Henny Bos, Lisette Kuyper and Nanette Gartrell just published another study aimed to investigate how children raised by same sex couples function on the journal *Family Process*. Data were obtained from the Dutch nationally representative survey "Youth and Development" composed by 25,250 participants from a larger 34,400 random selected household sample having one or more children underaged 18 years old. If more than one eligible children lived in the household, one was selected through a random procedure to be the sample child. On the basis of the gender of the adult partners authors identified 63 (0.39%) and 68 (0.42%) respectively female and male same-sex couples, while 16,154 (99.19%) resulted as opposite-sex couples all experiencing no couple dissolution in the previous 2 years. After removing stepchildren, foster children and adopted children the number of same-sex co-parents decreased to 47 females and 59 males same-sex couples (106 in total). To minimize any potential confounding effect in demographics between same-sex and opposite-sex parent households on children's psychological status and other end-points authors adopted a one-to-one matching procedure which considered parental age, education, marital status, ethnic background, child age, gender, and learning or developmental disability status. After the matching process authors obtained a final 190 households samples composed by 43 female, 52 male same-sex and 95 opposite-sex households. It was not possible to match samples and controls for ethnic background. Children's psychological wellbeing was indirectly assessed by the Strength and Difficulties Questionnaire (SDQ) for 5-18 years children. Parenting stress was measured with the Parenting Stress Questionnaire providing two separate subscales for parent-child relationship and perceived parental competency. Formal and informal support in child rearing was assessed with the Parenting and Child Rearing Support Questionnaire. According to authors, no statistical difference resulted between same-sex -both male and female- and different-sex household on the basis of the adopted parameters. The only exception is a higher feeling of competence in parenting and a smaller percentage declaring their worry about child rearing among same-sex female households. No difference was found in interaction between parenting stress and children's psychological wellbeing between same-sex and posited-sex households.

Although the best way to examine a study is to obtain the same data and re-examine the analysis in detail, which could not be done here, some considerations are possible.

1) The study contains no funding acknowledgements, strangely, but does report that it is a continuation of a study published last October funded by the Williams Institute, which advocates for the normalization and greater legalization of gay rights in the United States. One of the co-authors is a staff researcher at the Williams Institute. This is not evil on their part, they have a right to their point of view, but we should be aware that this study does not come from an unbiased source.

2) Given over 25,000 cases, they use only 109 for the study. To examine possible differences in a population, it is quite negligent throwing away 99% of the data. For this reason, observational studies using controls are much more widely used for this purpose. Even with a case control design,
the standard would be to use multiple cases of the larger group (different sex) to match single cases of the smaller group (same sex), which authors did not do. And, as the data are weighted (although it is not reported in the study), the weighting is rendered null by the matching procedure.

3) Case control matching is supposed to reduce selection bias. But when the matching variable may have some relation to the outcome, the data are "overmatched", resulting in an increase in selection bias. This is directly analogous to including a control variable in an observational study that is meaningfully correlated with the outcome variable. This clearly occurs in the Bos and colleagues' analysis with respect to two of the matching variables. First, developmental disabilities. It is demonstrated that the rate of developmental disabilities, especially ADHD, one of the most common disabilities, was much higher among children with same-sex parents. Abundant research, moreover, has shown that the features of family environment that affect developmental disabilities are very similar to, and highly correlated, with those that affect their outcome variables. Second, marital status. In the Netherlands, like most countries, over 90% of heterosexual couples with children are married. But only about 25% of same-sex parent couples are married in the Netherlands. Quite probably this minority of same-sex couples are the more stable, responsible subset. So, by matching the two sample groups for equal rates of marriage and child disability, the study authors could be selecting for a minority of the best same-sex parent couples, eliminating the majority of them whose children may have lower well-being. They could be said to be "cherry-picking" the best same-sex parents for the comparison.

4) The authors have no information about co-parenting arrangements of the parents designated in the study with other non-coresidential parents. In Dutch society, where such situations are much more common than elsewhere, this is a huge problem for a study like this, which attempts to make inferences about effects of the co-resident parent partners. A minority of the opposite-sex parent couples, but probably the large majority of the same-sex couples, are likely involved in parenting arrangements with the other parent of their child, who is the opposite sex of themselves. Under Dutch law, a child's father cannot have parental rights (without a court order) unless he is married to the mother at the time of birth, and is not permitted to rescind a mother's parental rights, so almost all the male same-sex couples in the study are probably sharing parenting with the non-residential mother of the child. The authors make this point themselves, in discussing limitations at the end of the study, when they acknowledge that "many participating fathers from same-sex parent households in the current study may be involved in a co-parenting construction with the mother(s) of the child."

5) There is good reason to doubt that the sample of "same-sex parents" in the study are even same-sex partners at all. The authors report that they identified same-sex partners by matching the reported sex of the respondent with the reported sex of his/her partner. But this method is known to produce a high degree of misassignment error, in which, due to human error in reporting the correct sex, a large portion of the category of "same-sex couple" actually consists of mistakenly specified opposite-sex couples (Cfr. Sullins P. 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, Social Science Research Network 2015, 11(2): 1-22). As Black explains in greater detail with regard to a similar problem on the 2000 Census, since same-sex married couples comprise only a fraction of one percent of all married couples in the U.S. population during the period studied, even a small random error in sex designation can result in a large inaccuracy in specifying the members of this tiny subpopulation, resulting in consequent false positives or negatives on hypothesis tests (Black D, Gates G, Sanders S, Taylor L. The measurement of same-sex unmarried partner couples in the 2000 US Census. Calif Cent Popul Res. 2007: https://escholarship.org/uc/item/72r1q94b.pdf). The problem can be corrected by including a follow-up question to make sure that the respondent actually
means to indicate that he or she is reporting a partner of the same sex, or a similar consistency check. The CDC includes such a check on NHIS, which is why it was possible to use the matching method on that dataset; however, for three years they neglected the check, resulting in an error rate, CDC reports, as high as 84%, meaning that 84% of supposed same-sex couples were actually opposite-sex couples.

It is presumable that something like that has happened in this Bos study, so that authors are actually just comparing two groups of opposite-sex parents. What makes it plausible this may have occurred is 1) there is no second check of sex designation in the data interview for this study. In fact, sex is designated by the respondent entering "1" or "2" into a laptop during a face to face interview, in which a small rate of error, hitting the wrong key, would be quite normal. 2) Both parents of the alleged "same-sex" couples indicate that the child is his/her "own child" (eigen kind). But in the Netherlands, at the time of the study, the only way for a same-sex co-parent to have parent rights was to register an adoption, so we would expect one of the partners, for most same-sex couples, to be reported as an adoptive parent. In fact none are. (And the authors match-selected on this response, which may be another instance of case control selection bias.) This is highly unlikely for same-sex couples, but what we would expect to see if the "same-sex" couples were really erroneously-coded opposite-sex couples. 3) The reported rate of parenting is improbably high for the male "same-sex" couples. In every other national and social setting I know, far fewer male same-sex couples raise children than female ones. In the U.S. the disparity is about four to one, that is, about four lesbian couples with children for every gay male couple with children. Yet the authors report that they found, by partner matching in a random sample, about equal numbers of both lesbian and gay male couples with children, actually more male couples (68) than female (63) with children over age 5, and 10 male couples and 20 female couples with children under age 5. This is extremely unlikely to be the case, if these actually are "same-sex" partners, but is exactly what we would expect if these were (mostly) couples that appeared to be same-sex due to random errors in partner sex designation.

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