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Race in the Relationship Quality of Sexual Minority People of Color:

A Meta-Analytic Review

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A Meta-Analytic Review

We all remember our first loves, our worst breakups, or our wedding days; love is universal to human experience. Intimate relationships transcend social boundaries like gender, sexuality, and race. The quality of intimate relationships is associated with lower psychopathology regardless of race or ethnicity (McShall and Johnson, 2015). Relationship quality can be defined as "how good or bad people perceive their relationship to be" (Bradbury and Karney, 2019). Yet, if relationship quality is a universal issue, why is the research dominated by disproportionately White, heterosexual samples (Boehmer, 2002; Tornello, 2021)? One answer for this might be simple: non-heterosexual and non-White relationships have only recently entered the modern American lexicon of love. Interracial marriage was legalized in 1967 and same-sex marriage was legalized in 2015. However, even this legalization is tenuous, as both rely on Supreme Court decisions: Loving v. Virginia and Obergefell v. Hodges, respectively. This means both groups of couples still fight for acceptance and actual legalization, such as constitutional and/or legislative changes. Today, there is a substantial body of research on samesex relationships and on interracial and minority relationships. However, the research combining these two, as in, relationships involving people who are both sexual minorities and racial minorities, has not received a great deal of attention. An emphasis on this type of intersectional research, especially in a comprehensive review, is necessary.

According to 2019 U.S. Census data, about one-fifth of people in same-sex relationships are people of color. Historically, however, as much as 85% of research on same-sex relationships omits mentions of race or ethnicity entirely (Boehmer 2002). While intersectional experiences are becoming more visible in the common culture, many papers still rely on disproportionately

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White samples, which misrepresent the actual population of sexual minority individuals (Tornello 2021). This means the field of same-sex relationship quality is missing perspectives of the many of the couples it seeks to understand and help, especially the perspective of race as it intersects with sexual minority status. The intersectional perspectives of sexual minority people of color (SMPOC) differ drastically from both their White sexual minority (SM) and heterosexual people of color (POC) counterparts. But what exactly is intersectionality?

In 1989, Dr. Kimberlé Crenshaw, professor of law, introduced the concept of "intersectionality" in a paper published in The University of Chicago Legal Forum. She originally uses the term to describe the experiences of Black women in the "intersection" of racism and sexism, which compound to create a unique type of discrimination. It has since been applied to any group that faces specific experiences of marginalization that are unique to the intersection of their identities. Thus, these intersectional experiences cannot be captured through the combination of single minority lenses. For example, in a 2020 study, participants express "disappointment" about racial prejudice within the LGBTO+ community, including racism and a lack of representation (Parmenter et al., 2020). Other studies show that negative intersectional experiences are related to more identity conflict and negative affect (Jackson et al., 2020). Not only is the wider intersectional experience different from single minority experiences, but intersectional experiences differ among individuals. A 2022 study from Enno and colleagues classifies these experiences into four distinct groups, which vary from (1) high connection with both identities/communities; (2) high connection to an ethnic community but not the LGBTQ+ community; (3) high connection to the LGBTQ+ community but not to an ethnic community; to (4) low connection to both communities. These are the experiences and factors missed when

focusing on single minority groups; without them, the field lacks the knowledge to help real people who make up a significant amount of the U.S. population.

Multiple minority stress theory is one way to interpret intersectionality in the field of psychology, especially mental health. The minority stress model, derived from several social psychological theories, can be defined as a model in which "stigma, prejudice, and discrimination create a hostile and stressful social environment that causes mental health problems" (Meyer, 2003). Thus, the multiple minority stress model posits that stigma, prejudice, and discrimination come from more than one marginalized identity. This stress is often experienced in the form of microaggressions, which vary depending on the intersecting identities of individuals. For example, a common microaggression that involves the assumption that a gay man must be "feminine" has different implications for a White gay man than a Latino gay man who must contend with traditional "Machismo" values (Cyrus 2017). This can be described as an intersectional experience, which is a single interaction or event that relies on the acknowledgement of both/all identities of the individual. Intersectional experiences can be positive or negative, but for the purposes of the multiple minority stress model, the negative experiences hold greater importance. This construct has been measured in Balsam's (2011) LGBT People of Color Microaggressions Scale (LGBT-PCMS), which has been independently validated (Zelaya et al., 2021) and made into a brief scale (Huynh et al., 2022). As for the effects on intimate relationships, studies show that SMPOC couples can struggle with bridging their communities and feeling included in both. They can face racism from the LGBTQ+ community, heterosexism from their ethnic community, and/or a general invisibility from both. This can lead to problems such as issues finding romantic partners, lack of social support for a couple, and more (Balsam et al., 2011; Mays et al., 1993; Parmenter et al., 2020). To map this individual

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stress model onto a relationship stress model relies on the social ecological model of relationships. One example of this is crisis theory.

In his 1949 book, Hill describes a model of relationship and family quality called the ABC-X Model, or crisis theory (See Figure 1). The ABC-X model consists of four parts: A, a stressor that occurs and requires a behavioral response; B, resources that include all the assets a couple has to cope with A; C, the couple's interpretation of A as a challenge or a catastrophe. All of these culminate into X, the crisis itself. For example, if A is severe, B is low, and C is catastrophic, they add together to form an X (crisis) that is too big or difficult to adapt to, weakening the relationship. In the relationships of SMPOC, the stressors that occur are different than those of SM Whites. Rather than deal with only homophobic stressors, SMPOC deal with racist, homophobic, and/or intersectional stressors (Balsam et al., 2011; Ghabriel, 2017). This combines with B, the resources, being lower for SMPOC (Badgett et al., 2019). If intimate relationship research is omitting the experiences of SMPOC, when a relationship therapist attempts to give resources to their SMPOC clientele, there's a possibility of poor fit, resulting in an overall lack of good resources for these couples. C may be when SMPOC have the advantage; the resilience hypothesis of multiple minority stress posits that because SMPOC experience more stigma (i.e., racism) than their White counterparts, they may be equipped to cope with experiences of homophobia (Meyer, 2010). However, this theory suffers from the controversial idea that one can "get used to" being marginalized. Still, if SMPOC are facing more/worse "X" crises, there is more opportunity for maladaptation or weakening of the relationship. This potential "C" advantage may obscure some of the deleterious effects of A and B, which is why sophisticated research is needed to understand the intersectional perspective.

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In the past twenty years, there have been some reviews of the literature surrounding intersectionality, stress, stigma, and relationship quality for same-sex couples. As mentioned, Boehmer's 2002 comprehensive review of studies in The National Library of Medicine found that 85% of all studies on sexual minority people omitted race/ethnicity. In addition, 1.75% of all papers about sexual minority individuals focused on their relationships (n = 3,777). However, this review took place twenty years ago and long before the legalization of same-sex marriage in 2015. More recently, a scoping review from Totenhagen et al (2022) found that a majority of papers studying daily stress and relationship quality did not include sexual minorities. Also, while a majority of papers included the race/ethnicity of participants, almost all did not include any analysis regarding race/ethnicity. However, this review focused on studies that included "daily methodologies to study stress" such as journaling, thus only 23 studies were analyzed in the end. Another review focused specifically on the relationship quality of SMPOC and found that out of 367 papers on the relationships of sexual minorities, only 15 (4.09%) had a sample of racial minorities greater than the respective country's minority population (Tornello 2021). This could be viewed as an ambitious criterion, but considering the majority of studies oversample White participants, it illustrates a crucial subversion of the idea of accurate sampling. In addition, oversampling is recommended practice for understanding cultural variables in research, meaning even papers which adequately sample BIPOC populations may still not be enough to draw culture-specific conclusions. Doyle and Molix (2015) conducted a meta-analysis of studies with sexual minority samples found that social stigma was associated with lower scores on measures of relationship quality, which supports the multiple minority stress model and the ABCX model. However, there were only three (8.57%) papers that reported a "mixed race" sample (as opposed to "predominantly White" samples), therefore there was no moderating factor of race in their

meta-analytic review. I wondered whether one could find an effect of race with a larger sample of mixed race or racial minority papers.

In this study, I conducted a meta-analysis of the predictors/covariates of relationship quality among sexual minority couples who are either interracial or racially minoritized. In this review, I took an intersectional approach to meta-analysis, ensuring every study includes demographic data on race/ethnicity and analyzing for an impact of race on the relationship quality of SMPOC. Applying Hill's crisis theory and the multiple minority model of stress, I hypothesized that intersectional discrimination would exacerbate the deleterious impacts of known predictors of relationship quality. I preregistered this hypothesis using Prospero from the National Institute for Health and Care Research (https://www.crd.york.ac.uk/prospero/display_ record.php?ID=CRD42023400626) and followed the Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) guidelines (Page et al., 2021).

Methods

Guidelines

This study was conducted according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 checklist. In addition to this checklist, the researcher followed a 12-step process created to break down the systematic review process by Cornell Libraries (Cornell University Libraries, 2022). The 12 steps are as follows: 0. Develop a Protocol, 1. Draft your Research Question, 2. Select Databases, 3. Select Grey Literature Sources, 4. Write a Search Strategy, 5. Register a Protocol, 6. Translate Search Strategies, 7. Citation Management, 8. Article Screening, 9. Risk of Bias Assessment, 10. Data Extraction, and 11. Synthesize, Map, or Describe the Results. This section will detail the application of these steps to the current review.

Selection Criteria

Five selection criteria were applied throughout the course of the literature search. Studies included in this review must: (1) be a quantitative study and/or provide quantitative data; (2) be a primary source (i.e., not secondary or a review) study conducted in North America; (3) analyze the relationship quality of sexual minority couples and/or individuals; (4) numerically recount the racial makeup of participants; and (5) not focus on HIV/AIDS, sexual health, or intimate partner violence. All five selection criteria were applied to each article. Any article that failed one or more criteria was excluded.

The first criterion excluded all qualitative studies, case studies, and other papers that did not provide any quantitative analysis. In order to conduct a meta-analysis, the included studies must contribute effect size(s) to be calculated and compared during the analysis itself.

The second criterion excluded all reviews and studies using secondary data as well as studies conducted outside of the North American continent. Specifying primary sources make sure the effect sizes extracted for meta-analysis are not redundant or doubled. Keeping the studies within North America should minimize any confounding variables due to cultural perceptions, different testing standards, etc.

The third criterion focused on eliminating papers on two fronts. One, papers that included same-sex couples but did not include separate analyses for them (e.g., the study did not limit to heterosexual couples, but included very few same-sex couples) were excluded as they would not provide valuable data to the meta-analysis. Studies that omitted sexual minority participants, because the Boolean search proved somewhat fallible, were also excluded. Two, the study had to include analysis of relationship quality, usually found in scored measures (e.g., the Dyadic

Adjustment Scale, or DAS, and others). This ensures that data regarding relationship quality, the object of this review, can be collected.

The fourth criterion excluded any papers that did not specify the race of all participants. This means that papers including an "other" section, categorizing race as "White and non-white," or plainly omitting the race of participants were excluded. Again, the Boolean search strategy proved fallible, as many studies with little to no mention of race were included in Round 1 because the abstract or full text contained a statement about the lack of racial minority participants, thus, containing some key words from the Boolean code. This criterion allows for calculations regarding race of participants.

The fifth and final criterion may be the most controversial. I excluded all studies focusing on sexual health topics because the researcher wanted to exclude deficit-based approaches, or approaches that begin with a sentiment that same-sex relationships are inherently more dangerous or risky to one's health than heterosexual ones. In Boehmer's review of 3,777 papers over twenty years, 60.5% of all studies were disease focused (2002). In addition, between the years of 1989-2011, 18.0% of LGBT studies funded by the National Institute of Health (NIH) did not focus on sexual health or HIV/AIDS; this is a miniscule number of studies considering all LGBT studies comprised only 0.5% of funded studies. Only 4.6% of all funded LGBT studies focused on couple and family health (Coulter et al., 2014). While sexual risk is important to study as a factor of health, especially as it pertains to the LGBT community that suffered the brunt of the AIDS epidemic, including it in irrelevant studies can be more stigmatizing than helpful.

Search Strategy

The search strategy for this review was developed with an attempt to balance diligence with feasibility for the timeline of the project. As such, six databases were selected based on their availability through Binghamton University's libraries and inclusion in other reviews similar to this one (Doyle and Molix, 2015; Tornello, 2021). These databases are: *PsycINFO, PubMed, Academic Search Ultimate, Web of Science, ProQuest Dissertations and Theses* (i.e., the grey literature), and *Google Scholar*. This literature search was conducted in June – August 2022. The researcher developed a Boolean code based on the criteria for inclusion and adapted it to each site's search functions; this was as follows:

"relationship quality, relationship satisfaction, relationship quality, relationship trust, relationship commitment, relationship closeness, dyadic adjustment, perceived regard" AND "BIPOC or POC or Black or African American or Indigenous or Native American or People of Color or Ethnic* or Race or Latin* or Hispanic" AND "LGB* or GLB* or lesbian or gay or homosexual* or bisex* or queer or same-sex or same-gender or sexual minority" NOT "review or systematic review or meta-analysis or content analysis" NOT "HIV or AIDS or sexual health or intimate partner violence or IPV"

The section before the first "AND" comprises of terms for relationship quality developed based on two sources: Doyle and Molix's 2015 review and Bradbury and Karney's 1995 book. The second and third sections describe racial and sexual minorities respectively. The fourth is intended to exclude papers that are not primary studies. The fifth is intended to exclude deficitbased studies, which will be explained in a later section on the selection criteria. See Figure 2 for a visual representation of this process.

Using this code, 155 studies were found in the initial search based on titles and abstracts. After duplicates were removed (n = 20), the full texts of 132 papers were screened for inclusion based on the selection criteria. In addition to the database search, dubbed Round 1, the researcher reviewed each study's reference section for titles that mentioned key words for relationship quality (e.g., quality, satisfaction, success/failure, outcomes...) and sexual minority couples/individuals (e.g., gay, lesbian, bisexual, homosexual, marginalized...). These studies formed Round 2 (n = 468), where, after removing duplicates (n = 218) and reports not retrieved (n = 72), 178 studies were added to the criteria exclusion process. The numbers reported below are how many "no" responses were reported for each criterion; one paper can fail multiple criteria. As the current review is a meta-analysis, only studies that collected quantitative data (e.g., effect sizes) were desired, so qualitative studies were excluded (n = 34). To avoid confounding factors of culture, only studies from North America were considered; all others were excluded (n = 96). Since the review is focusing on sexual minority couples and individuals, papers that did not include some analysis of relationship quality in sexual minorities were excluded (n = 101). For the intersectional perspective of this review, it was necessary for all papers included to have specific, numeric accounts of the racial makeup of their participants; any study that either did not mention race or included an unspecified "other" category were excluded (n = 163). Lastly, any studies that focused on detrimental sexual health or intimate partner violence were excluded (n = 12); however, mentions alone were not grounds for exclusion. In addition, the full texts for some studies were not located or available through Binghamton University's subscriptions (n = 72). This left a total of 45 studies to be included in the metaanalysis. This is graphically represented in Figure 3.

The written protocol was pre-registered using the online platform Prospero from the National Institute for Health and Care Research (https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42023400626). Citations were tracked using the citation management software EndNote 20.

Data Analyses

First, data were extracted manually from each paper by a single researcher. The data were reported in a Microsoft Excel spreadsheet. These data included: sample minority makeup, sample size, independent and dependent variables, type of measure used (e.g., self-report), specific measure of relationship quality and the quality aspect measured (e.g., DAS; satisfaction), and the method of analysis (e.g., ANOVA). A separate Microsoft Excel document was used to report effect sizes for each variable determined by the researcher to be relevant to the goals of the meta-analysis. A list of relevant qualities for said assessment was determined by the researcher. Data synthesis and meta-analyses were conducted in SPSS v28.0.1.0 (142).

Results

In total, thirty-two (32) studies were included in the final meta-analysis. While forty-five (45) studies were initially screened as meeting criteria, upon further review I found that eight studies did not, in fact, meet the first five criteria. Furthermore, two dissertations were excluded in favor of the second write-ups of the same studies published in peer-reviewed journals. One paper was excluded because it shared a population with another study; the study with the most effect sizes was chosen to be included. Four studies were excluded because they conducted multiple regression analyses without reporting the coefficients for individual variables such as semi-partial *r* or β (Beta) values. One dissertation was excluded because access to the full text

was lost between criteria elimination and data analysis. One paper was mathematically excluded in the weighting process because it contained no BIPOC in the sample.

A total of seventy-four (74) variables representing a total of two-hundred-sixty-seven (267) effect sizes were included in the final meta-analysis (See Table 1). These were divided into eight subgroups. Subgroup 1 included five social support variables. Subgroup 2 included 11 demographic variables. Subgroup 3 included four self and identity variables. Subgroup 4 included nine minority stress variables. Subgroup 5 included 23 relationship variables. Subgroup 6 included ten mental health variables. Subgroup 7 included eight stress and stressful event variables. Subgroup 8 included four variables that did not fit into the other seven categories. There are two meta-analyses presented: one that is weighted only by the inverse-variance test (see Table 1 and Figure 5) and the other that is additionally weighted by proportion of BIPOC found in the sample (see Table 2 and Figure 6). This weighting was done simply by multiplying each effect size by the numerical proportion of BIPOC. This process eliminated twenty-seven (27) effects from the weighted data set that became too small to be effectively measured (see Table 2 and Figure 6).

Subgroup Analyses

Social Support

Two out of five social support effects were shown to be significant in the unweighted dataset: general social support and partner support (see Table 1 and Figure 5). After weighting by proportion BIPOC sample, four social support effects were found to be significant: family support, social support, social/legal marriage, and partner support (see Table 2 and Figure 6). There was no effect of friend support in either dataset.

Demographic

Two out of eleven demographic factors were shown to be significant in the unweighted dataset: cohabitation and rural location (see Table 1 and Figure 5). After weighting by percent BIPOC sample, five demographic factors were found to be significant: presence of children, relationship duration, cohabitation, gender, and rural location (see Table 2 and Figure 6). No effects were significant for age, education, previous partners, religiosity, income/SES, or Spanish language.

Self and Identity

Two out of four self/identity factors were shown to be significant in the unweighted dataset: feminist self-identification and racial identity (see Table 1 and Figure 5). After weighting by percent BIPOC sample, two self/identity factors were found to be significant: outness and feminist self-identification (see Table 2 and Figure 6). No effects were significant for identity superiority.

Minority Stress

Three out of nine minority stress factors were shown to be significant in the unweighted dataset: internalized homophobia, prejudice events, and racism (see Table 1 and Figure 5). After weighting by percent BIPOC sample, no significant effects of minority stress were found. No effects were found significant for POC heterosexism (homophobia), LGBT racism, LGBT relationship racism, internalized racism, discrimination, or stigma sensitivity.

Relationship Factors

Nineteen out of twenty-three relationship factors were shown to be significant in the unweighted dataset: communication, similarity, monogamy, sexual satisfaction, sexual esteem, sexual anxiety, sexual cognition, sexual desire, sexual frequency, anxious attachment, equality, commitment, trust, investment, relationship constraints, frequency of affection, intimacy, breakup intent, and love (see Table 1 and Figure 5). After weighting by percent BIPOC sample, eighteen relationship factors were shown to be significant: communication, similarity, monogamy, sexual satisfaction, sexual esteem, sexual desire, sexual frequency, avoidant attachment, equality, commitment, trust, relationship alternatives or options, investment, relationship constraints, frequency of affection, intimacy, breakup intent, and love (see Table 2 and Figure 6). No significant effects were found for relationship attraction or time with partner.

Mental Health

Seven out of ten mental health factors were shown to be significant in the unweighted dataset: anxiety, depression, substance use, self-esteem, history of therapy use for sexuality, neuroticism, and social desirability (see Table 1 and Figure 5). After weighting by percent BIPOC sample, three mental health factors were shown to be significant: partner-objectification, self-esteem, and social desirability (see Table 2 and Figure 6). No significant effects were found for self-objectification or objectified body.

Stress and Stressful Events

Three out of eight stress factors were shown to be significant in the unweighted dataset: COVID-19 pandemic stressors, general stress, and HIV/AIDS related stress (see Table 1 and Figure 5). After weighting by percent BIPOC sample, no stress factors we found to be significant. No significant effects were found for child sexual abuse, adult sexual victimization, health, IPV perpetration, or IPV victimization.

Other

None of the four remaining uncategorized factors were shown to be significant in the unweighted dataset. After weighting by percent BIPOC sample, two stress factors were found to be significant: exercise and body mass index (see Table 2 and Figure 6). No significant effects were found for media exposure or enrichment.

Discussion

If we assume that weighting each effect for the proportion of BIPOC in the sample can show changes in significance between mixed and BIPOC-only samples, then analyzing the differences found between the unweighted and weighted dataset can reveal important differences. In the social support subgroup, family support and social/legal marriage were found to be positive predictors of satisfaction in the weighted dataset, but not the unweighted dataset. This suggests an increased role of family and marriage in the BIPOC sample rather than the mixed sample. For both sets, general social support and partner support were positive predictors. This ties into the demographic subgroup, where presence of children was significant only in the weighted dataset, as well as duration and gender. There were two effects of gender, both dummycoded (male = 0, female = 1), which means that female gender was a positive predictor of $\frac{1}{2}$ satisfaction. Given that presence of children ties into the family support aspect, it makes sense that this effect was also a positive predictor. For both weighted and unweighted, cohabitation and rural location were positive predictors. In the identity subgroup, identification as a feminist was a positive predictor in both groups. Racial identity was a negative predictor in the unweighted set and insignificant in the weighted set. Contrarily, outness was a positive predictor only in the weighted set. The opposite nature of these results is surprising given the similar nature of the effects themselves, since both measure the individual's perception of their marginalized identities. In the minority stress subgroup, effects were only found significant in the unweighted set, similar to the racial identity predictor. For the relationship factors subgroup, there were more similarities between the two groups than differences. In the unweighted dataset, anxious

attachment was found significant, while in the weighted dataset, avoidant attachment was found significant. In addition, options outside the relationship was an effect found significant only the weighted dataset. In the mental health subgroup, partner objectification was only found to be significant in the weighted dataset. All significant stress/stressful events predictors were found only in the unweighted dataset. Exercise and BMI were the only significant predictors found in the eighth category and were significant only in the weighted dataset.

Implications of Intersectionality on Relationship Quality

The purpose of this study was to review the effects found through an intersectional lens with the aid of Meyer's multiple minority stress model and Hill's crisis theory of relationships. When applying these models, I hypothesized that factors related to race would be negative predictors of relationship quality. I found five total factors related to race: racial identity, LGBT racism, LGBT relationship racism, internalized racism, and racism. Other variables that pertain to discrimination or prejudice refer to homophobic events only. Of these five factors, only two were found significant and both were negative predictors of relationship quality: racial identity and racism (See Table 2). This affirms my hypothesis. In the multiple minority stress model, minority identity impacts the occurrence of minority stress events, both distal and proximal, as well as coping and social supports (See Figure 2). For proximal events, identity can lead to vigilance, such as expectations of rejection, concealment, or internalized stigma. Distal stressors, however, can occur regardless of identity, especially when it comes to race. Rather, the reporting of such stressors can depend on identity. (Meyer, 2003). Instead, the predictor of racism appears to measure distal stressors, as it was measured by a self-report index that asked Black people to review racist incidents in their lives, whether they happened to themselves or another, and evaluate their impact (Grewal, 2005). This ties into intimate relationships through the ABCX

model of Hill's crisis theory. For a "crisis" to occur, the first step "A" is a stressor (See Figure 3). If the factor of racial identity affects proximal stress and the factor of racism measures distal stress, then their negative effect on relationship quality can demonstrate two concepts. One: these factors are capable of triggering crises and two: these crises lead to more opportunities for maladaptations that negatively impact relationship quality.

As for practical and clinical implications, these results emphasize the importance of cultural competence when treating and/or assessing couples. For all SM couples, cultural competence can involve discussing predictors that affect SM and SMPOC couples specifically. For instance, experiences of marginalization can impact the relationship quality of SM couples. These experiences include prejudice events, internalized homophobia, and racism. All these experiences were shown to be negative predictors of relationship quality. These proximal and distal minority stressors may be the source of more crises for marginalized relationships, especially for those that contain one or more SMPOC. It is also important to discuss identity with SM and SMPOC couples. In the multiple minority stress model, identity can lead to more minority stress, but it can also contribute to community and social support, which buffer the impact of minority stress. For instance, racial identity is shown to be a negative predictor of relationship quality but outness is a positive predictor. This makes sense given that outness is a deliberate choice on the part of an individual that requires a positive view of one's identity, but racial identity is not a deliberate choice and an individual's view of their identity can be negative as well as positive.

These results highlight the importance of multicultural competence. It is not enough to have or tech competence with only LGB or BIPOC individuals (or same-sex or BIPOC couples). One must strive for competence at the intersection of these identities as well. The results

presented here attest to the existence of differing predictors of relationship quality between SMPOC and mixed samples. Of course, the same need for competence applies to research. BIPOC make up 38.4% of the U.S. population according to the U.S Census Bureau (2020). BIPOC make up 31.3% of the Canadian population (Government of Canada, Statistics Canada, 2022). According to this information, twenty-five (25) out of the 32 studies included for metaanalysis over-sampled the White population of the country(s) they sampled. In order to achieve true inclusivity and representation of all individuals and couples, diverse samples are necessary, and the principle of intersectionality is a helpful approach.

Limitations

While this study did weight data by proportion BIPOC in the sample, this can only provide an approximate prediction of what results might look like for a BIPOC sample. As the theory of intersectionality states, it is not possible to fully encapsulate an intersectional identity (such as SMPOC) mathematically. One cannot add together two identities, nor subtract other identities from data that includes some intersectional identity. Thus, I can only provide predictions for inquiry into these effects as they impact the relationship quality of SMPOC. In addition, a total of seventy-two reports could not be retrieved due to a limitation of both time and available resources. Regrettably, due to a limited time schedule, a risk of bias assessment of the forty-five papers that initially passed criteria elimination was not completed. This study was conducted by one researcher under the supervision of a mentor, thus some aspects that require objectivity, such as criteria elimination, were not completed or checked by multiple people. Finally, I did not put out a call for unpublished data or studies. As such, this meta-analysis, is subject to the file drawer problem that is endemic to meta-analytic research.

Strengths

Despite these limitations, this meta-analysis had several strengths. First, a strict dedication to research ethics was observed throughout the research process. Before any research design was made, I spent time familiarizing myself with the systematic review process as laid out by PRISMA (Page et al., 2021) and the Cornell Libraries site (Cornell University Libraries, 2022). Second, the intersectional perspective of this analysis allows for a breadth of generalization unavailable to non-intersectional studies. Even though the weighting process is rudimentary, given the novelty of the design, this study can open up new paths of inquiry into specific, intersectional aspects of SMPOC relationships. In addition, the intersectional approach comes from a legal and social justice perspective, lending an interdisciplinary perspective to the current study as well. Finally, despite the limited, less-than-one-year timeline, as well as the limits of a single researcher, a total of 32 studies with a total of 74 effect sizes and a cumulative sample size of n=13,383 were analyzed.

Conclusion

Sexual minority people of color make up almost one-fifth of all reported same-sex couples in the U.S. (United States Census Bureau, 2019). This number does not include the amount of bisexual people of color in opposite-sex relationships, meaning the total number of SMPOC is likely even higher. All couples who seek help in their relationships deserve the same amount of knowledge as their white, heterosexual counterparts. In truth, the principles of equity and intersectionality dictate that they require more knowledge since there are even more factors that affect their relationships. The only way to appropriately represent BIPOC-only samples is to measure them directly; one must sample BIPOC populations and run analyses on their responses alone. This need is not reflected in the current field of research. This systematic review only found three studies with a 100% SMPOC sample. A future, more accurate meta-analysis might

focus only on studies with 100% SMPOC samples, but the field will have to provide them first. Academia is a system; systemic discrimination can only be changed by the systems. Change begins with demand and will. The results of this meta-analysis show a demand for further inquiry. From here, researchers must have the will to inquire and funders must have the will to invest.

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Table 1

Variable	Effect Size	Std. Error	Ζ	Sig. (2-	95% Confide	ence Interval
				tailed)	Lower	Upper
Family	.031	.0593	.531	.596	085	.148
Social support	.245	.0249	9.812	.000	.196	.293
Social/legal marriage	.116	.1250	.927	.354	129	.361
Partner support	.382	.1111	3.434	<.001	.164	.599
Friend support	.030	.0637	.466	.641	095	.155
Children	.187	.1246	1.497	.134	058	.431
Age	041	.0265	-1.564	.118	093	.010
Education	.090	.0774	1.163	.245	062	.242
Duration	.030	.0216	1.367	.172	013	.072
Previous partners	.135	.1298	1.038	.299	120	.389
Cohabitation	.115	.0293	3.940	<.001	.058	.173
Religiosity	.070	.0648	1.075	.282	057	.197
Income/SES	.050	.0653	.766	.444	078	.178
Gender	.110	.0585	1.874	.061	005	.224
Spanish	050	.1144	437	.662	274	.174
language						
Rural	.035	.0130	2.692	.007	.010	.060
Outness	003	.0360	083	.934	074	.068
Identity as	.090	.0410	2.196	.028	.010	.170
feminist						
Racial identity	259	.1140	-2.272	.023	482	036
Superiority	054	.0323	-1.668	.095	117	.009
POC	.010	.1005	.100	.921	187	.207
heterosexism						
LGBT racism	020	.1005	199	.842	217	.177
LGBT	110	.0993	-1.108	.268	305	.085
relationship						
racism						
Internalized	040	.1003	399	.690	237	.157
racism Internalized	149	.0285	-5.225	<.001	205	093
homophobia	149	.0283	-3.223	<.001	203	095
Prejudice	079	.0338	-2.329	.020	145	012
events	.017	.0550	2.527	.020	.175	.012
(homophobic)						
Racism	370	.1631	-2.268	.023	690	050
Discrimination	004	.0590	061	.952	119	.112
(homophobic)						
(

Effect Size Estimates for Subgroup Analysis

Stigma	055	.0426	-1.284	.199	138	.029
sensitivity						
Communication	.293	.0719	4.082	<.001	.153	.434
Couple	.138	.0632	2.187	.029	.014	.262
similarity						
Monogamy	.200	.0239	8.352	.000	.153	.247
Sexual	.472	.0395	11.945	.000	.395	.550
satisfaction						
Sexual esteem	.210	.0395	5.318	<.001	.133	.287
Sexual anxiety	241	.0290	-8.312	.000	298	184
Sexual	407	.1350	-3.014	.003	671	142
cognitions						
Sexual desire	.150	.0404	3.715	<.001	.071	.229
Sexual	.290	.0353	8.218	<.001	.221	.359
frequency						
Avoidant	201	.1454	-1.382	.167	486	.084
attachment						
Anxious	277	.0396	-6.995	<.001	354	199
attachment						
Equality	.361	.1629	2.218	.027	.042	.680
Commitment	.528	.0836	6.309	<.001	.364	.692
Trust	.622	.0153	40.611	.000	.592	.652
Alternatives	092	.1650	558	.577	415	.231
Investment	.317	.0913	3.468	<.001	.138	.496
Relationship	.184	.1074	1.710	.087	027	.394
attraction						
Relationship	.270	.1298	2.080	.038	.016	.524
constraints						
Time with	.267	.1389	1.923	.054	005	.540
partner						
Frequency of	.320	.0371	8.630	.000	.247	.393
affection						
Intimacy	.527	.1083	4.868	<.001	.315	.739
Breakup intent	406	.1099	-3.698	<.001	621	191
Love	.433	.0660	6.564	<.001	.304	.563
Self-	050	.1108	451	.652	267	.167
objectification						
Partner-	129	.1800	719	.472	482	.223
objectification						
Objectified	250	.4200	595	.552	-1.073	.573
body						
Anxiety	243	.0604	-4.031	<.001	362	125
Depression	232	.0874	-2.652	.008	403	060
Substance	228	.0609	-3.738	<.001	347	108
abuse						
Self esteem	.381	.0405	9.403	.000	.301	.460

Therapy for sexuality	124	.0466	-2.664	.008	216	033
Neuroticism	680	.2700	-2.519	.012	-1.209	151
Social desirability	.310	.0428	7.237	<.001	.226	.394
Child sexual abuse	080	.0410	-1.949	.051	160	.000
Adult sexual victimization	080	.0410	-1.949	.051	160	.000
C-19 stressors	285	.0500	-5.691	<.001	383	187
General stress	183	.0540	-3.379	<.001	289	077
HIV/AIDS	120	.0278	-4.317	<.001	175	066
Exercise	.087	.0819	1.063	.288	073	.247
BMI	.077	.0820	.939	.348	084	.238
Media exposure	170	.1079	-1.576	.115	381	.041
Enrichment	070	.0505	-1.387	.165	169	.029

Table 2

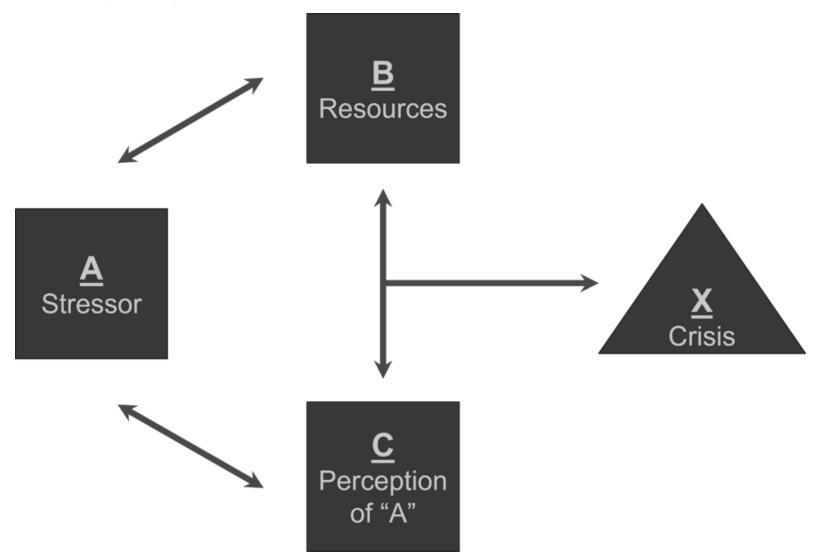
Variable	Effect Size	Std. Error	Ζ	Sig. (2-	95% Confide	ence Interval
				tailed)	Lower	Upper
Family	.127	.0137	9.243	.000	.100	.154
Social support	.215	.0228	9.455	.000	.171	.260
Social/legal	.240	.0852	2.817	.005	.073	.407
marriage						
Partner support	.331	.0860	3.850	<.001	.163	.500
Friend support	.116	.0683	1.692	.091	018	.249
Children	.187	.0342	5.456	<.001	.119	.254
Age	.099	.0730	1.358	.174	044	.242
Education	.115	.0978	1.173	.241	077	.307
Duration	.074	.0157	4.723	<.001	.043	.105
Previous partners	.132	.0961	1.378	.168	056	.321
Cohabitation	.118	.0417	2.840	.005	.037	.200
Religiosity	.080	.0620	1.289	.197	042	.201
Income/SES	.226	.1647	1.371	.170	097	.549
Gender	.107	.0141	7.538	<.001	.079	.134
Rural	.035	.0050	6.993	<.001	.025	.045
Outness	.090	.0227	3.989	<.001	.046	.135
Identity as	.090	.0117	7.692	<.001	.067	.113
feminist						
POC	.010	.0100	1.000	.317	010	.030
heterosexism						
Internalized	.088	.0618	1.432	.152	033	.210
homophobia						
Discrimination	.308	.2449	1.257	.209	172	.788
(homophobic)						
Communication	.335	.0453	7.399	<.001	.247	.424
Couple similarity	.200	.0531	3.775	<.001	.096	.304
Monogamy	.181	.0623	2.909	.004	.059	.303
Sexual	.438	.0968	4.526	<.001	.248	.628
satisfaction						
Sexual esteem	.210	.0273	7.692	<.001	.156	.264
Sexual desire	.150	.0195	7.692	<.001	.112	.188
Sexual frequency	.301	.0257	11.715	.000	.251	.352
Avoidant	.240	.1027	2.336	.019	.039	.441
attachment						
Equality	.471	.1487	3.169	.002	.180	.763
Commitment	.494	.0983	5.020	<.001	.301	.686
Trust	.602	.0710	8.483	.000	.463	.741
Alternatives	.070	.0300	2.336	.019	.011	.129
Investment	.310	.1065	2.913	.004	.101	.519
Relationship	.232	.1244	1.867	.062	012	.476
attraction			1.007			
Relationship	.270	.0675	4.000	<.001	.138	.402
constraints	, •					
- 5115 - 211110						

Effect Size Estimates for Subgroups Analysis: Weighted by Proportion BIPOC

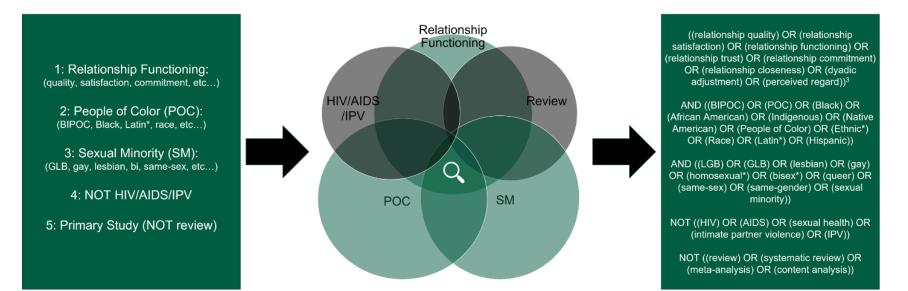
Lawrence Senior Honors Thesis

Time with partner	.244	.1399	1.745	.081	030	.518
Frequency of affection	.320	.0416	7.692	<.001	.238	.402
Intimacy	.315	.1169	2.694	.007	.086	.544
Breakup intent	.220	.0482	4.566	<.001	.126	.314
Love	.331	.0901	3.677	<.001	.155	.508
Partner- objectification	.050	.0099	5.051	<.001	.031	.069
Self-esteem	.381	.0221	17.241	.000	.337	.424
Social desirability	.310	.0180	17.241	.000	.275	.345
C-19 stressors	.040	.0236	1.695	.090	006	.086
General Stress	.012	.0089	1.342	.180	006	.030
Exercise	.087	.0412	2.114	.035	.006	.168
BMI	.077	.0364	2.114	.035	.006	.148

ABCX Model (Hill, 1958)

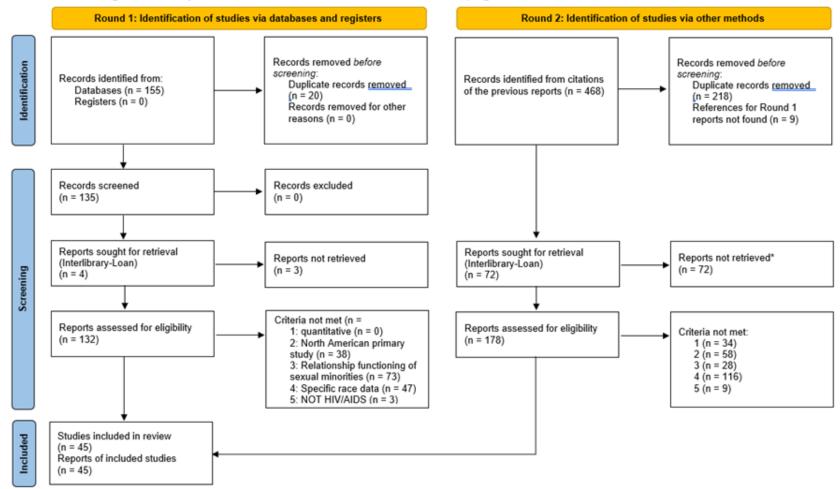


Graphical Representation of Boolean Code Process



PRISMA Flowchart for Criteria Elimination

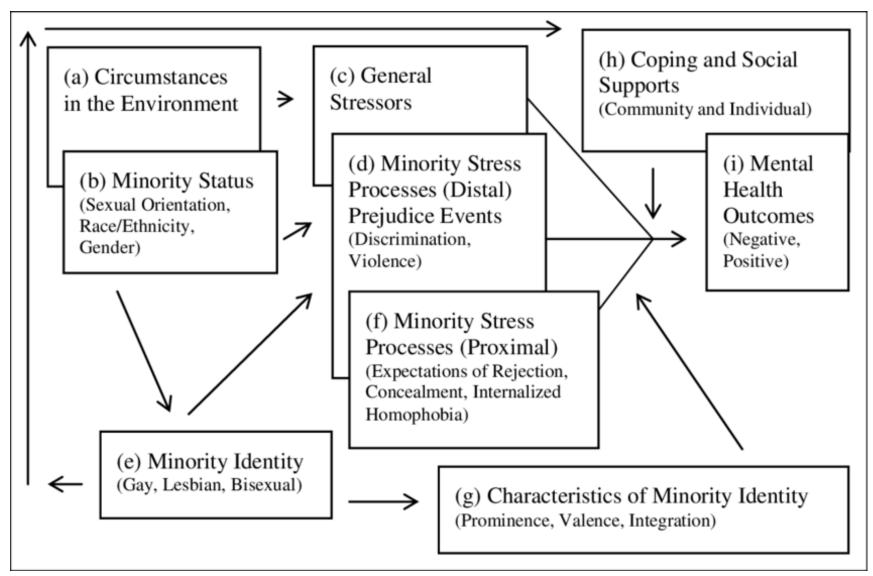
PRISMA 2020 flow diagram for new systematic reviews which included searches of databases, registers and other sources



*will be assessed again

From: Page MJ, McKenzie JE, Bossutt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. BMJ 2021;372:n71. doi: 10.1136/bmi.n71. For more information, visit: http://www.prisma-statement.org/

Multiple Minority Stress Model (from Meyer, 2003)

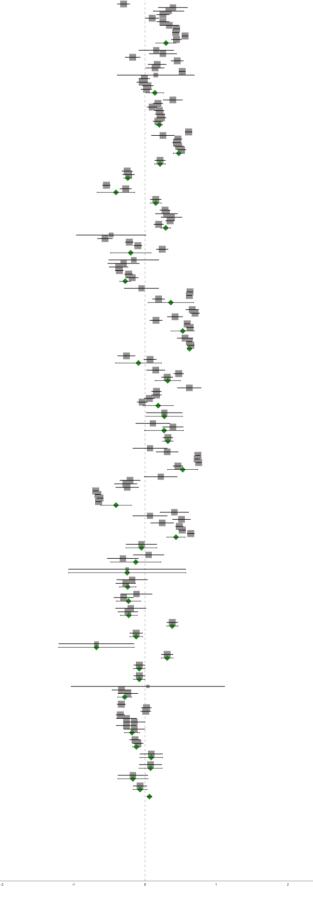


Forest Plot for Data Unweighted by Proportion BIPOC

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	8 Finch, T. M. 19 Li, Y.; Samp, J. A. (0.99 0.18 0.60 0.00 11.54	0.34 0.35
	19 Li, T.; Samp, J. A. (0.25 0.16 0.34 0.00 12.89	0.35
	25 Mole, J.J.; Selterman, 25 Mole, J.J.; Selterman,	0.44 0.39 0.49 0.00 13.14	0.39
	25 Mohr, J.J.; Selterman, Solgroup Overall	0.56 0.52 0.60 0.00 13.18 0.29 0.15 0.43 0.00	0.39
5	6 2 Berta, C.	0.16-0.09 0.40 0.21 10.96	0.32
	15 Josies, K.M.; Delaty,	-0.17-0.28-0.06 0.00 12.74 0.17 0.04 0.30 0.01 12.53	0.35
	18 Lehmiller, J.J.; Agrew 23 Mohr, J.J.; Fessinger,	0.17 0.04 0.30 0.01 12.53 0.52 0.47 0.57 0.00 13.16	
	31 Todocijevic, J.; Rothk	0.01 -0.09 0.07 0.80 12.98	0.35
	31 Todonjevic, J.; Roth	0.04-0.04 0.12 0.32 12.98	88.0
5e	Solgroup Overall 4 Caplan, M. A.	0.14 0.01 0.26 0.03	0.37
	27 Peplen, L.A.; Cochran,	0.10 0.03 0.17 0.01 13.02	0.35
	27 Peplin, L.A.; Cochran, 27 Peplin, L.A.; Cochran,	0.21 0.14 0.28 0.00 13.04 0.18 0.11 0.25 0.00 13.03	0.39
	and the second of the second of the		
	26 Peples, L.A.; Cochran,		0.36
	27 Peples, L.A.; Cochren, 30 Recenthal, L.; Starks,	0.44 0.38 0.50 0.00 13.10 0.51 0.44 0.58 0.00 13.05	0.39
51	Solgroup Overall	0.21 0.13 0.29 0.00	
54	5 Colsan, J. N. Solgroup Overall	-0.25-0.33-0.17 0.00 13.00 -0.24-0.30-0.18 0.00	0.35
5 c	5 Cohen, J. N.		0.39
5	Subgroup Overall 5 Coher, J. N.	-0.41-0.67-0.14 0.00 0.15 0.07 0.23 0.00 12.98	
59	5 Cabez, J. N.	0.15 0.07 0.23 0.00 12.98	0.35
	26 Peples, L.A.; Cochran,		0.36
	27 Peples, L.A.; Cochran,	0.35 0.29 0.41 0.00 13.07	0.39
5	Solgroup Oreanii 6 Corrington Jr., M. C.	0.29 0.22 0.36 0.00	0.21
-1	25 Molu, J.J.; Selterman,	-0.22-0.28-0.16 0.00 13.10	0.39
	30 Recentibal, L.; Starks,	0.24 0.15 0.33 0.00 12.93	0.38
	8 Finch, T. M.	-0.30-0.52-0.08 0.01 11.32	0.33
	8 Finch, T. M. 25 Mohr, J.J.; Selterman,		0.33
	30 Resentbal, L.; Starks,	-0.18 -0.27 -0.09 0.00 12.92	0.35
	March 8		
	14 Jenny, J., Horne, S. 30 Recenthal, L., Starks,	0.63 0.59 0.67 0.00 13.18 0.19 0.10 0.28 0.00 12.92	0.39
	a second as a second as		
	18 Lebusiller, J.J.; Agrew	0.70 0.63 0.77 0.00 13.05	0.39
	22 Melamed, D.K. 30 Rosenthal, L.; Starks,	0.15 0.06 0.24 0.00 12.89 0.63 0.58 0.68 0.00 13.12	0.35
	so resulting to (30036,	2 apr 4 4 0 apr 10.00 13.12	J.89
	25 Molu, J.J., Selterman,	0.62 0.58 0.66 0.00 13.19	0.39
50	Solgroup Overall 18 Lehmiller, J.J.; Agnew	0.62 0.59 0.65 0.00	0.**
	Subgroup Overall	-0.09 -0.42 0.23 0.58	0.31
5p	18 Lehmiller, J.J.; Agreen	0.15 0.02 0.28 0.02 12.52 0.31 0.23 0.39 0.00 12.96	0.37
	30 Recenthal, L.; Starks,	0.31 0.23 0.39 0.00 12.96	0.35
	27 Peples, L.A.; Cochran,	0.16 0.09 0.23 0.00 13.03	0.35
	27 Peples, L.A.; Cochran,	0.06-0.01 0.13 0.11 13.02	0.35
51	Subgroup Overall 24 Molu, J.J.; Daly, C.A.	0.18-0.03 0.39 0.09 0.27 0.02 0.52 0.04 10.84	0.32
	26 Peplen, L.A.; Cochran,	0.39 0.24 0.54 0.00 12:34	0.36
	Subgroup Overall	0.32 0.25 0.39 0.00	
54	S Fireb, T. M.	0.07-0.17 0.31 0.57 11.00	
	27 Peplen, L.A.; Cochran,	0.74 0.71 0.77 0.00 13.21	0.39
	30 Recenthal, L.; Starks, Subgroup Overall	0.75 0.71 0.79 0.00 13.19 0.53 0.31 0.74 0.00	0.39
54	8 Finch, T. M.	0.22-0.01 0.45 0.06 11.16	0.33
5+	26 Peples, L.A.; Cochran,	0.22-0.01 0.45 0.06 11.16 -0.27-0.43-0.11 0.00 12.17	0.36
54	26 Pepleu, L. A.; Cochran, 27 Pepleu, L. A.; Cochran,	0.22-0.01 0.45 0.06 11.16 -0.27-0.43-0.11 0.00 12.17 -0.69-0.73-0.65 0.00 13.19	0.36
54	26 Peplan, L. A.; Cochran, 27 Peplan, L. A.; Cochran, 27 Peplan, L. A.; Cochran, Sobgroup Ovecall	0 22 -0.01 0.45 0.06 11.16 -0.27 -0.43 -0.11 0.00 12.17 -0.69 -0.73 -0.65 0.00 13.19 -0.63 -0.67 -0.59 0.00 13.17 -0.41 -0.62 -0.19 0.00	0.36 0.39 0.39
54 54	 Peplen, L. A.; Cochran, Peplen, L. A.; Cochran, Peplen, L. A.; Cochran, Subgroup Overall Fanch, T. M. 	0 22 -0.01 0.45 0.06 11.16 -0.27 -0.43 -0.11 0.00 12.17 -0.69 -0.73 -0.65 0.00 13.19 -0.63 -0.67 -0.59 0.00 13.17 -0.41 -0.62 -0.19 0.00 0.41 0.21 0.41 0.00 11.60	0.36 0.39 0.39
	 Peplen, L. A.; Cochran, Peplen, L. A.; Cochran, Peplen, L. A.; Cochran, Sidgroup Overall Franh, T. M. Peplen, L. A.; Cochran, 	0.22.010.045 0.0611.16 -0.27.043.011 0.0012.17 -0.69.073.045 0.0013.19 -0.63.047.059 0.0013.17 -0.41.062.019 0.00 0.41 0.21 0.41 0.0011.60 0.51 0.38 0.44 0.0012.55	0.36 0.39 0.39 0.34 0.34
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	26 Pepine, L.A.; Contran, 27 Pepine, L.A.; Contran, 27 Pepine, L.A.; Contran, Subgroup Orwall 18 Fatch, T. M. 26 Pepine, L.A.; Contran, 20 Pepine, L.A.; Contran, 30 Resential, L.; Straka,	0 22 401 045 056 11.36 4 27 443 401 050 12.37 4 68 407 405 050 1317 4 44 405 100 050 1317 4 44 405 100 1400 0 41 021 044 050 146 0 51 0 33 044 050 17.55 0 48 042 0.54 050 1312 0 44 0.59 049 050 1313	0.36 0.39 0.39 0.34 0.34
50	26 Pepin, L.A., Cechran, 27 Pepin, L.A., Cechran, 27 Pepin, L.A., Cechran, Solgerop Owar. 8 Fank, T. M. 26 Pepin, L.A., Cechran, 27 Pepin, L.A., Cechran, 30 Romethal, L., Stechr, Solgerop Overail	022 401 045 056 11.16 427-44-01 050 127 468-03-045 050 1317 -441-62-419 050 1317 -441-62-419 050 1317 -441-62-419 050 1317 044 051 044 050 1512 044 051 045 050 1312 044 059 049 050 1313 040 051 037 047 050 1313	0.36 0.39 0.39 0.34 0.37 0.39 0.39
	26 Pepine, L.A.; Contran, 27 Pepine, L.A.; Contran, 27 Pepine, L.A.; Contran, Subgroup Orwall 18 Fatch, T. M. 26 Pepine, L.A.; Contran, 20 Pepine, L.A.; Contran, 30 Resential, L.; Straka,	0 22 401 045 056 11.36 4 27 443 401 050 12.37 4 68 407 405 050 1317 4 44 405 100 050 1317 4 44 405 100 1400 0 41 021 044 050 146 0 51 0 33 044 050 17.55 0 48 042 0.54 050 1312 0 44 0.59 049 050 1313	0.36 0.39 0.39 0.34 0.37 0.39 0.39
50	26 Pepin, L.A., Cechran, 27 Pepin, L.A.; Cechran, 27 Pepin, L.A.; Cechran, Subgroup Orvestil 8 Fands, T.M. 26 Pepin, L.A.; Cechran, 27 Pepin, L.A.; Cechran, 30 Fammital, L.; Steks, Subgroup Orvestil 7 Denakloo, K. S.	022-001 045 006 11.16 027-048-011 000 11.70 046-03-045 000 13.17 046-03-045 000 14.19 046-03-04 000 14.00 041-02-04 000 14.00 051-035 044 000 11.00 051-035 044 000 11.00 054-039 040 000 13.13 046-03-047 047 045 0.05-017 047 045	0.36 0.39 0.39 0.34 0.37 0.39 0.39
5a Øs	20 Paples, L.A., Cichan, 21 Paples, L.A., Cichan, 23 Paples, L.A., Cichan, 24 paples, L.A., Cichan, 26 Paples, L.A., Cichan, 20 Paples, L.A., Cichan, 20 Paples, L.A., Cichan, 20 Pansethal, E.; Staky Sidgroup Overall 7 Denaktors, K.S.	0.22.001 0.45 0.061 11.0 0.27.043.011 0.001 21.7 0.48.04 0.35 0.001 13.07 0.48.047.039 0.001 0.131 0.41.042.010 0.001 14.0 0.51 0.35 0.40 0.001 1.55 0.44.042 0.44 0.001 1.55 0.46.042 0.44 0.001 1.55 0.46.042 0.47 0.001 1.313 0.46.042 0.47 0.001 0.313 0.46.042 0.20 0.411 0.47.040 0.40 0.40 0.400 0.411 0.47.040 0.400 0.400 0.400 0.4000000	0.36 0.39 0.39 0.34 0.37 0.39 0.39 0.39
5a 6	26 Pepler, L.A.; Centrus, 27 Pepler, L.A.; Centrus, 27 Pepler, L.A.; Centrus, Salgore Great 8 Faich, T. M. 26 Pepler, L.A.; Centrus, 37 Pepler, L.A.; Centrus, 38 Fammital, L.; Stacks, 39 Fammital, L.; Stacks, 30 Fammital, E.; Stacks, 3 Danaktor, K.S. Salgorge Overall	022.0045 0.081.184 027.041.01 0.00 121 048.04.03 0.00 0.00 124 041.04.04 0.00 125 041.04.04 0.00 125 041.04.04 0.00 125 041.04.04 0.00 125 041.04.04 0.00 125 050.01 0.07 0.05 113 050.01 0.05 0.05 113 050.01 0.05 0.05 113 050.01 0.05 0.05 0.05 0.05 0.05 0.05 0.0	0.36 0.39 0.39 0.34 0.37 0.39 0.39 0.39
5a 6	20 Paples, L.A., Cichan, 21 Paples, L.A., Cichan, 23 Paples, L.A., Cichan, 24 paples, L.A., Cichan, 26 Paples, L.A., Cichan, 20 Paples, L.A., Cichan, 20 Paples, L.A., Cichan, 20 Pansethal, E.; Staky Sidgroup Overall 7 Denaktors, K.S.	0.22.001 0.45 0.061 11.0 0.27.043.011 0.001 21.7 0.48.04 0.35 0.001 13.07 0.48.047.039 0.001 0.131 0.41.042.010 0.001 14.0 0.51 0.35 0.40 0.001 1.55 0.44.042 0.44 0.001 1.55 0.46.042 0.44 0.001 1.55 0.46.042 0.47 0.001 1.313 0.46.042 0.47 0.001 0.313 0.46.042 0.20 0.411 0.47.040 0.40 0.40 0.400 0.411 0.47.040 0.400 0.400 0.400 0.4000000	0.36 0.39 0.39 0.34 0.37 0.39 0.39 0.39
5m 66	24 Pajan, L.A., Cichen, 29 Pajan, L.A., Cichen, 29 Pajan, L.A., Cichen, 20 Pajan, L.A., Cichen, 20 Pajan, L.A., Cichen, 20 Pajan, L.A., Cichen, 20 Pajan, L.A., Cichen, 30 Benentu, L., Stack, 30 Benentu, L., Stack, 30 Benentu, L., Stack, 3 Danakten, K. S. 3 Danakten, K. S. 3 Danakten, K. S. 3 Danakten, K. S.	022 00 41 00 41 00 41 141 277 44 41 00 10 1217 481 44 00 10 10 117 481 44 00 10 10 10 481 40 10 41 00 10 125 141 40 10 41 00 10 125 144 01 00 10 10 10 150 10 00 41 00 10 125 144 01 00 10 10 10 400 42 01 00 10 125 400 40 00 10 10 10 400 40 10 00 10 400 40 100 40 100 40 100 100 100 100 100	0.36 0.39 0.39 0.39 0.39 0.39 0.39 0.39 0.34 0.37 0.37
5m 66	 Papin, L.A., Cohm,	022.0045 0.081.184 027.041.01 0.00 121 048.04.03 0.00 0.00 124 041.04.04 0.00 125 041.04.04 0.00 125 041.04.04 0.00 125 041.04.04 0.00 125 041.04.04 0.00 125 050.01 0.07 0.05 113 050.01 0.05 0.05 113 050.01 0.05 0.05 113 050.01 0.05 0.05 0.05 0.05 0.05 0.05 0.0	0.36 0.39 0.39 0.39 0.34 0.37 0.39 0.39 0.34 0.34 0.12 0.37
5m 6k 6:	24 Papin L A. (1998)	0 2 2 0 4 2 0 8 1 1 0 8 1 1 1 0 1 2 1 1 1 0 1 2 1 1 1 1 0 1 1 2 1 1 1 0 1 1 2 1 1 1 0 1 1 1 1	0.36 0.39 0.39 0.34 0.37 0.39 0.39 0.39 0.34 0.12 0.37 0.37
5a 6	24 Papin, L.A., Cohm, 29 Papin, L.A., Cohm, 29 Papin, L.A., Cohm, 20 Romital, L.S., Cashen, 20 Bounders, K. I. 20 Bounders, K. S. 20 Li, Y., Samp, J.A. (2021) 20 Li, Y., Samp, J.A. (2021)	0 2 2 0 4 1 0 8 1 1 1 0 8 1 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	0.36 0.39 0.39 0.39 0.39 0.39 0.39 0.39 0.34 0.37 0.37
5m 6k 6t	24 Papin L A. (1998)	0 2 2 0 0 1 0 0 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 0 0 1 1 0 0 1 0 0 1 0 0 1 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0.36 0.39 0.39 0.34 0.37 0.39 0.39 0.39 0.34 0.12 0.37 0.37
5m 6k 6t	 Papin LA, Cothen,	0 2 2 0 4 2 0 8 1 1 0 8 1 2 0 7 2 0 4 2 0 8 1 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2 0 7 2	0.36 0.39 0.39 0.34 0.37 0.39 0.39 0.39 0.34 0.12 0.37 0.37
54 6. 6: 6)	 Papia LA, Cothen,	0 2 2 0 4 2 0 8 1 4 0 0 1 2 0 7 2 0 4 2 0 0 1 2 0 7 2 0 7 2 0 1 2 0 1 7 2 0 7 2 0 7 2 0 1 2 0 1 7 2 0 7 2 0 0 1 2 0 1 7 2 0 7 2 0 0 1 2 0 1 7 2 0 0 1 2 0 1 7 2 0 0 1 2 0 1 7 2 0 0 1 2 0 1 7 2 0 0 0 1 2 0 1 7 2 0 0 0 0 0 1 2 0 1 1 0 0 0 0 0 0 0 0 0	0.36 0.39 0.39 0.39 0.39 0.39 0.39 0.39 0.39
54 62 63	24 Papia LA, (1998), 29 Papia LA, (1998), 29 Papia LA, (1998), 39 Papia LA, (1998), 49 Papia LA, Coltma, 20 Papia LA, Coltma, 20 Papia LA, Coltma, 20 Papia LA, Coltma, 20 Besenthal, L, Suth, 20 Besenthal, L, Suth, 20 Besenthal, LA, (2001) 20 LY, T, Sang, JA, (2001) 21 Stationed, D.X. 22 Holmond, D.X. 23 Holmond, D.X. 23 Holmond, D.X.	0 2 2 0 4 1 0 8 1 1 0 8 1 1 1 0 1 2 1 1 0 8 1 2 1 1 1 0 1 2 1 1 1 0 1 2 1 1 1 0 1 1 1 1	0.36 0.39 0.39 0.39 0.39 0.39 0.39 0.39 0.39
54 60 67 63	24 Papia LA, Carban, 29 Papia LA, Carban, 29 Papia LA, Carban, 20 Pamaha, LA, Carban, 20 Besenba, 20 Besenba, 20 Besenba, 20 Besenba	02 2 04 0 08 108 108 108 108 108 108 108 108 10	0.36 0.39 0.39 0.34 0.37 0.39 0.39 0.34 0.12 0.37 0.37 0.37 0.35
5m 6b 6r 6h 6j	24 Papin L A, Cothm 27 Papin L A, Cothm 27 Papin L A, Cothm 28 Papin L A, Cothm 28 Papin L A, Cothm 29 Papin L A, Cothm 20 Daukkon, K J 20 L Y, Jamp, J A (2021) 20 L Y, Jamp, J A (2021) 20 L Y, Jamp, J A (2021) 21 Daukkon, D X. 21 Daukkon, D X. 21 Daukkon, D X. 21 Daukkon, D X.	0 2 2 0 4 0 4 0 8 1 2 0 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1	0.36 0.39 0.39 0.34 0.37 0.39 0.39 0.34 0.12 0.37 0.37 0.37 0.35
5m 6b 6r 6h 6j	24 Papin LA, Cothen 27 Papin LA, Cothen 27 Papin LA, Cothen 28 Papin LA, Cothen 29 Papin LA, Cothen 20 Papin LA, Cothen 20 Papin LA, Cothen 20 Pamental LA, Cothen 20 Pamental LA, Cothen 20 Beneration LA, Cothen	022 004 000110 027 04 04 0 00110 040 04 04 00110 040 04 04 00100 041 05 04 04 00100 041 05 04 04 00010 041 05 04 04 0000 041 05 04 04 0000 041 05 04 04 0000 041 04 05 04 0000 041 04 0000000 041 04 00000	0.36 0.39 0.39 0.34 0.37 0.39 0.39 0.39 0.34 0.31 0.37 0.37 0.37 0.37 0.33 0.35
500 60 60 70 70	24 Papin LA, Cothum 29 Papin LA, Cothum 29 Papin LA, Cothum 20 Resented LA, Cothum 20 Resented LA, Cothum 21 Papin LA, Cothum 21 Damaten LA, Cothum 21 Damaten LA, Cothum 21 Damaten LA, Cothum 22 House, DA, Cothum 23 Li, Y., Isang, JA, Cothu 23 Edisone, D.K. 23 Edisone, D.K. 24 Edisone, D.K. 25 Cahn, J. H. 20 Li, Y., Isang, JA, Cothum 20 Li, Y., Isang, JA, Cothum 20 Li, Y., Jang, JA, Cothum	102 204 204 204 204 204 204 204 204 204 2	0.36 0.39 0.39 0.34 0.37 0.39 0.34 0.32 0.37 0.37 0.37 0.35 0.35 0.35
500 60 60 70 70	24 Papin L A, Cothm 29 Papin L A, Cothm 29 Papin L A, Cothm 29 Papin L A, Cothm 20 Dauken, K J 20 Dauken, J A 20 Dauken, J A 20 Li, Y, Jamp, J A (2021) 20 Li, Y, Jamp, J A (2021) 20 Li, Y, Jamp, J A (2021) 21 Dauken, J A 21 Dauken, D X 21 Dauken,		0.36 0.39 0.37 0.37 0.37 0.36 0.37 0.37 0.37 0.38 0.38 0.38 0.38 0.38 0.38
500 60 60 70 70	20 Papin LA, Cothum 20 Papin LA, Cothum 20 Papin LA, Cothum 20 Papin LA, Cothum 21 Papin LA, Cothum 20 Papin LA, Cothum 20 Papin LA, Cothum 20 Papin LA, Cothum 21 Papin LA, Cothum 21 Papin LA, Cothum 21 Damage Overal 21 LY, Sang, JA (2021) 20 Balance, D.X. 20 Damage Overall 21 Balance, D.X. 20 Damage Overall 21 Papin LA, Cottan 21 Papin LA, Cottan 21 Papin LA, Cottan 21 Thronbage, C.J., Dat	12.2 0.4 0.4 0.8 1.9 1.9 1.9 1.9 1.9 1.9 1.9 1.9 1.9 1.9	0.36 0.39 0.39 0.39 0.39 0.39 0.39 0.39 0.31 0.31 0.37 0.35 0.35 0.35
500 60 60 70 70	24 Papin L A, Cothm 29 Papin L A, Cothm 29 Papin L A, Cothm 20 Dauken L J, Johnson L J, 20 Dauken L J, 20		0.36 0.39 0.37 0.37 0.37 0.36 0.37 0.37 0.37 0.38 0.38 0.38 0.38 0.38 0.38
500 60 60 70 72	24 Papin L A, Cothm 29 Papin L A, Cothm 29 Papin L A, Cothm 29 Papin L A, Cothm 20 Papin L A, Cothm 21 Papin L A, Cothm 21 Danken L J, John- 20 Danken D J, John- 20 Danken D J, John- 20 Danken		0.36 0.39 0.39 0.37 0.37 0.39 0.34 0.32 0.37 0.37 0.35 0.35 0.35 0.35 0.37 0.37 0.33
5m 60 60 76 74	20 Papin LA, Cothon 20 Papin LA, Cothon 21 Papin LA, Cothon 21 Papin LA, Cothon 21 Damage Over 21 Damage Over 22 Damage Over 23 Li Y, Sang, JA (2021) 23 Li Y, Sang, JA (2021) 23 Li Y, Sang, JA (2021) 23 Damage Over 23 Damage Over 24 Damage Over 25 Damage Over 25 Damage Over 26 Damage Over 27 Damage Over 27 Damage Over 27 Damage Over 27 Damage Over 27 Damage Over 27 Damage Over 28 Damag		0.36 0.39 0.39 0.37 0.39 0.39 0.39 0.39 0.31 0.37 0.37 0.35 0.35 0.35 0.35 0.35 0.35 0.35
500 60 60 70 72	24 Papin L A, Cothm 29 Papin L A, Cothm 29 Papin L A, Cothm 29 Papin L A, Cothm 20 Papin L A, Cothm 21 Papin L A, Cothm 21 Danken L J, John- 20 Danken D J, John- 20 Danken D J, John- 20 Danken		0.36 0.39 0.39 0.37 0.37 0.39 0.34 0.32 0.37 0.37 0.35 0.35 0.35 0.35 0.37 0.37 0.33
500 60 60 70 72 73	24 Papia LA, Cathan, 29 Papia LA, Cathan, 29 Papia LA, Cathan, 29 Papia LA, Cathan, 20 Papia LA, Cathan, 21 Panalan, LA, Cathan, LA, Cathan, LA, Cathan, LA, Cathan, 21 Panalan, LA, Cathan, LA, Cathan, LA, Cathan, LA, Cathan, LA, Cathan, LA, Cathan, 21 Panalan, LA, Cathan, LA, Cathan, LA, Cathan, LA, Cathan, LA, Cathan, 21 Panalan, CA, Cathan, LA, Cathan,		0.36 0.39 0.39 0.37 0.37 0.39 0.34 0.32 0.37 0.37 0.35 0.35 0.35 0.35 0.37 0.37 0.33
5m 6b 6c 7b 7k 5a 5a	24 Papin L A, (colum., 29 Papin L A, (colum., 29 Papin L A, (colum., 39 Papin L A, (colum., 30 Papin L A, Colum., 29 Papin L A, Colum., 30 Result L A, Colum., 31 Result L A, Colum., 32 Result L A, Colum., 33 Result L A, Colum., 33 Result L A, Colum., 33 Result L A, Colum., 33 Totologa, C J, Red., 33 Totologa, C J, Red., 34 Colum., L A, Colum., 31 Totologa, C J, Red., 31 Result L A, Re		0.36 0.39 0.39 0.34 0.37 0.39 0.39 0.39 0.39 0.37 0.37 0.37 0.33 0.35 0.35 0.33 0.37 0.33 0.37 0.33 0.37 0.33 0.37
5m 6b 6c 7b 7k 5a 5a	24 Papin LA, Cothan, 29 Papin LA, Cothan, 29 Papin LA, Cothan, 29 Papin LA, Cothan, 20 Papin LA, Cothan, 20 Papin LA, Cothan, 20 Papin LA, Cothan, 20 Rombal, L, Stuk- 10 Rombal, L, Stuk- 11 Sampo Over 20 Rombal, L, Stuk- 12 Rombal, L, Stuk- 13 Rombal, L, Stuk- 20 Rombal, LA, Cothan, 20 Rombal, LA, Cothan, 20 Rombal, LA, Cothan, 20 Rombal, LA, Cothan, 20 Rombal, LA, Stuk- 20 Rombal, LA, Stuk- Rombal,	022 044 040 140 155 045 044 040 1015 045 044 040 040 1015 045 044 040 040 1015 045 044 040 040 040 115 045 044 040 040 040 144 045 047 041 040 040 144 045 044 040 040 040 040 045 044 040 040 045 040 040 040 040 040 040 040 040 040 045 040 040 040 040 040 040 045 040 040 040 040 040 040 040 045 040 040 040 040 040 040 040 040 040 040 040 040 040 040 040 040 040 040 040 040 040 040 040 040	0.36 0.39 0.39 0.34 0.37 0.39 0.39 0.39 0.39 0.37 0.37 0.37 0.33 0.35 0.35 0.33 0.37 0.33 0.37 0.33 0.37 0.33 0.37
5m 6b 6c 7b 7k 5a 5a	24 Papin LA, Cothan, 29 Papin LA, Cothan, 29 Papin LA, Cothan, 29 Papin LA, Cothan, 20 Pamina, LA, Cothan, 20 Pamina, LA, Cothan, 20 Pamina, LA, Cothan, 21 Pamina, LA, Cothan, 21 Pamina, LA, Cothan, 21 Pamina, LA, Cothan, 21 Danishan, LA, Cothan, 21 Balawa, Darish 21 Balawa, Darish 21 Balawa, Darish 21 Danishan, LJ, Jama, LA, Cothan, 21 Papina, LA, Cothan, 21 Danishan, CJ, Jandi, 21 Danishan, C		0.36 0.39 0.39 0.34 0.37 0.39 0.39 0.39 0.39 0.37 0.37 0.37 0.33 0.35 0.35 0.33 0.37 0.33 0.37 0.33 0.37 0.33 0.37
5m 6b 6c 7b 7k 5a 5a	24 Papin LA, Cothan, 29 Papin LA, Cothan, 29 Papin LA, Cothan, 29 Papin LA, Cothan, 20 Pamina, LA, Cothan, 20 Pamina, LA, Cothan, 20 Pamina, LA, Cothan, 21 Pamina, LA, Cothan, 21 Pamina, LA, Cothan, 21 Pamina, LA, Cothan, 21 Danishan, LA, Cothan, 21 Balawa, Darish 21 Balawa, Darish 21 Balawa, Darish 21 Danishan, LJ, Jama, LA, Cothan, 21 Papina, LA, Cothan, 21 Danishan, CJ, Jandi, 21 Danishan, C		0.36 0.39 0.39 0.34 0.37 0.39 0.39 0.39 0.39 0.37 0.37 0.37 0.33 0.35 0.35 0.33 0.37 0.33 0.37 0.33 0.37 0.33 0.37
5m 6b 6c 7b 7k 5a 5a	24 Papin LA, Cothan, 29 Papin LA, Cothan, 29 Papin LA, Cothan, 29 Papin LA, Cothan, 20 Pamina, LA, Cothan, 20 Pamina, LA, Cothan, 20 Pamina, LA, Cothan, 21 Pamina, LA, Cothan, 21 Pamina, LA, Cothan, 21 Pamina, LA, Cothan, 21 Danishan, LA, Cothan, 21 Balawa, Darish 21 Balawa, Darish 21 Balawa, Darish 21 Danishan, LJ, Jama, LA, Cothan, 21 Papina, LA, Cothan, 21 Danishan, CJ, Jandi, 21 Danishan, C		0.36 0.39 0.39 0.34 0.37 0.39 0.39 0.39 0.39 0.37 0.37 0.37 0.33 0.35 0.35 0.33 0.37 0.33 0.37 0.33 0.37 0.33 0.37
5m 60 60 60 70 72 72 5a	24 Papin LA, Cothan, 29 Papin LA, Cothan, 29 Papin LA, Cothan, 29 Papin LA, Cothan, 20 Pamina, LA, Cothan, 20 Pamina, LA, Cothan, 20 Pamina, LA, Cothan, 21 Jana, Pamina, LA, Cothan, 21 Pamina, LA, Cothan, 21 Pamina, LA, Cothan, 21 Pamina, LA, Cothan, 21 Pamina, LA, Cothan,		0.36 0.39 0.39 0.34 0.37 0.39 0.39 0.39 0.39 0.37 0.37 0.37 0.33 0.35 0.35 0.33 0.37 0.33 0.37 0.33 0.37 0.33 0.37
5m 60 60 60 70 72 72 5a	24 Papin LA, Cothan, 29 Papin LA, Cothan, 29 Papin LA, Cothan, 29 Papin LA, Cothan, 20 Pamina, LA, Cothan, 20 Pamina, LA, Cothan, 20 Pamina, LA, Cothan, 21 Jana, Pamina, LA, Cothan, 21 Pamina, LA, Cothan, 21 Pamina, LA, Cothan, 21 Pamina, LA, Cothan, 21 Pamina, LA, Cothan,		0.36 0.39 0.39 0.34 0.37 0.39 0.39 0.39 0.39 0.37 0.37 0.37 0.33 0.35 0.35 0.33 0.37 0.33 0.37 0.33 0.37 0.33 0.37
5-0 6, 6; 70 74 54 54	24 Papin LA, Cothan, 29 Papin LA, Cothan, 29 Papin LA, Cothan, 29 Papin LA, Cothan, 20 Pamina, LA, Cothan, 20 Pamina, LA, Cothan, 20 Pamina, LA, Cothan, 21 Jana, Pamina, LA, Cothan, 21 Pamina, LA, Cothan, 21 Pamina, LA, Cothan, 21 Pamina, LA, Cothan, 21 Pamina, LA, Cothan,		0.36 0.39 0.39 0.34 0.37 0.39 0.39 0.39 0.39 0.37 0.37 0.37 0.33 0.35 0.35 0.33 0.37 0.33 0.37 0.33 0.37 0.33 0.37
5-0 6, 6; 70 74 54 54	24 Papin LA, Cothan, 29 Papin LA, Cothan, 29 Papin LA, Cothan, 29 Papin LA, Cothan, 20 Pamina, LA, Cothan, 20 Pamina, LA, Cothan, 20 Pamina, LA, Cothan, 21 Jana, Pamina, LA, Cothan, 21 Pamina, LA, Cothan, 21 Pamina, LA, Cothan, 21 Pamina, LA, Cothan, 21 Pamina, LA, Cothan,		0.36 0.39 0.39 0.34 0.37 0.39 0.39 0.39 0.39 0.37 0.37 0.37 0.33 0.35 0.35 0.33 0.37 0.33 0.37 0.33 0.37 0.33 0.37
5m 60 60 60 70 72 72 5a	24 Papin LA, Cothan, 29 Papin LA, Cothan, 29 Papin LA, Cothan, 29 Papin LA, Cothan, 20 Pamina, LA, Cothan, 20 Pamina, LA, Cothan, 20 Pamina, LA, Cothan, 21 Jana, Pamina, LA, Cothan, 21 Pamina, LA, Cothan, 21 Pamina, LA, Cothan, 21 Pamina, LA, Cothan, 21 Pamina, LA, Cothan,		0.36 0.39 0.39 0.34 0.37 0.39 0.39 0.39 0.39 0.37 0.37 0.37 0.33 0.35 0.35 0.33 0.37 0.33 0.37 0.33 0.37 0.33 0.37

Model: Test of effects model subgroup homogeneity: Q = 2373.23, df = 70, p-value = 0.00

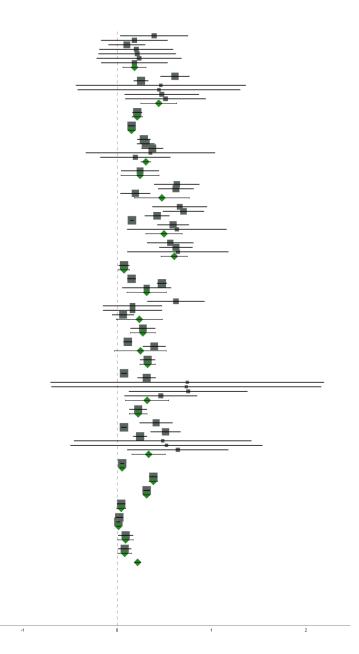


Forest Plot for Data Weighted by Proportion BIPOC

Estim	t size of each study nated overall effect size	Confidence interval	of effec
İstim	ated overall confidence int	erval	
la	6 Covington Jr., M. C.	0.39-0.06 0.84 0.09 13.16	0.27
	12 Gutierrez, D. M.	0.24-0.06 0.54 0.12 21.02	
	29 Reeves, T.; Home, S.G.	0.12 0.09 0.16 0.00 41.83	
	Subgroup Overall	0.13 0.10 0.15 0.00	
16	3 Brinkley, M.C.	0.39-0.37 1.15 0.32 5.69	0.12
	28 Peplan, L.A.; Cochran,	0.24 0.17 0.31 0.00 40.00	0.82
	Subgroup Overall	0.24 0.07 0.41 0.00	
ld	S Finch, T. M.	0.50 0.29 0.71 0.00 28.10	
		0.68 0.38 0.98 0.00 21.27	
	30 Rosenthal, L.; Starks,	0.13 0.02 0.24 0.02 37.46	0.77
	22 Melamed, D.K.	0.05 0.05 0.06 0.00 42.36	0.87
	Subgroup Overall	0.19 0.12 0.25 0.00	
2ь	Subgroup Overall 4 Caplan, M. A.	0.19 0.12 0.25 0.00	0.96
		0.02 0.01 0.03 0.00 42.34	
	20 24, 1.; 24mp, 1.8. (2021)	552 001 0.03 0.00 42.34	0.67
	7 Donaldson, K. S.	0.33 0.20 0.46 0.00 35.88	0 74
	Subgroup Overall	0.11-0.08 0.31 0.24	
2d	4 Caplan, M. A.	0.14 0.01 0.27 0.03 35.89	0.74
	9 Fingerbut, A.W.; Maise	0.16 0.05 0.27 0.00 37.28	0.77
	20 Li, Y.; Samp, J.A. (2021)	0.06 0.04 0.08 0.00 42.10	0.87
	29 Reeves, T.; Home, S.G.	0.10 0.07 0.13 0.00 42.01	0.87
	29 Reeves, T.; Home, S.G.	0.07 0.05 0.09 0.00 42.21	0.87
	26 Peplan, L.A.; Cochran,	0.19 0.13 0.25 0.00 40.82	
	27 Peplan, L.A.; Cochran,	0.08 -0.08 0.24 0.32 33.33	0.69
	Subgroup Overall	0.12 0.04 0.20 0.00	
2 g	6 Covington Jr., M. C.	0.01-0.00 0.02 0.09 42.31	
	26 Peplan, L.A.; Cochran,	0.21 0.14 0.28 0.00 40.44	0.83
		0.07 0.04 0.10 0.00 42.00	
	20 Li, Y.; Samp, J.A. (2021)	0.07 0.04 0.10 0.00 42.00	0.86
	23 Mohr II Fassinger	0.11 0.05 0.14 0.00 41.96	0.86
	23 NOR, 33., Passinger,	0.11 0.03 0.14 0.00 41.90	0.30
	Subgroup Overall	0.04 0.03 0.04 0.00	
3a	• I	0.14 0.09 0.19 0.00 41.25	0.85
	15 Jordan, K.M., Debity,		0.85
	23 Mohr, J.J.; Fassinger,		
	23 Mohr, J.J.; Fassinger,	0.03 0.02 0.04 0.00 42.34	0.87
	29 Reeves, T.; Home, S.G.	0.12 0.09 0.16 0.00 41.86	0.86
	Subgroup Overall	0.09 0.07 0.11 0.00	
4a	3 Brinkley, M. C.	0.01-0.01 0.03 0.32 42.19	0.87
		0.16 0.09 0.23 0.00 40.47	0.83
	Subgroup Overall	0.09-0.03 0.21 0.15	
h	17 Lehmiller, J.J.; Agnew	0.56 0.39 0.73 0.00 32.42	0.67
	Subgroup Overall	0.31 -0.17 0.79 0.21	
5a	S Finch, T. M.	0.39 0.22 0.56 0.00 32.37	
		0.25 0.17 0.33 0.00 39.26	
			0.51
	25 Mohr, J.J.; Selterman, 25 Mohr, J.J.; Selterman,	0.44 0.31 0.57 0.00 36.07 0.56 0.40 0.72 0.00 33.02	
	25 Mohr, J.J.; Selterman, Subgroup Overall	0.56 0.40 0.72 0.00 33.02 0.34 0.25 0.42 0.00	U.68
56		0.16 0.10 0.21 0.00 40.93	0.84
00	2 Berta, C. 15 Jordan, K.M.; Deluty,		
			0.85
	29 Reeves, T.; Home, S.G.	0.15 0.11 0.19 0.00 41.60	0.56

Lawrence Senior Honors Thesis

	27 Peplan, L.A.; Cochran,	0.18 -0.17 0.53 0.32 17.86	0.37
	27 Peplan, L.A.; Cochran,	0.20 -0.19 0.59 0.32 15.72	0.32
	27 Peplan, L.A.; Cochran,	0.23-0.22 0.68 0.32 13.07	0.27
	Subgroup Overall	0.18 0.06 0.30 0.00	
54	5 Cohen, J. N.	0.61 0.45 0.77 0.00 33.46	0.69
	27 Peplan, L.A.; Cochran,	0.46-0.44 1.36 0.32 4.25	0.09
	30 Rosenthal, L., Starks,	0.47 0.08 0.86 0.02 15.61	0.32
	Subgroup Overall	0.44 0.25 0.63 0.00	0.52
	• 1		
5e	5 Cohen, J. N.	0.21 0.16 0.26 0.00 41.08	0.85
	Subgroup Overall	0.15 0.11 0.19 0.00	
5i	5 Cohen, J. N.	0.28 0.21 0.35 0.00 40.12	0.83
	26 Peplan, L.A.; Cochran,	0.37 0.25 0.49 0.00 36.89	0.76
	27 Peplan, L.A.; Cochran,	0.19-0.18 0.56 0.32 16.75	0.34
	Subgroup Overall	0.24 0.04 0.44 0.02	
51	14 Jeong, J.; Home, S.	0.63 0.39 0.87 0.00 25.88	0.53
	30 Rosenthal, L.; Starks,	0.19 0.03 0.35 0.02 33.10	0.68
	18 Lehmiller, J.J.; Agnew	0.70 0.48 0.92 0.00 27.67	0.57
	22 Melamed, D K.	0.15 0.14 0.17 0.00 42.23	0.87
	30 Rosenthal, L.; Starks,	0.63 0.10 1.16 0.02 10.38	0.21
	50 100 million, 12., 5 million,	0.05 0.10 1.10 0.02 10.30	
	25 Mohr. J.J.; Selterman	0.62 0.44 0.80 0.00 31.45	0.65
	Subgroup Overall	0.60 0.46 0.74 0.00	0.05
50	30 Rosenthal, L.; Starks,	0.07 0.01 0.13 0.02 40.82	0.84
20	30 Kosenthal, L.; Starks,	0.07 0.01 0.13 0.02 40.82	0.84
	22 Melamed, D.K.	0.47 0.42 0.52 0.00 41.07	0.85
	22 Dielamen, D.K. Subgroup Overall	0.47 0.42 0.52 0.00 41.07	0.85
	• •	0.62 0.32 0.92 0.00 21.00	
5q	24 Mohr, J.J.; Daly, C.A.		0.43
	27 Peplan, L.A.; Cochran,	0.16 -0.15 0.47 0.32 20.33	0.42
	Subgroup Overall	0.23-0.01 0.48 0.06	
5r	24 Mohr, J.J.; Daly, C.A.	0.27 0.14 0.40 0.00 35.52	0.73
	26 Peplan, L.A.; Cochran,	0.39 0.27 0.51 0.00 36.37	0.75
	Subgroup Overall	0.32 0.24 0.40 0.00	
54	S Finch, T. M.	0.07 0.04 0.10 0.00 41.96	0.86
50		0.74-0.71 2.19 0.32 1.75	0.04
	27 Peplan, L.A.; Cochran,		
	30 Rosenthal, L.; Starks,	0.75 0.12 1.38 0.02 7.90	0.16
	Subgroup Overall	0.31 0.09 0.54 0.01	
5v	S Finch, T. M.	0.22 0.13 0.31 0.00 38.58	0.79
	S Finch, T. M.	0.07 0.04 0.10 0.00 41.97	0.86
	26 Peplan, L.A.; Cochran,	0.24 0.16 0.32 0.00 39.88	0.82
	27 Peplan, L.A.; Cochran,	0.52+0.50 1.54 0.32 3.40	0.07
	Subgroup Overall	0.33 0.15 0.51 0.00	
бъ	7 Donaldson, K. S.	0.05 0.03 0.07 0.00 42.20	0.87
	Subgroup Overall	0.38 0.34 0.42 0.00	
бј	22 Melamed, D.K.	0.31 0.27 0.35 0.00 41.80	0.86
	Subgroup Overall	0.04-0.01 0.09 0.09	
7d	27 Peplan, L.A.; Cochran,	0.02 -0.02 0.06 0.32 41.67	0.86
	Subgroup Overall	0.01 -0.01 0.03 0.18	
Sa	4 Caplan, M. A.	0.09 0.01 0.17 0.03 39.54	0.81
	Subgroup Overall	0.08 0.01 0.15 0.03	
	Overall	0.21 0.19 0.24 0.00	



Model: Random-effects model Test of between-subgroup homogeneity: Q = 938.48, df = 46, p-value = 0.00