Original Research Article

The Unexpected Harm of Same-sex Marriage: A Critical Appraisal, Replication and Re-analysis Of Wainright and Patterson's Studies of Adolescents with Same-sex Parents

ABSTRACT

Aims: To critique, replicate and re-analyze Wainright and Patterson's three studies of adolescents with same-sex parents, which conclude, based on representative population data, that such children suffer no disadvantages.
Methodology: After replicating Wainright and Patterson's sample and analyses using the National Longitudinal Survey of Adolescent Health, Wave I, (n = 20, 745), re-examination of the same-sex parent sample finds that 27 of the 44 cases are misidentified heterosexual parents; they did not adjust for survey design and clustering; and ignored 99 percent of the baseline by using a small matched sample for comparison. Outcomes are re-analyzed after correcting these problems, using OLS, logistic regression and Firth (bias-adjusted) regression models.
Results: The adolescents with same-sex parents experience significantly lower autonomy and higher anxiety, but also better school performance, than do adolescents with opposite-sex parents. Comparing unmarried to (self-described) married same-sex parents, above-average child depressive symptoms rises from 50% to 88%; daily fearfulness or crying rises from 5% to 32%; grade point average declines from 3.6 to 3.4; and child sex abuse by parent rises from zero to 38%. The longer a child has been with same-sex parents, the greater the harm.
Conclusion: Children with same-sex parents experience significant disadvantages, but also some advantages, compared to those with man-woman parents. On a wide range of child well-being measures, opposite-sex marriage is associated with improved outcomes, but same-sex marriage is associated with lower outcomes. Further work is needed to determine the relative influences of instability, duration, and marriage to these findings.

Keywords: National Longitudinal Survey of Adolescent Health, same-sex parents, child well-being, same-sex marriage

INTRODUCTION

Since the 1970s a rapidly-growing body of empirical studies has compared homosexual and heterosexual relationships and parenting outcomes, concluding almost without exception that relationship quality and human flourishing in homosexual relationships is equivalent to that in heterosexual ones and that children raised by homosexuals do not suffer adverse harm (the no differences thesis). Almost all such results have been based on small, non-random samples, usually consisting of participants recruited for convenience who are aware of the purpose of the study, and for this reason have failed to be convincing.

This problem has been noted repeatedly by scholars adopting different widely different opinions on the underlying question of same-sex parenting. For example, Wendy Manning and colleagues, reviewing the literature for a court brief supporting same-sex marriage, counted studies of only four large random samples, noting: "Convenience samples are more common .... Relying on convenience samples means that the same-sex parents in these studies are not representative of all same-sex parents and represent

only those who were targeted and agreed to participate, ….” (1). Likewise Michael Rosenfeld, in a study finding no differences in school outcomes with same-sex parents, observed: “As the critics have noted, convenience samples dominated this literature in the past” (2). Douglas Allen, in a rebuttal of Rosenfeld’s showing lower graduation rates for children with same-sex parents, agreed: “Although a proper probability sample is a necessary condition for making any claim about an unknown population, within the same-sex parenting literature researchers have studied only those community members who are convenient to study” (3).

As all three authors just cited acknowledge, a notable exception to the use of convenience samples has been three related studies that made use of data from the National Longitudinal Survey of Adolescent Health (“Add Health”). The first study, published in 2004 by Wainright, Russell and Patterson (hereafter “WRP 2004”), explored the connections between psychosocial well-being, school performance, and romantic relationships in the two family types (4). Wainright and Patterson (hereafter “WP”) followed up with a brief report in 2006 looking at delinquency, victimization and substance abuse (5), and a 2008 study of peer relations (6). A 2009 review by Patterson summarizes all three studies (7).

By most accounts, including Rosenfeld’s (2), these studies are the only ones prior to Rosenfeld’s 2010 study to employ a representative population sample with sufficient statistical power to discern differences, if they existed, for children with same-sex parents (but see 8). All three studies examined the same sample, a group of 44 adolescents with lesbian mothers on the initial wave of the National Longitudinal Survey of Adolescent Health, which surveyed over 20,000 adolescents in 1995. The design features of the analysis are similar in all three studies, comparing the adolescents with lesbian mothers with a matched group of adolescents with heterosexual parents; the main analytic differences (as distinct from the theoretical questions involved) have to do with the examination of different outcome variables in each study. The studies refer to the two groups of same-sex parents and opposite-sex parents as “family types”, a wording I will also adopt for simplicity in the present study.

All three WP studies concluded that, on the variables examined in the study, “adolescents living with same-sex parents did not differ from that of adolescents living with opposite-sex parents” (4) in any way that would disadvantage the former. With respect to this conclusion the authors are aware that their results “add significantly to those from earlier studies, which were most often smaller in their size, less representative in their sampling, and less comprehensive in their assessment of adolescent outcomes.”(4) Indeed, these three studies present some of the strongest evidence in support of the no differences thesis, and for that reason are often cited prominently in subsequent research and in legislative and judicial policy settings.

Subsequent studies of other representative data, however, have failed to confirm most of WP’s conclusions. In a representative sample of 2,988 adults in 2012, Regnerus found significantly less positive outcomes on a wide range of psychosocial, relational and functional measures for a group of 248 adults whose parent or parents had ever been in a homosexual relationship (9). Sullins, examining over 200,000 cases from the National Health Interview Survey that included 512 children with same-sex parents, found that emotional problems, including anxiety, and other indicators of psychosocial distress, were more than twice as prevalent among children with same-sex parents. The only conclusion of WP that may possibly have been replicated is Rosenfeld’s 2010 claim, based on a large sample from the U.S. Census, that children with same-sex parents progressed normally through school (2). However, Allen failed to replicate Rosenfeld’s finding using the Canadian census (3) and has disputed Rosenfeld’s analysis (10).

To address this difficulty, the current study attempts to critically evaluate and replicate WP’s 2004 conclusions, and if feasible to re-analyze their original data, in order to confirm or counter their findings with a greater degree of confidence than has previously been the case.

DATA AND METHODS

This research uses data from Add Health, a program project directed by Kathleen Mullan Harris and designed by J. Richard Udry, Peter S. Bearman, and Kathleen Mullan Harris at the University of North Carolina at Chapel Hill, and funded by grant P01-HD31921 from the Eunice Kennedy Shriver National

Institute of Child Health and Human Development, with cooperative funding from 23 other federal agencies and foundations. Special acknowledgment is due Ronald R. Rindfuss and Barbara Entwisle for assistance in the original design. Information on how to obtain the Add Health data files is available on the Add Health website (http://www.cpc.unc.edu/addhealth). No direct support was received from grant P01-HD31921 for this analysis. The author's management and use of the data has been reviewed and approved by the Institutional Review Board of the Catholic University of America.

Add Health, also known as the National Longitudinal Survey of Adolescent Health, has followed a large random sample of American adolescents for twenty years. Wave I was administered in 1995 through in-school interviews with over 90,000 American adolescents aged 13-19 selected by means of a stratified random sample of U.S. high schools. Of these, 27,000 were selected for a more extensive interview in their home and a separate related interview with their mother. If the mother was not available after separate attempts, the father or another adult in the household was interviewed. The in-home interview sample consisted of a core sample selected randomly using a complex multi-stage sampling process that was stratified by region, other strata, and geographic areas known as probability sampling units. A total of 12,105 core sample interviews were augmented by an additional 8,640 cases that reflect a series of oversamples and special interest data groups, to comprise the full sample of 20,745 cases. Through the application of post-stratification weights that reflect known characteristics of the adolescent population at that time, the sample is rendered representative of the adolescent population with a high degree of precision.

The current study replicates the sample and mean comparisons of WRP 2004 using t-tests in place of the original ANOVA, and employs logistic regression models to assess differences between family types. All analyses were performed with Stata 13 statistical software, incorporating the design features of the survey following guidelines for analyzing Add Health data published by the Carolina Population Center, University of North Carolina (11).

Variables in the Analysis

The outcome variables examined by WRP were replicated, as far as possible, from the description provided in their study. Depressive symptoms were measured by a 19-item version of the Center for Epidemiologic Studies' Depression Scale (CES-D) which was administered in the in-home interview (12) . The items in the scale name a list of symptoms such as feeling sad, lonely, tired or bothered about things. The response range for each item is from 0 (never or rarely) to 3 (most of the time or all of the time); the range of the 19-item scale is from 0 to 57.

WRP reported that they measured adolescent anxiety "with a seven-item scale from the In-Home Interview that included questions about the frequency of symptoms such as feeling moody or having trouble relaxing." These two items are part of a six-item series (not seven) on anxiety, which asks about both physical conditions such as sleeplessness or poor appetite as well as more direct indicators of emotional distress such as moodiness, fearfulness or frequent crying. The in-home interview asks how often the respondent has experienced each condition in the past twelve months, with possible responses of "never, "just a few times", "about once a week", "almost every day", and "every day", coded from 0 to 4. The present study uses these six items to form a scale as close as possible to that used by WRP, and in any event to effectively measure anxiety. The item "Daily fearfulness/crying" in Table 4 is derived from this scale, reporting the proportion who responded "every day" or "almost every day" for the items "fearfulness" or "frequent crying". Although WRP reported that their anxiety scale ranged from 0 to 28, and reported a corresponding number in the tables, in the text they reported a mean anxiety score based on a scale from 0 to 4. To ensure comparability the anxiety scores reported in Table 2 are also standardized on a 0-4 scale.

WRP reported that they summed 6 items with a response scale of 1 to 5 to produce a self-esteem scale ranging from 6 to 30, but report a mean value of 4.02 for the same-sex sample, and for each item report the reverse of the scale shown on the Add Health file. I took the mean of the reverse-coded items as the best guess at what they actually did. The results of this scale are consistent with the numbers they report (4). Grade point average was reported on a scale from 0 to 4.0. For school connectedness and

neighborhood integration WRP report the reverse of the true scoring scale; it appears that they recoded the items, so I did as well.

The Add Health in-home interview asked female adolescents, “Were you ever physically forced to have sexual intercourse against your will?” Males were asked, “Did you ever force someone to have sexual intercourse against her will?” About one in ten respondents (11.6%, 95% CI 10.5-12.7) overall reported forcing or being forced to have sex. In Table 4, where this variable is introduced, the opposite-sex categories and same-sex unmarried contain both male and female respondents, but only female respondents reported forced sexual intercourse in the same-sex marriages, almost all of which involve lesbian partners.

ANALYSIS

The analysis proceeded in three steps. The first step was a critical appraisal of the elements of the WRP study with regard to the possibility of identifying differences for adolescents with same-sex parents. Two features of the sample of same-sex parents defined by WRP obscured its effectiveness for identifying differences for children with same-sex parents: the sample mistakenly included a majority of cases that are actually heterosexual parent couples, and the sample excluded male same-sex couples. After correcting these issues, the second step involved replicating the analyses of WRP 2004, as far as possible, to examine the affect, if any, of amending the sample defects on the study outcomes. Third, the corrected sample was employed to examine new questions about child outcomes with same-sex parents, to the extent possible.

Step One: Critical Appraisal

Miscoded Heterosexual Parents

WRP identified same-sex parents by comparing the sex of the responding mother with the reported sex of a partner with whom she reported that she was married or living in a marriage-like relationship. They explain the procedure they used:

> We first identified families in which parents reported being in a marriage or marriage-like relationship with a person of the same sex. … [Then] the consistency of parental reports about gender and family relationships was examined. To guard against the possibility that some families may have been misclassified because of coding errors, we retained only cases in which parental reports of gender and family relationship were consistent (e.g., a parent reported being female and described her relationship to the target adolescent as ‘‘biological mother ’’). … The focal group of families identified through this process consisted of 44 adolescents, 23 girls and 21 boys. Approximately 68% of the adolescents identified themselves as European American or White, and 31.8% identified themselves as non-White or as biracial. On average, the adolescents were 15.1 years of age (SD 5 1.5 years), with a range from 12 to 18 years of age (4).

In a related table, they also report that 4.5% of these adolescents were adopted.

Following these procedures, I also found 44 adolescent cases on the Add Health sample whose female parent respondent reported being in a marriage or marriage-like relationship with a another woman. I found no inconsistent parental reports of gender and family relationships. This group of 44 cases consisted of 23 girl and 21 boys (52.3% female), was 68% white with an average age of 15.1 years, and 4.5% were adopted. Since these characteristics exactly match those reported by WRP above, I concluded that this group is the same lesbian parent sample identified in their study.

In the in-home interviews, responding adolescents were asked to identify the sex and relationship to themselves of all members of the household. WRP 2004 reported that they explored another consistency check for the same-sex partners, which “required that if an adolescent reported living with his or her

biological mother, he or she reported no male figure (e.g., biological father, stepfather) as residing in the household." Applying this criterion, they identified 18 cases which clearly consisted of adolescents living only with two adult parents of the same sex. Remarkably, they rejected this criterion, even though it incorporates effectively the same safeguard against misclassification as the similar check they report using on the parental interview. Their justification for this is that they believed that "application of the more stringent criteria effectively eliminated from the sample many adolescents from divorced families in which one or both parents were currently involved in same-sex relationships" (4) as well as children in joint custody arrangements.

It is hard to know what they mean by this. The Add Health interview only asked responding adolescents about persons "who live in your household" (13). If the adolescent reported the presence of a father or father figure in this series of questions, this could not have been a father in another household, as would be the case in a joint custody situation. In fact, of the 44 sample adolescents, half (22) of them reported that their biological father lived in the home. An additional four identified one of the household members as their step or adoptive father, and one reported the presence of a foster father. In a separate question that asked the adolescent to confirm the sex of each person, all 27 of these fathers were explicitly identified as male.

In a series of questions about non-resident biological fathers, only the 18 clear cases of adolescents living with two female same-sex parents indicated any knowledge of a non-resident father. Three of the four adolescents who identified an adoptive or foster father were assumed to have a non-resident biological father, but they reported they did not know anything about him. It is quite clear, in other words, that only among the 18 clear cases could there possibly be anything like a joint custody arrangement. Five parents among the 18 clear cases, but only one among the additional 26 cases including by rejecting the criterion of having two same-sex parents, indicated that he or she was divorced. Thus it is not the case that the more stringent criteria "eliminated from the sample many adolescents from divorced families" (4).

Clearly, the 27 families for which the child reports the presence of a resident male father cannot reasonably be considered lesbian parent families. Probably they are miscoded opposite-sex families. At the very least, it is fair to say that the sex designation is inconsistent, and, on the same principle that WRP already screened out cases with inconsistent parental reports of sex, these cases should also be discarded. Excluding these cases leaves 17 cases that are clearly and consistently identified as lesbian parent couples. WRP report finding 18 cases in this group; it is possible that they include the one household where the adolescent identified a "foster father". WRP note that the group identified by this more stringent criteria has "the advantage of including only clear cases in which adolescents described themselves as living only with two same-sex adults, and in which parents described themselves as unmarried and as involved in a marriage or marriage-like relationship with a person of the same sex. In short, these families conformed in every particular to an idealized image of lesbian mother families" (4).

Other Design Difficulties

Three other elements of WRP's study design obscure possible differences for adolescents with same-sex parents. First, WRP compare boys and girls separately within each family type, despite having already matching the two comparison groups on sex. This analytical choice responds to other interests in their study, but it also reduces each of the already-small family type groups by about half.

Second, and more seriously, instead of comparing the children with same-sex parents with the full remaining sample of approximately 20,000 children, WRP compared them to another group of 44 children matched to the children with same-sex parents on a number of demographic characteristics. A matched comparison like this is an acceptable way to control for differences in age, sex, parent education and income, etc., but in this case, since the groups are so small to begin with, doing so renders it needlessly more difficult to show differences between the groups. Compared with matched samples, correcting for demographic differences by the use of control variables is much more common in social science analysis, since it preserves the ability to standardize the groups on relevant demographic characteristics while retaining the statistical power of the entire dataset. Instead of comparing a small group with large

standard errors to a large group that has small standard errors, WRP compare two small groups, both of which have large standard errors. Essentially, WRP throw away 99% of the baseline.

Table 1. Replication of WRP's Analysis with Alternative Samples of Same-sex Parents: Add Health Wave 1

	A	B		C		D		E		F	
	44 opposite-sex cases (reported)	44 same-sex cases (reported)		44 same-sex cases (observed, unweighted)		27 "real world" cases (unweighted)		17 "ideal" cases (unweighted)		6 same-sex male parent couples (unweighted)	
	Mean (SD)	Mean (SD)	p > t (A=B)	Mean (SD)	p > t (A=C)	Mean (SD)	p > t (A=D)	Mean (SD)	p > t (A=E)	Mean (SD)	p > t (A=F)
Depressive symptoms (CES-D)	9.67 (6.24)	10.93 (8.46)	.50	11.53 (8.10)	.25	10.70 (8.81)	.60	12.94 (6.79)	.11	13.33 (6.15)	.22
Self-esteem	4.04 (.62)	3.99 (.50)	.73	4.19 (.64)	.29	4.30* (.55)	.08	4.0 (.73)	.85	3.97 (.31)	.68
Anxiety (6 items only)	.76 (.44)	.99* (.53)	.07	.85 (.62)	.45	.76 (.60)	.99	1.0 (.64)	.17	.56 (.51)	.40
GPA (grade point average)	2.80 (.78)	2.83 (.90)	.88	3.00 (.82)	.32	2.86 (.87)	.80	3.3* (.67)	.06	2.65 (.98)	.73
Trouble in school	.95 (.73)	1.03 (.70)	.64	1.10 (.80)	.39	1.18 (.73)	.22	.97 (.92)	.94	.79 (.84)	.68
School connectedness	3.43 (.83)	3.92** (.81)	.015	3.73* (.71)	.096	3.75 (.76)	.12	3.70 (.62)	.20	3.72* (.20)	.08
Parental warmth	4.39 (.34)	4.27 (.54)	.22	4.23 (.59)	.13	4.30 (.49)	.41	4.11 (.73)	.15	4.4 (.35)	.99
Care from adults and peers	4.09 (.62)	4.04 (.69)	.72	4.05 (.69)	.27	4.12 (.62)	.84	3.94 (.80)	.50	4.17 (.62)	.77
Autonomy	5.44 (1.30)	5.19 (1.59)	.43	5.11 (1.47)	.84	5.30 (1.03)	.62	4.82 (1.96)	.24	5.67 (1.21)	.68
Neighborhood Integration	2.37 (.93)	2.21 (.91)	.42	2.21 (.91)	.42	2.26 (.86)	.62	2.13 (1.02)	.42	1.83 (.75)	.15

Columns A & B report interpolated results from WRP 2004 Table 2 (p. 1892), which are slightly different than those reported in the text. Except for column A and B all statistics, including t-test comparisons, are based on the Add Health Wave 1 full sample (n=20,745): * t, $P < 0.10$; ** t, $P < 0.05$; *** t, $P < 0.01$; **** t, $P < 0.001$. 4.54 Anxiety scale is transformed to a 0-4 range.

Third, WRP's 2004 study appears to have made no use of Add Health's complex survey design or post-stratification weights. They do not report having done so, and elements of their analysis make clear that they did not do so. They reported, for example, that they created the list of matched adolescents with opposite-sex parents "by generating a list of adolescents from the Add Health database who matched each target adolescent on the following characteristics: sex, age, ethnic background, adoption status (identified through parent reports), learning disability status, family income, and parent's educational attainment. The first matching adolescent on each list was chosen as the comparison adolescent for that target adolescent." Since each unweighted case represents a large and variable number of weighted cases, this kind of one-to-one matching could only have been accomplished using unweighted cases. It is difficult to determine what effect this omission may have, if any, on the ability to identify differences for the adolescents with same-sex parents, but it is a consequential error that undermines confidence in the representativeness of the study.

The lack of weighting might not be a problem, or much of a problem, if WRP's analysis had been based on the Add Health Core Sample, as they claim, but this is not possible: of the 44 cases in the WRP 2004 sample of same-sex parents, only 29 are in the Core Sample. The Core Sample, which is based on a stratified random sample of U.S. high schools, could arguably be taken as roughly representative of the adolescent population without weighting, but the additional cases are not representative of this population. The additional cases, and thus the full sample, are made representative of the population only by the application of post-stratification weights.

Add Health's Guidelines for Analyzing Add Health Data advise: "To obtain unbiased estimates, it is important to account for the sampling design by using analytical methods designed to handle clustered data collected from respondents with unequal probability of selection" (11). In a section on common errors when using Add Health, the first error listed is "Ignoring clustering and unequal probability of selection when analyzing the Add Health data" (boldfaced in original) (11). Since they ignore clustering, WRP's findings cannot statistically represent the population of same-sex parents, even if the sample were accurate. They may, of course, be suggestive in a general way. At best, these three studies present findings from another unrepresentative small group of same-sex parents, such as are almost universal in this area of research.

Step Two: Replication

Replication with the Original Sample (and Alternative Partitions)

WRP also found 6 male same-sex partners in the Add Health sample, but report that they excluded them from their sample in order to focus more clearly on lesbian parents, after preliminary analyses that included the 6 male same-sex partners produced results that "were very nearly identical to those including only [the 44] families headed by female same-sex couples." Likewise, they reported that they "completed all the analyses" with the smaller group of 18 clear cases of same-sex parents and the "results were essentially identical" to those of the larger group of 44 cases.

These claims may be a bit overstated, but they are essentially accurate. Table 1 replicates WRP's analysis, as closely as possible, showing results for their full sample (44 cases) and the alternative sample groups or partitions discussed: verifiable lesbian couple parents (17 cases), the "real world" cases of heterosexual parents, one or both of whom may be in a same-sex relationship with someone else (27 cases), and male same-sex parents (6 cases). The table replicates WRP's method of analysis, comparing group mean values for each of the outcome variables of interest. Only individual outcomes are assessed, ignoring WRP's multivariate analyses. Rather than the ANOVA tests reported by WRP, the table reports the more commonly-used t-tests; t-tests and ANOVA produce statistically identical decision results for mean comparisons. Consistent with recommended standards and other research on the small population of same-sex parents, the table also identifies group differences at the more relaxed .10 level of significance, as well as the conventional .05 level.

Columns A and B of Table 1 are derived from WRP 2004, Table 2, with results interpolated by sex, comparing the matched sample of 44 opposite-sex parents with their full sample of 44 (alleged) same-sex parents. WRP did not show the p-values, but reported that the children with same-sex parents had higher school connectedness, significant at .05, and marginally higher anxiety, which was not quite significant. The t-test results shown in column B present essentially the same results. School connectedness, with a p-value of .015, is the only comparison that is significant at .05, but anxiety has a p-value of .07, that is, approaching but not quite attaining significance at the conventional .05 level.

Column C reports the observed mean value in the Add Health full sample for WRP's sample of same-sex parents. The values in this column are not exactly the same as those in column B. The column B values were interpolated, which may have introduced unknown error, but the most likely source of the differences between the columns is differences in missing data. The present study computed mean values from all non-missing cases for each outcome variable (for most outcomes either 43 or 44 cases), but WRP analyzed the variables in three structural groups; if data were missing for any outcome variable in the group, it was counted as missing for all variables in the group. For most of the outcome variables shown, this analytical decision substantially reduced the number of cases on which their mean value computations were actually made. For depressive symptoms, for example, WRP's mean value of 10.93, shown in column B, was based on 27 cases, while the corresponding value shown in column C, computed for the present study, is based on 43 cases. The values in column C, therefore, are generally more accurate than those in column B, although the differences are generally slight. For only three variables are the p-values testing mean difference higher in column C than in column B. In the bottom four rows of Table 1, WRP's reported values are based on the highest number of cases in their same-sex parents sample (43 of 44), so the column B values are most similar to column C for those outcomes; for neighborhood integration the values are identical.

In column C no adolescent differences are significant at .05, although school connectedness is still significant at the .10 level. Likewise, no difference is significant at .05 on any outcome for any of the remaining columns of the table (columns D, E, and F). For column F, showing results for the 6 gay male parent couples, school connectedness is also significant at .08, suggesting that the results for this group could be described as "very nearly identical" to those of column B, but this does not seem to be the case for column E, which shows the 17 actual same-sex parent cases.

For this group, school connectedness is not significantly different from the matched sample shown in column A, as is the case for WRP's findings for the full group of 44 alleged same-sex parent cases shown in column B. Moreover, child GPA (grade point average) is significant at .06, very close to the .05 level, which is decidedly not the case for column B. Perhaps WRP's matched comparison group for this sample of 17 ideal same-sex parent cases was different than that for the full sample of 44 cases.

Columns D and E disaggregate the 44 cases shown in columns B and C into the 27 cases of misidentified opposite-sex parents and the 17 clear cases of lesbian parents respectively. Notably, as judged by p-value, column E has more items that are closer to significant difference from column B than does column D (5 compared to 3), despite the fact that it has fewer cases. GPA, depressive symptoms and anxiety are much closer to significance in column E than in column D. For the 17 ideal cases in column E, all three variables measuring adolescent psychological well-being (depressive symptoms, self-esteem and anxiety) and family and relationship processes (parental warmth, care from adults and peers, autonomy and integration) show less favorable results, but all three school outcome variables (GPA, trouble in school and school connectedness) show more favorable results.

Replication with the Corrected Sample

Table 2 presents new means tests results for the outcome variables in WRP 2004 after correcting the same-sex parent sample to remove the 27 opposite-sex parent partners and applying the appropriate sample weights. The corrected same-sex parents sample reported in column E also includes 3 of the 6 cases of male same-sex parents, who were verified by the same stricter screening procedures used to verify the clear cases of female same-sex parents, for a total sample of 20 clear cases of parenting same-

sex partners. The analyses presented in Table 2 generally confirm the accuracy of WRP's analysis regarding significant differences by family type, given their use of a small extract of unweighted cases and a corrupted sample. At the same time, the new findings shown demonstrate the increased power of the corrected sample, and the use of sample weights and survey design features, to identify differences, both advantageous and disadvantageous, for children with same-sex parents.

As in Table 1, combined variables or multivariate tests are ignored. In the absence of WRP's matched sample of opposite-sex parents, Column A in the table reports the unweighted mean value for each outcome variable from the Add Health Core Sample. Columns B-E report outcome values under various conditions, with corresponding t-test results. For comparison purposes, column B repeats the replicated findings from WRP 2004 already shown in Table 1, column B. Columns C and D report respectively the replicated values and significance test results from the unweighted and weighted Add Health Full Sample. Column E shows the results for the corrected category of same-sex parents. Columns D and E, but no other, adjust variance estimates for survey design and weights, and thus present results that may be inferred to the population in question.

Table 2 confirms several points made in the critique above. For every variable in the table, the standard errors reported by WRP, shown in Column B, are larger, in most cases much larger, than those of any other sample condition shown. This confirms that, as discussed above, WRP analyzed the matched groups of 44 parents each independently, not as part of the Add Health dataset. Columns C and D show mean values for the WRP 2004 sample computed with unweighted and weighted cases respectively. Consistent with the warning provided in the Guidelines for Analyzing Add Health Data (11), the standard errors for the unweighted values (Column C) are smaller for every variable but one than the standard errors for the weighted values (Column D). The mean values reported by WRP 2004 for the "lesbian parents" sample (Column B), which is really composed primarily of heterosexual parents, are, with two exceptions, very similar to the mean value (unweighted) for the Add Health Core Sample.

As already noted, WRP reported only one significant difference by family type: children with same-sex parents had significantly higher school connectedness (than did the comparison group of children with opposite-sex parents). Table 2 confirms this finding when comparing the weighted cases of children with same-sex parents to the mean of the full sample. In the corrected sample (Column E), school connectedness for children with same-sex parents is even higher, with higher statistical significance.

Table 2. Adolescent Characteristics as a Function of Family Type: Add Health Wave 1

	A	B		C		D		E	
	Add Health core sample (12,105)	WRP 2004 (reported) (44)		WRP 2004 observed (unweighted)		WRP 2004 observed (weighted)		Corrected SS parents Sample (weighted)	
	Mean (SE)	Mean (SD)	p > t (ss=os)	Mean (SE)	p > t (ss=os)	Mean (SE)	p > t (ss=os)	Mean (SE)	p > t (ss=os)
Depressive symptoms (CES-D)	10.91 (.137)	10.93 (8.46)	.50	11.53 (1.24)	.91	10.43 (.940)	.54	11.06 (1.48)	.96
Self-esteem	4.12 (.01)	3.99 (.50)	.73	4.19 (.10)	.40	4.26 (.14)	.28	4.10 (.23)	.94
Anxiety (6 items only)	.76 (.01)	.99* (.53)	.07	.85 (.62)	.28	.92 (.11)	.16	1.12*** (.14)	.01
GPA	2.83 (.02)	2.83 (.90)	.88	3.00 (.15)	.14	3.16* (.19)	.08	3.49**** (.21)	.002
Trouble in school	1.06 (.01)	1.03 (.70)	.64	1.10 (.12)	.63	1.02 (.14)	.78	.77 (.24)	.24
School connectedness	3.61 (.01)	3.92** (.81)	.015	3.73 (.11)	.20	3.92** (.13)	.02	4.04*** (.16)	.009
Parental warmth	4.30 (.01)	4.27 (.54)	.22	4.23 (.09)	.63	4.44 (.09)	.13	4.50 (.17)	.23
Care from adults and peers	4.06 (.01)	4.04 (.69)	.72	4.05 (.11)	.91	4.17 (.17)	.71	4.25 (.26)	.44
Autonomy	5.11 (.05)	5.19 (1.59)	.43	5.11 (.22)	.84	4.71 (.35)	.23	4.16 (.64)	.13
Neighborhood Integration	2.24 (02)	2.21 (.91)	.42	2.21 (.14)	.98	2.12 (.20)	.54	1.89 (.43)	.41

Column B reports interpolated results from WRP 2004 Table 2 (p. 1892), which are slightly different than those reported in the text. To facilitate comparison standard deviations are converted to standard errors. Statistics for columns C, D, and E, including t-test comparisons, are based on the Add Health Wave 1 full sample (n=20,745): * t, $P < 0.10$; ** t, $P < 0.05$; *** t, $P < 0.01$; **** t, $P < 0.001$.

WRP did not find a significant difference for grade point average by family type, but this is also found to be significantly higher for the WRP 2004 sample when sample weights and clustering are incorporated (Column D), and even higher, with a more significant difference, when the sample is corrected to include only clear cases of same-sex parents (Column E). For anxiety WRP reported results that were a third larger for boys, and a sixth larger for girls, with same-sex parents, with a large F-statistic (4.5) for the difference by family type (4.5). However, they reported that multivariate anova revealed no significant effects, so they concluded that there was no difference. Table 2 confirms this conclusion for the full WRP 2004 sample of 44 cases.

When the original sample is corrected to include only same-sex parents, the mean for adolescents with those parents differs significantly from their counterparts with opposite-sex parents on three of the ten outcomes examined: anxiety, grade point average (GPA), and school connectedness. In the next section, the inclusion of control variables confirms and extends this finding.

Replicating Control Variables

An advantage of WRP's analysis that is not reflected in Table 2 is that their two sample groups were matched on seven important demographic characteristics. Table 3 addresses this lack, presenting the results of multiple regression models that include controls for the same characteristics (child sex, age,

Table 3. Multiple regression coefficients predicting child characteristics by family type: Add Health Wave 1

	SS Parents WRP 2004 observed (weighted)		Corrected SS Parents sample	
	Coeff	P>t	Coeff	P>t
Depressive symptoms (CES-D)	-.428	.31	.058	.96
Self-esteem	.059	.41	.043	.85
Anxiety (6 items only)	.259	.48	1.70*	.08
GPA	.089	.37	.430***	.004
Trouble in school	-.043	.51	-.232	.30
School connectedness	.117*	.06	.407***	.007
Parental warmth	.070	.16	.222	.16
Care from adults and peers	.007	.93	.134	.58
Autonomy	-.27	.13	-1.27**	.03
Neighborhood Integration	-.081	.42	-.325	.43

Shown are OLS regression models controlling for child sex, age, race (white/nonwhite), and adoption status; parent age and education (college degree or not), and family income. * t, P < 0.10; ** t, P < 0.05; *** t, P < 0.01; **** t, P < 0.001

Table 4. Adolescent Characteristics as a Function of Family Type and Marriage, showing unadjusted mean values: Add Health Waves 1 and 3

	Opposite-sex Parents			Same-sex Parents			
	Unmarried		Married Parents	Unmarried		Married	
	Mean (SE)	p>t (OS Marr)	Mean (SE)	Mean (SE)	p>t (OS Marr)	Mean (SE)	p>t (OS Marr)
Psychological well-being							
Depressive symptoms (CES-D) - *percent above average*	56.0**** (1.1)	.00	47.2 (.89)	50.4 (24.6)	.90	87.7**** (11.1)	.00
2CES-D Interpersonal – People unfriendly or disliked you - *percent above average*	50.0**** (1.0)	.00	44.8 (.71)	11.5 (8.4)	.19	22.7**** (9.0)	.00
CES-D Lack of Positive Affect – Not hopeful, happy, joyful - *percent above average*	56.9**** (1.0)	.00	51.3 (.86)	34.0 (19.7)	.38	94.9**** (6.2)	.00
Anxiety	4.65* (.09)	.09	4.51 (.05)	6.31** (.77)	.02	7.10* (1.45)	.08
Daily fearfulness/crying (%)	4.4%*** (.46)	.004	3.1% (.25)	5.4% (5.7)	.69	32.4% (25.2)	.25
School Outcomes							
GPA	2.64**** (.02)	.00	2.91 (.02)	3.59** (.31)	.04	3.37**** (.12)	.00
School connectedness	3.51**** (.02)	.00	3.66 (.01)	4.10 (.28)	.13	3.98**** (.03)	.00
Family process							
Parental warmth	4.21**** (.02)	.00	4.34 (.01)	4.59 (.24)	.29	4.41 (.22)	.75
Care from adults and peers	3.99**** (.02)	.00	4.09 (.01)	4.64*** (.18)	.003	3.78**** (.08)	.00
Family stability							
Child's time in current family (years)	10.35**** (.18)	.00	13.03 (.12)	4.01**** (2.3)	.00	10.36 (3.1)	.40
Percent child transitions	45.0%**** (1.3)	.00	18.5% (.75)	83.0**** (16.1)	.00	88.0**** (10.9)	.00
Sexual development/identity							
Same-sex attraction	7.5%*** (.53)	.001	5.5% (.39)	23.2% (17.5)	.31	19.0% (9.6)	.16
Ever same-sex romantic partner	1.4%**** (.20)	.000	.9% (.13)	0%**** (0)	.00	0%**** (0)	.00
Ever sexual intercourse?	46.3%**** (.02)	.00	32.7% (.02)	27.8% (.19)	.31	15.7% (.15)	.22
Divorced/Cohabiting/ed at age 19-25	47.9%**** (.02)	.00	36.2% (.01)	35.2% (.27)	.97	57.7%** (.11)	.047
(If ever intercourse): Ever physically forced to have sex against your will? - *% yes*	12.2%**** (.92)	.00	10.0% (.73)	23.5% (23.1)	.31	70.5%** (29.7)	.04
Experienced sex abuse by parent	6.8% (.60)	.00	3.5% (.33)	0%**** (0.0)	.00	37.8%** (14.3)	.02

Unmarried includes single never married. Reference category for t tests is opposite-sex married parents. T-test results: equality of means * t, P < 0.10; **t, P < 0.05; ***t, P < 0.01; ****t, P < 0.001. CES-D scales presented are not predictive of

race, and adoption status, and parent age, education and income), thus more closely replicating WRP's analysis. Coefficients for control variables were significant for all outcomes. When using the WRP 2004 sample of same-sex parents, the regression models with controls found, just as WRP did, that the only variable that is significantly different by family type is school connectedness. In the corrected sample, school connectedness, grade point average, and anxiety all remain significantly higher, as they were in Table 2, in the presence of controls. In addition, after including controls child autonomy is significantly lower for children with same-sex parents. These findings confirm and extend the findings of Table 2.

Step Three: Re-Analysis

This section of the analysis reports on a re-analysis of the new sample, using the original variables or other variables, to see what other differences or characteristics of interest can be discovered for children with same-sex parents.

Forty percent of the same-sex partners reported their marital status as married, rather than as unmarried partners. This is consistent with other representative data such as the National Health Interview Survey and the 2000 Census, where many same-sex couples also indicated that their partnership was a marriage prior to same-sex marriage attaining legal status in any part of the United States in 2004. While not legally recognized marriages, these cases clearly reflect a marital self-understanding, and the partners they may well have been married in a religious or private ceremony during this era. Prior studies have found that such couples may be plausibly interpreted as reflecting many of the attributes of marriage (2,14–17), thereby offering, as Reczek and colleagues conclude, "our closest possible representation of the current population of the same-sex married" (17). In the present study, moreover, the married same-sex parents strongly reflect the most commonly-referenced potential advantage of marriage for same-sex parents: greater family stability. As discussed below, the time children had resided with their current set of parents averaged 4 years (SE 2.3) with unmarried same-sex partners, but with married same-sex partners, 10.4 years (SE 3.1).

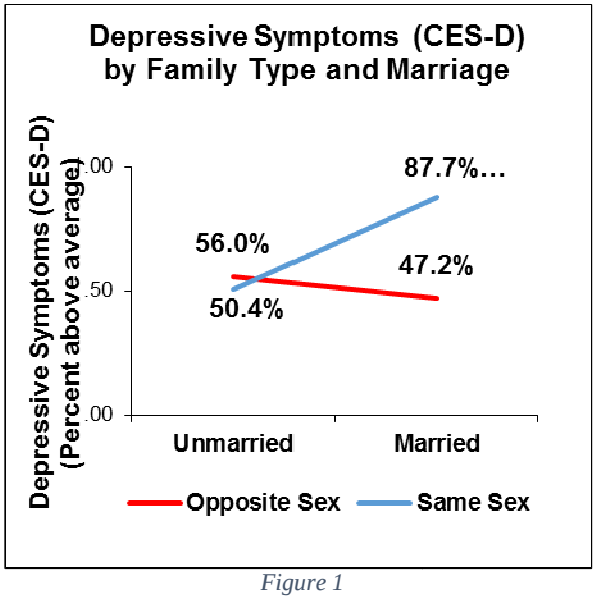

Figure 1

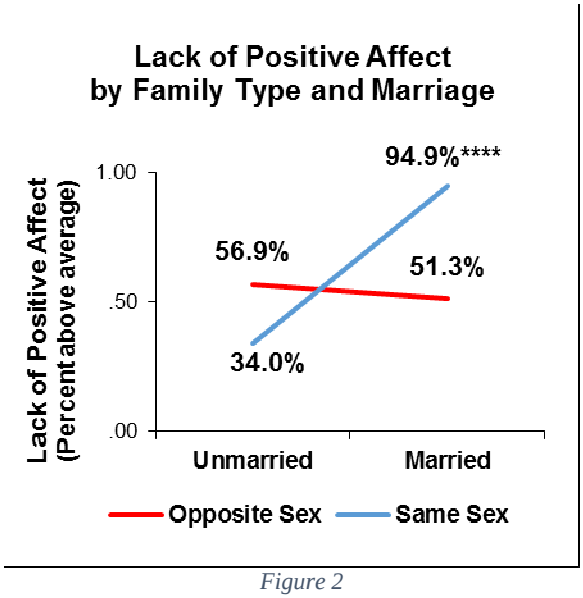

Figure 2

Table 4, accordingly, reports the findings of a re-analysis of the Add Health data, with the corrected same-sex parent category expressed in the Full Sample, by family type and marriage; figures 1-6 illustrate selected effects. The table presents the findings of logistic regression models that impose the

seven demographic controls used by WRP. The reference category for statistical tests is opposite-sex married parents.

In Table 4, due to the sparseness of the data, the 57-point CES-D scale and related subscales are expressed as dichotomous predictors divided at the median of the distribution. It is important to bear in mind that the resulting categories do not predict for a psychological disorder or an abnormal level of depressive symptoms. Depressive symptoms are lower than average (47.2% SE .89 are above average) for children with opposite-sex married parents. Child depressive symptoms are 9 points higher with unmarried opposite-sex parents (56.0% SE 1.1) and a full 40 points higher with married same-sex parents (87.7% SE 11). Among children with unmarried parents, depressive symptoms (50.4% SE 25) are lower with same-sex parents than with opposite-sex parents, though the difference is not statistically significant. See Figure 1. The same pattern can be observed, only more strongly, on the CES-D subscale for lack of positive affect (unhappiness). Children with unmarried same-sex parents are much less unhappy (34.0% SE 20) than children with unmarried opposite-sex parents (56.9% SE 1.0), but children with married same-sex parents are much more unhappy (94.9% SE 6) than are children with married opposite-sex parents (51.3% SE.86). See Figure 2.

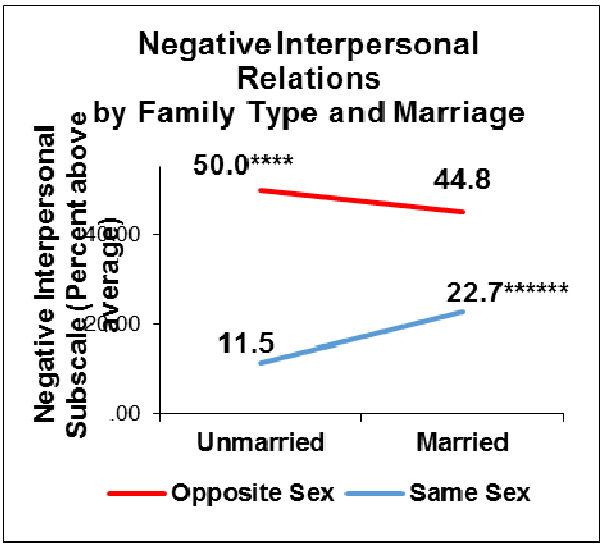

Figure 3

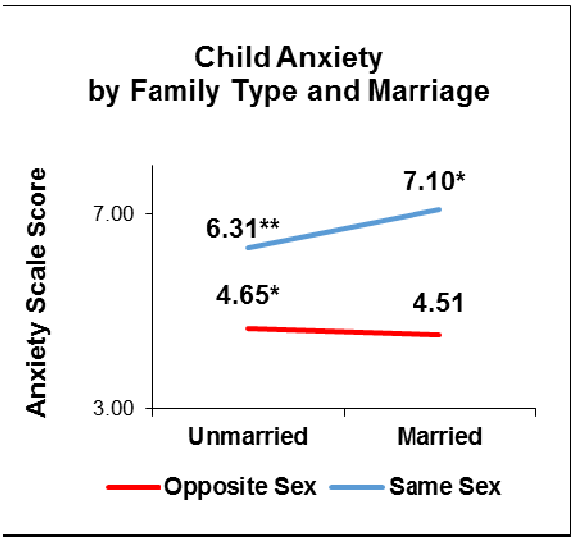

Figure 4

Negative interpersonal symptoms are lower overall for children with same-sex parents, suggesting that they are not subject to widespread social rejection, or at least not as much as are children with opposite-sex parents. Nonetheless, children whose same-sex parents are married are over twice as likely to have above-average negative interpersonal symptoms (22.7% SE 9) than are those whose same-sex parents are unmarried (11.5% SE 8). See Figure 3. On the other hand, anxiety is significantly higher for children with both unmarried and married same-sex parents, although the latter are higher. With marriage, child anxiety drops (from 4.65 SE .09 to 4.51 SE .05) with opposite-sex parents, but rises (from 6.31 SE .77 to 7.1 SE 1.5) with same-sex parents. See Figure 4.

The proportion of children reporting daily fearfulness or crying, compared to children with married opposite-sex married parents (3.1% SE .25), is moderately higher for children with unmarried opposite-sex parents (4.4% SE .46) and unmarried same-sex parents (5.4% SE 5.7), but much higher—over ten times as high—for children with married same-sex parents (32.4% SE 25.2). Almost a third of children with same-sex married parents reported feeling fearful or crying daily. This difference is not significant in Table 4, but (as discussed below) is highly significant in the maximum likelihood models after fitting control variables.

Unlike psychological well-being, both grades and school connectedness are higher with same-sex parents than with opposite-sex parents. Parental warmth estimates are also slightly higher with same-sex parents, though the difference is not significant. Like the interpersonal and lack of positive affect scales, perceived care from adults and peers is higher for children with unmarried same-sex parents, but lower for children with married same-sex parents, than it is for the corresponding categories of children with opposite-sex parents. In all of these contrasts, however, the pattern of higher well-being with unmarried same-sex parents rather than married same-sex parents continues to be observed.

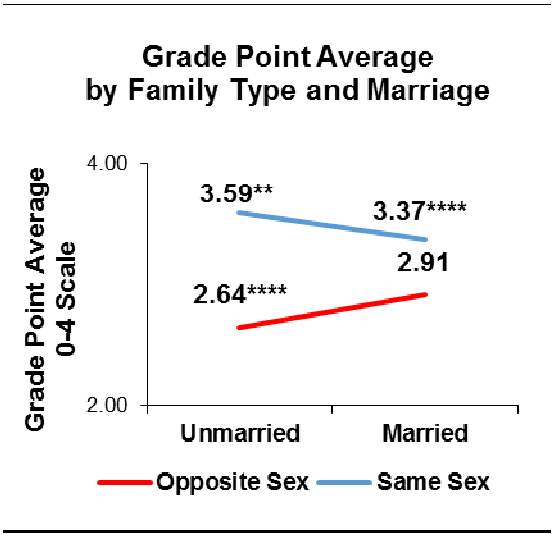

Figure 5

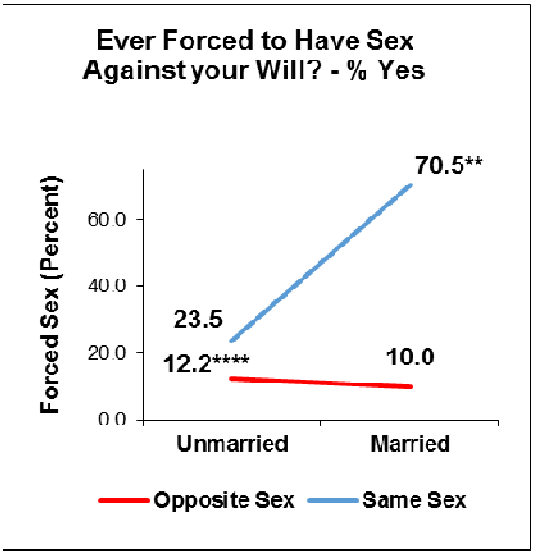

Figure 6

Grade point average (GPA), for example, is higher overall for children with same-sex parents, but while GPA is lower with unmarried opposite-sex parents (2.6 SE .02) than with married opposite-sex parents (2.9 SE .02), it is higher with unmarried same-sex parents (3.6 SE .31) than with married same-sex parents (3.4 SE .12). See Figure 5

Two variables in Table 4 measure family stability. The length of time the adolescents have been with in their current family relates to whether the outcomes observed are due to the current parents or may be the effect of residence with former parents. Recall that average age is 15 years for the Add Health adolescent respondents. Adolescents with opposite-sex married parents have the longest duration with those parents, at 13 years. Average duration drops by about 2.5 years with unmarried opposite-sex parents (10.4 years SE .18) and married same-sex parents (10.4 years SE 3.1), then plummets to only 4 years (SE 2.3) with unmarried same-sex parents. By this measure, married same-sex parents are much more stable, though child well-being is generally lower, than are unmarried same-sex parents.

The percentage of children who have undergone one or more relational transitions from one set of parents to another one, a related measure, is lowest for children with opposite-sex married parents and highest for those with same-sex married parents; the latter is over four times the size of the former. Almost all (83%-88% SE 11-16) children with same-sex parents have experienced at least one relational transition, compared to under half (45% SE 1.3) of children with unmarried opposite-sex parents and less than a fifth (19% SE .75) of children with opposite-sex married parents. By this measure, married same-sex parents are a little less stable than unmarried same-sex parents, though both are much less stable than opposite-sex parents.

The remaining variables in Table 4 explore different issues of sexual development and family formation. Six percent of adolescents with opposite-sex married parents reported that they have ever been romantically or sexually attracted to someone of the same sex. This proportion rises to 8 percent with

Table 5. Adolescent Characteristics as a Function of Family Type and Marriage, showing adjusted regression predictors: Add Health Waves 1 and 3

	Opposite-sex Parents			Same-sex Parents			
	Unmarried		Married Parents (Reference)	Unmarried		Married	
	Coeff. (95% CI)	P>t		Coeff. (95% CI)	P>t	Coeff. (95% CI)	P>t
Psychological well-being							
Depressive symptoms (CES-D) - *above vs. below average*	.056**** (.03-.08)	.000	--	.030 (-.4-.4)	.89	.361*** (.10-.62)	.006
CES-D Interpersonal – People unfriendly or disliked you - *percent above average*	.043**** (.02-.07)	.000	--	-.324**** (-.48-.17)	.19	-.253** (-.47--.03)	.024
CES-D Lack of Positive Affect – Not hopeful, happy, joyful - *percent above average*	.031** (.004-.06)	.025	--	-.173 (-.51-.17)	.31	.473**** (.31-.63)	.000
Anxiety	.019 (-.01-.05)	.16	--	.279**** (.16-.40)	.000	.367**** (.27-.46)	.000
Daily fearfulness/crying (%)	.007 (-.003-.02)	.16	--	.010 (-.10-.12)	.87	.303 (-.23-.83)	.26
School Outcomes							
GPA	-.078**** (-.11--.04)	.000	--	.287**** (.25-.33)	.000	.208**** (.12-.30)	.000
School connectedness	-.059**** (-.09--.03)	.000	--	.338**** (.23-.45)	.000	.391**** (.35-.43)	.000
Family process and stability							
Parental warmth	-.036*** (-.06--.01)	.005	--	.082 (-.27-.44)	.65	.357**** (.16-.56)	.001
Care from adults and peers	-.055**** (-.08--.03)	.000	--	.357**** (.23-.48)	.000	.002 (-.39-.39)	.99
Child's time in current family (years)	-2.53**** (-2.9--2.2)	.000	--	-8.01**** (-12.6--3.4)	.001	-5.01* (-10.6-0.6)	.08
Percent child transitions	.246**** (.22-.27)	.000	--	.655**** (.28-1.0)	.001	.729**** (.47-.99)	.000
Sexual development/identity							
Same-sex attraction	.022**** (.01-.04)	.001	--	.195 (-.15-.53)	.26	.138 (-.06-.34)	.18
Ever same-sex romantic partner	.004 (.00-.01)	.14	--	-.011**** (-.02--.01)	.000	-.012**** (-.02--.01)	.000
Ever sexual intercourse?	.102**** (.07-.13)	.000	--	.096 (-.12-.31)	.38	-.222 (-.56-.11)	.19
Divorced/Cohabiting/ed at age 19-25	.094**** (.06-.13)	.000	--	.042 (-.29-.37)	.80	.247** (.05-.45)	.016
(If ever intercourse): Ever physically forced to have sex against your will? - *% yes*	.013 (-.01-.04)	.26	--	.068 (-.39-.53)	.77	.576** (.09-1.0)	.021
Experienced sex abuse by parent	.031**** (.02-.05)	.000	--	-.033**** (-.05--.02)	.000	.387*** (.11-.66)	.007

unmarried opposite-sex parents, then to much larger estimated proportions with same-sex parents, although the differences are not statistically significant. Despite apparently higher rates of same-sex attraction, no child with same-sex parents reported ever having had a same-sex romantic partner. Adolescents with same-sex parents were also about half as likely to have ever had sexual intercourse. In an item taken from the Wave III follow-up, those with unmarried same-sex parents were less likely, and those with married same-sex parents more likely, to be divorced or cohabiting with an unmarried partner six years after the initial Add Health interview. Over half of the children with married same-sex parents were divorced or cohabiting after six years.

The last two lines of Table 4 report findings on the sensitive topic of child sex abuse. To increase accuracy, adolescents entered their answers to these sensitive questions anonymously into a laptop computer in response to recorded questions they heard using earphones. Adolescents who had ever had sexual intercourse were given a series of follow-up questions that included being asked about forced sex. Males were asked if they had ever physically forced someone to have sexual intercourse; females were asked if they had ever been physically forced to have sexual intercourse. This is the only item examined in the present study where the question varied by gender. Of adolescents who had ever had sexual intercourse, 10% to 12% (SE .73-.92) of those with opposite-sex parents reported having been forced (or forcing someone) to have sexual intercourse. This proportion doubles with same-sex unmarried parents (24% SE 23), and almost triples again with same-sex married parents.

Over two-thirds (71% SE 30) of the children with same-sex married parents who had ever had sexual intercourse reported that they had been forced to have sex against their will at some point. All the "yes" responses for this group are from female adolescents, meaning that these are all reports of being forced, not forcing someone else, to have sex relations. In fact, strikingly, every sexually active female adolescent living with married same-sex parents (which are all lesbian parent couples) responded "yes" to having experienced forced sex. On the other hand, as already noted this group of adolescent females were only about half as likely to have ever had sexual intercourse (15%) than were those with married opposite-sex parents (32%), though the difference is not statistically significant; and this question does not preclude the possibility that they had experienced date rape or peer sexual abuse.

The final item in Table 4, however, clarifies that much of the sex abuse reported did occur in the family and confirms that the prevalence of abuse was much higher with married same-sex parents than in the other family types. This question, a retrospective item from a subsequent wave of Add Health, was asked of all respondents, not just those who had ever had sexual intercourse. The question asks whether the responding adolescent had ever, prior to the sixth grade, been forced to give or receive a sexual touch or to have intercourse by a parent or caregiver. A total of 38% (SE 14) of respondents with married same-sex parents reported that they had experienced such abuse, compared to much smaller proportions (0-7% SE 0-.6) of the other three categories of marriage and family type.

Table 5 sharpens the contrasts by imposing control variables to assess whether the differences between the groups can be the result of demographic differences rather than marriage or family type. The table reports linear regression predictors adjusted for child age, sex and race, and parent education and income, i.e., the same variables on which WRP matched their samples. Most of the contrasts show little or no change, and few are significantly reduced, after accounting for these control conditions. For same-sex married parents, the following contrasts are stronger or have higher statistical significance in the regression models with controls: anxiety, parental warmth, child's time in current family, forced sex and parent sex abuse. The following are lower or have lower significance: depressive symptoms, interpersonal, lack of positive affect, and care from adults and peers. None of the differences by family type for married persons is rendered insignificant after adjusting for controls.

As additional scrutiny to support or withhold further confidence in these findings, the mean and regression contrasts reported in Tables 3 and 5 were also estimated by maximum-likelihood procedures to assess the possibility of small-sample bias. Table 6 shows the results for the smallest category, married same-sex parents. The reference category for all contrasts is married opposite-sex parents. The first two columns re-present for convenience the mean and regression results already reported in Tables 2 and 3.

Table 6. Outcomes for same-sex married under various model assumptions
Add Health Wave 1

Method	Unadjusted Mean/Percent (no controls)		OLS Regression (with controls)		Logistic regression (with controls)		Firth bias-adjusted logistic regression (with controls)	
	Mean or Percent	P>t	OR	P>t	OR	P>t	OR	P>t
Depressive symptoms (CES-D)	87.7%****	.00	.36***	.006	6.36*	.10	1.90	.41
CES-D Interpersonal	22.7%****	.000	-.25**	.024	.29**	.067	.27	.15
CES-D Lack of Positive Affect	94.9%****	.000	.47****	.000	19.3**	.031	3.4	.19
Anxiety	7.10*	.08	.37****	.000	19.1**	.011	3.6	.17
Daily fearfulness/crying (%)	32.4%	.25	.30	.26	15.6**	.043	12.1***	.002
GPA	3.37****	.000	.21****	.000	7.4*	.064	2.2	.40
School connectedness	3.37****	.000	.39****	.000	--	--	12.0*	.089
Parental warmth	4.41	.75	.36***	.001	8.6*	.086	3.4	.18
Care from adults and peers	3.78****	.00	.002	.99	1.07	.94	.89	.87
Same-sex attraction	19.0%	.16	.138	.18	3.96*	.058	3.6	.16
Ever sexual intercourse?	15.7%	.22	-.22	.19	.30	.37	.83	.83
Divorced/Cohabiting/ed at age 19-25	57.7%**	.047	.25**	.016	3.02***	.009	1.8	.47
(If ever intercourse): Ever physically forced to have sex against your will? - *% yes*	70.5%**	.04	.57**	.021	23.9***	.002	10.3	.106
Experienced sex abuse by parent	37.8%**	.02	.39***	.007	13.9***	.007	7.7**	.034

All models shown included controls for child sex, age, race (white/nonwhite), and adoption status; parent age and education (college degree or not); and family income. Reference category for tests is opposite-sex married, except for bias-adjusted models, which contrast same-sex married with all other. For dichotomous models outcome variables were transformed to dichotomies at the distribution median. * t, P = < 0.10; ** t, P < 0.05; *** t, P < 0.01; **** t, P < 0.001

The remaining two columns predict the same contrasts using two forms of logistic regression. The third column shows the result of canonical binary logistic regression employing case weights and survey design clusters. The results generally, though not always, confirm the consistent results of the linear analyses shown in the first two columns. Since logistic regression may be biased when one of the comparison groups are very sparse, column four reports the results of a bias-adjusted logistic regression designed for rare events estimation. Developed by mathematician David Firth, this form of logistic regression penalizes the log-likelihood so as to produce unbiased estimates even when one category is very sparse (18). However, the Firth method cannot make use of the sample weights and clustering used on Add Health. Thus, while the resulting point estimates for the Firth logistic regression are probably less accurate than those of regular logistic regression, when the significance probability is very different between the two methods, we may suspect that the canonical estimates are biased, thus providing

greater confidence that they are not biased in the alternative condition. Taking .25 or greater as "very different", and confining ourselves to cases where the decision on the null hypothesis would be changed by the difference, in Table 6 this is the case for "Depressive symptoms", "GPA", and "Divorced/cohabiting at age 19-25". While all of these contrasts are significant, and the first two highly significant, in the linear analyses, this comparison suggests that these findings may not be as robust as other findings in the table. On the other hand, both logistic estimates are highly significant for the contrast for "Daily fearfulness/crying", which is substantively large but not significant in the linear models.

In general, contrasts that are confirmed using more of the methods shown in Table 5 are likely more robust and merit higher confidence. By this test, the strongest finding shown is for parental sex abuse, which is large and significant by all four methods. All of the psychometric contrasts are consistent over three methods, as is GPA, school connectedness, later divorce/cohabitation, and forced sex. While no finding in the table is invalidated by these additional comparisons, those with more consistent findings may merit additional confidence.

DISCUSSION

Almost all scholarly and policy consideration of same-sex marriage has assumed that marriage between partners of the same sex would result in improved outcomes for children, just as marriage generally does for children with opposite-sex parents. This presumption is so widespread and so strong that the prospect of improved child well-being has been cited as one of the primary justifications for regularizing same-sex marriage.

The evidence presented in Table 4 calls that presumption sharply into question. On every measure, well-being for children with same-sex parents is lower if those parents are married than if they are not. Figures 1-6 illustrate the effect, showing findings from Table 4. Residing with married rather than unmarried parents of the same sex is associated with substantially increased depressive symptoms, anxiety and daily distress, and lower educational achievement and school connectedness. The extremely high lack of positive affect—lack of hopefulness, happiness, a positive affirmation of life—among children with married same-sex parents, but low lack of positive affect among children with unmarried same-sex parents, is particularly notable.

To be sure, not all outcomes for children with same-sex parents in these data are negative. In the corrected sample reported in Table 3, four significant differences are visible for children with same-sex parents. Two of the differences related to school performance—higher grade point average and school connectedness—are advantageous, consistent with Rosenfeld's (2010) finding that children with same-sex parents progress normally through school. The other two differences report lower outcomes on two psychosocial measures—anxiety and autonomy—consistent with studies that have found that children with same-sex parents suffer higher emotional distress (9,14). The positive "differences", however, follow the same pattern as do the negative psychological "differences" with respect to marriage, i.e., they are more positive for children with unmarried, rather than married, same-sex parents. For example, the mean grade point average of 3.6 for those children with same-sex parents who are unmarried drops to 3.4 if the parents are married; although both of these numbers are higher than corresponding means for children with opposite-sex parents. Parental warmth and perceived care from adults and peers are mixed, higher among children with unmarried same-sex parents, but lower for children with married same-sex parents, than they are for children with opposite-sex married parents.

In the absence of further information, interpretation of these mixed results is necessarily speculative. One possible explanation for the co-presence of negative psychological effects with positive educational outcomes is that same-sex attracted persons, and hence their children, may be more intelligent than the general population. A similar co-existence, of higher average incomes despite increased psychological distress, has been well established for the population of same-sex attracted adults. It is also possible that the negative and positive effects are partitioned, each manifesting in a different portion of the population in question.

Another possible explanation is consistent with the recognition that, for the children with same-sex parents, the relatively positive outcomes, like school progress, family warmth and even interpersonal perceptions, are more public matters known to peers and community while the negative psychological effects and child abuse tend to be private and hidden. Previous research has noted the tendency for same-sex parents to minimize negative features in accounts of their children's lives (19,20). For example, Malmquist and Nelson, analyzing 96 lesbian mothers' counterfactual descriptions of experiences with maternal and parenting healthcare professional as "just great", observed that political concerns shaped their rhetorical accounts: "at stake was the risk of feeding opponents of lesbian parenthood with arguments they could use against these families, namely that it would be harmful for any child to be brought up in a two-mother family. Instead, the unproblematic journey, a 'just great' story, was stressed, highlighted and emphasized over and over again". Thus "when our interviewees claimed their 'just great' stories, despite their descriptions of inadequate encounters, they were accounting for their creditability as competent parents" (20). Moreover, just as parents have been reluctant to supply negative accounts, researchers have been reluctant to demand or acknowledge them (21). Parental bias of this sort could be avoided or reduced by a greater use of third-party reports, such as those of teachers, or, as Allen recommends (3), the avoidance of subjective reports in favor of more standardized, objective measures of child well-being.

Lopez and Edelman, in a volume of qualitative reports from children raised by same-sex couples, have critiqued the "no differences" research on just these grounds. "[S]ocial-science research that has ostensibly shown positive "outcomes" for children raised by same-sex couples… are really just measurements of what adults want from children so the adults look good: Does the child have good grades? Does the child look happy in photographs. …? Is the child well-adjusted, healthy, a good athlete, well liked by his peers, …? In other words, …: Do children in same-sex couple's homes turn out the way gay people want them to, so that gay people look good to straight people" (22)? In support of this point, it is striking that few studies (to my knowledge, only four) in the "no differences" literature have employed standard psychometric measures of emotional distress such as the CES-D or the Strengths and Difficulties Questionnaire (23), and no study has asked about parental child abuse. If politically aware concern for demonstrably positive child outcomes is as pervasive as these accounts suggest, it is conceivable that same-sex parents could also disproportionately emphasize such demonstrable achievement in their children, leading to just the kind of mixed results observed in the Add Health data.

Increased family stability is often cited as a likely benefit of same-sex marriage, but these findings also call into question the premise of that argument. Stability leads to more positive child outcomes with opposite-sex partners, but it appears to have the opposite effect for children with same-sex parents. As Table 4 shows, children whose same-sex parents were married had been with that particular set of parents over 2.5 times longer, at over ten years on average, than had children with unmarried same-sex parents, at about four years on average. Marriage did bring greater stability, but stability did not bring better child outcomes: married same-sex parents were much more stable, though child well-being was generally lower, than were unmarried same-sex parents. Similarly, the proportion of children who had undergone at least one transition from one set of parents to another, such as in a divorce and remarriage, was at least four times higher, at 83% and 88% for unmarried and married same-sex parents respectively, than it was for opposite-sex married parents, at 19%. Such transitions are experienced by children as traumatic, generally impeding their well-being and development. Perhaps the substantially higher rate of transitions with same-sex parents, estimated at even somewhat higher if they are married, may help to account for the relatively lower child well-being with married same-sex parents. Multivariate models suggest that the effects of tenure, transitions and marital status are largely independent, although further research is necessary to clarify the relationship of these factors.

In sum, from the evidence presented in this paper, it does not appear that the operational benefits of marriage that accrue to opposite-sex couples are severable from the man-woman relationship. It may be that the kind of functional thinking that underlies the argument that the two forms of marriage relationship are analogous is mistaken, and the beneficial factors that are observed in man-woman marriage--greater stability, financial resources, relational security—do not float free in a manner that can be independently conveyed to another kind of relationship.

Limitations

Despite the signal strengths of Add Health as a large nationally representative dataset, and notwithstanding the strong significance for contrast effects reported above, due to the small sample sizes involved, the findings of this study should be considered only provisional and exploratory until and unless they are confirmed by further research. In particular, the findings presented in Table 4 and related analyses are based on very small or sparse categories and should not be considered definitive without corroboration. Although Add Health enables longitudinal analysis, this study examined data from only one wave, and thus, as with any cross-sectional data, causal inference is not possible. The findings presented in this study are focused on an assessment of measures presented in prior studies, and should not be taken as presenting a comprehensive profile of parenting outcomes.

CONCLUSION

Contrary to the expectations prompted by the "no differences" literature and related ideologies, harm for children with same-sex parents does not appear to be attributable to prior heterosexual relationships, lower stability, relational commitment, or higher stigma among same-sex parents. In the data observed in this study, the greatest harm for children with same-sex parents came from the most stable and most marital family arrangements. This unexpected harm was present despite warm and loving parents who promoted positive school outcomes, but also may be related to higher rates of abuse. Recent first-person narrative accounts of growing up with same-sex parents have presented a complex image of harm despite positive parental qualities that is very similar to the impression suggested by these findings (22,24,25) .

The present study has re-examined some of the strongest evidence adduced in support of the no differences thesis, concluding that, when re-analyzed in a manner that could show differences if they existed, such differences are manifestly present. As noted in the introduction, a steady drumbeat of dozens of studies based on small, non-random samples has been celebrated by the American social science establishment as definitive proof that having same-sex parents is innocuous for child well-being. In the face of mounting evidence to the contrary, the American Psychological Association continues to claim: "Not a single study has found children of lesbian or gay parents to be disadvantaged in any significant respect relative to children of heterosexual parents" (26). The present study definitively demonstrates that statement to be false.

To those convinced that the no differences thesis is true, the evidence presented in this study is unexpected and possibly inconvenient. Whether future evidence upholds, modifies or rebuts these findings, they suggest that much of the received social science wisdom about such relationships is mistaken, and we have just begun to try to understand the effect on children of having two parents of the same sex.

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