 association between sex-change past-life memories and GNC is constrained by the observational
36
37 nature of our study. At best, the reported association is only correlational. Second, the main
38
39 outcome of interest— GNC—encompassed a broad range of behaviors, and it is unclear if past-
40
41 life memories of a **different sex** are differentially associated with specific behaviors. Third,
42
43 despite the observed association between sex-change past-life memories and gender
44
45 nonconformity, it is unclear if this association persists as memories of the past life fade, as they
46
47 typically do.
48
49
50
51
52
53

54 **CONCLUSIONS**

1
2
3
4
5 Among children who report memories of a previous life, gender nonconformity is
6 strongly associated with a purported life as a member of a different sex. This association may
7 offer insights into contributors to gender nonconformity in children who do not express such
8 memories. In clinical settings, when past-life memories are present in conjunction with GNC, it
9 may be beneficial to address this connection in focused psychotherapy. It is possible that
10 currently unidentified hormonal or neurochemical factors could predispose affected children to
11 both phenomena, or as Stevenson and Keil (2001) suggested, perhaps a previously unrecognized
12 factor of consciousness may be involved.
13
14
15
16
17
18
19
20
21
22
23
24
25

26 **ACKNOWLEDGEMENTS**

27
28 The authors report no actual or potential financial, personal, or other conflicts of interest
29 in this work. This research was not supported by any specific grants from public or commercial
30 granting agencies.
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

REFERENCES

- Achenbach, T. M., & Edelbrock, C. S. (1981). Behavioral problems and competencies reported by parents of normal and disturbed children aged four through sixteen. *Monographs of the Society for Research in Child Development*, 46(1), 1-82. doi:10.2307/1165983
- Alanko, K., Santtila, P., Harlaar, N., Witting, K., Varjonen, M., Jern, P., . . . Sandnabba, N. K. (2010). Common genetic effects of gender atypical behavior in childhood and sexual orientation in adulthood: A study of Finnish twins. *Archives of Sexual Behavior*, 39(1), 81-92. <http://dx.doi.org/10.1007/s10508-008-9457-3>
- Alanko, K., Santtila, P., Witting, K., Varjonen, M., Jern, P., Johansson, A., . . . Sandnabba, N. K. (2009). Psychiatric symptoms and same-sex sexual attraction and behavior in light of childhood gender atypical behavior and parental relationships. *The Journal of Sex Research*, 46(5), 494-504. Retrieved from <http://www.jstor.org/stable/20620454>
- Bailey, J. M., Dunne, M. P., & Martin, N. G. (2000). Genetic and environmental influences on sexual orientation and its correlates in an Australian twin sample. *Journal of Personality and Social Psychology*, 78(3), 524-536. <http://dx.doi.org/10.1037/0022-3514.78.3.524>
- Campbell, A., Shirley, L., & Caygill, L. (2002). Sex-typed preferences in three domains: Do two-year-olds need cognitive variables? *British Journal of Psychology*, 93(2), 203-217. <http://dx.doi.org/10.1348/000712602162544>
- Coleman, E., Bockting, W., Botzer, M., Cohen-Kettenis, P., DeCuypere, G., Feldman, J., . . . Zucker, K. (2012). Standards of care for the health of transsexual, transgender, and

gender-nonconforming people, version 7. *International Journal of Transgenderism*,
13(4), 165-232. <http://dx.doi.org/10.1080/15532739.2011.700873>

Golombok, S., Rust, J., Zervoulis, K., Golding, J., & Hines, M. (2012). Continuity in sex-typed behavior from preschool to adolescence: A longitudinal population study of boys and girls aged 3–13 years. *Archives of Sexual Behavior*, 41(3), 591-597.

<http://dx.doi.org/10.1007/s10508-011-9784-7>

Haraldsson, E. (1995). Personality and abilities of children claiming previous-life memories. *Journal of Nervous and Mental Disease*, 183(7), 445-451.

<http://dx.doi.org/10.1097/00005053-199507000-00004>

Haraldsson, E. (1997). A psychological comparison between ordinary children and those who claim previous-life memories. *Journal of Scientific Exploration*, 11(3):323-335.

Haraldsson, E. (2003). Children who speak of past-life experiences: Is there a psychological explanation? *Psychology and Psychotherapy: Theory, Research and Practice*, 76(1), 55-67. <http://dx.doi.org/10.1348/14760830260569256>

Hines, M. (2010). Sex-related variation in human behavior and the brain. *Trends in Cognitive Sciences*, 14(10), 448-456. <http://dx.doi.org/10.1016/j.tics.2010.07.005>

Iervolino, A. C., Hines, M., Golombok, S. E., Rust, J., & Plomin, R. (2005). Genetic and environmental influences on sex-typed behavior during the preschool years. *Child Development*, 76(4), 826-840. <http://dx.doi.org/10.1111/j.1467-8624.2005.00880.x>

- 1
2
3 Knafo, A., Iervolino, A. C., & Plomin, R. (2005). Masculine girls and feminine boys: Genetic
4 and environmental contributions to atypical gender development in early childhood.
5
6 *Journal of Personality and Social Psychology*, 88(2), 400-412. doi:10.1037/0022-
7
8 3514.88.2.400
9
10
11
12
13 LaFreniere, P., Strayer, F. F., & Gauthier, R. (1984). The emergence of same-sex affiliative
14 preferences among preschool peers: A developmental/ethological perspective. *Child*
15 *Development*, 55(5), 1958-1965. <http://dx.doi.org/10.2307/1129942>
16
17
18
19
20
21 Landolt, M. A., Bartholomew, K., Saffrey, C., Oram, D., & Perlman, D. (2004). Gender
22 nonconformity, childhood rejection, and adult attachment: A study of gay men. *Archives*
23 *of Sexual Behavior*, 33(2), 117-128.
24
25 <http://dx.doi.org/10.1023/B:ASEB.0000014326.64934.50>
26
27
28
29
30
31 Maccoby, E. E., & Jacklin, C. N. (1987). Gender segregation in children. In H. W. Reece (Ed.),
32 *Advances in child development and behavior* (pp. 239-287). New York: Academic Press.
33
34
35
36
37
38 Martin, C. L., & Fabes, R. A. (2001). The stability and consequences of young children's same-
39 sex peer interactions. *Developmental Psychology*, 37(3), 431-446.
40
41 <http://dx.doi.org/10.1037/0012-1649.37.3.431>
42
43
44
45
46 Meyersburg, C. A., Bogdan, R., Gallo, D. A., & McNally, R. J. (2009). False memory propensity
47 in people reporting recovered memories of past lives. *Journal of Abnormal Psychology*,
48 118(2), 399-404. <http://dx.doi.org/10.1037/a0015371>
49
50
51
52
53
54
55
56
57

- 1
2
3 O'Brien, M., & Huston, A. C. (1985). Activity level and sex-stereotyped toy choice in toddler
4 boys and girls. *The Journal of Genetic Psychology*, 146(4), 527-533.
5
6 <http://dx.doi.org/10.1080/00221325.1985.10532472>
7
8
9
10
11 Pasterski, V., Hindmarsh, P., Geffner, M., Brook, C., Brain, C., & Hines, M. (2007). Increased
12 aggression and activity level in 3- to 11-year-old girls with congenital adrenal hyperplasia
13 (CAH). *Hormones and Behavior*, 52(3), 368-374.
14
15 <http://dx.doi.org/10.1016/j.yhbeh.2007.05.015>
16
17
18
19
20
21 Pitcher, E. G., & Schultz, L. H. (1983). *Boys and girls at play: The development of sex roles*.
22 South Hadley, MA: Bergin & Garvey.
23
24
25
26
27
28 Ruble, D. N., Martin, C. L., & Berenbaum, S. A. (2006). Gender development. In N. Eisenberg
29 (Ed.), *Handbook of child psychology* (Vol. 3, pp. 858-932). New York: Wiley.
30
31
32
33
34
35 Servin, A., Bohlin, G., & Berlin, L. (1999). Sex differences in 1-, 3-, and 5-year-olds' toy-choice
36 in a structured play-session. *Scandinavian Journal of Psychology*, 40(1), 43-48.
37
38 <http://dx.doi.org/10.1111/1467-9450.00096>
39
40
41
42
43 Sharma, P., & Tucker, J. B. (2004). Cases of the reincarnation type with memories from the
44 intermission between lives. *Journal of Near-Death Studies*, 23(2), 101-118.
45
46
47
48 Steensma, T. D., van der Ende, J., Verhulst, F. C., & Cohen-Kettenis, P. T. (2013). Gender
49 variance in childhood and sexual orientation in adulthood: A prospective study. *Journal*
50 *of Sexual Medicine*, 10(11), 2723-2733. [http://dx.doi.org/10.1111/j.1743-](http://dx.doi.org/10.1111/j.1743-6109.2012.02701.x)
51 [6109.2012.02701.x](http://dx.doi.org/10.1111/j.1743-6109.2012.02701.x)
52
53
54
55
56
57

1
2
3 Stevenson, I. (1977a). Reincarnation: Field studies and theoretical issues. In B. B. Wolman (Ed.),
4
5 *Handbook of parapsychology* (pp. 631–663). New York: Van Nostrand Reinhold.

6
7
8
9
10 Stevenson, I. (1977b). The Southeast Asian interpretation of gender dysphoria: An illustrative
11
12 case report. *Journal of Nervous and Mental Disease*, 165(3), 201-208.

13
14
15 <http://dx.doi.org/10.1097/00005053-197709000-00008>

16
17
18 Stevenson, I. (1990). Phobias in children who claim to remember previous lives. *Journal of*
19
20 *Scientific Exploration*, 4(2):243-254.

21
22
23 Stevenson, I. (1997). *Reincarnation and biology: A contribution to the etiology of birthmarks*
24
25 *and birth defects*. Westport, CT: Praeger.

26
27
28
29
30 Stevenson, I. (2001). *Children who remember previous lives: A question of reincarnation*
31
32 (Revised ed.). Jefferson, NC: McFarland.

33
34
35
36 Stevenson, I., & Haraldsson, E. (2003). The similarity of features of reincarnation type cases
37
38 over many years: A third study. *Journal of Scientific Exploration*, 17(2):283-289.

39
40
41 Stevenson, I., & Keil, H.H.J. (2005). Children of Myanmar who behave like Japanese soldiers: A
42
43 possible third element in personality. *Journal of Scientific Exploration*, 19(2):171-183.

44
45
46 Todd, B. K., Barry, J. A., & Thommessen, S. A. O. (2016). Preferences for 'gender-typed' toys in
47
48 boys and girls aged 9 to 32 months. *Infant and Child Development*, 26(3), e1986.

49
50
51 <https://onlinelibrary.wiley.com/doi/epdf/10.1002/icd.1986>

1
2
3 Todd, B. K., Fischer, R. A., Di Costa, S., Roestorf, A., Harbour, K., Hardiman, P., & Barry, J. A.

4
5 (2017). Sex differences in children's toy preferences: A systematic review, meta-
6
7 regression, and meta-analysis. *Infant and Child Development*, 27, e2064.

8
9
10 <https://onlinelibrary.wiley.com/doi/epdf/10.1002/icd.2064>

11
12
13 Tucker, J.B. (2000). A scale to measure the strength of children's claims of previous lives:

14
15 Methodology and initial findings. *Journal of Scientific Exploration*, 14(4):571-581.

16
17
18 Tucker, J.B. (2008). Children's reports of past-life memories: A review. *Explore*, 4:244-248.

19
20
21
22
23 Tucker, J. B., & Keil, H. H. J. (2001). Can cultural beliefs cause a gender identity disorder?

24
25
26 *Journal of Psychology & Human Sexuality*, 13(2), 21-30.

27
28 http://dx.doi.org/10.1300/J056v13n02_02

29
30
31 van Beijsterveldt, C. E. M., Hudziak, J. J., & Boomsma, D. I. (2006). Genetic and environmental

32
33 influences on cross-gender behavior and relation to behavior problems: A study of Dutch
34
35 twins at ages 7 and 10 years. *Archives of Sexual Behavior*, 35(6), 647-658.

36
37
38 <http://dx.doi.org/10.1007/s10508-006-9072-0>

39
40
41 Weisgram, E. S., Fulcher, M., & Dinella, L. M. (2014). Pink gives girls permission: Exploring

42
43 the roles of explicit gender labels and gender-typed colors on preschool children's toy
44
45 preferences. *Journal of Applied Developmental Psychology*, 35, 401-409.

46
47
48 <http://dx.doi.org/10.1016/j.appdev.2014.06.004>

49
50
51 Zucker, K. J. (2005). Measurement of psychosexual differentiation. *Archives of Sexual Behavior*,

52
53 34(4), 375-388. <http://dx.doi.org/10.1007/s10508-005-4336-7>

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

For Peer Review Only

Table 1

Descriptive Statistics for Samples of CORTs

Variable	Full Sample		Solved cases		Solved cases from same family	
	N*	Mean ± SD or %	N*	Mean ± SD or %	N*	Mean ± SD or %
GNC (present)	469	22.8%	296	25.0%	202	22.3%
Sex-change memories (yes)	469	22.8%	296	25.3%	202	21.3%
Sex of subject (female)	469	49.5%	296	47.3%	202	50.5%
Age in months at 1 st speaking in coherent phrases	384	22.0 ± 10.3	246	22.6 ± 11.0	176	23.4 ± 11.6
Age in months at 1 st speaking about PP	469	33.3 ± 16.2	296	33.4 ± 15.6	202	32.6 ± 12.7
Strength-of-case scale	469	11.6 ± 8.9	296	14.2 ± 9.4	202	16.7 ± 9.5
Emotion during recall (yes)	382	38.2%	235	41.0%	169	46.2%
Announcing dream (yes)	410	38.5%	268	52.6%	179	45.3%
Same family (yes)	453	21.0%	294	31.3%	202	0.0%
Mother's attitude towards claims (encouraging)	307	15.6%	197	18.3%	136	11.8%
Father's attitude towards claims (encouraging)	285	11.6%	189	12.7%	141	12.1%
Birthmarks (yes)	469	25.0%	296	27.7%	202	29.7%
Subject from Myanmar (yes)	469	10.4%	296	12.2%	202	6.4%

* N is number of observations for each variable in each sample

Table 2

Univariate Analysis of Association Between Type of Memories and GNC (Contingency Table)

GNC	Sex-change		Same-sex	
	N	% within column	N	% within column
GNC present	86	80.4	21	5.8
No GNC	21	19.6	341	94.2
$\chi^2(1)$	260.82			
p	<0.0001			
OR	66.50			
95% CI for OR	[34.74, 127.31]			

$\chi^2(1)$ = chi-squared statistic with 1 degree of freedom; p = p-value; OR = odds ratio; CI = confidence interval.

Table 3

Univariate Analyses Predicting GNC (Regression Models)

Predictor	<i>N</i>	Category	<i>OR</i>	Wald ₁	<i>p</i>	95% CI for <i>OR</i>
Sex-change memories	469	Yes	66.50	160.4	<.0001*	[34.74, 127.31]
		No	—	—	—	—
Sex of subject	469	Female	3.06	22.4	<.0001*	[1.93, 4.86]
		Male	—	—	—	—
Age at 1 st speaking in coherent phrases	384	—	.99	1.07	.301	[.96, 1.01]
Age at 1 st speaking about PP	469	—	1.01	2.34	.126	[1.00, 1.02]
Strength-of-case scale	469	—	1.01	.58	.445	[.99, 1.03]
Emotion during recall	382	Yes	2.17	7.70	.006	[1.26, 3.74]
		No	—	—	—	—
Announcing dream	410	Yes	1.26	.92	.338	[.79, 2.02]
		No	—	—	—	—
Same family	453	Yes	1.63	3.60	.058	[.98, 2.70]
		No	—	—	—	—
Mother's attitude towards claims	307	Encouraging	2.35	5.81	.016	[1.17, 4.70]
		Neutral or negative	—	—	—	—
Father's attitude towards claims	285	Encouraging	1.93	2.38	.123	[.84, 4.45]
		Neutral or negative	—	—	—	—
Birthmarks	469	Yes	1.09	.11	.740	[.66, 1.78]
		No	—	—	—	—
Subject from Myanmar	469	Yes	12.08	53.18	<.0001*	[6.19, 23.61]
		No	—	—	—	—

OR = Odds ratio; Wald₁ = Wald statistic with 1 degree of freedom; *p* = p-value; CI = confidence interval.

* Significant after Bonferroni correction

Table 4

Multivariate Analysis Predicting GNC, N = 270

Predictor	Category	OR	Wald ₁	p	95% CI for OR
Sex-change memories	Yes	67.54	57.35	<.0001	[22.70, 200.93]
	No	—	—	—	—
Sex of subject	Female	1.62	.93	.335	[.61, 4.34]
	Male	—	—	—	—
Emotion during recall	Yes	1.74	1.19	.275	[.64, 4.73]
	No	—	—	—	—
Same family	Yes	.62	.54	.464	[.17, 2.21]
	No	—	—	—	—
Mother's attitude towards claims	Encouraging	3.00	2.94	.087	[.85, 10.52]
	Neutral or negative	—	—	—	—
Subject from Myanmar	Yes	.36	.63	.426	[.03, 4.53]
	No	—	—	—	—

OR = Odds ratio; Wald₁ = Wald statistic with 1 degree of freedom; p = p-value; CI = confidence interval.

Table 5

Univariate Regression Analyses Predicting GNC in Two Samples of “Solved” Cases

Sample	Predictor	<i>N</i>	Category	<i>OR</i>	Wald ₁	<i>p</i>	95% CI for <i>OR</i>
Solved cases only	Sex-change memories	296	Yes	69.71	106.25	<.0001	[31.11, 156.25]
			No	—	—	—	—
Solved cases which were not in the same family	Sex-change memories	202	Yes	85.71	68.69	<.0001	[29.92, 245.57]
			No	—	—	—	—

OR = Odds ratio; Wald₁ = Wald statistic with 1 degree of freedom; *p* = p-value; CI = confidence interval.