

No Differences? Meta-Analytic Comparisons of Psychological Adjustment in Children of Gay Fathers and Heterosexual Parents

Benjamin Graham Miller, Stephanie Kors, and Jenny Macfie
University of Tennessee at Knoxville

The field of literature on gay male parenting is small, especially compared to the number of studies on lesbian parenting. No meta-analysis has specifically compared the children of gay fathers to the children of heterosexual parents nor has any meta-analysis applied the newly developed quality-effects model to this field of research. The current study applied the fixed effects, random effects, and quality-effects models of meta-analysis to 10 studies (35 standardized mean differences) from the past 10 years to evaluate child psychological adjustment by parent sexual orientation. Studies both within and outside of the United States with a range of child ages and sample sizes were included. The quality-effects model of meta-analysis helps mitigate error caused by methodological differences in studies in addition to random error attributed to small sample sizes, making it the most appropriate model for this study. Although the quality-effects model provided results closest to our hypothesis that there would be no difference, results indicated that children of gay fathers had significantly *better* outcomes than did children of heterosexual parents in all 3 models of meta-analysis. These results may be attributable to potential higher socioeconomic status for gay fathers traditionally associated with dual earner households, better preparedness for fatherhood in the face of strong antigay stigma directed at same-sex families, and more egalitarian parenting roles. Limitations and implications of the study are discussed.

Public Significance Statement

Results suggest that children of gay fathers have better outcomes than do children of heterosexual couples. As an early study in a growing field, the current study highlights the need for further research in areas such as parental preparation, family support resources, and nontraditional family types.

Keywords: gay fathers, heterosexual parents, meta-analysis, quality-effects model

The field of research on lesbian, gay, bisexual, and transgender (LGBT) parenting is still in its infancy, and the subset of gay parenting research is even more undeveloped due to the relatively small population of openly gay father couples. Recent estimates suggest only 0.5% of Americans identify as being part of any same-sex relationship (Gates & Newport, 2015). While many more studies than currently available are required to provide evidence for definitive patterns and analysis of gay parenting, it is important to provide an analysis of the current research to identify preliminary findings and methodological improvements needed in future research.

Despite the small field of research on gay parenting, the comparison between gay parenting and heterosexual parenting has grown quickly in recent years (Pavlik, 2013), as the estimated number of same-sex partnerships has grown from 700,000 to

nearly 1 million between 2013 and 2014 (Gates & Newport, 2015). It is essential to understand the extent to which existing parenting research, traditionally focused on heterosexual couples, applies to gay parents. If differences do exist, it is crucial for the scientific community to recognize and explore them to better understand parenting differences in terms of child outcomes. Comparing the two groups will not only produce research that helps either gay or heterosexual couples become better parents, but will also highlight the factors that lead to successful parenting across all demographics.

Past research has indicated that gay parents might be better prepared for child rearing than heterosexual parents (Goldberg, Kashy, & Smith, 2012). This discrepancy may be because having a child as a gay couple often comes under more scrutiny, requires more resources, and often necessitates more intense planning (Appell, 2011; Crawford, McLeod, Zamboni, & Jordan, 1999; Gato & Fontaine, 2013). Additionally, there is evidence that gay and lesbian parents have more egalitarian divisions of labor, parenting roles, and child responsibilities (Goldberg, Smith, & Perry-Jenkins, 2012; Tornello, Sonnenberg, & Patterson, 2015).

There is also a need to address the prevalent stigma against families headed by same-sex parents in not only the general population (Gato & Fontaine, 2013) but also among social workers (Bernica, 2001), psychologists involved in making custody deci-

This article was published Online First October 13, 2016.

Benjamin Graham Miller, Stephanie Kors, and Jenny Macfie, Department of Psychology, University of Tennessee at Knoxville.

Correspondence concerning this article should be addressed to Benjamin Graham Miller, Department of Psychology, University of Tennessee at Knoxville, 301E Austin Peay, Knoxville, TN 37996-0900. E-mail: bmille54@utk.edu

sions (Crawford et al., 1999), and lawmakers. Researchers have also pointed to the problem of teacher-held stigma against children of gay and lesbian couples and potential negative consequences in the classroom (Goldberg & Smith, 2014). Given the studies showing that teacher belief plays a significant role in child academic performance through self-fulfilling prophecies (Jussim, Robustelli, & Cain, 2009; Madon et al., 2001), it is imperative to reduce any antigay stigma should the research confirm that there are no differences between children of same-sex couples and heterosexual couples.

There is also evidence that this stigma may be present in the minds of same-sex couples themselves (Riskind, 2013), suggesting that even gay fathers may believe their children will have poorer outcomes. Research suggests this may be because gay fathers are less confident about their ability to parent effectively (Brinamen & Mitchell, 2008). Research on the differences between children of heterosexual parents and children of gay parents is needed to explore this, and determine what the causes and remedies of potential differences are, if differences do exist. It is also important for these fathers to recognize and explore what resources help gay parents become more successful, so that communities can begin employing successful supportive child rearing strategies.

Further, child outcomes by family type may be influenced differently by additional factors. In other words, the term *gay parents* is not quite as straightforward or homogeneous as many believe (Rothblum, 2009). The term *gay parents* may be applied to families with one gay parent and one heterosexual parent, two gay parents who adopt, a gay couple who share child rearing with a lesbian couple as a result of a surrogate agreement, and gay couples who use reproductive technologies. Demographics for gay and lesbian couples also tend to differ from the demographics of heterosexual couples. Thus, an important factor of child outcome research is the role of different moderator variables, what effect they have, and how that effect differs between family types. As such, these factors play a role in selecting a meta-analysis model.

All of the above notwithstanding, the most common result of current research in the field of gay and lesbian parenting is that children of same-sex couples do just as well as children of heterosexual couples (Herek, 2006), leading the American Psychological Association, among other organizations, to publicly resolve that there is no difference in child outcomes between same-sex and heterosexual couples (Paige, 2005). Nevertheless, the existing research has come under scrutiny for many of its continued limitations. Critics point to the small sample sizes, the focus on lesbian couples, convenience and purposive sampling methods, homogeneous samples, and oversimplification of the issues that these studies often involve (D. Allen, 2015; Schumm, 2010). Although these problems are increasingly being addressed in the emergence of new literature, their prevalence has made it hard for many critics of the no-difference hypothesis to view the current research outcomes as a consensus. Fortunately, a quality effects meta-analytic approach can mitigate and elucidate these issues, making it the most appropriate model for this study.

A meta-analysis allows the statistical results of a collection of individual studies to be combined to provide a summary that is more accurate because it has a larger sample size (Lipsey & Wilson, 2001). Although there have been several meta-analyses on the subject of child outcome by family type (M. Allen & Burrell, 1996, 2002; Crowl, Ahn, & Baker, 2008; Fedewa, Black, & Ahn,

2015), but there are still important reasons to undertake another. First of all, while most of the previous meta-analyses have included both lesbian and gay couples they have overwhelmingly been made up of mostly lesbian couples due to the lack of research on gay couples. The most recent meta-analysis only included three effect sizes that measured outcomes of children of gay parents. As more studies focused on gay couples have since been released, a meta-analysis with greater statistical significance can now be conducted.

Second, past meta-analyses include a range of studies that date back several decades. In the face of accelerated cultural change regarding the same-sex community, it is conceivable that child outcomes in today's culture might differ than those of decades past. Therefore, this study limits selection to the most recent decade. Third, another meta-analysis is also justified because new studies on child outcomes continue to be published which allow for replication and confirmation of previous meta-analytic results. Finally, research regarding the statistical method of meta-analysis has also evolved over the past few years. While previous studies have used fixed-effects, mixed-effects, and random-effects models, new literature suggests that a new model, quality effects, may perform better because it is able to account for random error stemming from methodological variation across studies (Doi, Barendregt, Khan, Thalib, & Williams, 2015; Doi & Thalib, 2008). This model has been used across disciplines, including other areas of psychology (Blore, Sim, Forbes, Creamer, & Kelsall, 2015).

Prior meta-analyses composed of mostly lesbian couples have concentrated on many child outcome categories including psychological adjustment, the relationship between child gender and sexual identity, and child social functioning (Crowl et al., 2008; Fedewa et al., 2015). Due to the limited supply of studies that include separate statistical results for gay fathers, the current meta-analysis focuses solely on the outcome of child psychological adjustment. Child psychological adjustment has been the primary variable of interest in gay and lesbian research and scholarly discussion up to this point, because it is one of the broadest categories of measurement. This study tested the following hypotheses: that (Hypothesis 1) children of gay parents and children of heterosexual parents would have no statistically significant differences in psychological adjustment, consistent with past research hypotheses and results, and that (Hypothesis 2) the quality-effects model of meta-analysis would provide stronger statistical evidence for the no difference hypothesis than would the fixed effects and random-effects models.

Method

Study Selection

Studies were initially compiled into a list of over 6,000 citations of published and unpublished studies from 2005 and later based on the search terms *same sex*, *same gender*, *gay*, *child*, and *parent* in any combination. The search was carried out in several large psychology online databases, such as PsycINFO and ProQuest, and included peer-reviewed, nonpeer-reviewed, and unpublished studies to make sure there was no publication bias.

The list of over 6,000 citations was then manually filtered by coders to only include studies that (a) reported distinct statistics for the group of children of gay fathers, (b) measured some element of

child outcome, (c) had a control sample or provided population normative data, and (d) were quantitative studies with results that could be used to calculate meta-analysis statistics. This process resulted in 10 studies and 35 standardized mean differences (SMDs).

Coding

After the final studies were selected, two coders independently coded each SMD to determine dependent variable category, statistics needed to calculate SMDs, and quality scale factors. Inter-coder reliability was $\kappa = 1.0$ for variable category, $\alpha = .91$ to $\alpha = 1.0$ for statistics, and $\kappa = .78$ to $\kappa = 1.0$ for quality factors. Discrepancies were resolved through discussion between the two coders. Each study was coded to determine what category of child outcome it measured. The three categories of child outcome used by the coders were child psychological adjustment, gender/sexual identity, or neither. After determining there were not enough studies to analyze the child gender/sexual identity outcome, only the child psychological adjustment was used. Studies and differences that did not measure child psychological adjustment were not included. Psychological adjustment was defined as the measure of a child's emotional functioning, self-esteem, and general mental health. It is generally assessed through questionnaires filled out by either the child, parent, or teacher such as the Achenbach Child Behavioral Checklist (Achenbach & Rescorla, 2000) or Child Strengths and Difficulties Questionnaire (Goodman, 1997).

The quality-effects model of meta-analysis uses a weighting measure based on the methodological soundness of each study as determined by the researchers. While even a basic ranking of studies based on the authors' judgment of methodological quality has been shown to be effective (Doi & Thalib, 2008), the scale is significantly more effective when multiple, specific, criterion measures of methodological purity are used. The quality scale used for the quality-effects model of this meta-analysis was composed of five items: sampling method, matching method, data source, parents' marital status, and child's adopted status. Random and cluster sampling methods were weighted more heavily than were convenience or purposive methods as those techniques mitigate sampling error. Studies that randomly sampled both children of gay parents and children of heterosexual parents scored higher on the quality scale. In contrast, studies where the group of interest was selected first, and then a control group was selected based on matching characteristics scored lower. Matching the control group after selecting the group of interest can often introduce sampling bias and is not as preferred as random sampling. The source of data used in each study's measures was also rated. Sources were favored in the following order: child, teacher, and parent. Data collected firsthand from the child was considered to have less variation attributed to study participation than data collected from teachers and parents who were aware of participation in a study measuring child outcome by family type. Additionally, studies were considered higher quality if the parents indicated they had been together prior to having a child, as there is less likely to be the conflating factors of parents coming out to their children, leaving a previous heterosexual marriage, or raising the child by themselves for an unspecified and varying amount of time. Finally, studies with biological children of gay parents (usually obtained through surrogates) were weighted more heavily than were studies

measuring outcomes of adopted children, because adoption often involves multiple extraneous factors such as adoption agency, foreign versus domestic, and age of child at adoption that were not provided and whose effect still needs to be researched.

Standardized Mean Difference Sizes

The measure used to calculate differences in psychological adjustment between children raised by a heterosexual parent or parents and children raised by a gay parent or parents was the SMD. A SMD is the mean difference that would be expected of two groups they were both transformed to use the same scale (Borenstein, Hedges, Higgins, & Rothstein, 2009). The term *SMD* is generally recommended over the traditional term *effect size* because it is more specific and is less likely to be confused with its medical namesake, which can falsely imply causation (Higgins, Green, 2011).

SMD is computed using the following equation:

$$SMD = \frac{\bar{Y}_1 - \bar{Y}_2}{S_p}$$

In this equation, \bar{Y}_1 is the mean of the group of children with gay parents, \bar{Y}_2 is the mean of the group of children with heterosexual parents and S_p is the pooled standard deviation across the two groups (Cooper, Hedges, & Valentine, 2009). S_p was calculated using the following formula:

$$S_p = \sqrt{\frac{(n_1 - 1)S_1^2 + (n_2 - 1)S_2^2}{(n_1 + n_2 - 2)}}$$

In this equation n_1 and n_2 are sample sizes for each group, and S_1 and S_2 are standard deviations for each group. The direction of each SMD was computed such that a negative SMD indicated better outcomes for the children of gay parents and positive SMDs indicated better outcomes for children of heterosexual parents.

Statistical Analyses

Three different models of statistical analysis were used: fixed effects, random effects, and quality effects. The fixed and random-effects model follow methods described by Hedges and Olkin, 1985 and Cooper et al. (2009). The quality-effects model follows methods proposed by Doi and Thalib (2008). Below is a brief introduction to each model of meta-analysis, and a description of how this study weighted each SMD according to that model.

A *fixed-effects* meta-analysis is most useful when comparing studies of the same, homogeneous population (Cooper, 2009). Each study is assumed to sample from the same population, and therefore the only reason for differences between studies is random error. Primarily used in the physical sciences due to its assumptions about samples and populations, it weights each SMD by inverse of its variance. As a result, the size of each SMD is the primary component of its weight. A homogeneity test of the SMDs was also conducted to test the assumptions, and therefore validity, of this model. The end result of this model is an estimate of the true difference between two populations, which in this study is the true difference between children of gay parents and children of heterosexual parents. This approach is rarely used in the social sciences, however,

because there is often a range of differences between two populations. We included the fixed-effects model in this study as a baseline for two more appropriate models, and because it still remains a popular model of meta-analysis.

A *random-effects* model, on the other hand, is more common in the social sciences. This model not only factors in random error as measured by a study's variance, but also assumes that each study may have sampled a slightly different population. In addition to the "within-study" random error, this model weights SMDs to account for a "between-study" variation because it is possible that different populations may have varying differences. For example, black gay and heterosexual parents may have a stronger difference than Hispanic gay and heterosexual parents. This method therefore tries to estimate the mean of all true differences.

A *quality-effects* model is a more evolved version of the random-effects model. It assumes that not only is there "within-study" random error and "between-study" variance, but that the methodological heterogeneity of each study should also be considered. In other words, a study with stricter methodological controls can be considered to have smaller variance than a study with looser methodology. For example, while a low quality score does not necessarily mean a study has a larger error, it does mean the study has a greater possibility for error at greater degrees of magnitude. This method first weights SMDs according to a random-effects model, and then further weights each SMD by its rescaled quality rank (Qi). Each study's Qi is calculated dividing the sum of its quality scale components (Quality Rank) by the Quality Rank of the highest scoring study.

Results

Study Characteristics

Table 1 shows each study included in this meta-analysis, along with coded attributes. This results in a total of 10 studies and 35 SMDs. The study publication dates ranged from 2005 to 2015, with two studies (four SMDs) being unpublished dissertations. The inclusion of unpublished studies is consistent with past meta-analyses (Fedewa et al., 2015) and is considered methodologically sound (Cooper et al., 2009) as it helps to eliminate publication bias. Publication bias can be a problem because it is more likely that significant results are published than are insignificant results.

Of the 35 SMDs, 19 occurred outside of the United States and 16 occurred in the United States. Sample sizes for children of heterosexual parents ranged from eight to 935 and sample sizes of children of gay parents ranged from 11 to 86. These studies covered children of all ages, with some studies focusing on young children (1.5–6 years old) and others focusing on adolescents up to 18 years old.

Publication Bias

As noted above, the inclusion of unpublished dissertations was utilized to help eliminate publication bias. Additionally, the inclusion of unpublished studies also allowed for statistical testing of publication bias by using Egger's regression test for intercepts (Cooper et al., 2009). Egger's regression test also showed no evidence of publication bias.

Assessing Child Outcomes

Figure 1 shows the overall estimated difference for the fixed effects, random effects, and quality-effects models, respectively. They also show the weight for each SMD according to that specific model. These figures were constructed using the same software used to run the meta-analyses (EpiGear MetaXL).

For the fixed-effects model, 95% confidence interval (CI) $[-0.023, -0.091]$. For the random-effects and quality-effects models, 95% CI $[-0.257, -0.065]$ and $[-0.249, -0.042]$, respectively. All of these models were significant at the $p < .01$ level. The negative directionality indicates that children of gay parents had better outcomes than did children of heterosexual parents. Additionally, a test for homogeneity of effects was conducted to determine the appropriateness of the fixed-effects model. This test resulted in a p value of $< .0001$, indicating that the fixed-effects model was not an appropriate model to use in this situation because the differences were not homogeneous enough.

Discussion

This study tested the following hypotheses: that children of gay parents and children of heterosexual parents would have no statistically significant differences in psychological adjustment, consistent with past research, and that the quality-effects model of meta-analysis would provide stronger statistical evidence for the no difference hypothesis than would the fixed effects and random-effects models. Investigation into the first hypothesis not only provided no evidence that children of gay parents are likely to have worse outcomes than children of heterosexual parents, but actually found evidence that children of gay parents had better outcomes than did children of heterosexual parents at the $p < .01$ level for all models of meta-analysis. Moreover, the second hypothesis that the quality-effects model of meta-analysis would provide the most support for the no-difference hypothesis was supported, as the quality-effects model had the confidence interval that was closest to zero, suggesting it was the least statistically significant finding, and the closest to finding no difference in child psychological adjustment between children of gay and heterosexual parents. In other words, the quality-effects model, while still significant, is closest to the no difference hypothesis, which supports the second hypothesis.

There are several possible reasons why children of gay fathers may have better outcomes than children of heterosexual parents. First, married same-sex couples are more likely to have a higher income, lower poverty rate and higher education level than married heterosexual couples (Gates, 2015). Higher socioeconomic status is often a predictor of better child outcomes (Bornstein & Bradley, 2003). Second, this study may lend further support to the idea that gay parents might be better prepared than heterosexual parents, as a result of the stigma of having a child in a gay family (Crawford et al., 1999; Gato & Fontaine, 2013) and the difficulties commonly associated with parenting a child for gay couples (Appell, 2011). These obstacles, along with the presence of any doubt of their parenting skill (Brinamen & Mitchell, 2008) may make gay couples more likely to seek out parenting resources and support. Further research is needed to determine whether and how gay couples are more prepared for parenthood than heterosexual couples. Research has also supported the premise that gay parents have more egalitarian parenting and relationship roles

Table 1
Descriptive Characteristics of Each Study

Study, year	Location	Sampling method	Matching method	Parents' marital status	Child's adopted status	Study measure	Data Source	Gay			Heterosexual					
								n	M	SD	n	M	SD			
Averett, Nalavany, and Ryan (2009)	1	1	1	1	1	1.5-5 years internalizing CBCL	3	86	5.53	4.26	294	6.79	7.3	-.187	.591	
						1.5-5 years externalizing CBCL	3	86	7.88	5.06	294	10.28	9.28	-.282	.591	
						6-18 years externalizing CBCL	3	69	6.94	7.18	935	6.81	7.06	-.018	.591	
Baiocco et al (2015)	2	1	1	1	0	6-18 years externalizing CBCL	3	69	8.57	9.78	935	11.45	11.7	-.249	.591	
						Liberty/Negativity	3	20	1.56	.29	40	1.7	.33	-.441	.682	
						Emotional regulation	3	20	3.31	.29	40	3.22	.32	-.290	.682	
Bos (2010)	2	1	1	1	0	Emotional symptoms	3	20	1.8	1.4	40	2.65	1.9	-.485	.682	
						Conduct problems	3	20	1.5	1.28	40	1.68	1.53	-.124	.682	
						Hyperactivity/ Inattention	3	20	2.6	2.04	40	2.8	2.3	-.090	.682	
						Peer relations problems	3	20	1.15	1.53	40	1.78	1.54	-.410	.682	
						Prosocial behavior	3	40	8.53	1.75	20	8.55	1.82	-.011	.682	
						Emotional problems	3	36	1.19	.5	36	1.26	.27	-.174	.682	
						Conduct problems	3	36	1.18	.33	36	1.19	.25	-.034	.682	
						Hyperactivity	3	36	1.53	.5	36	1.6	.48	-.143	.682	
						Prosocial behavior	3	36	2.67	.28	36	2.67	.33	-.000	.682	
						CBCL	3	15	54.6	5.64	38	59.79	10.14	-.569	.682	
Braun (2007)	1	2	1	2	1	Self-esteem	1	21	82.7	7.5	11	79.8	11.7	.318	.727	
						Psychosocial problems	3	11	49.5	7	21	49.9	7.4	-.055	.545	
						Affective problems	3	11	52.7	4.3	21	55.5	5.2	-.569	.545	
Canning (2006)	1	1	1	3	0	Internalizing CBCL	3	29	43.19	10.31	50	44.03	9.39	-.086	.591	
						Externalizing CBCL	3	29	46.76	9.76	50	47.21	8.31	-.051	.591	
						Internalizing TRF	2	29	46.2	8.19	50	45.66	8.97	.062	.682	
Farr, Forssell, and Patterson (2010)	1	1	1	1	1	Externalizing TRF	2	29	50.05	8.03	50	50.72	9.48	-.075	.682	
						Social adjustment	3	35	3.1	.39	8	3	.49	.245	1.000	
						Internalizing CBCL	3	35	40.78	1.26	45	42.57	1.02	-1.583	.273	
Fedewa and Clark (2009)	1	3	1	0	1	Externalizing CBCL	3	35	45.93	1.42	45	45.86	1.14	.055	.273	
						Conduct problems CBCL	3	41	2.12	2.1	49	2.9	1.8	-.402	.273	
						Hyperactivity CBCL	3	41	4.61	2.4	49	5.18	2.79	-.218	.273	
Goldberg, Kashy, and Smith (2012)	1	1	0	1	1	Emotional problems CBCL	3	41	1.83	2.49	49	1.98	1.77	-.070	.273	
						Peer problems CBCL	3	41	1.61	1.73	49	1.51	1.68	.059	.273	
						Conduct problems TRF	3	41	1.62	2.26	49	1.82	2.38	-.086	.364	
Golombok (2014)	2	1	0	1	1	Hyperactivity TRF	2	41	4.75	2.79	49	4.95	3.31	-.065	.364	
						Emotional problems TRF	2	41	1.34	1.53	49	2.05	2.36	-.351	.364	
						Peer problems TRF	2	41	1.78	2.53	49	2.12	1.76	-.159	.364	
Hawkins (2011)	1	2	0	2	2	2	Adolescent behavior problems	3	25	2.54	.49	35	2.38	.42	.355	.136

Note. CBCL = Child Behavior Checklist; TRF = Teacher Report Form; SMD = standardized mean difference; Q_i = rescaled quality rank. Location: 1 = United States, 2 = other; sampling: 1 = convenience/purposive, 2 = cluster, 3 = random; matching: 1 = yes, 0 = no; marital: 1 = married/partnered, 2 = mixed, 3 = not informed; adopted: 0 = not adopted, 1 = adopted, 2 = mixed; data source: 1 = child, 2 = teacher, 3 = parent.

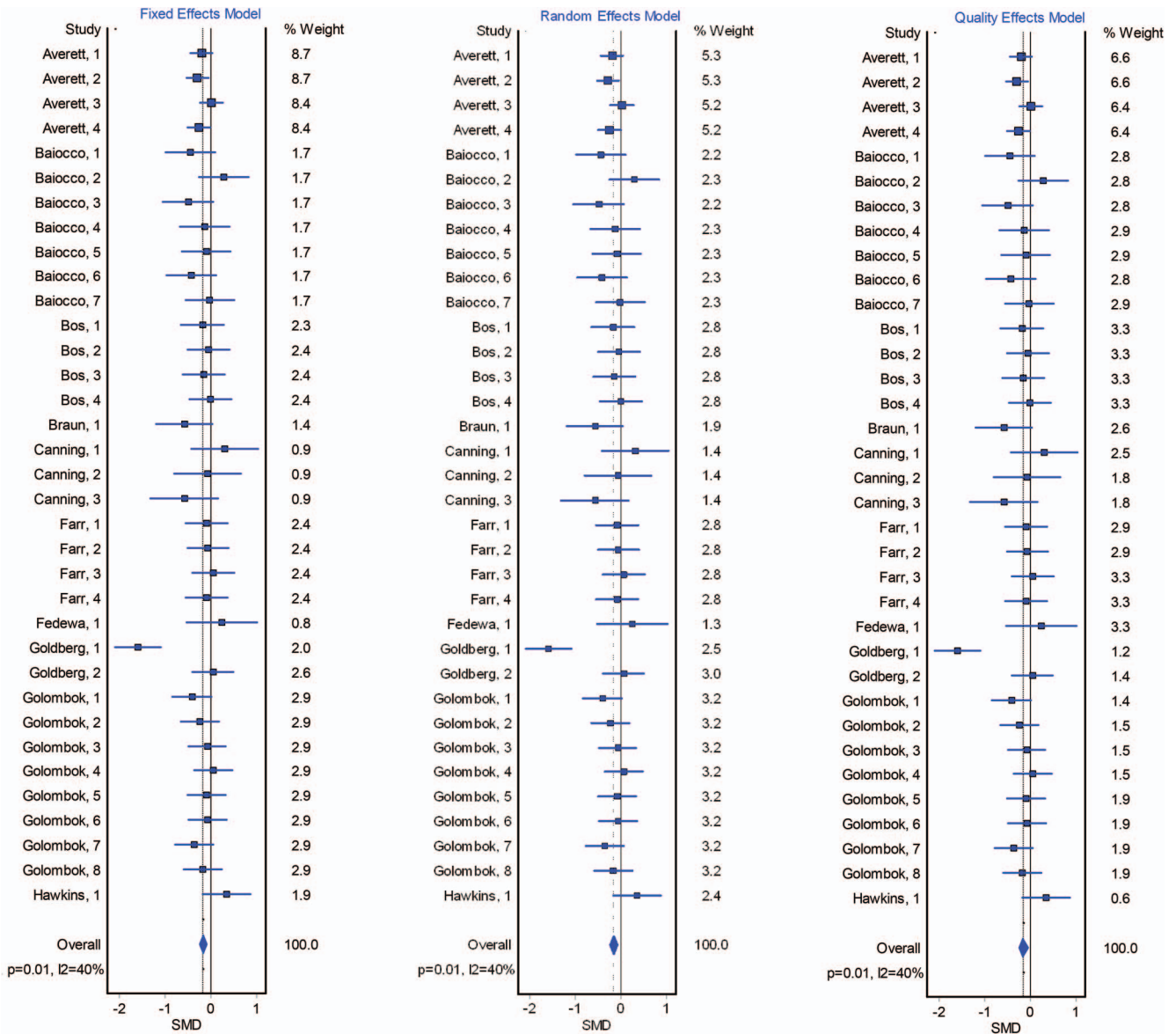


Figure 1. Results and weight of each study by meta-analysis model study. See the online article for the color version of this figure.

(Goldberg, Smith, & Perry-Jenkins, 2012; Tornello et al., 2015). If the better outcomes of children of gay parents are partially attributable to better preparation, increased resilience, and more egalitarian parenting roles, there could be possible implications and strategies for improvement for both gay and heterosexual couples.

There are the potential that biological children of gay couples fare better than biological children of heterosexual couples, as most of the biological children included in the included studies were a result of surrogacy. Arranging for a surrogate is often more expensive and requires more planning than does traditional heterosexual conception. Furthermore, gay couples are not likely to have an unexpected pregnancy. In contrast, nearly 50% of all heterosexual pregnancies may be unintended (Hatcher, 2011),

which has been linked with poorer child outcomes (Claridge, 2016; Lindberg, Maddow-Zimet, Kost, & Lincoln, 2015). Further research is needed to understand the role of surrogacy on gay parenting in comparison to adoption and shared custody arrangements.

Another possible reason for this result is the inclusion of the Goldberg, Kashy, et al. (2012) study. One SMD from this study was the strongest finding in support of better outcomes for children of gay parents, making it one of the most influential SMDs. This difference was included in this meta-analysis because it did not fail the statistical checks for outliers, and the other SMD from that same study was well within the normal range. Finally, because there is evidence that the quality-effects model is the least statistically significant, the methodologies of the included studies may

play a role in the outcome. Many studies sampled their gay parent population from gay parenting websites, and then matched the control group from the same school as the child of the gay parents. It may be that membership to a parenting websites is associated with better child outcomes. When quality of the studies' methodology was accounted for in the quality-effects model, the confidence interval was closest to zero, and therefore closest to supporting the no difference hypothesis.

This is the first meta-analysis to find this result exclusively for children of gay fathers. These results have implications for communities, schools, therapists, and social workers and their existing stigma against gay families (Bernica, 2001; Crawford et al., 1999; Gato & Fontaine, 2013; Goldberg & Smith, 2014). Research has shown that LGBT-specific training for teachers (Mitton-Kukner, Kearns, & Tompkins, 2016), counselors (Case & Meier, 2014), and therapists (Garner & Emano, 2013) is effective in fighting stigma against LGBT youth and children from LGBT families. However, much more research with larger sample sizes are needed across the field of gay parenting, from further studies on child outcomes to analyses of the effectiveness of differing systems of support for gay fathers. Additional implications include supporting and enabling the legal right of gay couples to adopt and the necessity of programs that encourage and support gay couples who want children but may doubt their parenting abilities.

Limitations

As the field of gay parenting research is very young, there were many unavoidable limitations to this study. The primary limitation of this study is the small sample size. By restricting inclusion of studies to the more relevant range of the last 10 years, potential statistical power was lost and descriptive analysis of moderator variables was not possible. However, the inclusion of some of these potential moderating factors in the coded quality scale we were able to mitigate some of the influence. As more studies become available, it will be possible to compute the statistical significance of each of these moderating factors as well as including more items in the quality scale, such as whether the parents had come out before or after having the child. Because the population of gay headed households is small, there were a limited number of studies to include in this meta-analysis, especially after removing studies that did not provide distinct quantitative statistics for the gay subsample of families. Many studies combined gay and lesbian samples into one "same-sex" group, which could not be used for this meta-analysis. There is a dire need for more research in this field, especially as more and more gay couples are entering into marriage and pursuing families.

Additionally, although the quality-effects model does mitigate some of the looser methodological controls, it does not remove them. Because this field is still growing, many of the studies relied upon convenience sampling, such as gay parenting websites, and less than optimal matching techniques. There is a need to continue research on gay fathers with higher quality studies.

Finally, as with any meta-analysis in the social sciences, the grouping of related measures into a larger category runs the risk of missing some of the nuances in the data. If more studies had been available, it would have been possible to do a meta-analysis on each of the sub categories of child psychological adjustment (such

as externalizing and internalizing behavior). As such, this meta-analysis only measured the aggregate category of child psychological adjustment, which combines sub categories at equal weight. Neither type of measure (such as internalizing vs. externalizing) nor granularity of measure (peer relation problems vs. Child Behavioral Checklist) was used in the weighting process. This is a potential issue because, for example, internalizing problems may not be of as much interests to some researchers as externalizing problems. Additionally, in this meta-analysis, sub categories of some studies were weighted as heavily as the broader category of another study. Statistics were calculated at the smallest level of granularity possible.

Conclusion

The field of gay parenting research is largely unexplored. Results from this meta-analytic study on the early research of gay parenting find that children of gay parents have better outcomes than do children of heterosexual parents which may have important implications for gay parents and their children, teachers, social workers, therapists, and the community.

References

- Achenbach, T., & Rescorla, L. (2000). *Manual for the ASEBA preschool forms and profiles*. Burlington, VT: University of Vermont, Research Center for Children, Youth, and Families.
- Allen, D. (2015). More heat than light: A critical assessment of the same-sex parenting literature, 1995–2013. *Marriage & Family Review, 51*, 154–182. <http://dx.doi.org/10.1080/01494929.2015.1033317>
- Allen, M., & Burrell, N. (1996). Comparing the impact of homosexual and heterosexual parents on children: Meta-analysis of existing research. *Journal of Homosexuality, 32*, 19–35. http://dx.doi.org/10.1300/J082v32n02_02
- Allen, M., & Burrell, N. (2002). Sexual orientation of the parent: The impact on the child. In M. Allen (Ed.), *Interpersonal communication research: Advances through meta-analysis* (pp. 125–143). Mahwah, NJ: Erlbaum Associates.
- Appell, A. R. (2011). Legal issues in lesbian and gay adoption. In D. Brodzinsky & A. Pertman (Eds.), *Adoption by lesbians and gay men* (pp. 36–61). New York, NY: Oxford University Press. <http://dx.doi.org/10.1093/acprof:oso/9780195322606.003.0021>
- Averett, P., Nalavany, B., & Ryan, S. (2009). An evaluation of gay/lesbian and heterosexual adoption. *Adoption Quarterly, 12*, 129–151. <http://dx.doi.org/10.1080/10926750903313278>
- Baiocco, R., Santamaria, F., Ioverno, S., Fontanesi, L., Baumgartner, E., Laghi, F., & Lingiardi, V. (2015). Lesbian mother families and gay father families in Italy: Family functioning, dyadic satisfaction, and child well-being. *Sexuality Research & Social Policy: A Journal of the NSRC, 12*, 202–212. <http://dx.doi.org/10.1007/s13178-015-0185-x>
- Bernica, N. L. (2001). *Attitudes of social workers toward gay and lesbian adoption* (Master's thesis). Retrieved from ProQuest Dissertations and Theses database. (UMI No. 1405848)
- Blore, J. D., Sim, M. R., Forbes, A. B., Creamer, M. C., & Kelsall, H. L. (2015). Depression in Gulf War veterans: A systematic review and meta-analysis. *Psychological Medicine, 45*, 1565–1580. <http://dx.doi.org/10.1017/S0033291714001913>
- Borenstein, M., Hedges, L. V., Higgins, J. P. T., & Rothstein, H. R. (2009). *Introduction to meta-analysis*. Chichester, England: Wiley.
- Bornstein, M. H., & Bradley, R. H. (2003). *Socioeconomic status, parenting, and child development*. Mahwah, NJ: Erlbaum Associates.

- Bos, H. M. W. (2010). Planned gay father families in kinship arrangements. *ANZJFT Australian and New Zealand Journal of Family Therapy, 31*, 356–371. <http://dx.doi.org/10.1375/anft.31.4.356>
- Braun, S. D. (2007). *Gay fathers with children adopted from foster care: Understanding their experiences and predicting adoption outcomes* (Doctoral dissertation). Retrieved from ProQuest Information and Learning. (Order No. AAI3252381)
- Brinamen, C. F., & Mitchell, V. (2008). Gay men becoming fathers: A model of identity expansion. *Journal of GLBT Family Studies, 4*, 521–541. <http://dx.doi.org/10.1080/15504280802191772>
- Canning, T. T. (2006). *Gay and heterosexual fathers: A comparative analysis of child behavior and well-being* (Doctoral dissertation). Retrieved from ProQuest Information and Learning. (Order No. AAI3182597)
- Case, K. A., & Meier, S. C. (2014). Developing allies to transgender and gender-nonconforming youth: Training for counselors and educators. *Journal of LGBT Youth, 11*, 62–82. <http://dx.doi.org/10.1080/19361653.2014.840764>
- Claridge, A. M. (2016). Pregnancy plans of first-time mothers and their children's outcomes: An examination of mechanisms. *Infant and Child Development, 47*, 1–12. <http://dx.doi.org/10.1002/icd.1715>
- Cooper, H., Hedges, L. V., & Valentine, J. C. (Eds.). (2009). *The handbook of research synthesis and meta-analysis*. New York, NY: Russell Sage Foundation.
- Crawford, I., McLeod, A., Zamboni, B. D., & Jordan, M. B. (1999). Psychologists' attitudes toward gay and lesbian parenting. *Professional Psychology, Research and Practice, 30*, 394–401. <http://dx.doi.org/10.1037/0735-7028.30.4.394>
- Crowl, A., Ahn, S., & Baker, J. (2008). A meta-analysis of developmental outcomes for children of same-sex and heterosexual parents. *Journal of GLBT Family Studies, 4*, 385–407. <http://dx.doi.org/10.1080/15504280802177615>
- Doi, S. A. R., Barendregt, J. J., Khan, S., Thalib, L., & Williams, G. M. (2015). Simulation comparison of the quality effects and random effects methods of meta-analysis. *Epidemiology, 26*, e42–e44. <http://dx.doi.org/10.1097/EDE.0000000000000289>
- Doi, S. A. R., & Thalib, L. (2008). A quality-effects model for meta-analysis. *Epidemiology, 19*, 94–100. <http://dx.doi.org/10.1097/EDE.0b013e31815c24e7>
- Farr, R. H., Forssell, S. L., & Patterson, C. J. (2010). Parenting and child development in adoptive families: Does parental sexual orientation matter? *Applied Developmental Science, 14*, 164–178. <http://dx.doi.org/10.1080/10888691.2010.500958>
- Fedewa, A. L., Black, W. W., & Ahn, S. (2015). Children and adolescents with same-gender parents: A meta-analytic approach in assessing outcomes. *Journal of GLBT Family Studies, 11*, 1–34. <http://dx.doi.org/10.1080/1550428X.2013.869486>
- Fedewa, A. L., & Clark, T. P. (2009). Parent practices and home-school partnerships: A differential effect for children with same-sex coupled parents? *Journal of GLBT Family Studies, 5*, 312–339. <http://dx.doi.org/10.1080/15504280903263736>
- Garner, G. L., Jr., & Emano, D. M. (2013). Counseling lesbian, gay, bisexual, transgender, and questioning students. In E. S. Fisher & J. Chiasson (Eds.), *Creating safe and supportive learning environments: A guide for working with lesbian, gay, bisexual, transgender, and questioning youth and families* (pp. 189–208). New York, NY: Routledge/Taylor & Francis Group.
- Gates, G. (2015). *Demographics of married and unmarried same-sex couples: Analyses of the 2013 American Community Survey*. Los Angeles, CA: Williams Institute, UCLA School of Law.
- Gates, G., & Newport, F. (2015). *Gallup daily tracking Jan. 28–Apr. 19, 2015*. Retrieved from <http://www.gallup.com/poll/182837/estimated-780-000-americans-sex-marriages.aspx>
- Gato, J., & Fontaine, A. M. (2013). Anticipation of the sexual and gender development of children adopted by same-sex couples. *International Journal of Psychology, 48*, 244–253. <http://dx.doi.org/10.1080/00207594.2011.645484>
- Goldberg, A. E., Kashy, D. A., & Smith, J. Z. (2012). Gender-typed play behavior in early childhood: Adopted children with lesbian, gay, and heterosexual parents. *Sex Roles, 67*, 503–515. <http://dx.doi.org/10.1007/s11199-012-0198-3>
- Goldberg, A. E., & Smith, J. Z. (2014). Perceptions of stigma and self-reported school engagement in same-sex couples with young children. *Psychology of Sexual Orientation and Gender Diversity, 1*, 202–212. <http://dx.doi.org/10.1037/sgd0000052>
- Goldberg, A. E., Smith, J. Z., & Perry-Jenkins, M. (2012). The division of labor in lesbian, gay, and heterosexual new adoptive parents. *Journal of Marriage and the Family, 74*, 812–828. <http://dx.doi.org/10.1111/j.1741-3737.2012.00992.x>
- Golombok, S., Mellish, L., Jennings, S., Casey, P., Tasker, F., & Lamb, M. E. (2014). Adoptive gay father families: Parent-child relationships and children's psychological adjustment. *Child Development, 85*, 456–468. <http://dx.doi.org/10.1111/cdev.12155>
- Goodman, R. (1997). The strengths and difficulties questionnaire: A research note. *Journal of Child Psychology and Psychiatry, and Allied Disciplines, 38*, 581–586. <http://dx.doi.org/10.1111/j.1469-7610.1997.tb01545.x>
- Hatcher, R. A. (2011). *Contraceptive technology*. New York, NY: Ardent Media.
- Hawkins, S. A. (2011). *Family relationships and adolescent behavior: A look at families headed by heterosexual, lesbian, and gay parents* (Unpublished doctoral dissertation). Retrieved from ProQuest Information and Learning. (Order No. AAI3416901)
- Hedges, L. V., & Olkin, I. (1985). *Statistical methods for meta-analysis*. Orlando, FL: Academic Press.
- Herek, G. M. (2006). Legal recognition of same-sex relationships in the United States: A social science perspective. *American Psychologist, 61*, 607–621. <http://dx.doi.org/10.1037/0003-066X.61.6.607>
- Higgins, J. P. T., & Green, S. (Eds.). (2011). *Cochrane Handbook for Systematic Reviews of Interventions*. (Version 5.1.0) Available from <http://www.cochrane-handbook.org>
- Jussim, L., Robustelli, S. L., & Cain, T. R. (2009). Teacher expectations and self-fulfilling prophecies. In K. R. Wentzel (Ed.), *Handbook of motivation at school* (pp. 349–380). New York, NY: Routledge/Taylor & Francis Group.
- Lindberg, L., Maddow-Zimet, I., Kost, K., & Lincoln, A. (2015). Pregnancy intentions and maternal and child health: An analysis of longitudinal data in Oklahoma. *Maternal and Child Health Journal, 19*, 1087–1096. <http://dx.doi.org/10.1007/s10995-014-1609-6>
- Lipsey, M. W., & Wilson, D. B. (2001). *Practical meta-analysis*. Thousand Oaks, CA: Sage.
- Madon, S., Smith, A., Jussim, L., Russell, D. W., Eccles, J., Palumbo, P., & Walkiewicz, M. (2001). Am I as you see me or do you see me as I am? Self-fulfilling prophecies and self-verification. *Personality and Social Psychology Bulletin, 27*, 1214–1224. <http://dx.doi.org/10.1177/0146167201279013>
- Mitton-Kukner, J., Kearns, L., & Tompkins, J. (2016). Pre-service educators and anti-oppressive pedagogy: Interrupting and challenging LGBTQ oppression in schools. *Asia-Pacific Journal of Teacher Education, 44*, 20–34. <http://dx.doi.org/10.1080/1359866X.2015.1020047>
- Paige, R. U. (2005). Proceedings of the American Psychological Association, Incorporated for the legislative year 2004: Minutes of the annual meeting of the Council of Representatives. *American Psychologist, 60*, 436–511. <http://dx.doi.org/10.1037/0003-066X.60.5.436>
- Pavlik, K. M. (2013). *A critical literature review of thriving among adopted children of gay and lesbian parents* (Unpublished doctoral dissertation). Retrieved from PsycINFO. (Order No. AAI3527700)

- Riskind, R. G. (2013). *Psychological barriers to parenthood among lesbians and gay men* (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses database. (UMI No. 3570385)
- Rothblum, E. D. (2009). An overview of same-sex couples in relationships: A research area still at sea. In D. A. Hope (Ed.), *Contemporary perspectives on lesbian, gay, and bisexual identities* (pp. 113–139). New York, NY: Springer Science & Business Media. http://dx.doi.org/10.1007/978-0-387-09556-1_5
- Schumm, W. R. (2010). Evidence of pro-homosexual bias in social science: Citation rates and research on lesbian parenting. *Psychological Reports, 106*, 374–380. <http://dx.doi.org/10.2466/pr0.106.2.374-380>
- Tornello, S. L., Sonnenberg, B. N., & Patterson, C. J. (2015). Division of labor among gay fathers: Associations with parent, couple, and child adjustment. *Psychology of Sexual Orientation and Gender Diversity, 2*, 365–375. <http://dx.doi.org/10.1037/sgd0000109>

Received May 22, 2016

Revision received August 18, 2016

Accepted August 22, 2016 ■

E-Mail Notification of Your Latest Issue Online!

Would you like to know when the next issue of your favorite APA journal will be available online? This service is now available to you. Sign up at <http://notify.apa.org/> and you will be notified by e-mail when issues of interest to you become available!