

PSYCHOLOGY OBSERVED WITHIN EVERY ROMANTIC RELATIONSHIP STUDY:
TESTING EQUALITY OF PARAMETERS ACROSS DIVERSE GENDER AND SEXUAL
IDENTITIES

BY

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DISSERTATION

Submitted in partial fulfillment of the requirements
for the degree of Doctor of Philosophy in Psychology
in the Graduate College of the
University of Illinois Urbana-Champaign, 2024

Urbana, Illinois

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Abstract

How do we know whether psychological science generalizes across groups? Systematic evaluations are key for establishing the validity of psychological constructs in under-investigated populations. Sexual and gender minority (SGM) people are underrepresented in wellness-framed psychological research. Arguments for their exclusion rely on the recruitment challenges and differences in outcomes and experiences (Junkins, Dugan, et al., 2024). I used an online, monthly longitudinal study measuring personality, social relationships, and mental health to conduct two studies across people with sexual and gender diverse (SGD) identities. I recruited the sample mainly through paid advertisements on Instagram. In study 1, I compared means, variances, and correlations across 34 psychosocial variables between categories of SGM, gender identity, sexual orientation, relationship status, and monogamy ($N = 1,743$). Consistently, I find largely similarities across gender and sexual orientation categories. These results support a general expectation that similarities are more common than differences in normative psychological processes, although clear differences in means and variances exist for specific experiences and outcomes. In study 2, I used data from the first three waves ($N=1,777$; 31% retention), 73% of respondents identified as SGM. I examined longitudinal growth parameters, rank-order stability, and cross-lagged correlations. The findings showed remarkably similar associations and rank-order stability. These exploratory results can inform longitudinal research to be better equipped to disentangle processes that support resilience in the face of extant negative influences, address health disparities, and identify associations that are more universal in the studied contexts lending support for diversifying psychological research across SGM identities. Altogether, this work examines prevalences, variations, and associations among basic psychological domains and

further emphasizes the necessity of rigorous work to establish the generalizability of past findings to populations historically underrepresented in psychological science.

Acknowledgments

I would like to thank all those who have supported me academically, kept me entertained, listened to my stumbling blocks, and made grad school fun. I came prepared for graduate school to be the most difficult, grueling thing I would ever do. It was not. The external feedback can be hard. Straddling the space between a topical area, like personality science, and minority research places you in an interdisciplinary position that leads to challenging grant and paper reviews. But the people you are in school with matter way more for your education, learning, growth, and support.

For better or worse, PIG-ie shaped a lot of my academic opinions. I fear it has made me quite annoying, but I am grateful.

Thank you to Jaime Derringer for being a great supervisor. You allowed me to pursue my interests with no pushback, including my queer interests. I deepened my understanding a lot while in grad school because of the conversations I opted into. You helped give me a varied background and really just taught from a rigorous science perspective. I appreciated this a lot. You also created a space where open discussions of racism and harms within science were not ignored or shied away from while we did our work. All in all, you were the mentor I needed.

To the EPIC lab, I was around for two completely different lab experiences. To those who were the first generation, I was able to learn a lot from you in my first years and I hope I was not too annoying asking my questions and giving feedback from a novice perspective. I think of those as the Behavior Genetics days. It was a great bonding experience attending the BG workshop and coding hundreds of twin studies together. To the new generation, I leave you without a captain. All I can say is “folks what are we doing?”

To the Dugans, thank you for taking in the best little street cat ever and giving me my Minerva. She is the most perfect, best baby.

To my Quality friends and to my family, you matter lots. Thank you for your support, listening, and not getting too bored when I shared about school. In the vein of entertainment, I must thank Taskmaster for always being everything I needed and wanted in terms of light entertainment television. Hint: look at Kwesi Owusu Adjei's acknowledgments for more Quality friends.

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CHAPTER 1: INTRODUCTION

Sexual and Gender Minority (SGM) groups experience disparate negative mental and physical health outcomes compared to cisgender, heterosexual peers (Cochran et al., 2003; Lick et al., 2013). SGM groups are especially vulnerable to depression (Plöderl & Tremblay, 2015), suicidal behaviors and self-injury (A. P. Haas et al., 2010; Jackman et al., 2018), substance use (King et al., 2008), acute physical symptoms (Sandfort et al., 2006), and cardiovascular disease risk (Caceres et al., 2017). SGM people also have less access to resources due to higher rates of poverty (M. V. L. Badgett et al., 2020), homelessness (Choi et al., 2015), food insecurity (Brown et al., 2016), and lack of health insurance (Bonvicini, 2017). Known risk factors of health disparities, in broader populations, include family history, substance use, poor nutrition, stress and trauma, abuse or lack of support, and poverty (Risk and Protective Factors, 2021). In SGM populations these risk factors include discrimination, violence, and victimization (Factor & Rothblum, 2007; Szalacha et al., 2017; Valentine & Shipherd, 2018). Some protective factors identified, in broader populations, are healthy diet, social support, financial security, and access to health services (Risk and Protective Factors, 2021). Protective factors specifically important to SGM groups are community and social supports which validate minority identities (Valentine & Shipherd, 2018). Tight-knit and supportive communities are one strength of LGBTQIA+ populations. Evidence shows change in negative disparities is possible as cultural indicators of stigma, such as the federal legalization of same-sex marriage in the U.S., impact SGM people's mental health (Ogolsky et al., 2019). Systemic and sociocultural change can ameliorate health disparities between SGM and heterosexual, cisgender people.

Romantic relationships are a specific source of social support with implications for well-being (Gómez-López et al., 2019; Roberson et al., 2018), mental health (Gómez-López et al.,

2019), positive growth (Neyer & Asendorpf, 2001; Zhou et al., 2017), substance use (Whitton et al., 2021), and mortality (Holt-Lunstad et al., 2010). Qualitative evidence suggests lower power within romantic relationships relates to lower relationship satisfaction and well-being (Gray-Little & Burks, 1983a; Sprecher et al., 2006; Kifer et al., 2013a), and the most secure and happy relationships show power equality. However, SGM people are currently substantially underrepresented within relationships research (Junkins, Dugan, et al., 2024). Further, few studies have examined personality within SGM people (exceptions see [Bogaert et al., 2018](#); [Lippa, 2005](#)). Still not addressed is quantitative examination of prevalence and associations in positive-framed basic psychology among people with diverse sexual and gender identities.

Due to the importance of health disparities, like depression, there is a major focus in the literature on negative-framed risks and harms experienced by SGM people. What is little investigated are positive-framed experiences and individual differences to understand how basic psychological processes may be quite similar or different between people of diverse sexual and gender identities (see glossary in Table 1.1). In order to fill in these gaps in the literature, I extend prior research by evaluating how romantic relationship contexts, social relationships, and personality relate to negative outcomes (depression) and positive outcomes (well-being) over time among diverse sexual and gender identities. I selected a range of constructs relevant to people's health and experiences to measure monthly or every several months: relationship power, personality, social support, relationship satisfaction, social isolation, minority stress, depression, and subjective well-being. I proposed three studies to address these gaps in the literature focusing on equivalence of means, variances, cross-sectional associations, stability, and validity. Study 1 evaluated cross-sectional associations, means, and variances. Study 2 examined intercepts from growth models, rank-order stability, and cross-lagged associations given little

change was observed over a three month period. Due to very little change over a three-month period, I adapted the original proposed studies 2 and 3 to one study of psychometrics and repeated measures. See Supplement E for the original three studies. I prioritized these two studies to evaluate how romantic relationships, individual characteristics, and other social influences relate to poor mental health and positive well-being over time among people of varying sexual and gender identities.

Much research (especially quantitative work) takes a deficit approach to marginalized populations (Junkins, Dugan, et al., 2024). Although the systemic presence of prejudice results in mean differences in exposures to risk and support, I do not expect there to be substantial differences between SGM and non-SGM groups in terms of the observed associations (i.e., correlations and cross-lagged correlations). Put differently, the extent to which SGM and non-SGM individuals increase in experiences of discrimination, the resulting impact on mental health will be equivalent. However, SGM individuals are more likely than non-SGM individuals to experience increased rates of discrimination.

In the next sections, I highlight the disparities found in the depression and well-being literature and cover in short what we (do not) know about each of the study variables including their links to mental health across people grouped by sexual and gender identities.

Table 1.1. Glossary of terms for groups/identities. This list is not exhaustive but clarifies the way we use these terms which may be ambiguous or unfamiliar.

Term	Definition of term within the thesis	Related terms
Sexual and/or Gender Minority (SGM)	Term used by the NIH to include, but not be limited to, people outside of cisgender binary gender identity and/or a sexual orientation other than heterosexual.	SGM; queer; SGD
Sexual and gender diversity (SGD)	Not exclusive to people outside of cisgender binary gender identity and/or a sexual orientation other than heterosexual, but especially referring to having higher proportions of non-cisheterosexual people.	
Queer	All people who do not identify as heterosexual or cisgender binary gender, used synonymously with SGM.	
Men	All people who identify as a man, selecting either cisgender or transgender.	
Women	All people who identify as a woman, selecting either cisgender or transgender.	
Genderqueer	People who identify as outside the gender binary. Some people choose nonbinary identities in addition to man or woman, but not including those who wrote in “agender” as it is considered distinct.	Nonbinary; enby; genderqueer; gender non-conforming; bigender

Table 1.1 (cont.). Glossary of terms for groups/identities. This list is not exhaustive but clarifies the way we use these terms which may be ambiguous or unfamiliar.

Transgender	All people who identify as a different gender than the one assigned to them at birth.	Transgender women; transgender men; transgender nonbinary
Cisgender	All people whose gender identity matches their assigned gender at birth.	
Plurisexual	People who are romantically and/or sexually attracted to multiple genders.	Bisexual; pansexual; omnisexual; queer
Monosexual	People who are romantically and/or sexually attracted to primarily one gender.	Gay/lesbian; heterosexual
Asexual	People who are romantically but not sexually attracted to others. Other identities help explain their romantic attractions.	Ace; asexual spectrum; grey-sexual; demisexual
Consensual Non-Monogamy (CNM)	Consensually non-monogamous people are people who are romantically and/or sexually involved with more than one person or are open to being involved with more than one person in agreement with all involved.	Ethical non-monogamy; open relationships; polyamory

1.1. Two Sides of Mental Health

There are two sides to mental health: it is both the absence of debilitating psychopathology and the presence of well-being. The most common form of psychopathology affecting adults around the world is depression. The World Health Organization listed depression

as a leading cause of disability and suicide. A recent estimate placed the global rate of suffering from depression at 5% in the year 2021 (World Health Organization, 2021). Depression can be chronic, lasting on average 20 years, and often recurrent within 6 months to a year (Kocsis et al., 2008; Solomon, 2000, p. 200). Yet the number of people who seek treatment is much lower than those experiencing depression (Evans-Lacko et al., 2018). The prevalence of depression is markedly higher in SGM groups, specifically transgender women, nonbinary people, and bisexual or cisgender queer people (Ferlatte et al., 2020), while treatment rates are even lower.

In addition to the absence of disability, a sense of well-being is critical to mental health (Jahoda, 1958). Depression and subjective well-being are very strongly negatively correlated ($r = -0.68$; Gonzalez Avilés et al., 2021), but well-being is not the same construct as absence of pathology (Keyes, 2002; Wetherell et al., 2001). The pattern of influences on each of these health outcomes are similar as I discuss in the respective topic sections below. Yet there are important distinctions in both meaning and empirical results between depression and well-being.

Moreover, mental health research often focuses on risk-framed research posed as avoiding or lessening depression. An alternative way to understand downstream negative consequences is to focus on how we achieve and maintain well-being. It is important to know whether the same influences will lead to low depression and high well-being or if they only have an effect on either depression or well-being. Indeed, previous research has shown similar risk and resilience factors exist for well-being as they do for negative mental health outcomes. Social isolation and minority stress are consistently identified as risk factors, while social support and sense of community belonging are identified as protective factors (Valentine & Shipherd, 2018). Most of the individual characteristics and social influences discussed in the sections below have been at one time or another correlated with depression or subjective well-being (see Table A1-

A3). The proposed research builds on these studies that have looked at these associations individually to not only focus on risk-framed research but importantly, wellness-framed research.

As stated earlier, mental health outcomes have been identified as a health disparity for SGM people. Depression, specifically, is more common in certain groups compared to others. Sexual minority people compared to heterosexual people, then gender minority and women compared to men have higher average rates of depression (Hyde, 2014; Hyde & Mezulis, 2020). Psychological well-being, on the other hand, has a smaller to non-existent mean difference at least between men and women (Batz & Tay, 2018; Zell et al., 2015). Taken together, study 1 examines the cross-sectional associations of individual characteristics and social factors on mental health across SGD people.

1.2. Individual Characteristics

Experiences of mental health are related to individual characteristics that differentiate patterns of thinking, feeling, and behaving between people. Characteristic patterns, like power, that define social dynamics are important to consider in addition to personality traits. In the following sections these important traits are discussed in brief: relationship power, Big Five, and Agency-Communion.

1.2.1. Relationship Power

Power in social dynamics has been noted by philosophers to be akin to energy in physics: to understand social dynamics we must speak in terms of power (B. Russell, 1938). In the context of romantic relationships, specifically, power can be defined as “the ability or capacity to change another person’s thoughts, feelings, or behavior so they align with one’s own desired preferences, along with the ability or capacity to resist influence attempts imposed by another

person” (Simpson et al., 2015). Consistently, a person’s subjective sense of how much power they have is more than their physical resources or social status; feeling powerful can act above and beyond what objective resources available to an individual would suggest (Simpson et al., 2015). Power has a fundamental role in romantic relationships because partners have a joint, shared life in which they depend on each other to fulfill key needs and they can influence whether their partner will realize their needs and goals (Overall & Cross, 2019).

Past and present research operationalized power as a state giving a high or low power label to one partner based on social experiments or resource allocation. Otherwise, measurement of power often was on 3-point scales or similar. Few exceptions exist. The first exception is the Sense of Power scale (C. Anderson et al., 2012) and other measures specific to one interaction or domain, like sexual relationships (Pulerwitz et al., 2002), or to related constructs, like decision making or locus of control (e.g., Lucea, 2011). The Relationship Power Inventory was the first to be a trait-like overall relationship measure that accounts for both the self and the partner (Farrell et al., 2015). Many of the expectations for power are based on limited research with very disparate methods. Next, I cover the consequences, individual characteristics, and dyadic characteristics related to power.

i. Consequences of Power within Romantic Relationships

Power impacts positive and negative relationship behaviors and outcomes, both narrowly defined and in general. Lower relationship power is consistently associated with lower relationship satisfaction and personal well-being (Gray-Little & Burks, 1983b; Kifer et al., 2013b; Sprecher et al., 2006). Within different-gender relationships, condom use- an important relationship health behavior and dyadic decision- is more strongly influenced by individuals higher in relationship power, dispositional dominance, and by men, even after controlling for the

couple's aggregated intentions to use condoms (VanderDrift et al., 2013). Individuals higher in power are more resistant to negative emotion, or drops in self-esteem, following partner hostility (Kuehn et al., 2015) and are less likely to sacrifice for their lower power partner (Righetti et al., 2015). Conversely, individuals lower in power are more likely to prioritize partner's goals (Laurin et al., 2016), comply with the partner whether it is in their own best interest or not (Knudson-Martin, 2013), and not communicate their own needs regarding relationship issues (Samp & Solomon, 2001).

Those with higher relative power can promote positive outcomes (such as by being more forgiving or attending to their partner's needs) in their relationship; this was found to be enhanced by relationship motivation and pro-relationship behaviors (Kim et al., 2019). However, in general, equality in relationships is highly valued (Cochran & Peplau, 1985; Galliher et al., 1999). Egalitarian relationships, those reporting more equal divisions of responsibility, show greater trust and commitment (Grauerholz, 1987), happiness and security (Walster et al., 1978) and highest relationship satisfaction (Gray-Little & Burks, 1983b). Overall, having power balance appears to be more ideal and show better relationship, health, and emotional outcomes. So, how does the relationship power trait relate to mental health?

Few cross-sectional studies of relationship power and either subjective well-being or depression are available where the sample was not all clinically depressed, HIV-positive, or limited to one gender (e.g., Byrne et al., 2004; Hatcher et al., 2012). In a sample of HIV-positive women in Uganda, high sexual relationship power was related to lower depression diagnosis (OR = 0.44; Hatcher et al., 2012). Another study tested power's mediating effect on the relationship between intimate partner violence (i.e., victimization) and depression in women (Filson et al., 2010). They indeed found that power partially mediated this relationship; after controlling for the

effects of power, the direct effects of victimization on depression were no longer significant. Therefore, there is evidence that feeling powerless in a romantic relationship is related to higher depression. Much of the research with sexual relationship power poses power as mediators for *why* or *how* this occurs of relationships that we have long understood, e.g., how victimization consistently leads to depression rather than leaving a partner. Relationship power might operate as a powerful mediator on these important psychological relationships. Thus, a person's relationship power could be a critical place to intervene for depression. Longitudinal research between relationship power and depression is key to establish that not only are they related, but whether they also change together. First, prevalences and bivariate associations among different groups need to be established.

In contrast, one cross-sectional study that used the sense of power scale, defined as generalized psychological power that goes beyond status and resources, showed a strong positive association with subjective well-being ($r = 0.72$; Wang, 2015). Unlike the previous studies, there was no element of the study rendering it less comparable to work proposed here, only the measure itself. Sense of power in contrast to relationship power is not context-dependent; it focuses on a general sense of power in all social situations which is more about a feeling of being able to influence and avoid influence if not desired. Unlike other models, Wang et al. (2015) used the sense of power scale and proposed mediation models with agency mediating the path between power and subjective well-being instead of power as the mediator.

ii. Individual Characteristics Influence Power Perceptions

Because relationship power is a psychological trait which may be expected to vary between individuals, we may ask what other individual characteristics might relate to relationship power. Limited research has highlighted potential associations between individual-

level power measures and personality outside of the context of romantic relationships. The sense of power measure was correlated with personality using both the Big Five Inventory in 316 undergraduates (BFI; John, Donahue, & Kentle, 1991) and the NEO-PI-R in 184 undergraduates (Costa & McCrae, 1985). The results showed the strongest association with extraversion ($r = 0.43 - 0.49$), followed by conscientiousness, open-mindedness, and emotional stability, ranging from 0.25 to 0.37. Only agreeableness showed a nonsignificant correlation less than 0.10. This generalized psychological trait measure of power was, also, shown to be correlated equivalently with personality across different relationships (e.g., sorority, dormitory, same-gender friends, same-gender parent; Anderson et al., 2012). A similar but weaker relationship was seen between Big Five factors and leadership emergence—not necessarily the most effective leaders but those that tend to be in leadership roles (Judge, Bono, Ilies, & Gerhardt, 2002). When leadership is broken up by sample the student leadership emergence approaches the correlations in Anderson and colleagues' (2012) study.

Limited work with other measures of power suggests no gender differences in self-reported power within romantic relationships (Hall & Knox, 2017; Farrell, Simpson, & Rothman, 2015) or platonic, same-gender relationships (Anderson, John, & Keltner, 2012). This result might be slightly counterintuitive to some who note that gender gaps do exist in faculty jobs (Moss-Racusin, Dovidio, Brescoll, Graham, & Handelsman, 2012), CEOs, and leaders (Hill, 2016). Women are still the underdog in leadership and prestigious roles. Extensive work has been done on power strategies within intimate relationships that indicate gender differences exist in the strategies used to influence each other (Falbo & Peplau, 1980). However, it is unclear whether gender differences exist in the perception of relationship power. Anderson et al. (2012)

found no gender differences in sense of power. Overall, power constructs do not show reliable differences between men and women.

The previous examples show that individual-level power is related to personality across non-romantic relationships. Results in these samples showed internal consistency of power-related beliefs even where there was no specific context given to the relationship. Within romantic relationships, where partners are reliant on each other, we do not yet know if similar patterns will emerge.

iii. Context Matters: Within-dyad Characteristics Influence Power Perceptions

What research currently exists on the dynamics of power within the context of romantic relationships relies overwhelmingly on heterosexual participants (or participants currently in different-gender relationships). So, results that we take to represent couples, in general, only support generalizations to different-gender relationships. Beyond being exclusionary, only focusing on different-gender couples ignores one major potential confound of power—gender roles. Inclusion of participants in same-gender relationships and those with more diverse gender and sexual identities can help inform whether individual differences in power are due to gender roles (such as sociocultural norms) or if differences are due to relatively stable characteristics of the individual, like personality.

Situational constraints on behavior and personality that arise in heterosexual different-gender relationships may not apply similarly to same-gender couples or queer different-gender relationships. Research on gay/lesbian relationships finds that one positive aspect unique to the context of same-gender relationships is that partners report having equality consistent with their values and freedom from gender roles within their relationships (e.g., [Riggle et al., 2008](#); [Rostosky & Riggle, 2017](#); [Scales Rostosky et al., 2010](#)). Freedom from gender roles would be

more impactful for women, who are archetypically the lesser powered partner in the relationship. Women, more than men, report valuing equality in the relationship and deemphasize having more power (Falbo & Peplau, 1980). In the same study Falbo & Peplau (1980) found heterosexual men and women to overall report having somewhat greater power than their partner. There is some support for this idea that female same-gender couples over male same-gender couples and different-gender couples report equality in their contribution, treatment, commitment, and power (Kurdek, 2001, 2003). Looking across sexual and gender diverse people would support a more conclusive analysis of gender roles and personality's relation to power within romantic relationships.

In sum, these relationships showed mean differences in power may exist between partners by gender, but they do not suggest that the process is different. Power is associated with outcomes across all the genders (men and women) and sexual orientations (heterosexual and gay/lesbian) reviewed here. In the proposed studies, I expand the sexual and gender identities included.

1.2.2. Personality

An area of research that has garnered much more attention drawing from more consistent theory and measurement is the Five Factor Model of personality, otherwise known as the Big Five. Alongside the Big Five are Agency-Communion, which has a more muddled history, but nevertheless has been prolific in social psychology and related areas. First, I cover the Big Five traits, then I briefly discuss Agency-Communion as an alternative but usually not competing taxonomy of personality. Lastly, their relation to mental health is discussed. Both taxonomies draw from Trait Theory that suggests they are relatively stable patterns of thinking, feeling, and behaving shared across people.

The Big Five traits were derived using the Lexical Hypothesis and have (mostly) replicated cross-culturally in many different languages (De Raad, 1998; Hřebíčková et al., 2002; Peabody & Goldberg, 1989; Saucier, 1997; Saucier & Goldberg, 1996; Shmelyov & Pokhil'ko, 1993; Szarota, 1996). In short, the lexical approach involved reviewing every adjective or descriptor in a dictionary and reducing them to unique constructs using factor analysis. Goldberg and other factor analysts determined a five-factor structure that has replicated (L. R. Goldberg, 1990). In Western contexts, these five are consistently extraversion, agreeableness, conscientiousness, neuroticism, and openness to experience (also referred to as open-mindedness). Extraversion is the propensity to be social. Agreeableness is the tendency to be kind and caring. Conscientiousness is the inclination to be clean, orderly, and respectful. It is strongly associated with work (B. Roberts et al., 2009). Neuroticism is the predisposition to be anxious, stressed, or sad. It is highly intertwined with most negative internalizing symptoms, like anxiety and depression (John et al., 2008). Open-mindedness is the fuzziest of the constructs ranging from intelligence to politics to culture. In its current conceptualization, open-mindedness emphasizes creativity, appreciation for art and aesthetics, and a willingness to try new things (L. R. Goldberg, 1990). As can be seen from the multiple adjectives listed to describe those five traits, they can easily be broken down into lower-order facets. In the most recent version of the Big Five Inventory (BFI-2; Soto & John, 2017), each of the Big Five traits has three lower-order facets. For example, the facets of extraversion are sociability, assertiveness, and energy level. At times specificity is desirable (meaning lower-order facets), but at most times research prioritizes construct coverage and brevity (meaning higher-order traits).

Agency is theoretically related to extraversion in that it is a self-focused dominance (Jenkins, 2020). One facet of agency is assertiveness, which overlaps with extraversion. The

other facet is competence. Communion is the opposite to agency but is not negatively related to it (Wiggins, 1979). Communion is other-focused care. Facets of communion are warmth and morality (Abele et al., 2016). Similarly, warmth is closely related to agreeableness. Where the Big Five have flourished in many contexts, Agency-Communion is most used in interpersonal relations and care settings and is studied as two orthogonal types of values, motivations, or approaches (e.g., Cundiff & Smith, 2017; Paulhus & Trapnell, 2008; Trapnell & Paulhus, 2012).

Cross-cultural evidence of mean gender differences in the Big Five shows that the pattern of differences often found in U.S. contexts between men and women do not generalize to the rest of the world (D. P. Schmitt et al., 2008, 2017). However, even in the U.S. we define most of the empirical differences as small (Hyde, 1990; Junkins, Pantin, et al., 2024; Zell et al., 2015), meaning that they would not be apparent to someone observing men and women. There would be enough overlap, or people of these genders acting similarly, that the small mean shift is empirical and group-level but does not carry much translation into real world context with individual prediction. In a gender diverse sample, comparisons between men, women, and nonbinary folks showed more similarities in personality between women and nonbinary folks and a stronger difference between men and everyone else. Consistently, women and nonbinary folks are on average more neurotic and open than men (Junkins, Pantin, et al., 2024). Cohort differences are important when considering gender differences as well because mean differences change between generations. Cohort differences are indicative of the sociocultural context shaping the behaviors, thoughts, and/or feelings of people rather than biology or physical markers, like the brain or genes (Hyatt et al., 2022; Hyde, 2005; South et al., 2018).

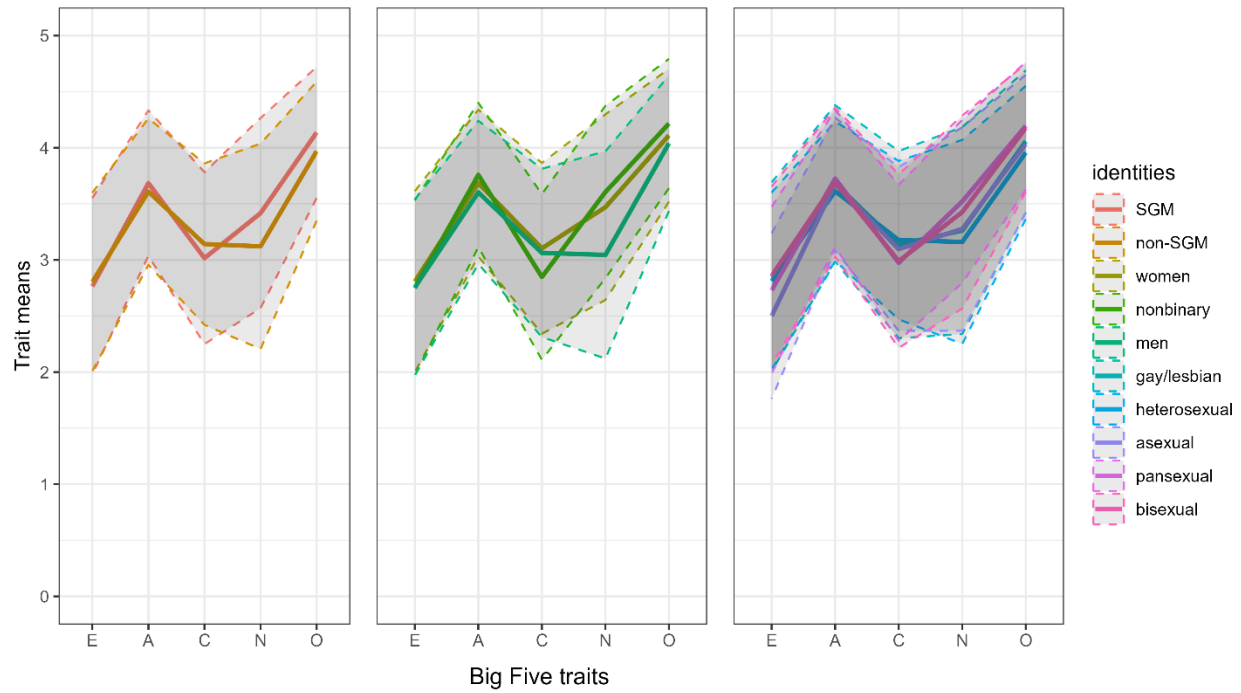
Similar evidence of mean differences for agency and communion is murky at best. A shift in the 1970's led to what were originally men's and women's sex roles or masculine and

feminine attitudes to be relabeled agency and communion, respectively (Bem, 2011; Spence & Helmreich, 1979). Yet the traits in theory preceded their operationalization as masculine and feminine attributes (Bakan, 1966). Therefore, a gender difference was expected on these two-dimensional scales. But over time mean differences have diminished or disappeared entirely (Hsu et al., 2021; Junkins, 2020). These traits have not been well-studied cross-culturally, in part because they describe Western notions of what it means to be independent and dominant (agency). Communion and agency are also assumed to differ between people within collectivistic cultures, like much of East Asia, versus individualistic cultures, like the U.S., with communion being higher on average in East Asian nations and agency higher on average in the U.S. However, in reality, the data does not show the effects as cleanly as is theorized (e.g., Wojciszke & Bialobrzeska, 2014; Ybarra et al., 2012). Instead, research shows consistently that agency and communion are differentially related to self-esteem, self- and other-construal, and motivations (e.g., Abele & Wojciszke, 2007; Paulhus & Trapnell, 2008). All in all, cross-cultural and gender differences in Agency-Communion align with the Big Five in that people are more similar, on average (Gebauer et al., 2014).

Knowledge around sexual orientation and these personality taxonomies is somewhat limited. With the Big Five, or similar traits i.e., HEXACO, there have been some group differences studies (Allen & Robson, 2020; Bogaert et al., 2018; Junkins, Pantin, et al., 2024). Figure 1.1 illustrates the estimated (lack of) group differences in personality that are consistent with mostly small effect sizes and overlapping distributions. The effects show that socially constructed groups are more similar than not, regardless of how groupings were defined. The patterns of associations were generally that there were more similarities between monosexual identities (heterosexual and gay/lesbian), similarities between plurisexual identities (pansexual

and bisexual), and medium differences in extraversion between asexual and all other sexual orientations. Part of the monosexual and plurisexual similarities to each other were their similar pattern of differences between monosexual and plurisexual identities. In other words, gay/lesbian people were different from pansexual and bisexual people in a similar pattern as heterosexual. Important to note are that these patterns were mostly descriptive and exploratory as most of these differences were small (Junkins, Pantin, et al., 2024). For Agency-Communion, stereotyping and sex role attributions have been studied with select minority sexual orientations. For instance, the stereotypes of gay men as more feminine and lesbian women as more masculine were still evident in the early 21st century (Blashill & Powlishta, 2009). In a more recent study, stereotypes of heterosexual women as being more communal still held, but the stereotypes of heterosexual men and sexual minorities did not hold (Klysing et al., 2021). All in all, recent research is showing fewer personality differences between people categorized by their sexual identities, which could relate to shifting attitudes from classifying sexual or gender diversity as a sign of mental health disorder to a more typical psychological experience as well as increased exposure to people who are sexual minorities (Riggle et al., 2008, 2011; S. S. Rostosky & Riggle, 2017).

Figure 1.1. Personality trait means plotted by identity with standard deviations shown as shaded regions (Junkins, Pantin, et al., 2024).



Furthermore, individual characteristics are related to experiences of depression and well-being. For the Big Five, meta-analysis shows that neuroticism ($r = -0.39$) and extraversion ($r = 0.32$) are the strongest correlates of subjective well-being followed by conscientiousness and agreeableness (Anglim et al., 2020). Depression and personality are largely related through neuroticism followed by extraversion and conscientiousness. Partial correlations adjusted for age, sex assigned at birth, and other personality traits are 0.37 for neuroticism, -0.07 for extraversion, and -0.09 for conscientiousness (Hakulinen et al., 2015). In comparison, other meta-analyses for Major Depressive Disorder report unadjusted correlations that are 0.47, -0.25, and -0.36, respectively (Kotov et al., 2010). Agency appears to be related to lower depression and higher well-being to a lesser extent (for a review see Helgeson, 1994). However, unlike the Big Five, the meta-analyses are largely from the 20th century and are less translatable because

they do not simply report correlations from two dimensions (agency and communion) rather they use different groupings of categorized males and females to separately correlate with depression. Communion appears to be a non-existent to weak correlate of both depression and well-being (Helgeson, 1994). Certain aspects of well-being, like adjustment, have shown some positive associations but all in all communion appears to be mostly unrelated to these constructs of mental health directly. In short, subjective well-being and depression are each most strongly related to neuroticism, extraversion, conscientiousness, and agency.

These findings from past research on relationship power, the Big Five, and Agency-Communion highlight how traits that differentiate people for their characteristic patterns of behavior, thoughts, and feelings are importantly related to relationship and health outcomes. Due to prior limitations, research with higher amounts of sexual and/or gender diversity is needed.

1.3. Social Influences

The importance of social connections on development, well-being, and longevity has been established through decades of psychological research (e.g., Holt-Lunstad et al., 2010; Jose et al., 2012). People do not do well in total isolation for long periods of time (e.g., solitary confinement in prisons; Strong et al., 2020) or from being raised isolated with limited care or love as shown from (Spitz, 1945). Romantic relationships are a key social experience that can have positive, or negative, impacts on mental health (Gómez-López et al., 2019). Personality has been shown consistently to be related to romantic relationship outcomes, like relationship satisfaction, conflict, and abuse (Karney & Bradbury, 1995). In part as Caspi et al. (2005) describe, personality is related to relationships due to both selection and exposure. These findings have held up across multiple romantic relationships in a person's life and longitudinally with evidence that personality precedes and influences later relationship trouble (Caspi et al.,

2005; Ehrensaft et al., 2004; Robins et al., 2002). I focus here on four constructs that span romantic relationships to other community or workplace interactions to all general relationships. These social influences have been studied as more proximal influences on health. A person's individual characteristics might directly impact their health, but they also will interact with the social influences in their lives to determine how people fair. For example, someone who is extraverted likes spending time with people and if they are feeling very lonely or dissatisfied with their relationship, this likely will lead to worse coping and worse depression. In contrast, an extraverted person who is well-supported or happy with their relationship might cope better and have better subjective well-being. I next discuss the literature on relationship satisfaction, social support, social isolation, and discrimination selected to cover a wide breadth of relationship variables.

1.3.1. Minority stress (discrimination)

Closely related concepts that try to capture the experiences of those who are marginalized for any reason are minority stress and discrimination. These constructs have been studied in a variety of contexts, like racial identity (James, 2022), ethnicity (Smedley et al., 1993), gender (Hendricks & Testa, 2012), sexuality (Meyer, 2003), and the intersection of multiple marginalized identities (Cyrus, 2017). Minority stress is not specific to any one measure. Instead, minority stress refers to many processes, behaviors, and attitudes that disproportionately affect minority groups, so discrimination is the focus I have for one way in which people in the minority are treated badly or unfairly by those around them. To clarify, discrimination experiences can happen to anyone because it can be targeted based on a variety of social identities. So, I expect non-zero discrimination experiences in cisgender binary, heterosexual folks especially if starting with a binary indicator of discrimination experiences. But it is

expected that there should be markedly less discrimination than that experienced by someone who is gender diverse, sexually diverse, or both. It is well-established that sexual and gender diverse people experience increased rates of discrimination and these are related to poor mental and physical health outcomes (Caceres et al., 2017; Kessler et al., 1999; Lick et al., 2013; Valentine & Shipherd, 2018).

Mental processes that allow infants to identify or differentiate faces of different races or ethnicities develop as young as 6 months (Quinn et al., 2002), so perceptions of differences, or novelty, begin in infancy. A few years later, toddlers are being socialized according to gender roles that distinguish boys from girls as described by social role theory (Van Lange et al., 2012). Toddlers learn to associate specific things, like pink clothing, with girl and other things with boys, like blue clothing. Children are more rigid in their adherence to gender roles which leads to gender policing of kids who would be more ambiguous or do things that are not in line with their assigned gender, such as a boy wearing a skirt on the playground (Payne & Smith, 2016). Yet gender non-conformity or the knowing that one's self does not align with the assigned sex at birth can begin at young ages (Fast & Olson, 2018). Similarly, indications of sexual orientation are present early in life (Bailey & Zucker, 1995).

As early as childhood, discrimination in some form begins towards non-conforming kids. Biases in childhood are already present showing high saliency of gender (Steele & Lipman, 2023). Throughout adolescence, discrimination experiences in school and peer groups increase (Rivas-Koehl et al., 2021), and this might vary by generation (Andersen & Fetner, 2008), geographic region in the U.S., (Swank et al., 2013), between nations (Flores, 2019; Gerhards, 2010), and by other environmental characteristics associated with where people live. Attitudes towards those who break gender binary or heteronormative roles are not always positive. Select

traits are associated with these negative attitudes, like political orientation (Jensen et al., 1988), religiosity (Whitehead, 2010), educational attainment (Ohlander et al., 2005), age (Jensen et al., 1988), and intergroup contact (Collier et al., 2012; Smith et al., 2009).

Discrimination continues in college and the workplace. Graduating, getting hired, being promoted, or keeping a job is harder when one is a sexual or gender diverse person on average in the U.S. (M. Badgett, 2009; Cortez et al., 2021; A. E. Goldberg, 2018). From childhood through adulthood, many settings are not truly an equal opportunity for those who hold diverse sexual orientations or gender identities. Buffering against these discrimination experiences are coping mechanisms, such as friends, community (specifically queer communities), and family (Cyranowski et al., 2013; Frost et al., 2016; Valentine & Shipherd, 2018).

Discrimination is positively associated with depression and negatively associated with subjective well-being. In a small sample of cisgender lesbian/gay or bisexual adults, discrimination and subjective well-being were moderately correlated ($r = -0.24$; Conlin et al., 2019). In meta-analyses, a similar average effect is found for perceived discrimination ($r = -0.24$), which is larger for disadvantaged groups, like queer folks, versus advantaged groups (cisgender, heterosexual folks; Schmitt et al., 2014). When discrimination is operationalized as microaggressions, the cross-sectional correlation with depression is 0.34 (Dyar et al., 2020).

1.3.2. Social isolation (loneliness)

Transitioning now into what is known about social isolation, or loneliness, it is first important to understand that loneliness is the difference between desired and actual social connections (Peplau, 1985). There is an estimated 15-30% of the population that is in a chronic state of loneliness, whereas most people (79%) report feeling lonely at least sometimes (Heinrich

& Gullone, 2006). Loneliness can be quite stable over long periods of time as evidenced by cross-time correlations around 0.48 to 0.55 when taken 5-years apart (Abdellaoui et al., 2019). Not only is loneliness quite prevalent, but it is also related to important physical and psychological health outcomes. Those who feel lonely experience a 26% increase in likelihood of death (Holt-Lunstad et al., 2015). Younger ages, including adolescents and young adults compared to older adults, have the highest reports of loneliness (Barreto et al., 2021) and are at 57% increased risk for death (Holt-Lunstad et al., 2015). Other physical health symptoms, like sleep problems, cardiovascular functioning, and immune functioning, are worse for those who are more lonely (for a review see Heinrich & Gullone, 2006). Mental health is also associated with loneliness, mainly depression and suicidal ideation or suicidal risk amongst others, like schizophrenia, anxiety, and social anxiety (for a review see Heinrich & Gullone, 2006). Evidence from longitudinal studies show loneliness at baseline related to higher follow-up depression symptom severity (Wang et al., 2018). So, while it is expected that most of us might feel lonely at times there are severe consequences linked to being lonely chronically or very highly, recurrently.

There have been differences found between sexual and gender identities in loneliness. Men appear to be more lonely, on average, than women using reports of participants from 237 countries (Barreto et al., 2021). In surveys that include more gender identities, nonbinary people are more lonely than cisgender binary peers. The odds ratio in a sample of 69 transgender nonbinary Norwegian young adults was 2 to 5 times more likely to be lonely than the 50,000 cisgender binary Norwegian adults (Anderssen et al., 2020). Compared to heterosexual people, those who are sexual minority adults were, on average, more lonely ($d = 0.35$) in a national sample of U.S. older adults (Hsieh & Liu, 2021). Also, comparing sexual and gender diverse

people to cisgender binary, heterosexual people shows that loneliness is higher in SGM people (Eres et al., 2021), and this is true across all ages (Herrmann et al., 2023). Specific patterns are not often available due to small subgroup sizes, e.g., not knowing the patterns within sexual minorities or gender minorities. In part higher loneliness is hypothesized to be because of social supports in place or their lack and the “other”-ing forces of being in the minority. For loneliness, there are strong links with depression ($r = 0.65$; Gonzalez Avilés et al., 2021) as early as adolescence, and with subjective well-being through old age ($r = -0.33$; Rochelle, 2022). Higher loneliness, particularly if caused by systemic disadvantages in certain groups, is of high priority to understand especially when considering the close ties to depression.

1.3.3. Social support

Social support is the physical, mental, or emotional support given by any one in a person’s life—family, friends, significant others, etc. It can be relationship specific, but here and in general, it is studied broadly to determine whether there are close social connections in a person’s life that will help them through the good and the bad. In childhood and adolescence, the supports are largely from parents and family, and this social support is related to lower depression (Gariépy et al., 2016). In adulthood and late adulthood, emotional support from spouses is key to protect against depression because this is often people’s most significant and close relationship (Gariépy et al., 2016). Adults in Western countries—like the U.S. and UK—show associations between poor baseline social support and low follow-up life satisfaction and worse follow-up depression in non-clinical and clinically-diagnosed populations (Wang et al., 2018). The association between social support and mental health is not moderated by sex assigned at birth (Fasihi Harandi et al., 2017). Further past evidence suggests the association

should be similar for gender diverse people (Valentine & Shipherd, 2018) and for lesbian or bisexual women (Ehlke et al., 2020).

Despite the emphasis in adulthood on spousal support, social support is a general measure of emotional and instrumental support. It covers many domains and many relationships to account for differences between people in who shows up and who matters in their life (Cyranowski et al., 2013). While the average adult receives most support from their spouse, there are still those who would most highly rate a friend or family member. This can change within a couple of years as was shown in a sample of college students with within-person across-time correlations in social support ranging from 0.35 to 0.48 (S. Hu et al., 2022). Sources of social support may differ for different groups as well (Frost et al., 2016). Frost and colleagues (2016) found in a New York community sample that lesbian, heterosexual, or bisexual women rely on families more than gay or bisexual men who rely on other lesbian/gay or bisexual people for support. Overall, sources of support may differ between individuals or groups but having social support is important to health and well-being.

There is a negative association between social support and depression (OR = 0.53; Gariépy et al., 2016) across all ages and sources of support, suggesting that having support is related to lower odds of having depression. This is true for all groups (Valentine & Shipherd, 2018). Lastly, the correlations within-time between social support and loneliness point to distinct constructs that are mutually influential and not redundant ($r = -0.39$; Zhang & Dong, 2022). It could be assumed that the absence of support is loneliness. However, this is not what the research has shown.

1.3.4. Relationship satisfaction

While the importance of romantic relationships was stated earlier when discussing relationship power, here I am interested in the happiness and quality of romantic partnerships. In other words, how satisfying is the relationship built with this partner? In early adulthood, referring mainly to college populations, relationship satisfaction decreases within the first year of a relationship. Across the lifespan, relationship satisfaction declines from age 20 to age 40 and then increases until retirement age (Bühler et al., 2021). The 20-year span of average decline in satisfaction is consistent with the time in which the average person leaves college, starts a job, makes a home, and raises a family. Responsibilities mount and less time is put into the relationship with the partner. This evidence showing the life span development of relationship satisfaction comes from a meta-analysis of mean-levels in cross-sectional data and mean-level change in longitudinal data (Bühler et al., 2021).

Previous research has shown mixed findings when searching for gender differences in relationship satisfaction. Instead, meta-analyses derived mostly from community samples show no differences between men and women (Bühler et al., 2021). It was noted in these results that dyadic data was coded separately to strengthen moderator analyses of gender, which suggests that all the dyadic data was from man-woman partnerships. No indication of sexual orientation was coded in the study by Bühler et al. (2021). Other single studies have looked at differences in gender, relationship-type, and/or sexuality. Research shows that within-gender between-orientation comparisons suggest little to no differences for women and men who are heterosexual or gay/lesbian (Cusack et al., 2012) and similar results were seen between-gender between-orientation (Duffy & Rusbult, 1986). Other studies with higher proportions of diversity, meaning representing more than just two genders and two sexual orientations, do not always look for

these between-group differences and instead look at overall minority group effects (S. M. Haas & Lannutti, 2021), which is also highly important work; however, does not help to resolve the search for group differences.

Relationship satisfaction is one outcome that is investigated in terms of relationship maintenance behaviors (e.g., assurances, understanding, and sharing tasks; S. M. Haas & Lannutti, 2021; Ogolsky et al., 2017), individual differences (Malouff et al., 2010; O'Meara & South, 2019; Schaffhuser et al., 2014; Ta, 2017), and relationship status (e.g., married versus unmarried). Relationship satisfaction studied as a predictor of health and well-being shows it positively impacts well-being (Proulx et al., 2007) and impacts physical health (Randall & Bodenmann, 2017). This result was replicated in a sample of sexual and gender diverse people assigned female at birth suggesting the process by which relationships buffer against negative health might be similar across groups (Whitton et al., 2021). All in all, relationship satisfaction is a context in which individual traits affect the individual outcomes of each partner. The context of your current relationship is influenced in part by how happy you are as well as how happy your partner is. Together you create a highly satisfactory relationship or a poorly disappointing one. Past research on relationship satisfaction often was nested within heterosexual relationships or same-gender relationships, so I compiled evidence from each to show consistent findings across relationship-types. Relationship satisfaction is associated with higher subjective well-being in heterosexual marriages ($r = 0.37$; Proulx et al., 2007). It is also related to lower depression in same-gender relationships ($r = -0.33$; Whitton & Kuryluk, 2014), in women who are young adults and dating ($r = -0.38$; Whitton & Kuryluk, 2012), in men who are young adults and dating ($r = -0.19$; Whitton & Kuryluk, 2012), and in heterosexual marriages ($r = -0.50$ - -0.54 ; Culp & Beach, 1998). Studies that look at simply relationship involvement rather than the quality of the

relationship point also to a negative association with depressive symptoms ($r = -0.11$; Whitton et al., 2021). Those who want a romantic partner in their life and have a satisfying relationship are less depressed and have higher subjective well-being on average.

The social influences I describe are all related to depression and subjective well-being. I have also shown that the associations within-time are similar in magnitude ($r > 0.30$). The exception is that loneliness is most strongly correlated with depression and depressive symptoms in all forms. These findings from past research on discrimination, loneliness, social support, and relationship satisfaction begin to develop our understanding of relationship dynamic effects on mental health. However, the romantic relationships literature suffers from several major limitations. First, research is typically limited to highly homogeneous, non-representative samples, including (but not limited) to the exclusion of participants who are not in man-woman relationships. Second, there is an overwhelming reliance on cross-sectional data that limits our ability to evaluate dynamic associations. Third, results (especially with relationship power or diverse groups) are typically drawn from small-scale, highly-specific, largely qualitative or experimental research, which limits statistical power for formal hypothesis testing and the potential to make use of data for future secondary analysis or meta-analysis (Junkins, Dugan, et al., 2024).

1.4. Current research

In order to address the questions raised here, I developed a longitudinal survey using online recruitment to examine the concurrent and cross-lagged associations among individual traits, social factors, and mental health in a more sexually- and gender-diverse sample than is typically included in psychosocial research. By employing inclusive recruitment, inclusive language in questionnaires, and statistical methods appropriate to estimate precise effect sizes, I

address the gaps in the literature raised here. For this research, I examined associations between the following constructs assessed monthly or every other month in our dataset—Big Five, Agency-Communion, relationship power, relationship satisfaction, social support, social isolation, discrimination, depression, and subjective well-being. The focus of the statistical precision analyses below and the study results were on meaningful effect sizes defined a priori and precise estimation rather than statistical significance. Study ¹1 evaluated differences in cross-sectional associations, means, and variances. Study 2 examined intercepts from growth models, rank-order stability, and cross-lagged associations.

¹ Please note that Study 1 and Study 2 in the thesis are both available as preprints. Co-authors contributed and reviewed each preprint but the work was primarily done by the first author. Study 1 included here is a long draft of the full manuscript with much fewer co-author revisions. Study 2 is a match to the preprint, the first author only had one draft lightly revised by co-author feedback.

They appear in the references as:

Junkins, E. J., Ogolsky, B. G., & Derringer, J. (2023). Not Like Everybody Else But We're the Same: Psychosocial Variables across Diverse Sexual and Gender Identities. [Preprint]. <https://doi.org/10.31234/osf.io/asfx2>

Junkins, E. J., Briley, D. A., Ogolsky, B. G., & Derringer, J. (2024). Psychometrics of psychosocial variables in a sexual and gender diverse longitudinal study. [Preprint, Version 1]. <https://doi.org/10.31234/osf.io/wxkmd>

CHAPTER 2: SURVEY AND METHODOLOGY

2.1. Recruitment

The sampling methodology of the study was unique. I used inclusive ads and targeted messages that acknowledged the current state of science underrepresenting portions of the population. As I have seen in prior work, people are quite aware of some of the gaps in science especially as it pertains to ignoring marginalized groups (Junkins, Chehab, et al., 2023). The ads varied to cue people into who we were trying to explicitly include, i.e., pride flags, rainbows, and other pride imagery, or general ads to advertise the relationship focus of the study. I used color schemes that were darker blues, greens, reds to attract more men to the study as that is often a challenge especially for relationships research. The flags and other inclusive messaging were clearly targeted at diverse sexual and gender identities, and I did in fact see large numbers of people with these identities participate. The study design helped with this as well because our demographics better matched who I said I wanted to include. For example, the way I measured sexual orientation and romantic orientation showed I understood and acknowledged a wide array of identities and their complexity by allowing multi-select.

The one tailored targeting I could include on Meta (Facebook/Instagram) was to target people “interested in relationships.” As a result, I feel this led to a larger number of people with polyamorous or other consensual non-monogamous relationships. It could be that getting more queer identities led to this, but our recruitment method could also have led to the numbers I saw. I also used posts on Instagram sharing “results” which were single-item data summaries and other information posts as passive recruitment methods. I did not use money to boost these as ads but I used hashtags and tried to retain an active presence online. There is much less back and forth with participants on Instagram than social media sites like Reddit. But Facebook/Meta was

quickly eliminated as a place to recruit SGM identities due to negative feedback that quickly and consistently popped up on ads. In short, based on recruitment I was able to obtain diverse, knowledgeable, interested, and older participants on Instagram than other traditional avenues (e.g., undergrad psych pools or survey services like MTurk).

To illustrate the success and diversity with gender and sexual orientation, I include Table 2.1 to show how people responded to single categories among the list of options for each identity. For gender and sexual orientation, there were checkboxes for selecting multiple identities and for racial identity/ethnicity there was one open textbox. The multi-select option showed that one label does not fit the majority of people. In the sample of 1,777 people (used in study 2), 513 used two labels and 763 used three or more options to describe their gender identity. A large number (441) used two options for sexual orientation, and 1,328 used three or more options. See the overlap between each identity in Table 2.1.

Table 2.1. The overlap of each gender and sexual orientation pre-specified option (agender and queer were some of the most common write-ins that should have been included in the list of options). The total n will exceed the number of people since so many used more than one label.

Gender identity	Sexual orientation								
	Asexual	Greysexual	Demisexual	Gay/lesbian	Heterosexual	Bisexual	Pansexual	Unsure	Prefer add
Transgender	77	33	75	153	6	202	133	13	100
Cisgender	43	11	52	111	142	200	68	26	39
Man	39	14	36	133	150	126	57	17	32
Woman	62	23	84	155	223	304	120	38	61
Nonbinary	95	44	95	129	8	216	155	15	103
Gender nonconforming	46	24	55	98	5	122	84	10	54
Genderqueer	50	32	67	91	12	147	108	15	70
Masc/masculine	50	22	49	137	38	145	75	17	63
Femme/feminine	34	14	53	95	53	171	85	12	50
Fluid	34	23	45	42	4	77	75	10	27
Prefer add	22	10	14	31	0	27	16	4	32

For the initial survey, participants were recruited through the website

(<https://publish.illinois.edu/powerstudy-research/>), through advertisements on social media, Reddit, Instagram and Facebook, and via university psychology sites. Paid ads were used on Facebook twice and Instagram four times. An online survey link redirected participants to the REDCap survey where they filled out the questionnaires and either entered an email (for longitudinal follow-up) or exited the survey (for one-time participation). Upon completion of the first survey, participants were provided a unique partner code to share. At the start of the survey was a place to enter this code if shared. This way I can link data for romantic partners to do dyadic analysis in the future. Personalized links for the first follow-up were emailed to all participants that were 18 or older, consented, and provided their email. Based on preliminary

data from the survey, the initial survey took approximately 27 minutes, and follow-ups took less time. For all follow-ups, monthly automated messages were sent from REDCap as long as participants completed a survey within the last 60 days. After that, they were no longer contacted. Payments were sent each month on the 23rd until September 23, 2023, when the 1-year grant ended. Forty participants who completed month 3 or beyond since the prior payment were selected and sent an Amazon ecode for \$30 directly. The first several months with funding only had a handful of winners, February 2023 was the first month where there were forty eligible people. The study protocol was approved by the Institutional Review Board at University of Illinois Urbana-Champaign (IRB#22114).

The survey at time 1 consisted of all measures (Table B2), and each subsequent assessment surveyed the core measures and alternated other measures (Table B3). Monthly assessments were selected on the basis of previously documented patterns of change in mental health outcomes, including depression (Hasin et al., 2018). The assessments were planned to occur indefinitely based on participant engagement, external funding, and resources. Measures were selected to cover a broad range of constructs most relevant to romantic relationships (Joel et al., 2020).

2.2. Study Design

2.2.1. Demographics

Demographic items are: age (text field); country (drop-down menu); U.S. states (drop-down); education (secondary school, vocational training, 2-year degree, some university, graduate & postgraduate degree); employment status (are you currently employed? Select multiple- unemployed, unable to work, student, employed including self-employed); if employed are you in a supervisory role or a leadership position? (yes, unsure, no); job title (text field);

employer (text field); healthcare coverage (yes/no); healthcare coverage provider (job/employer, school, self, spouse/partner; parent; national service); medical care and medicine monthly expenses (almost nothing, a little, some, somewhat a lot, a lot); socioeconomic standing (slider from 0 to 100); children or dependents (yes/no); number of children or dependents (text field); race/ethnicity (text field); sex assigned at birth (male, female, intersex); gender (check all: transgender, cisgender, fluid, man, woman, nonbinary, genderqueer, gender nonconforming, masc/masculine, femme/feminine, prefer to self-describe open box); sexual orientation (asexual, bisexual, demisexual, gay/lesbian/homosexual, grey-sexual, pansexual, straight/heterosexual, unsure, prefer to self-identify open box); romantic orientation (aromantic, biromantic, demiromantic, grey-romantic, heteroromantic, homoromantic, panromantic, polyromantic, unsure, prefer to self-describe open box); sexual and/or gender minority (yes/no); personal pronouns (check all: she/her, he/him, they/them, zie/zim, sie/sie, ey/em, ve/ver, tey/ter, e/em); current relationship status (check all: single, openly dating partner(s), exclusively dating partner, cohabitating, engaged/ married, consensually non-monogamous); for single, ever been in a relationship (yes/no); how many current relationships (text field); relationship-type (matched gender relationship, differing gender relationship, prefer to self-describe open box); relationship length (months open box, years open box). Partner demographics asked with the same answer choices include: gender, sexual orientation, and romantic orientation. All other information was decided to be identifying by the IRB at UIUC and so would require partner consent.

2.2.2. Attention check

One question asked “Is there any reason we should not use your data?” with a checkbox saying “yes.” The follow-up text box asks for what reason should we not include your data. For people who say they lied or otherwise tried to mislead us, then their responses were removed.

2.2.3. Diary

Discrimination items. Nine items were written to assess experiences with discrimination (yes/no), sources of discrimination, harmfulness of experience, sources of support, and two open-text fields on responses to experience and/or the perpetrator and coping.

Two open-ended prompts for participants to journal. “Is there anything else that you would like to write about? Any significant events in your life? You can use this space however you choose.” and “Is there any other feedback you would like to leave? About the survey? About your experiences in general?”

2.2.4. Scales

i. Individual Differences

Overall Relationship Power Inventory (Farrell et al., 2015) is a 20-item self-report inventory. It assesses the general power dynamics of couples as reported by one partner. It taps into both individual’s power and partner’s power, and looks at process power (i.e., “I tend to lead and structure discussions”; “My partner tends to bring up issues”) and outcome power (i.e., “I get the final say when making decisions”; “My partner tends to give in to my preferences”) for both the individual and their partner. Items are rated 1 (*never*) to 7 (*always*) with midpoint 4 (*sometimes*).

Experiences in Close Relationships- romantic relationship structure (Fraley, Heffernan, Vicary, & Brumbaugh, 2011) is a 9-item self-report instrument. Responses are rated from 1 (*strongly disagree*) to 7 (*strongly agree*). It assesses attachment patterns across multiple close relationships. The same items are used to assess attachment styles to 4 targets (mother, father,

romantic partner, and best friend). A score for attachment anxiety and attachment avoidance is calculated from each target.

Big Five Inventory-2 (Soto & John, 2017) is a 60-item inventory. The scale assesses the 15 facets of the Big Five from the BFI-2 with four items apiece, so facet-level analyses can be done in large enough samples. The five factors are extraversion (facets: sociability, assertiveness, and energy level), agreeableness (compassion, respectfulness, and trust), open-mindedness (intellectual curiosity, aesthetic sensitivity, and creative imagination), conscientiousness (organization, productiveness, and responsibility), and negative emotionality (anxiety, depression, and emotional volatility). The items are brief definitions, adjectives, or synonyms of traits (i.e., “Is complex, a deep thinker.”) that participants will respond 1 (*disagree strongly*) to 5 (*agree strongly*) that they are “someone who...”. Trait-level and facet-level averages will be obtained from the corresponding items.

Traditional Masculinity-Femininity (Kachel et al., 2016) is a 12-item scale. It measures the core concepts of Masculinity/Femininity (i.e., gender-role adoption, gender-role preference, and gender-role identity) on unidimensional scales. Six items ask participants to rate their interests, attitudes and beliefs, behavior, appearance, and how they consider themselves from 1 (*not at all masculine*) to 7 (*totally masculine*). An identical 6 questions are rated from *not at all feminine* to *totally feminine*. Average scores will be obtained for masculinity trait and femininity trait.

Agency-Communion Inventory (Abele et al., 2016) is a 20-item inventory. The measure assesses two facets per domain (agency and communion). For agency, there is assertive and competence facet. For communion, there is warmth and morality facet. Respondents rate how descriptive a trait is of them from the negative pole to the positive pole. For example, one

communion-warmth item is little caring (1) to very caring (5). And an agency assertive item is “give up very easily” (1) to “never give up easily” (5). Trait-level and facet-level averages will be calculated from the respective items.

ii. Relationship Functioning Outcomes

Relationship Assessment Scale (Hendrick, 1988) is a 7-item self-report instrument. It assesses global satisfaction with an individual’s current relationship from 1 (*poorly*) to 5 (*extremely well*). An example item is ‘How well does your partner meet your needs?’. One score is computed for relationship satisfaction.

Social Support (Cyranowski et al., 2013) is a 16-item measure. The self-report scales comes from the adult Toolbox Social Relationship scales compiled by NIH. These items assess emotional support and instrumental support. Items are rated from 1 (*never*) to 5 (*always*). One variable average will be used in further analysis.

Social Isolation Scale (D. W. Russell, 1996) is a 20-item inventory. Nine of the items are reversed so higher scores reflect greater loneliness. One lonely average will be used in further analysis.

iii. Mental Health Outcomes

Quick Inventory of Depressive Symptoms (Rush et al., 2003) measures depression. Each items is rated 0-3 with 0 referring to no symptoms and 3 referring to highest level of symptom. High scores relate to more depressive symptoms. One score is computed for depression.

Satisfaction with Life Scale (Diener et al., 1985) is a 5-item measure of subjective well-being. An example is ‘The conditions of my life are excellent’. Items are rated 1 (*Strongly disagree*) to 7 (*Strongly agree*). One score is computed for subjective well-being.

For the following studies, the structural equation models included latent measurement models. I prioritized the study variables that cover a wide range of psychosocial processes. These include relationship power, Big Five, Agency-Communion, relationship satisfaction, social support, social isolation, discrimination, depression, and subjective well-being. The full dataset was built to address a wide range of important questions, of which, I have prioritized the following to lay the groundwork for further research: are cross-sectional psychosocial processes equivalent across people who are sexual and/or gender minority and those that are not; is growth of important psychosocial variables equivalent across groups; and, are stability and validity psychometric metrics similar in magnitude and generalizable across groups. The focus of the statistical precision analyses below and the study results were on meaningful effect sizes defined a priori and precise estimation rather than statistical significance.

CHAPTER 3: PSYCHOSOCIAL FACTORS AND HEALTH ACROSS DIVERSE SEXUAL AND GENDER IDENTITIES: CROSS-SECTIONAL STUDY 1

Studied in tandem, the present study sought to investigate psychosocial correlational processes through mean, variance, and correlation differences in an explicitly sexual and gender diverse sample. Individual traits—including relationship power, Big Five, agency, and communion; positive and negative social influences—social support, relationship satisfaction, loneliness, and discrimination; and mental health outcomes—depressive symptoms and well-being were examined. The equivalence of parameters (Jöreskog, 1971; Sörbom, 1974) (means, variances, and correlations) were tested across demographic variables—SGM status, gender, transgender, sexual orientation, monogamy, and in relationship—using structural equation modeling and bootstrapped parameters. Following the statistical precision analysis described below, approximately 800 participants per group were needed to have the statistical precision to detect mean differences and 600 participants per group were needed to detect correlation differences with narrow confidence intervals (CI width ≤ 0.20). The results were evaluated in terms of within domain versus across domain associations. In short, mean, variance, and correlation differences were examined across diverse sexual and gender identities. The study was preregistered on <https://osf.io/fnu4h/>.

- *Hypothesis 1a*: Means were expected to differ mostly in the small range for individual traits, positive social influences, and well-being ($|d| < 0.22$) and in the small to large range for negative social influences and depression ($|d| < 0.44$).
- *Hypothesis 1b*: Variances were expected to be equivalent across groups ($V_{ratio} = 1$). These results were exploratory, and it was expected that variables which had larger mean differences would also have larger variance differences.

- *Hypothesis 2*: Correlations were expected to be equivalent across groups ($\Delta r < 0.20$).

Methods

Dataset

Data came from an online, social media advertised study described in Chapter 2 (POWER study: <https://publish.illinois.edu/powerstudy-research/>). Measures were selected to cover a broad range of constructs most relevant to romantic relationships and personality psychology (Joel et al., 2020). The survey was started in January 2022 with minimal recruitment efforts while technical bugs and funding were worked out. Recruitment efforts increased when funding was secured from the Center for Social and Behavioral Sciences in September 2022. The survey instrument is available with code for all analyses and model estimated correlations in each group on OSF: <https://osf.io/fnu4h/>. The data is not completely openly shared. The survey questionnaire items without the demographics are made open at the OSF link. The reason for this is the heightened need for privacy with our data. Sharing directly, upon reasonable request, is considered by the authors.

Sample

The total sample size was 1,743 people. The majority of respondents were recruited using paid ads on Instagram (89% U.S. residents). The average age of the participants was 27.24 years old (SD = 8.95 years, range from 18 to 78). The majority of respondents identified as a sexual and/or gender minority (73.6%). The assigned sex at birth of the participants was 78.4% female, 20.3% male, and 0.5% intersex. There were 489 people who used transgender as part of their gender identity and 497 who used cisgender (gender and most demographics were multi-select). The education levels of the sample were majority some college or Bachelor's degree (50.9%)

followed by 22.1% with a graduate degree, and 17% with high school or secondary school education. Socioeconomic status was a 4.74 out of 10 on average based on standing compared to others in the same country ($SD = 2.04$). The racial identity of the participants was largely White (66%) roughly 6.6% multiracial, 6.4% Asian, 5.2% Black, 0.8% Middle Eastern, 0.7% Native or Indigenous, the rest did not want to report or used descriptions that do not fit within the definition of ‘race’ (e.g., “European”). Additionally, 9.4% of participants were Hispanic. For sexual orientation, people who selected multiple options were labeled as queer (e.g., one person selecting pansexual, heterosexual and demisexual), because the most common write-in was queer for sexual orientation and romantic orientation but also queer is an umbrella term for many identities. Over a quarter (26.3%) of the sample was queer, 20.9% heterosexual, 18.9% bisexual, 14.9% homosexual, 6% pansexual, 5.2% asexual, and 6.9% other (e.g., bi/pan, androsexual, demisexual, greysexual, and unsure). For romantic orientation, most people chose multiple or wrote in queer and were labeled queerromantic (20.9%), 16.8% biromantic, 14.9% heteroromantic, 13.9% homoromantic, 7.3% panromantic, 14.1% aromantic, greyromantic, demiromantic, bi/panromantic, polyromantic, and 10.4% were unsure.

There were originally 2,808 responses to the survey. The data were cleaned removing 59 people who did not consent, 985 who completed almost none of the survey past the demographics, 15 responded ‘yes’ their data should be removed, 3 completed the survey in an unreasonably short time, 1 inappropriate responder (extremely hostile), and 2 minors. I also pairwise removed romantic relationship-specific measures for those who were single and had never dated.

Grouping variables

There were large amounts of diversity in gender, sexual orientation, and relationship structures; therefore, I considered categorized versions of each of these variables as groups to compare. Based on the precision analyses, 600 people for correlation differences and 800 for mean differences were appropriate for precise estimates. Therefore, the sample sizes of SGM, women, genderqueer, monosexual, plurisexual, in relationship, and monogamous were sufficient for precise estimates. Below the thresholds were non-SGM, men, cisgender, transgender, asexual, single, and consensually non-monogamous, which means the effects estimated within these groups should be interpreted with more caution as the confidence intervals on effects were be greater than 0.20 in width. However, I am confident in the interpretations of effects from groups greater than 800.

Table 3.1. The grouping variables in the dataset that were used in the comparison analyses.

Identity and relationships	Sexual and/or Gender Minority (N=1,283)	Non-SGM (N=448)	Total
Man	225	127	353
Woman	345	254	605
Genderqueer	668	28	700
Cisgender	316	178	497
Transgender	478	8	489
Monosexual	296	324	624
Plurisexual	861	103	970
Asexual	113	10	124
In relationship	929	369	1,308
Single	353	78	432
Monogamous	1016	407	1,431
Consensually non-monogamous	266	40	309

Variables

Demographic items surveyed were: age; country and state (if applicable) of residence; education; employment status; socioeconomic standing (slider from 0 to 10); sex assigned at birth (male, female, intersex); gender identity; sexual orientation; romantic orientation; sexual and/or gender minority; current relationship status; and relationship-type. All but SGM identities and relationship structures were only used for description of the sample.

Individual traits. *Relationship power* (Farrell et al., 2015) is a 20-item self-report inventory assessing the general power dynamics of couples as reported by one partner. It taps into both individual's power and partner's power, and looks at process power (i.e., "I tend to lead and structure discussions") as well as outcome power (i.e., "My partner tends to give in to my preferences") for both the individual and their partner. Items are rated 1 (*never*) to 7 (*always*) with midpoint 4 (*sometimes*). *Big Five Inventory-2* (Soto & John, 2017) is a 60-item inventory. The scale assesses the 15 facets of the Big Five from the BFI-2 with four items apiece. The five factors are extraversion (facets: sociability, assertiveness, and energy level), agreeableness (compassion, respectfulness, and trust), open-mindedness (intellectual curiosity, aesthetic sensitivity, and creative imagination), conscientiousness (organization, productiveness, and responsibility), and neuroticism (anxiety, depression, and emotional volatility). Items are rated 1 (*disagree strongly*) to 5 (*agree strongly*). *Agency-Communion Inventory* (Abele et al., 2016) is a 20-item inventory. The measure assesses two facets per domain (agency and communion). For agency, there is assertive and competence facet. For communion, there is warmth and morality facet. Respondents rate how descriptive a trait is of them from the negative pole to the positive pole. For example, one communion-warmth item is little caring (1) to very caring (5). And an agency assertive item is "give up very easily" (1) to "never give up easily" (5).

Social influences. *Relationship Assessment Scale* (Hendrick, 1988) is a 7-item self-report instrument. It assesses global satisfaction with an individual's current relationship from 1 (*poorly*) to 5 (*extremely well*). *Social Support* (Cyranowski et al., 2013) is a 16-item measure. The self-report scales came from the adult Toolbox Social Relationship scales compiled by NIH. These items assess emotional support and instrumental support rated from 1 (*never*) to 5 (*always*). *Social Isolation Scale* (D. W. Russell, 1996) is a 20-item inventory rated from 1

(*never*) to 4 (*always*). Nine of the items are reversed so higher scores reflect greater loneliness. *Discrimination* is measured with two items written to assess experiences with discrimination (yes/no) and harmfulness of experience rated 1 (*not at all*) to 5 (*extremely*), so that all people at the group-level should report non-zero discrimination. The discrimination items were meant to measure general discrimination, so it could be discrimination based on appearance, racial identity, ethnicity, sexual orientation, religion, gender, etc. Harmfulness was predicated on someone having selected yes they have experienced discrimination in the last 6 months.

Health variables. *Quick Inventory of Depressive Symptoms* (Rush et al., 2003) measures depression. Each item is rated 0 (*no symptoms*) to 3 (*high*). The scoring for depression followed the original scale, so items were parceled for the highest score and then averaged over three parcels. *Satisfaction with Life Scale* (Diener et al., 1985) is a 5-item measure of subjective well-being. An example is ‘The conditions of my life are excellent’. Items are rated 1 (*Strongly disagree*) to 7 (*Strongly agree*).

A priori Statistical Precision Analysis

Statistical precision simulations were run for mean differences and correlation differences in order to find the sample size at which narrow confidence intervals are estimated (CI width < 0.20). In order to estimate statistical precision for the mean differences, I varied the sample size of each group to determine at what sample size the confidence interval width was 0.20. At sample sizes of 800 or greater, I can precisely estimate effects with narrow confidence intervals (see Figure E.1). Comparatively, running statistical power analyses with 80% power at small ($d = 0.22$), medium ($d = 0.33$), or large ($d = 0.44$) Cohen’s d , the sample size needed is 100 for large effects, 200 for medium effects, and 350 for small effects at $p < .05$ (see Figure E.1). The package used to conduct the precision and power analyses was *paramtest* (Hughes, 2017).

In order to estimate statistical precision for the correlation differences, two datasets were simulated specifying different population correlations and varying the sample sizes. Each time, 2,000 bootstrap samples were simulated. In the first set, normally distributed data with means of 0 and standard deviations of 1 were simulated. In the second set, ordinal non-normal data were simulated. The correlation difference was varied to be 0, 0.10, 0.20, or 0.30 with varying sample sizes shown in the supplement (Table C.1). Importantly, small sample sizes would allow a higher likelihood of falsely failing to reject the null (type II error) which is supportive of the present hypothesis. Therefore, the simulations were used to determine an appropriate sample size based on when the estimated bootstrap correlations reach similarity to the population parameters specified. Thus, for each correlation comparison, I require at least 600 people per group (confidence interval range of 0.20 shown in Table C.1). In Figure E.2, the elements that were varied are displayed and the output of each run is recorded. Packages *faux* (DeBruine, 2021) and *bootcorci* (Rousselet et al., 2019b) were used to complete the simulation.

Statistical Analysis

Each study variable was measured latently. Measurement invariance of each variable was first assessed by testing loadings and thresholds invariance (Svetina et al., 2020; Wu & Estabrook, 2016). Categorical data treatment was used for measurement invariance because the results would be closely aligned as continuous data treatment if the distribution truly is normal; however, based on past research, items were expected to be highly skewed (Rhemtulla et al., 2012). Missing data mechanism was pairwise and the estimator was ULSMV because it estimates robust standard errors and slightly outperforms WLSMV (Forero et al., 2009; Savalei & Rhemtulla, 2013; Yang-Wallentin et al., 2010). Fit between nested measurement invariance models was compared with the cutoffs of $\Delta CFI \geq -.01$, $\Delta RMSEA \geq .015$, and $\Delta SRMR \geq .03$ as

changes in these goodness of fit indices greater than these cutoffs would suggest worsening fit (Hu & Bentler, 1999; Chen, 2007; Cheung & Rensvold, 2002). Primary packages to run analyses were *lavaan* (Rosseel, 2012) and *semTools* (Jorgensen et al., 2021). In the subsequent analyses, structural equation modeling was used to freely estimate latent variable means, variances, correlations, and their differences between groups across each pairwise combination of variables (excluding within trait-facet correlations).

The latent means in group 2 were subtracted from group 1 and standardized to be Cohen's *ds*. Mean differences were considered small, medium, or large using these conventions: $0 \leq |d| < 0.22$ was non-existent to small; $0.22 < |d| < 0.44$ was moderate; $|d| \geq 0.44$ was large. These conventions were derived from comparisons of effects for personality (Allen & Robson, 2020; Junkins, Pantin, et al., 2024) and across psychology (Hyde, 1990; Zell et al., 2015). The ratio of latent variances was calculated as $V_{\text{group1}}/V_{\text{group2}}$. Variance differences were explored as they related to mean differences.

Last, the differences between correlations ($\Delta r = r_{\text{group1}} - r_{\text{group2}}$) were specified in measurement models with each pairwise combination of the variables by transforming the covariances to correlations within the defined parameters. Bootstrap procedures were applied to the parameters and confidence intervals around the bootstrap estimates were reported. Correlations were compared for equivalence.

A difference in correlations of 0.20 was determined to be meaningful as it relates to a conceptual change in correlation size from small to moderate or moderate to large (Cohen, 2013), whereas any smaller difference ($\Delta r < 0.10$) was expected levels of noise as shown in the simulation reported in the Supplement. The average psychology correlation is 0.21, and the range of most variables is $0.10 < r < 0.42$ (Lovakov & Agadullina, 2021). Again, a greater difference

than 0.20 would be meaningful here, and within the range of what I consider likely. Results for calculations of differences were presented in terms of the spread of effect sizes across all combinations.

Results

All in all, our hypotheses were supported. First, mean differences and correlation differences were mostly small equating to similarity. Second, variance differences which were exploratory, showed that even a variance ratio of 2 suggesting twice the variance in one group did not relate to two completely separate distributions. The structures of the two groups' distributions differed in which response option was the highest peak or in width, but there was often more within-group variance than between-group. Next, I discuss each result in more depth.

Table 3.2. The average variance and mean differences between each group comparison among the three domains of variables (health, social, and personality).

Group Comparison	Health		Social		Personality	
	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.
	variance	Cohen's	variance	Cohen's	variance	Cohen's
	ratio	d	ratio	d	ratio	d
SGM- nonSGM	0.977	0.362	1.201	0.253	0.999	0.248
Man-genderqueer	1.208	0.378	0.987	0.155	1.217	0.310
Woman-genderqueer	1.164	0.374	0.993	0.223	1.189	0.241
Man-woman	1.034	0.062	1.003	0.096	1.032	0.193
Transgender-cisgender	0.920	0.432	1.047	0.289	0.945	0.227
Monosexual-plurisexual	1.314	0.306	0.980	0.118	1.168	0.253
Monosexual-asexual	1.340	0.467	1.134	0.182	1.072	0.349
Plurisexual-asexual	1.083	0.172	1.166	0.180	0.939	0.313
CNM-monogamous	0.875	0.148	0.927	0.061	0.926	0.103
In relationship-single	0.889	0.294	0.896	0.545	0.989	0.162
Total average	1.080	0.300	1.033	0.210	1.048	0.240

Note. Variance ratio greater than 1 indicates the first group had a larger variance, and a ratio less than 1 indicates the second group had a larger variance.

Table 3.3. The average variance and mean differences between each group comparison per study variable.

Variable	Avg. variance ratio	Avg. Cohen's d
Subjective well-being	1.046	0.247
Depression	1.115	0.352
Social support	0.961	0.205
Relationship satisfaction	0.861	0.221
Loneliness	0.966	0.212
Discrimination	1.087	0.321
Harmfulness	1.292	0.092
Relationship Power	1.353	0.372
Communion	1.103	0.174
Warmth	1.035	0.205
Morality	1.054	0.102
Agreeable	0.965	0.167
Trust	0.903	0.064
Compassion	0.991	0.235
Respectfulness	1.038	0.185
Agency	0.994	0.251
A-Assertiveness	0.971	0.279
Competence	0.966	0.187
Extraversion	1.012	0.244
E-Assertiveness	1.074	0.251

Table 3.3 (cont.). The average variance and mean differences between each group comparison per study variable.

Sociability	0.958	0.218
Energy level	0.897	0.155
Conscientious	1.010	0.250
Responsibility	0.961	0.233
Productiveness	1.020	0.254
Organization	1.004	0.188
Neuroticism	1.029	0.282
N-Depression	0.958	0.246
Anxiety	1.102	0.352
Emotional volatility	0.993	0.199
Openness	1.237	0.377
Intellectual curiosity	1.244	0.355
Aesthetic sensitivity	1.327	0.413
Creative imagination	1.087	0.243

Note. A-assertiveness is the agency facet; E-assertiveness is the extraversion facet; N-depression is the neuroticism facet.

Mean Differences

The average mean difference between all groups was $d = 0.239$ and the range of differences was $0.002 < |d| < 1.327$. Overall, this suggests the average effect is a moderate difference with 54.7% of mean differences between all groups considered small. This was true across SGM status, gender (man, woman, nonbinary), cisgender vs. transgender, sexual

orientation (monosexual, plurisexual, asexual), single vs. partnered, and monogamy vs. consensual non-monogamy.

By domain, on average, the mean differences were small to moderate across all groups (Table 3.2). Health was an average difference of 0.30, social was 0.21, and personality was 0.24. The least differences ($|d| \sim 0$) were seen for traits like trust or other agreeable/communion facets, social support, and harmfulness (the rating of how harmful a discriminatory experience was perceived to be) across all identities (Table 3.3). The biggest differences as shown in Figure 3.1 were neuroticism, openness, and discrimination for SGM status, gender, and transgender vs. cisgender. Extraversion and openness were the largest differences for sexual orientation. And social variables were largest for relationship status but not monogamous vs. consensually non-monogamous. People who are consensually non-monogamous vs. monogamous had no non-small differences ($|d| < 0.257$).

Next, the patterns that emerged between groups within domains are discussed. For Health, specifically subjective well-being and depression, there were more similarities in subjective well-being as expected. The three largest differences were the difference between people in relationships and single ($d = 0.467$), followed by monosexual and asexual people ($d = 0.373$) and transgender and cisgender people ($d = -0.339$). Nonexistent to small differences were found between men and women, CNM and monogamous, plurisexual and asexual, and monosexual and plurisexual. For depression, the non-small effect sizes were the differences between monosexual and asexual people ($d = -0.560$), transgender and cisgender people ($d = 0.526$), men and genderqueer people ($d = -0.512$), women and genderqueer people ($d = -0.459$), SGM and non-SGM people ($d = 0.454$), and monosexual and plurisexual people ($d = -0.430$). There were no differences in depression between plurisexual and asexual people. These larger

effects are all in line with prior literature that suggests depression is higher in those that are part of marginalized communities meaning anyone outside of the heterosexual, cisgender, allosexual hegemonic norms (Borgogna et al., 2021; Ferlatte et al., 2020).

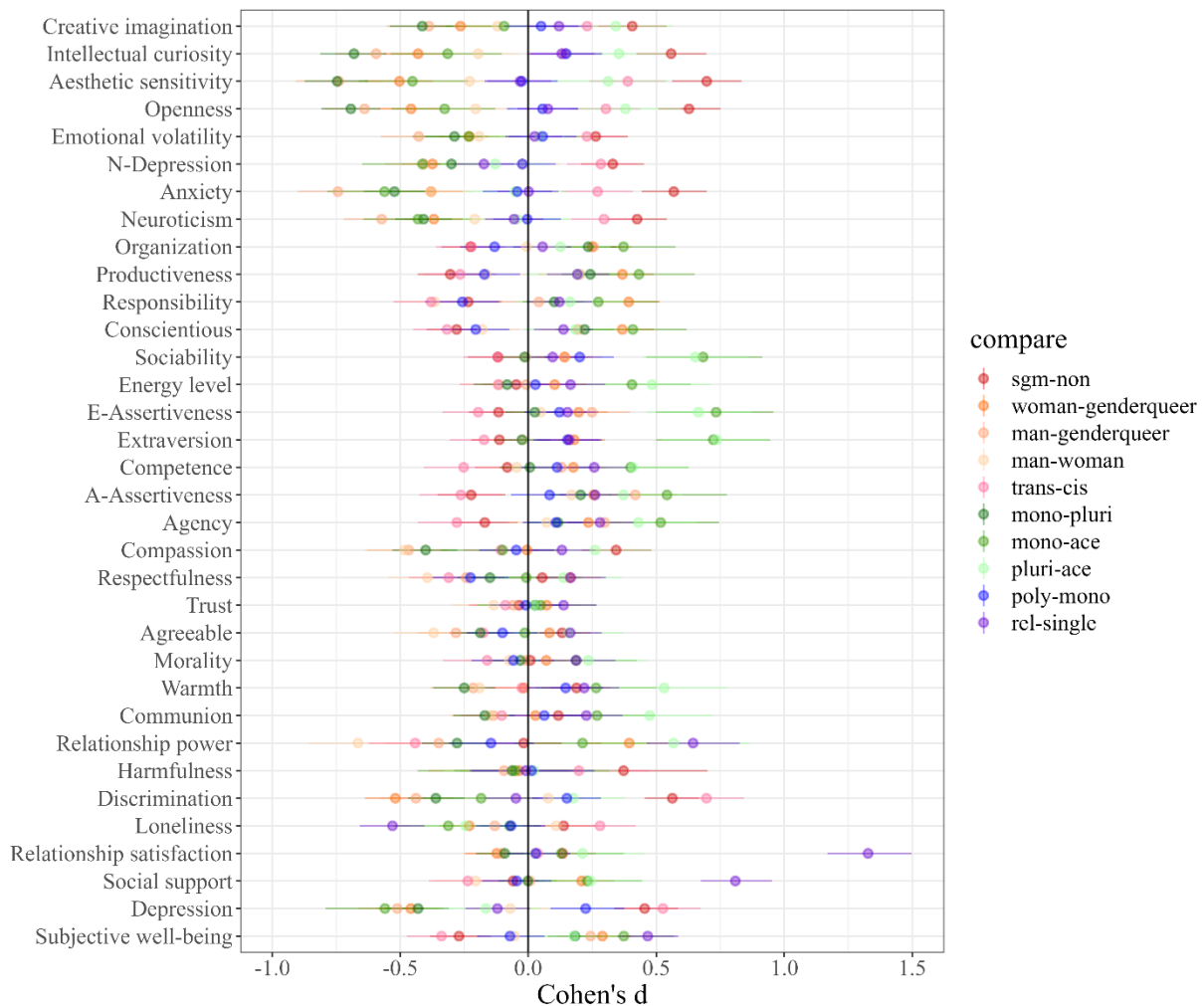
Social variables, which spanned from discrimination and loneliness to social support and relationship satisfaction, were most different between people in relationships and those not. Specifically, social support and relationship satisfaction were much greater in people in relationships likely because they have at least one built-in support—their romantic partner ($d = 0.809$). For partnered people, their current relationship is likely working well compared to single people who would have ended their most recent relationship suggesting it was not satisfying ($d = 1.327$). Loneliness was also higher in single people ($d = -0.530$). The next biggest social difference was in discrimination between transgender versus cisgender people and SGM versus non-SGM people (d 's = 0.696 and 0.563 respectively). People who are marginalized experience greater discrimination than their peers as we know. When comparing gender defined as men, women, and genderqueer people encompassing all nonbinary identities, genderqueer people reported higher rates of discrimination than men ($d = -0.439$) or women ($d = -0.519$) despite the fact that included in men are binary transgender men and in women are binary transgender women. These results would suggest it is those who try to live outside the binary or fluctuate between different presentations that could be suffering the most, on average. In sum, loneliness and discrimination had more group differences that were non-small than social support or relationship satisfaction.

Personality traits, especially openness facets, showed the greatest differences between men and genderqueer people and all sexual orientations. Traits like aesthetic sensitivity, anxiety, assertiveness, openness, and intellectual curiosity were the most frequent traits among

differences between Cohen's d of 0.50 and 0.75. Asexual people, on average, report lower extraversion and assertiveness than either monosexual ($d = 0.723$ and 0.734) or plurisexual people ($d = 0.736$ and 0.665) which matches prior research (Bogaert et al., 2018; Junkins, Pantin, et al., 2024). Men are less anxious and aesthetically sensitive than genderqueer people ($d = -0.744$ and -0.740) and overall less neurotic and less open (Junkins, Pantin, et al., 2024).

Relationship power, or the influence-ability and decision-making you hold compared to your romantic partner, is less similar between men and women ($d = -0.665$), partnered versus single people ($d = 0.644$), and plurisexual and asexual people ($d = 0.567$). Men report lower relationship power on average likely because the standard has shifted such that men who date women tend to go along with what the woman wants in small day-to-day matters. This is the norm that has been pervasive in media as the power of women at home has flourished. Therefore, relationship power is different to power outside the goings-on between romantic partners.

Figure 3.1. Mean differences between each grouping variable. Cohen's d on the left-hand side implies the first group in the legend is higher on the variable on average.



In order to visualize what similarities and differences were between these groups, I selected small, medium, and large examples of differences between different groups on the same variable. First in Figure 3.2, a small difference, Cohen's d of 0.21, was found between men and genderqueer people and people in relationships versus single on the communion facet, warmth. As seen in the figure, the differences look roughly similar with people who are genderqueer and people in relationships showing a higher peak and less spread. A medium difference, $d = 0.45$, shown for SGM status and women versus genderqueer people shows a slight shift of the

distribution to the left or right but the middle peaks are quite close. Lastly, the large difference, $d = 0.63$, on openness begins to show differences in distributions such that in certain groups (e.g., SGM and genderqueer) there is a large left-skew perhaps due to the reference point for these groups on how open the average person is.

Figure 3.2. Different effect sizes were selected to show the distributions.

Panel A. Small differences, $d = 0.21$

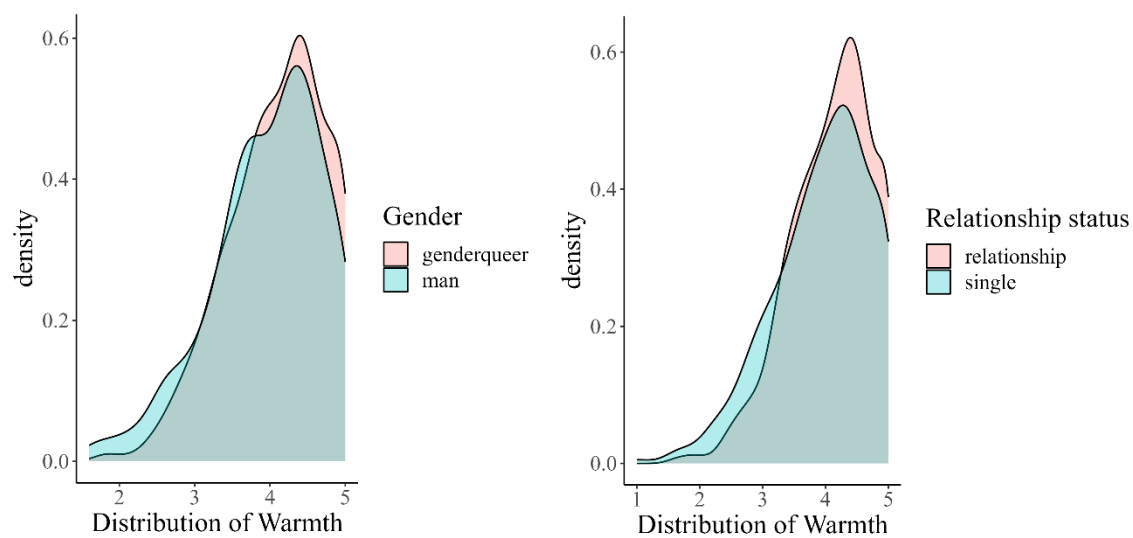
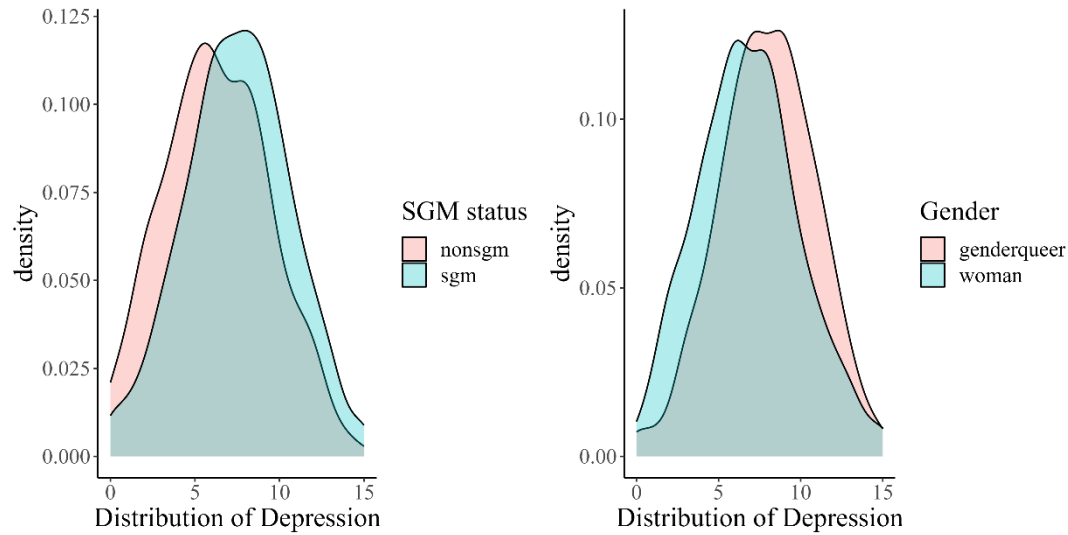
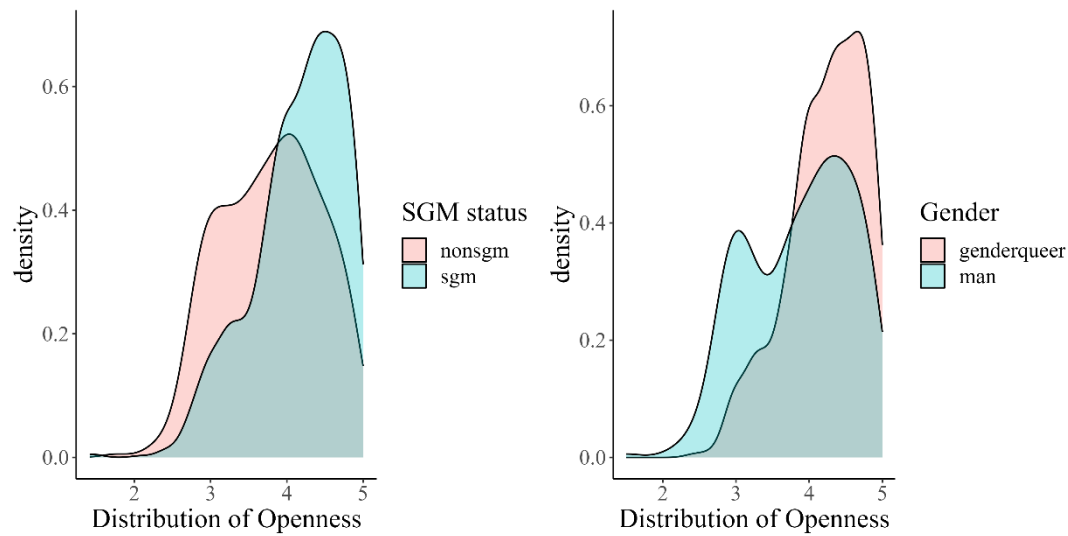


Figure 3.2 (cont.). Different effect sizes were selected to show the distributions.

Panel B. Medium differences, $d = 0.45$



Panel C. Large differences, $d = 0.63$



As shown in Figure 3.2 these differences still relate to a large amount of overlap even if the Cohen's d was 0.20, 0.45, or 0.63. In conclusion, similarities are prevalent across identities and relationship structures. Bigger differences are seen based on someone's current status, like

single, than based on identity. Each group contains substantial heterogeneity. Next, I discuss the variance ratios between groups. In this way, I address whether groups are equally heterogeneous or if one group is more or less heterogeneous.

Variance Differences

Comparing the variance ratios across the groups yielded some variables that may have greater variation in select groups (see Figure 3.3). The estimated ratios were in the range of 0.47 to 2.52 with the average ratio across groups being 1.047. A ratio of 1 implies completely equal variances, so the average implies across all groups and all variables the variances are equal. The domains of variables that were more often similar in either group was health. The variance ratios of depression and subjective well-being were more similar ($0.72 < v < 1.65$) than personality ($0.47 < v < 2.52$) or social relationships ($0.64 < v < 2.03$). Relationship power and openness of personality had the greatest variance differences between select groups (i.e., gender and sexual orientation). Harmfulness and discrimination of the social variables had the greatest variance differences between most identities (gender, sexual orientation, SGM status, trans vs. cis). Conscientious traits were among the variables with the most variance similarity between groups (SGM status and trans vs. cis).

Figure 3.3. Variance ratios between each grouping variable. Ratios on the left-hand side imply the first group in the header is higher on the variable on average.

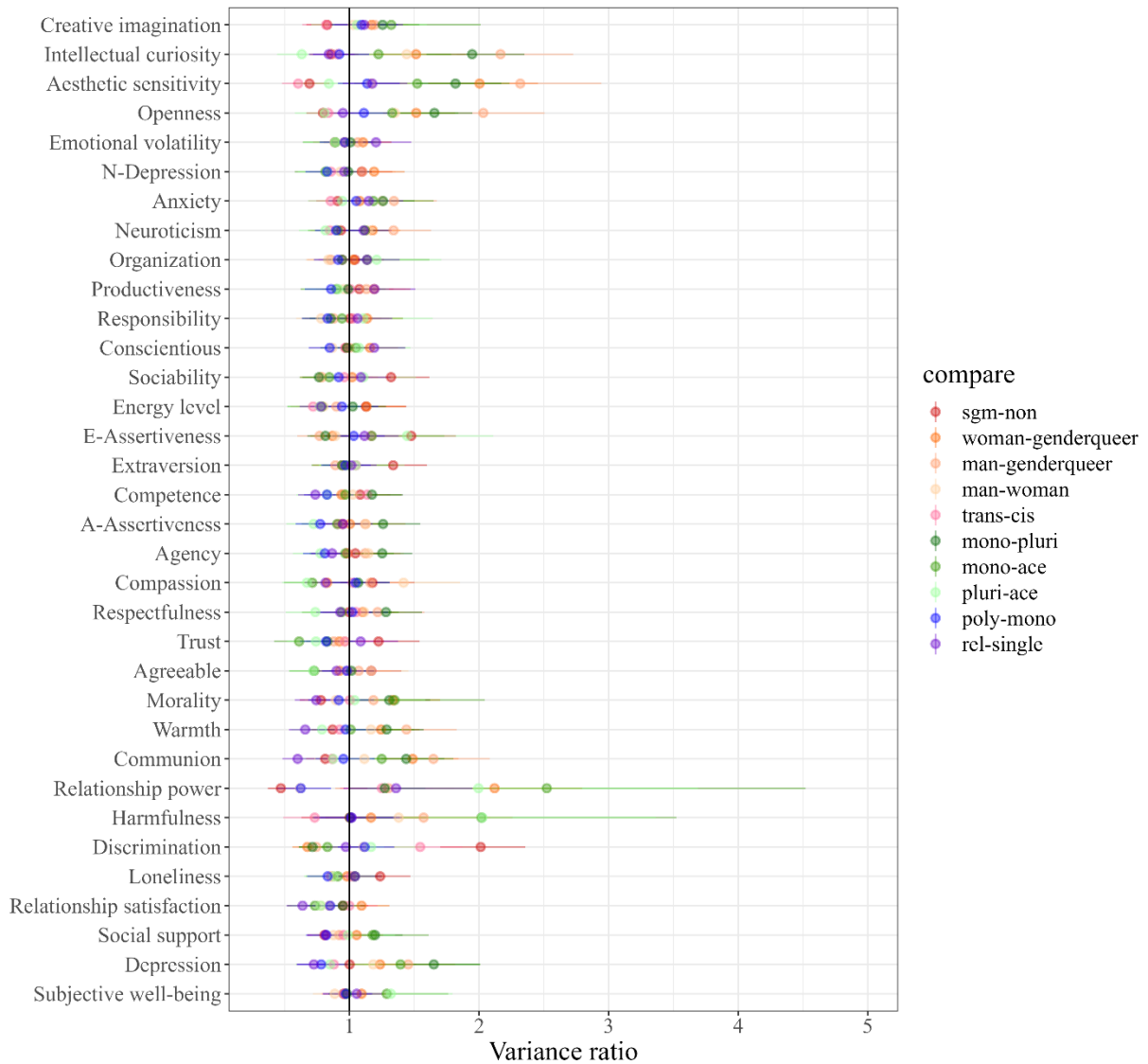
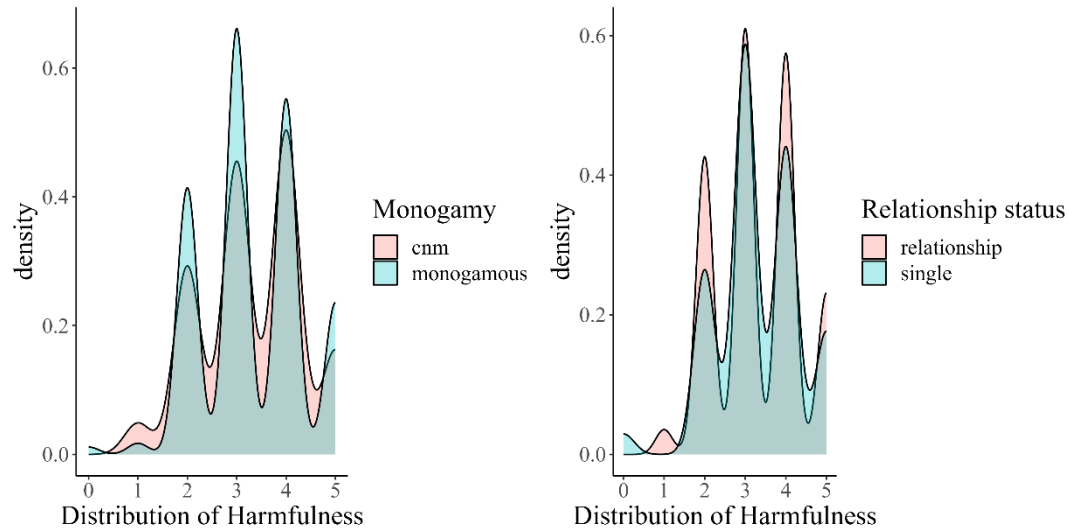


Figure 3.4. Variance ratios of varying sizes are shown via density plots.

Panel A. No differences, $v = 1.01$



Panel B. Moderate differences, $v = 0.71$ plurisexual-asexual and 0.72 monosexual-asexual

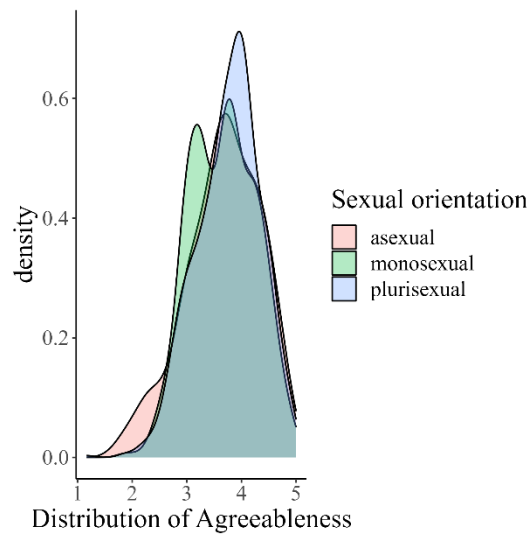
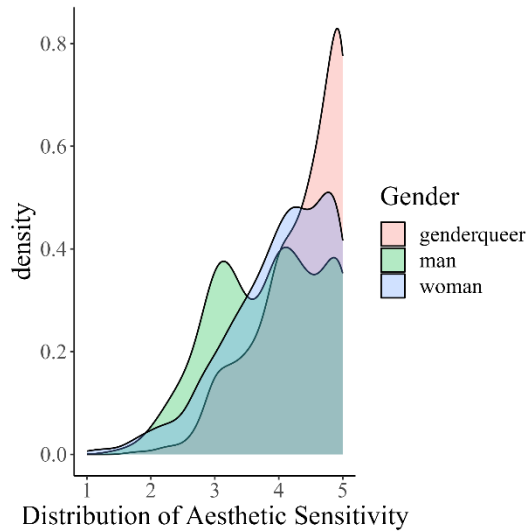


Figure 3.4 (cont.). Variance ratios of varying sizes are shown via density plots.

Panel C. Large differences, $v = 2.0$ man-genderqueer and 2.3 woman-genderqueer



In sum, the variance ratios revealed a large number of variables (69%) have little to no differences in heterogeneity between groups ($V \sim 1$). Figure 3.4 shows the shape differences in distributions between no differences, moderate, and large differences in heterogeneity. A large difference can relate to higher peaks, more narrow distributions, or polymodal distributions with at least one peak non-overlapping.

Table 3.4. The average correlation differences between each variable and all other variables in each domain.

Variable	Health	Social	Personality
	Avg. Δr	Avg. Δr	Avg. Δr
Health			
Subjective well-being	0.094	0.106	0.073
Depression	0.094	0.146	0.081
Social			
Social support	0.137	0.100	0.084
Relationship satisfaction	0.119	0.117	0.081
Loneliness	0.086	0.105	0.071
Discrimination	0.111	0.070	0.076
Harmfulness	0.179	0.175	0.161
Personality			
Relationship Power	0.127	0.141	0.119
Communion	0.091	0.120	0.081
Warmth	0.092	0.124	0.086
Morality	0.075	0.093	0.089
Agreeable	0.062	0.087	0.078
Trust	0.048	0.091	0.069
Compassion	0.091	0.083	0.084
Respectfulness	0.091	0.108	0.081
Agency	0.073	0.077	0.076

Table 3.4 (cont.). The average correlation differences between each variable and all other variables in each domain.

A-Assertiveness	0.072	0.104	0.087
Competence	0.063	0.075	0.071
Extraversion	0.058	0.076	0.079
E-Assertiveness	0.074	0.093	0.085
Sociability	0.066	0.080	0.069
Energy level	0.061	0.090	0.075
Conscientious	0.078	0.060	0.072
Responsibility	0.091	0.082	0.089
Productiveness	0.055	0.074	0.074
Organization	0.086	0.070	0.060
Neuroticism	0.084	0.116	0.082
N-Depression	0.082	0.118	0.074
Anxiety	0.072	0.116	0.106
Emotional volatility	0.083	0.108	0.070
Openness	0.080	0.098	0.089
Intellectual curiosity	0.087	0.107	0.095
Aesthetic sensitivity	0.089	0.087	0.094
Creative imagination	0.050	0.090	0.094

Table 3.5. The average correlation differences between each group for all variables within domain (not including cross-domain correlations).

Group Comparison	Health	Social	Personality
	Avg. Δr	Avg. Δr	Avg. Δr
SGM- nonSGM	0.016	0.078	0.066
Man-genderqueer	0.099	0.143	0.106
Woman-genderqueer	0.034	0.101	0.071
Man-woman	0.065	0.145	0.087
Transgender- cisgender	0.073	0.078	0.068
Monosexual- plurisexual	0.155	0.063	0.068
Monosexual-asexual	0.297	0.149	0.103
Plurisexual-asexual	0.141	0.158	0.106
CNM-monogamous	0.014	0.066	0.068
In relationship-single	0.046	0.155	0.081

Correlation Differences

Correlation differences between groups were largely in the range of small differences as I defined it (Tables 3.4-3.5). In total 7.5% of 5,420 correlation differences were outside the bounds of small, suggesting that there could be a meaningful difference. Of course, repeated sampling, significantly increasing the sample sizes, and examination over time or generations would be appropriate before arriving at the conclusion of a difference. The differences in correlations

ranged from 0 to 0.910. As shown in Figure 3.5, these differences were centered and highly peaked at 0 and appear as a normal distribution. Three-quarters of the differences greater than 0.2 were between 0.2 and 0.3. The five largest differences were between the single-item measure of harmfulness and another variable-the largest three being anxiety, assertiveness, and neuroticism-in monosexual versus asexual people. In each case, the correlation in asexual people was based on less than 30 responses of harmfulness of discrimination experience. For example, the correlation between anxiety and harmfulness was -0.42 in asexual people and 0.49 in monosexual people. The next largest difference among groups with better response coverage was that between relationship satisfaction and relationship power between women and genderqueer people. The correlation in genderqueer people is -0.24 and 0.39 in women suggesting women find having more power to be related to higher relationship satisfaction. Next, the correlation differences are discussed more in-depth by domain.

The health variables, depression and subjective well-being, were mostly similarly related to each other and to personality or social variables. Of the 51 differences (out of 650 effects) greater than 0.2, the majority were between sexual orientation groups. These group comparisons accounted for 35 of the 51 differences ranging from 0.20 to 0.68. The only difference in association between depression and subjective well-being was between monosexual and asexual identities. The correlations in each group were -0.53 and -0.84 respectively leading to a bootstrapped difference of 0.30. The association between depression and subjective well-being in asexual people was especially high but both suggest a strong negative association between the two constructs. Harmfulness and social support were frequent social differences, and conscientious facets (responsibility, organization, respectfulness) were frequent personality differences. Social support correlated with depression was different between men and women,

men and genderqueer people, monosexual and asexual people, and plurisexual and asexual people. In men, the association was -0.17 whereas in women it was -0.49 and in genderqueer people it was -0.48. The correlations suggest having more social supports was highly related to depression in people other than men. In asexual people, the association was -0.70 whereas in monosexual people it was -0.31 and in plurisexual people it was -0.48. These associations suggest that asexual people rate social support most highly related to depression followed by plurisexual and then monosexual people. One conscientious facet, responsibility, correlated with health differed between monosexual and asexual people as well as plurisexual and asexual people. Depression correlated with responsibility was approximately the same in plurisexual and monosexual people (-0.29 and -0.30) whereas asexual people was -0.65. Subjective well-being correlated with responsibility was 0.29 in plurisexual people and 0.51 in asexual people. These associations suggest stronger relationships between health and responsibility in asexual people. Lastly, in terms of what was very similar across groups, the correlation difference between subjective well-being and depression was 0.01 between SGM and non-SGM as well as CNM and monogamous people.

The four social variables were mostly similarly related to each other and to personality. Of the 1,450 differences (excluding social and health correlations as these were already discussed), 146 were greater than 0.2. Of these differences, the majority (99) were with the single-item measure of harmfulness including the four largest social differences. Of the remaining differences, the only within social variables differences were between people in relationships and single people. These associations were relationship satisfaction and loneliness as well as relationship satisfaction and social support. The correlation in partnered people was stronger in both cases (-0.43 and 0.55) than single people (-0.18 and 0.18). In part this could be

explained by single people who reported on their most recent, failed relationship thus their satisfaction is not related to their feelings of social support or loneliness. Or consider that people who have romantic partners and are happy have a built-in social support and someone to stave away some loneliness. The largest social-personality differences were with the personality variable, relationship power, between gender and people in relationships versus single.

Relationship satisfaction and social support with relationship power differed between men and genderqueer people as well as women and genderqueer people. The association with relationship satisfaction was positive in men and women (0.39 and 0.42) versus negative (-0.24) in genderqueer people. The association with social support followed a similar pattern, suggesting having influence and decision-making power is associated with feeling support in your life and being satisfied in your relationship for men and women. Genderqueer people feel supported and satisfied in their romantic relationship when they report lower relationship power. Lastly, many differences were small to nonexistent across all group comparisons, like extraversion and relationship satisfaction, conscientiousness and discrimination/harmfulness, and social support and loneliness.

The personality variables were mostly similarly related to each other. Very few (207) differences were greater than 0.2 out of the 3,320 differences between personality variables. The five largest differences were between openness facets and relationship power followed by agreeableness facets and relationship power. These differences were between relationship status and men versus genderqueer people. Each of these differences followed the same pattern where the correlation was positive in men and people in relationships but negative in genderqueer or single people. This consistent pattern across two different groupings was not explained by genderqueer people being mostly single because in fact five out of six genderqueer people were

in relationships and the rest were single. Lastly, many differences were small to nonexistent between all groups, like productiveness correlated with emotional volatility, agreeableness with depression facet of neuroticism, and neuroticism and competence facet of agency.

Figure 3.5. The distribution of correlation differences by domains (Panel A) and by groups (Panel B).

Panel A. Correlation differences across all groups shown by domain.

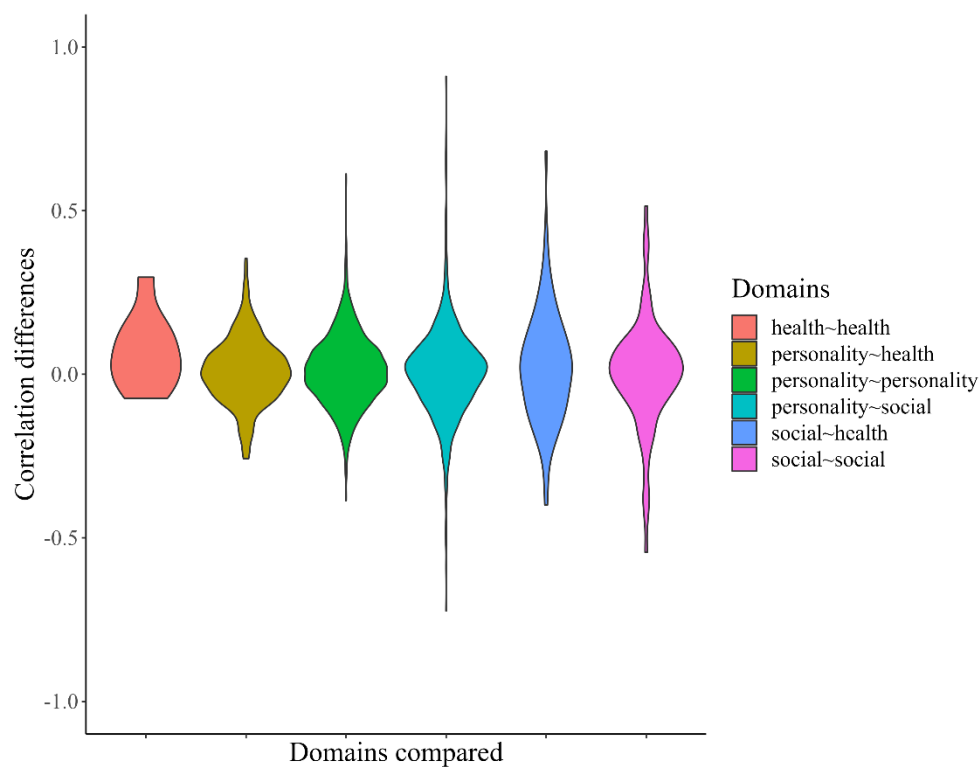
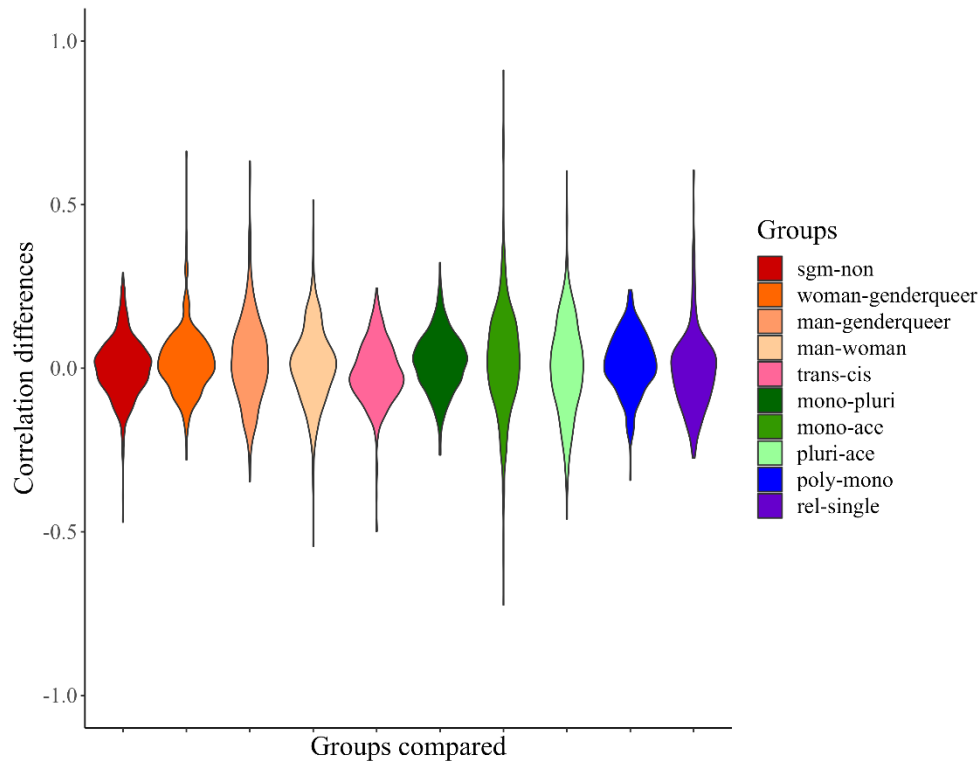


Figure 3.5 (cont.). The distribution of correlation differences by domains (Panel A) and by groups (Panel B).

Panel B. Correlation differences across all domains shown by group.



In sum, the correlation differences revealed a large number of variables (92.5%) have little to no differences in correlations between groups ($|\Delta r| < 0.20$). In conclusion, similarities in association were prevalent across identities and relationship structures. The assumption that "new" or different groups necessitate different processes in basic and normal psychological processes was not supported, but it is important to empirically investigate generalizability and similarity. In order to examine another assumption, I explored the association between mean differences, variance differences, and correlation differences.

Relationship among Mean Differences, Variance Differences, and Correlation Differences

I also wanted to explore the assumption that differences in one parameter would relate to differences in another parameter. More specifically, the assumption that if there are mean differences in a variable, like depression, the variable therefore must relate differentially to traits, like loneliness, in groups at higher risk of depression versus those at lower risk. Thus, I examined scatterplots and the correlations between mean differences, variance differences, and correlation differences. The correlation between mean differences and correlation differences was -0.010, between mean differences and variance differences was -0.022, and between correlation differences and variance differences was 0.019. Each of the associations between different parameters looked similar with no discernible trend overall, by domain, or by group comparison. Failing to support the assumption that mean differences suggest process differences reinforces the validity of descriptive research to include all identities in a single study².

Discussion

Our results were largely in line with previous studies of mean differences in personality, social relationships, and health (Anderssen et al., 2020; Batz & Tay, 2018; Bogaert et al., 2018; Cusack et al., 2012; Ehlke et al., 2020; Eres et al., 2021; Ferlatte et al., 2020; Hendricks & Testa, 2012; Hyde & Mezulis, 2020; Junkins, Pantin, et al., 2024; Meyer, 2003; Plöderl & Tremblay, 2015; Valentine & Shipherd, 2018; Whitton et al., 2021). Few studies included asexual (exception Bogaert et al., 2018; Junkins, Pantin, et al., 2024), nonbinary, or queer people broadly. The majority of previous research split gender as men or women and sexual orientation

² When variables are correlated, they are centered so mean differences should not indicate on their own whether there would be process differences. Yet, in some respects it seems intuitive to identify moderators/mediators by their differences between groups. An example of this is in depression research and how we use gender as a moderator because depression may differ between men and women. Gender is being tested as the moderator of depression and stress, but these moderation effects do not often show strong changes (e.g., Boyraz et al., 2015).

as heterosexual or lesbian/gay, especially in personality and relationships research (Junkins, Dugan, et al., 2024). Mental health and risk/protective factor research, for example social support and loneliness, are more common in transgender, nonbinary, and queer communities. However, there remains a disconnect between positive-framed, basic psychological research and queer populations. Few studies dissect the variance, the distribution, and overlap or the differences in association outside the context of moderation. In this regard, I expand prior research of "differences" and highlight even more similarities in means and associations across diverse identities. Further, our research speaks to more within-group variability than between-group variability and normal distributions for most variables in our online sample. Next, I will revisit our hypotheses in some depth before discussing the implications for future research.

Revisiting our hypotheses, means were expected to differ mostly in the small range for individual traits, positive social influences, and well-being ($|d| < 0.22$) and in the small to large range for negative social influences and depression ($|d| < 0.44$). Based on average differences in Table 3.2, I found the average difference for traits to be 0.24, positive social relationships to be 0.21-0.22, well-being to be 0.25, negative social relationships to be 0.09-0.32, and depression to be 0.35. All in all, our expectations were in line with what was found. Variances were expected to be equivalent across groups ($V_{ratio} = 1$) with less specific expectations. I found the average variance ratio for health variables was 1.08, social relationships was 1.03, and personality was 1.05. Correlations were expected to be equivalent across groups ($\Delta r < 0.20$). In fact, 92.5% of the calculated correlation differences were in this range. I found the average correlation difference to be 0.09; the within-domain health association differences were between 0.01 and 0.29, within-domain social associations were between 0.06 and 0.16, and within-domain personality associations were between 0.07 and 0.11 as shown in Table 3.5.

In the framework of the Gender Similarities Hypothesis these differences can be understood to relate to similarities across people grouped by their sexual or gender identities as well as similarities across people grouped by relationship structures. Based on survey response rates, I expanded the groups I compared to include SGM vs. non-SGM, men vs. women vs. genderqueer, cisgender vs. transgender, monosexual vs. plurisexual vs. asexual, CNM vs. monogamous, and in relationship vs. single. Each of these identities and relationship structures supported our framing of differences in light of a similarities hypothesis that suggests people are more alike than different and the few "larger" differences that exist can be considered in light of the timing and nature of the sample as well as measurement or statistical validity concerns.

The broader implication of this finding is that research which excludes people based on gender identity, sexuality, or relationship harms the generalizability of research without justifiable scientific reasoning. By estimating effect sizes that are contextualized by the variable studied, the sociopolitical climate, and compared across generations, we can more comprehensively discuss what might be indicators of the sample versus persistent differences. Small mean differences that are not persistent across time and simply might represent a difference in norms or reference groups (i.e., multiculturalism) can best be considered a description of the non-random sample studied. However, patterns between these variables with differences and health, work, or life outcomes would suggest future research and intervention.

Limitations, Strengths, & Future Research

Replication of these results should be done with different samples, especially national data with indicators of sexual and gender diversity which are not currently available. One potential limitation of the current study was that people were recruited from Instagram and were majority White. However, along other axes, I had wider coverage of people with different

backgrounds (e.g., age, education, SES, relationship styles). Additionally, larger sample sizes such that each group has more than 600 people would lead to more confident conclusions. As it stands, multiple groups had between 100 and 300 participants, which implies caution in the interpretation of effects as they were less precise. Lastly, representativeness cannot be assumed, but I would argue people online are more representative of their respective groups than undergraduate students taken from a single university (Gosling et al., 2004, 2010; Shatz, 2017). According to one study, people on Instagram versus non-users might differ in levels of anxiety, depression, and loneliness such that Instagram users had lower levels on average (Mackson et al., 2019). Only if these differences in Instagram users versus non were exacerbated or mitigated in queer populations would this present a problem for the current research.

Future research should continue to contextualize psychological processes. The majority of our research should be considered normative, meaning common to human experience, research. Some of our measures may be contaminated by the overemphasis of androcentrism, ethnocentrism, and/or heterocentrism which leads to items that reflect White heterosexual men's experiences best. Yet, these processes seem to be roughly universal. Other processes may be more unique to specific groups, like differences in identity development and coming out among queer people that cisgender or heterosexual people do not experience or experience to a much lesser extent. Also, there may be specific people not categorized by monolithic identities, like transgender, that could experience these psychological processes differently. In other words, people randomly across identities or small subsets within monolithic identities. Complementary, we should search for meaning and context with qualitative research or finer-grained, nuanced dynamic research. Future research should also look for the off-cases, the variables that are most likely to disprove this theoretical framing in order for the boundaries of similarities to be

outlined. These two goals go hand in hand to improve the generalizability of our research and build a strong framework by which to interpret and conduct meaningful research across marginalized identities in psychological science.

Correlational Process Differences not yet Causal Process

Correlation is not causation. We are emphatically taught this day one in psychology. But what do no differences in correlations imply about causation versus what do differences imply? Differences in correlations suggest sociocultural influences could be leading to different associations based on identity (Little, 1997), whereas a null result is useful because it supports generalizability across the studied contexts (in this case, identities and relationship structures). Cross-sectional associations like what is tested here are enough to address the questions raised.

Next steps to understand similarities between groups are to look for causal processes. Correlations are almost always necessary to suggest causation but they are by no means sufficient to conclude causation. One aim of conducting this study was to determine whether correlations between variables are different in diverse groups. If they were different then it would support doing research with multiple-group models to study the heterogeneous effects. As they are similar, I conclude that research interpretability and generalizability can be strengthened by enhancing diversity, at least along the axes of sexual and gender diversity that I have tested. The benefit of doing larger, more diverse research is we can determine relationships or interventions that are true when applied at large-scale. Therefore, the next step will be for research to determine if the same causal processes are happening amongst these variables and others. The efficacy of population level changes, which is likely the level at which we might see shifts in behaviors and indicators of marginalization, is best understood when we have accounted for possible heterogeneity of effects in people with different identities or backgrounds. It would

be wrong to assume that because we have not measured an identity (e.g., sexuality) in our studies that the findings will apply equally across identities without evidence to support this. Also necessary are whether the same associations hold between groups over time. In other words are the dynamic processes similar across groups (Junkins, Briley, et al., 2024). Specifically, it is important that we are not ignoring parts of the population because our normal recruitment strategies (e.g., recruiting within one university) may underrepresent them.

CHAPTER 4: PSYCHOMETRICS EVALUATION ACROSS DIVERSE SEXUAL AND GENDER IDENTITIES: REPEATED MEASURES STUDY 2

How do we know whether psychological science generalizes across groups? Thus far, research in psychology has focused on differences between groups, like gender (e.g., Hyde, 2014; Zell et al., 2015) or sexual orientation (e.g., Lippa, 2020) with a large focus on differences-as-deficits in single studies (Eagly & Wood, 2012; Herek, 2010; Hyde, 1990). The search for differences, at least between men and women, has been reframed as showing mostly similarities across a range of psychological constructs (Hyde, 2005; Zell et al., 2015). Past work has looked at similarities among personality (Junkins, Pantin, et al., 2024), social relationships, and mental health cross-sectionally among diverse sexual and gender identities (Junkins et al., 2023, preprint) and found results consistent with the similarities perspective. Still unexamined is whether these measures of personality, social relationships, and mental health are reliable, consistent, and/or stable cross-time. The current study examined the longitudinal consistency of measures of personality, relationship power, relationship satisfaction, subjective well-being, and depression across diverse sexual and gender identities.

Personality psychology has a large history of examining psychometrics. However, the current literature has considered mostly majority, well-educated groups (Bleidorn et al., 2022; Robins et al., 2001). To determine whether personality measures generalize, reliabilities and stabilities have been assessed across cultures (e.g., Gurven et al., 2013; McCrae et al., 2011; Schmitt et al., 2007), diverse groups, or minority groups (e.g., Atherton et al., 2022; Worrell & Cross, 2004). However, the psychometrics of personality and important life outcomes have not been well-attended among sexual and gender diverse identities. The extent to which personality,

social relationships, and mental health are reliable and valid using longitudinal assessments is an important, unaddressed question.

Although mean-level change measures average change within the sample, rank-order stability assesses the relative position of each person within a sample over time (B. W. Roberts & DelVecchio, 2000). Mean-level changes can be large whereas rank-order stability is still high. For personality, this matches the findings across multiple meta-analyses (Bleidorn et al., 2022; Damian et al., 2019; B. W. Roberts & DelVecchio, 2000). As people age, there are mean differences in an average person's agreeableness at age 20 versus age 40. Yet, people also tend to rank at a similar level showing that this trend of increasing agreeableness from young to middle adulthood is common across individuals.

Rank-order stability in personality has been studied from a lifespan perspective looking at stability across age (Damian et al., 2019; B. W. Roberts & DelVecchio, 2000) or across years within one developmental period (Robins et al., 2001). During intervention research on depression symptoms, neuroticism at 5-week follow-up had moderate to high rank-ordered stability at a correlation of 0.76 and extraversion showed rank-ordered stability at 0.80 (Santor et al., 1997). Longitudinal studies of personality report test-retest correlations (rank-order stability) to be comparable across 1- to 8-week lags (Gnambs, 2014), 10-week lags (Gnambs, 2016), or multiple years (Atherton et al., 2022). The average rank-order stability for one-week to two-month follow-ups were as follows; extraversion = 0.85, agreeableness = 0.78, conscientiousness = 0.82, neuroticism = 0.82, and openness = 0.81 (Gnambs, 2014). Longer time spans sometimes show lower rank-order stabilities, especially in agreeableness (Atherton et al., 2022). All in all, personality traits show high consistency and rank-order stability.

Relationship satisfaction is often measured as a global assessment of how satisfying a current relationship is. Relationship satisfaction shows age-specific, relationship-length-specific, and gender-consistent (men and women) trends across the lifespan (Bühler et al., 2021). For instance, the largest declines in relationship satisfaction are in the first years of a relationship. In comparison, rank-order stability is moderate to high at 0.76 meta-analyzed across studies ranging from 3-month lags to 46-year lags (mean lag = 2.3 years; Bühler & Orth, 2022). Rank-order stability studies did not report on diverse identities of gender or sexual orientation. However, a meta-analysis on the internal consistency of different relationship satisfaction measures considered whether larger proportion heterosexual samples affected the average internal consistency. These researchers found that same-gender relationships had slightly higher internal consistency and non-college samples also show higher internal consistency (Graham et al., 2011).

Subjective well-being shows moderate to high rank-order stability depending on the time lag and sample. At two-week assessments, the rank-order stability was 0.59 in a community sample (Krueger & Schkade, 2008). At three-month lags, the stability in almost completely White mother and White elderly samples was 0.62 to 0.75 (Chamberlain & Zika, 1992). At two-year intervals, the stability was 0.69 in a Dutch sample (Gnambs & Buntins, 2017). In a meta-analysis, the rank-order stability of life satisfaction was 0.52 across unspecified time lags versus personality was 0.83 on average (Anusic & Schimmack, 2016). The researchers concluded personality is more stable compared to subjective well-being which is more variable within-person and between-person.

The reliability of depressive symptoms is high, with internal consistencies ranging from 0.69 to 0.89 in studies reviewed in a meta-analysis by Reilly and colleagues (2015). Research

measuring depression and personality before and after the introduction of medication for 5 weeks reported rank-order stability of two different depression measures to be 0.41 and 0.54 (Santor et al., 1997). In addition, depression decreased over the 5-week trial as did neuroticism and extraversion increased. These findings suggest that personality traits and depression represent parallel vulnerabilities.

The stability and validity of psychosocial variables have been examined across different time spans. The past literature shows that student versus non-student samples and other aspects of diversity may have some effect on psychometrics that may represent patterns of differences in how the items are assessed and reported. Depression is higher and a much greater risk for marginalized communities (A. P. Haas et al., 2010; Valentine & Shipherd, 2018). Personality, relationship satisfaction, and mental health have not been examined among diverse sexual and gender identities. Longitudinal studies are needed to inform how social relationships and mental health change over time and whether the cross-sectional relationships are indicative of stable patterns of association. The implications of such work bears on intervention designs. Evaluating nomological networks and investigating psychological relationships in multiple affected populations tests the applicability and generalizability of interventions to different populations.

Current Study

The current study examined the longitudinal psychometrics of personality, relationship power, relationship satisfaction, subjective well-being, and depression symptoms. I originally preregistered multi-group univariate and bivariate growth models to examine differences among sexual and gender identities. Based on estimated variance in change being too small for Personality and Social relationships to sufficiently address our research questions, I focus instead on descriptive statistics of repeated measurements. Based on past literature, I expected to find

high rank-order stability in Personality and similar magnitude of correlations in each group across SGM status, cisgender versus transgender experience, gender identity (man, woman, genderqueer), and sexual orientation (monosexual and plurisexual). Rank-order stability of Social relationship and Health variables were expected to be lower than Personality.

Methods

Sample

The current sample was drawn from the Psychology Observed Within Every Romantic Relationship (POWER) study ([Junkins et al., 2023, preprint](#)). The final sample included 1,777 participants at wave 1. People were largely recruited from Instagram (@power_relationship_study), other social media platforms (e.g., Reddit and Facebook), and general faculty and administrative listservs. Almost forty percent of participants continued to wave 2 and 31% continued to wave 3 ($N_{wave2} = 703$ and $N_{wave3} = 555$). The majority (89%) of people were living in the U.S. and identified as sexual and/or gender minority (73%). On average the sample was 27 years old ($SD = 8.9$; range 18 to 78). Education was mostly Bachelor's degrees (50.7%), 22.2% graduate degree, 18.5% high school diploma, 6.2% Associate's or 2-year degree, and 3% trade or vocational school. Socioeconomic status was on average 4.74 ($SD = 2.03$), rated 1 to 10 in relation to others in the nation. Racial identity from an open response item suggests respondents were 68% White, 7% multiracial, 6.5% Asian, 5.2% Black, 0.7% Native or Indigenous Persons, and 0.6% Middle Eastern. In addition, 9.5% of people were Hispanic and 1.5% were Jewish. Gender, sexual orientation, and romantic orientation were all multi-select. For those choosing multiple options, they were grouped as genderqueer, queer, and queerromantic (e.g., man and nonbinary, pansexual and asexual, or heteroromantic and panromantic). See Table 4.1 for the proportions of gender and sexual orientation. Asexual

orientation (7% of the sample) was not included in the longitudinal analysis because of low numbers. Additionally, 21% of people were queerromantic, 16.5% biromantic, 15.3% heteroromantic, 14% homoromantic, 7.4% panromantic, and 8.5% aromantic spectrum.

During data cleaning, 1,081 people were removed. Fifty-nine did not provide consent, 1,002 people did not fill out the first surveys beyond demographics, 2 were minors, and 18 people responded with inappropriate open responses, endorsed their data were bad, or completed the survey too fast (e.g., 3 minutes for over 300 items). In the end, I used data from 1,777 people. Sample demographics by wave are provided in Table D.1. Standardized mean differences of our study variables for those who completed wave 1, wave 1 and 2, or all three waves were $0.0002 < |d| < 0.27$ (Table D.3).

Table 4.1. Retention by identity and a short glossary for the terms used.

Group	Brief description	Wave 1	Wave 2	Wave 3
		<i>N</i>	<i>N</i>	<i>N</i>
SGM	Self-identified as a member of a sexual and/or gender minority.	1,302	539	422
Non-SGM	Self-identified as not a member of a sexual and/or gender minority.	462	162	129
Monosexual	Categorized those who identified heterosexual or gay/lesbian as their only sexual orientation.	644	231	190

Table 4.1 (cont.). Retention by identity and a short glossary for the terms used.

Plurisexual	Categorized as all sexual orientations that relate to attraction to more than one gender, including those who selected multiple sexual orientations. Not including asexual identities.	982	407	317
Cisgender	People whose gender identity matches their sex assigned at birth.	510	226	177
Transgender	People whose gender identity does not match their sex assigned at birth.	498	217	173
Men	Anyone who selected man as gender identity but not also nonbinary or woman.	362	119	104
Women	Anyone who selected woman as gender identity but not also nonbinary or man.	620	253	190
Genderqueer	Anyone who selected one of the nonbinary gender identity options or chose multiple descriptions of man, woman, and/or nonbinary. Not including those who wrote in “agender”.	710	304	241

Measures

Personality variables assessed were the Big Five personality traits (and their facets) including openness to experience (O), conscientiousness (C), extraversion (E), agreeableness (A), and neuroticism (N; Soto & John, 2017). The Social relationship variables were relationship satisfaction (Hendrick, 1988) and relationship power (Farrell et al., 2015). Health variables were

depressive symptoms (Rush et al., 2003) and subjective well-being (Diener et al., 1985).

Additional details about specific inventories used and their response options are provided online at https://osf.io/426ku/?view_only=d97c48c1f6514f4486b33449791ddd91.

Statistical Analysis

All analyses were performed in R (R version 4.1.3, 2022) using *lavaan* (Rosseel, 2012) and *semTools* (Jorgensen et al., 2021) packages. Data and analysis scripts are available at <https://osf.io/5kpmu/>. After multi-group latent growth modeling showed little growth on average and very little variation in growth, I conducted descriptive analysis of longitudinal associations (see Figure D.4 and Table D.6). I focused on stability (based on cross-lagged within-trait correlations), intercept differences (from growth models), and cross-lagged correlations among Personality, Social relationships, and Health variables. Growth model intercept mean differences were standardized mean estimates of differences between groups using three waves to measure each construct. Rank-order stability measured by cross-lagged within-trait correlations and cross-lagged Personality and Social relationships and Health correlations are reported. Each of these indices provides information on the psychometrics and validity of psychosocial variables within sexual- and gender-diverse people. Sexual and gender diverse people are often explicitly unstudied. The results of the current study illuminate the extent to which there are differences in mean levels, stability, and validity of Personality, Social relationship, and Health variables across groups.

Results

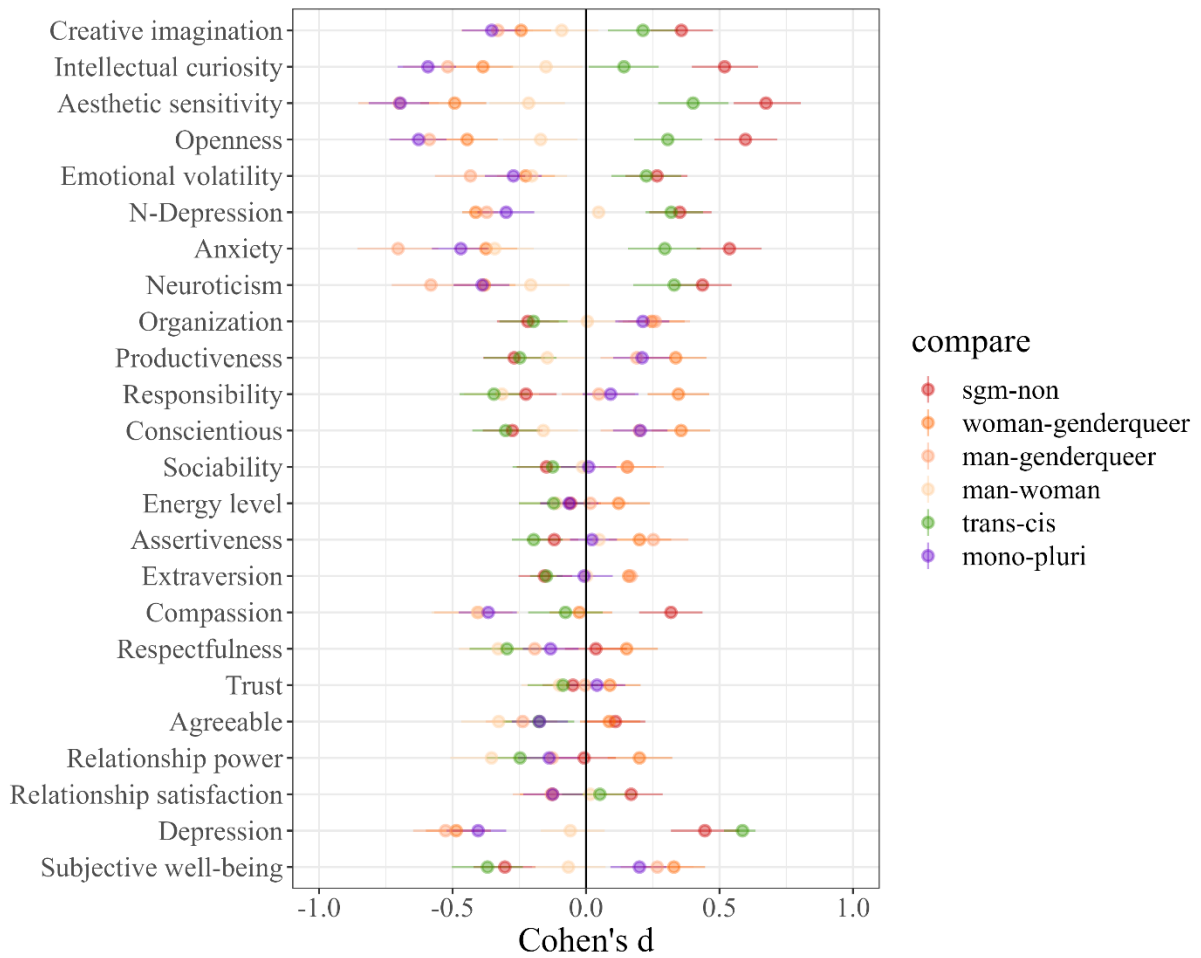
Personality change was very slight when measured monthly. The slope means were less than 0.05 for all except Health variables and variances were extremely small, less than 0.07.

Although I observed change in depression as intended in the study design, the monthly timing was inadequate to capture individual differences in change in Personality or Social relationships sufficient to address the differences in change (see Table D.5-D.6). See the Supplement for measurement invariance (Table D.2).

How Large are Multi-Wave Group Mean Differences?

The intercepts from all models are reported in Table D.5. As shown in Figure 4.1, the differences in the starting levels of Personality, Social relationships, and Health variables ranged between the absolute value of 0.002 and 0.704 standard deviation units. The average intercept difference was 0.251 standard deviation units, which is considered small to moderate based on what is often observed in psychology. In other words, stable estimates of Personality, Social relationships, and Health show only slightly smaller mean differences than cross-sectional data (Junkins et al., 2023, *preprint*, 2024). Trends of intercept differences in Figure 4.1 show that openness and neuroticism continue to exhibit larger differences, whereas extraversion, agreeableness, and Social relationship variables show small to non-existent differences across all the identities compared. For Health, I found differences that match expectations based on past literature; SGM, transgender people, and other minority-identified people like plurisexual and genderqueer people were higher in depression. Marginalized groups like SGM and transgender people had higher depression ($d \sim 0.5$) on average and to a lesser extent lower subjective well-being ($d \sim 0.3$). I have observed similar patterns in multiple samples for Personality with sizes of mean differences slightly lessened by disattenuating measurement error using longitudinal data (Junkins, Pantin, et al., 2024).

Figure 4.1. Intercept differences from a longitudinal growth curve across groups. Intercept is the starting point as estimated by loading all three waves fixed at a loading of 1.



How Stable Are Psychosocial Variables Over Time?

Figure 4.2. Rank-order stability within each group for two variables (neuroticism and depression symptoms). Red and pink graphs are SGM and non-SGM; orange colors are gender groups; green are cisgender and transgender people; and purple are monosexual and plurisexual people.

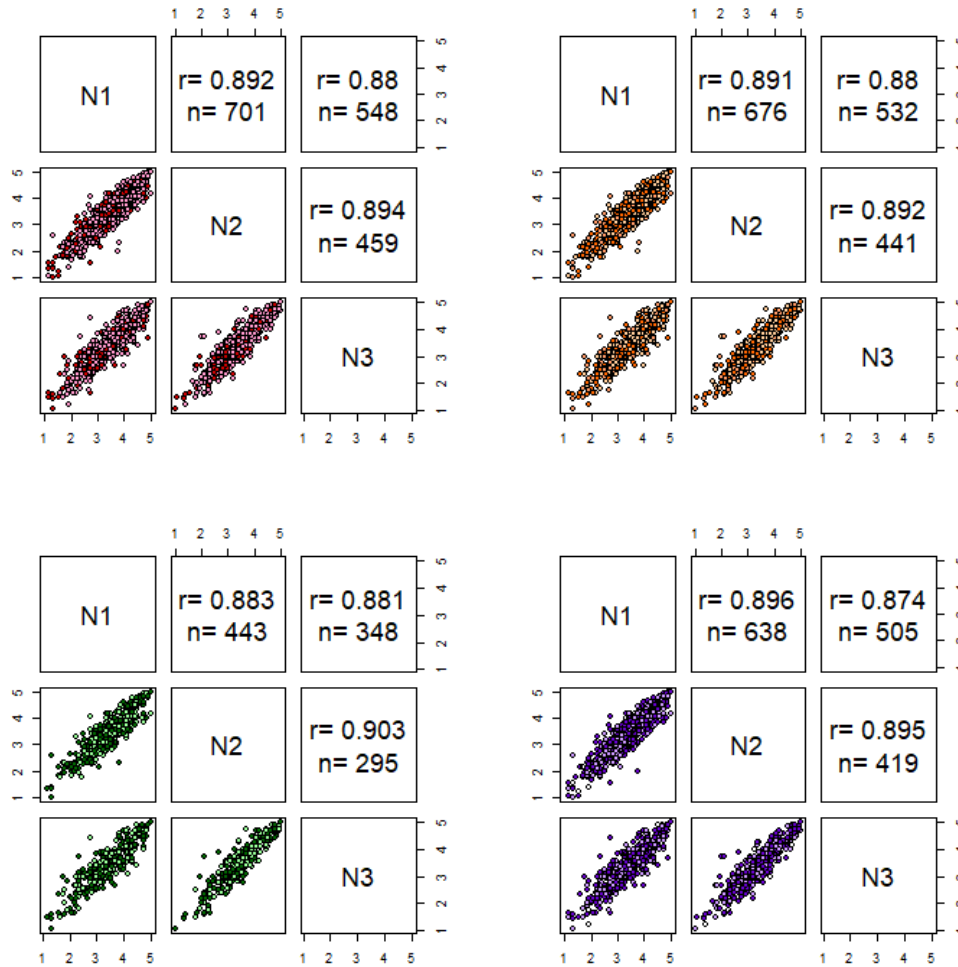
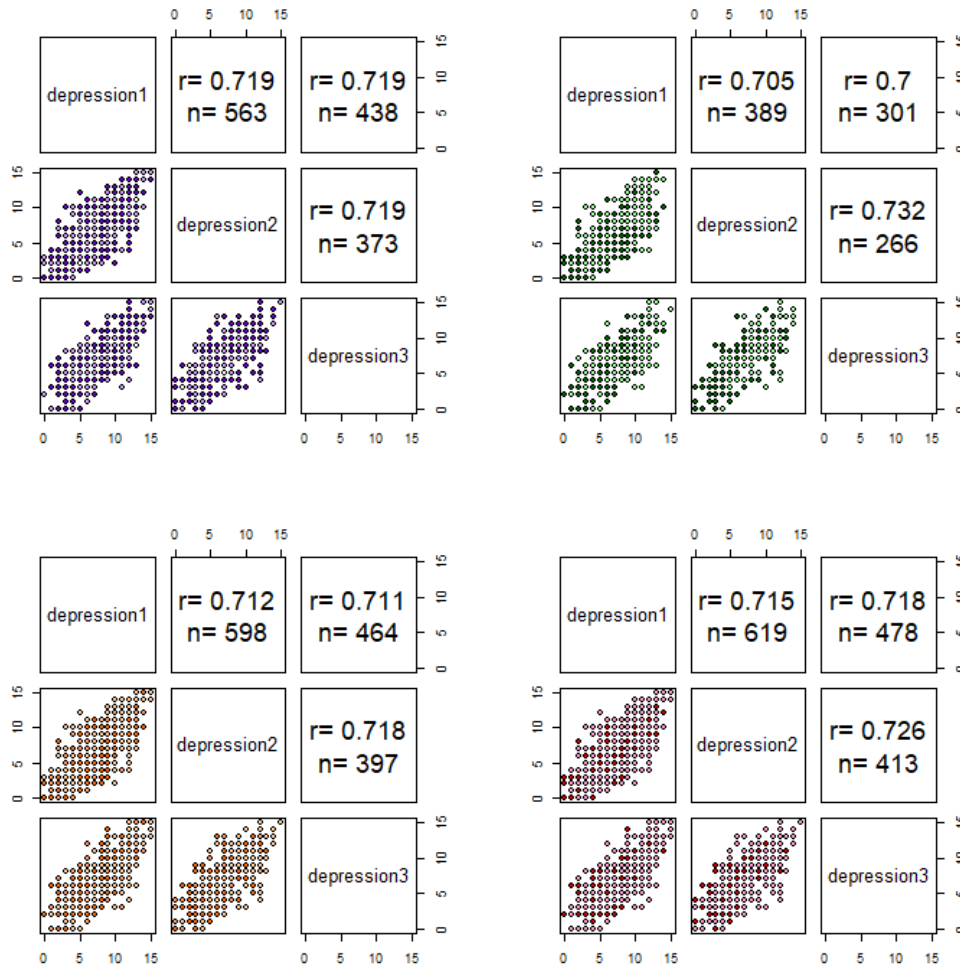


Figure 4.2 (cont.). Rank-order stability within each group for two variables (neuroticism and depression symptoms). Red and pink graphs are SGM and non-SGM; orange colors are gender groups; green are cisgender and transgender people; and purple are monosexual and plurisexual people.



Overall, the rank-order stability was high showing that where people ranked at time 1 was highly correlated with their standing at time 2 and time 3 (all r s > 0.55, see Table D4 for full reporting). The average differences in rank-order stability between identities were all quite small (all $\Delta r < 0.05$, see Table 8). Relationship satisfaction was one of the lowest rank-order stable constructs between time 2 and time 3 among people who were plurisexual, transgender, or genderqueer. Personality traits (E, A, C, N, and O) showed high stability across waves (all r s >

0.80). Personality facets, on the other hand, showed weaker stability. Depression was less rank-order stable than subjective well-being with correlations around 0.60 to 0.70 versus 0.80. Figure 4.2 displays two constructs with different rank-order stability: neuroticism and depression. Evident from the scatterplots was the large consistency in rank-order stability across each identity.

Table 4.2. Average differences in rank-order stability of all study variables within each group comparison (cross-lagged correlation).

Group comparison	Group 1 range of <i>r</i>	Group 2 range of <i>r</i>	Average Δr	N1	N2
SGM-nonSGM	0.61-0.93	0.61-0.92	0.045	1,303	462
Trans-Cis	0.55-0.92	0.69-0.94	0.044	499	510
Man-woman	0.60-0.92	0.71-0.95	0.045	363	620
Man-genderqueer	0.60-0.92	0.67-0.92	0.041	363	710
Woman-genderqueer	0.71-0.95	0.67-0.92	0.038	620	710
Mono-pluri	0.68-0.92	0.58-0.93	0.032	644	983

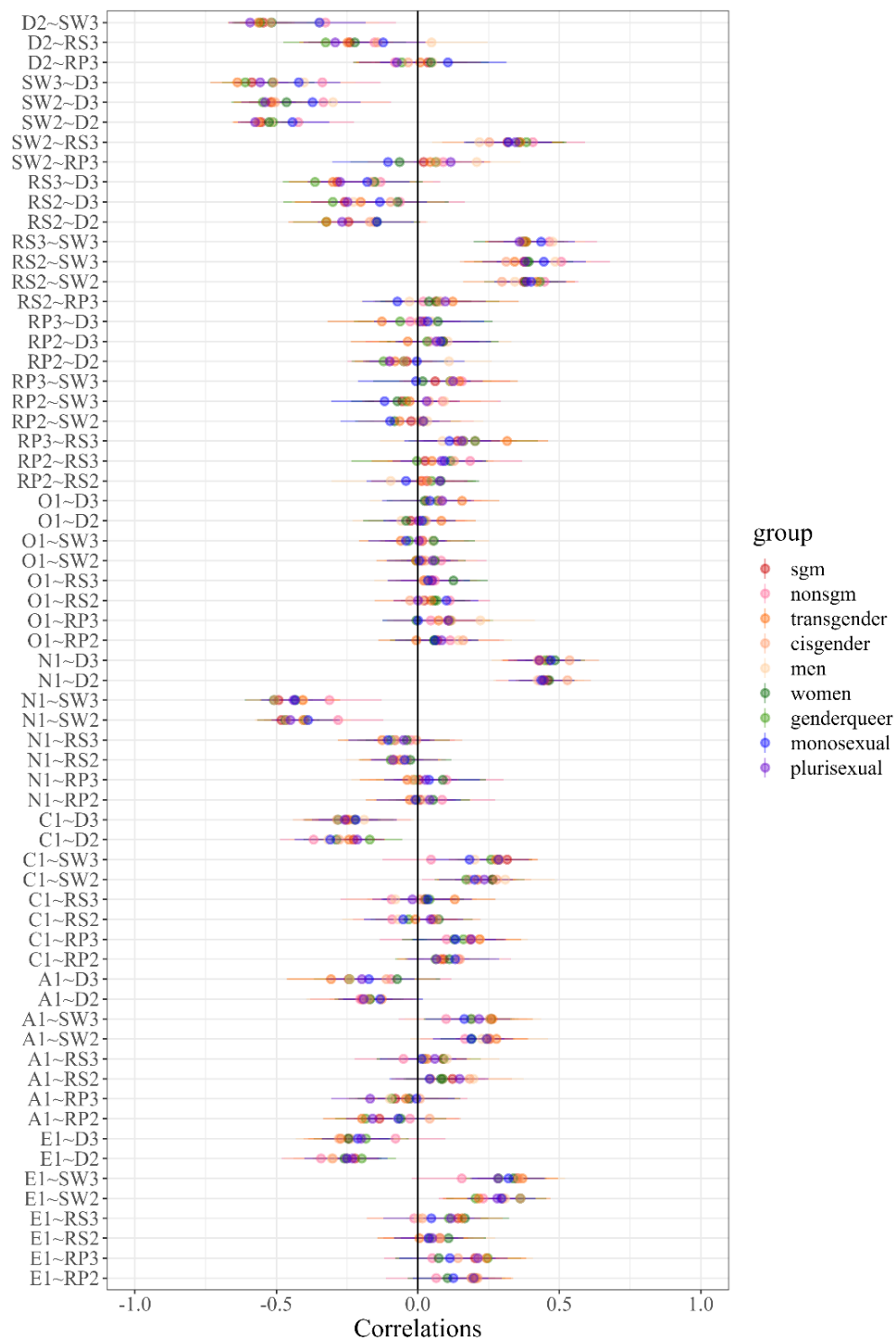
Note. Averaged across all study variables and W1~W2, W1~W3, and W2~W3.

Are Psychosocial Variables Correlated Similarly Over Time?

Because change over time was very close to zero, I examined cross-lagged correlations to evaluate whether the relationships were similar in magnitude and similar across different groups. In Figure 4.3, specifically, I examined how Personality related to later timepoint measures of Social relationships and Health. Full reporting of cross-time correlations is available on OSF.

The group-estimated correlations on each row shown in Figure 4.3 were tightly clustered showing overlapping confidence intervals between different identities. Due to multiple groups, I expect some associations to be approximately zero in repeated sampling, like openness with later relationship satisfaction, relationship power, subjective well-being, and depression. In contrast, other correlations between Personality time 1 and later Social relationships and Health showed consistent positive or negative associations. For instance, neuroticism was positively related to depression across time in all groups. Also, depression and subjective well-being were similarly negatively correlated within-time and across-time. There were no visible trends for select groups having consistently stronger or weaker associations. All in all, I found evidence that cross-lagged associations were remarkably similar.

Figure 4.3. Cross-lagged correlations within each group. On each row, the correlation was estimated within each group indicated by different color circles. The sequential rows highlight roughly similar magnitude correlation coefficients. D is depression, SW is subjective well-being, RS is relationship satisfaction, and RP is relationship power. The numbers indicate wave 1, wave 2, or wave 3.



Discussion

The current study was the first to examine short-term development among personality, social relationships, and mental health variables in a sexual and gender diverse sample. I compared SGM status, gender identity, and sexual orientation to find that rank-order stability was high in each group, mean differences calculated on stable measures were smaller than cross-sectional but consistent in direction, and cross-lagged associations had quite similar magnitudes. Compared to cross-sectional mean differences, I observed the same pattern of differences with only slightly diminished effect sizes (Junkins et al., 2023, *preprint*, 2024). Importantly, the pattern I found in multiple studies is that privileged identities, like being non-SGM, cisgender, monosexual, or a man, are lower in depression and to a lesser extent higher in subjective well-being (refer to Figure 4.1). Unlike past research looking at stability, I was evaluating short-term, monthly data. Specifically, this is important for cycles of depressive episodes that operate on a 3- to 6-month timespan compared to most longitudinal studies that look across multiple years (Hasin et al., 2018). For personality, the high rank-order stability is consistent with the idea that personality represents stable patterns of thinking, feeling, and behaving that also is expected to change on average as people age and undergo different life experiences (e.g., Bleidorn et al., 2013, 2018, 2022; Damian et al., 2019; Roberts et al., 2006; Roberts & DelVecchio, 2000). Our monthly associations were quite similar compared to cross-lagged correlations among Personality, Social relationships, and Health in past literature (Joshani, 2022; Taggart et al., 2019; Wood et al., 2008).

These results provide support for the validity of psychosocial variables in sexual- and gender-diverse samples. Importantly, they expand past evidence that the relationship between personality and depression is not state-dependent (B. W. Roberts et al., 2007; Santor et al.,

1997). Past research examined longitudinal associations in SGM samples primarily through two timepoint datasets calculating differences in time 1 and time 2 (Pollitt et al., 2023). The current study expands the literature by measuring three waves to examine within-person change.

Although I only observed average change in depression, I also evaluated other markers of intraindividual change. Rank-order stability was quite high month to month for all study variables, and was consistently high for each group of people I compared. Longer longitudinal research will be necessary to observe the group-level average changes in psychosocial variables.

There were several limitations to the study. Although the retention rate was acceptable (>30%) compared to similar studies, most group-defined sample sizes were quite low by wave three. Despite this, our exploratory findings are still extremely important for designing future studies with effect sizes estimated in diverse groups. Further, the recruitment method on Instagram was aimed toward people interested in relationships, which could introduce selection effects, although previous analyses demonstrate that the POWER study is comparable to previous non-representative samples (Junkins, Pantin, et al., 2024). Overall, the current study provides initial evidence that psychometric properties are consistent across diverse sexual and gender identities over time.

Future research should continue to address the question of change processes, like correlated growth or directional change. Originally, I preregistered looking at change and co-development processes. The total time investigated (3 months) was insufficient to address larger questions of how variables influence each other or grow and change together over time. I diversified our sample to begin to assess similarities in longitudinal associations, and I encourage others to do the same to ensure these change processes are shared across different groups. Importantly, SGM groups show health disparities that should especially be investigated with

methods sufficient to examine change within- and between-person (Allemand & Martin, 2016; Pérez-Stable, 2016). Understanding resiliency mechanisms and how they counteract, buffer, and influence later depression and well-being is a primary goal for psychology. Using more than three waves over longer periods, we can begin to disentangle these effects once change over time is observable.

The major contribution of this research is demonstrating that we do not see large differences in short-term longitudinal associations in specific underrepresented groups in psychosocial research. I used a sample of commonly studied variables to examine their psychometrics for generalizability. The broader implications of these findings are that the inclusion of diverse identities to psychological science is appropriate and will only strengthen our science. We can consider diverse identities to be markers of context because people of differing identities in different nations experience disparate social and political environments. Of course, there are individual differences in how diverse identities are experienced in reality. For instance, some SGM people may experience little to no discrimination and still experience privilege based on their background and other demographics. The treatment of diverse research as being “special issues” or better relegated to the fringes of our science is not best practice to further our field. We should encourage the diversification of our samples in order to better examine the generalizability of the studied psychological relationships.

The importance of generalizability is clear with interventions. If we designed a population-level intervention in the U.S. to minimize the effects of depression by employing relationship education programs, we might find that the education programs are not targeting the right mechanisms for specific populations or are not culturally sensitive to apply beyond certain groups. Therefore, we may not see a change in depression in those at highest risk of depression.

The average effect would show success of the intervention, but our vulnerable populations would be in the same place as they started—higher depression and further alienated by population-level policy efforts.

The explicit and implicit exclusion of SGM people from research (see Junkins, Dugan, et al., 2024; McGorray et al., 2023) will only lead to a biased and limited understanding of psychology. Contrastingly, it is important to not presume the studied psychological relationship is similar in other groups without empirically examining the generalizability. The small differences I saw here may impact our full conceptual or theoretical models for what leads to a happy and healthy life or what leads to lower depression. While the scope of the current study focuses on SGM, similar framing could be considered for other characteristics of people in order to move the field in a positive direction as a study of psychology concerned not only with average effects but average effects accounting for multiple factors (IJzerman et al., 2020; Premachandra & Lewis, 2022).

CHAPTER 5: GENERAL DISCUSSION

People who are sexual and/or gender minority are marked to have disparities in health and increased risk factors (Ferlatte et al., 2020; Plöderl & Tremblay, 2015) whereas less research has minded normative processes, meaning common to all people, like personality and relationships (Valentine & Shipherd, 2018). In a sample of about 1,700, mostly SGM people, I found strong similarities based on effect sizes of prevalence, variation, and association among a large number of health, social relationships, and personality variables across people of diverse sexual and gender identities. Study 1 addressed cross-sectional means, variances, and correlation differences across diverse identities. Study 2 further showed strong psychometrics and validity of cross-lagged associations in diverse identities that are similar in magnitude not only within-time but cross-time. Taken together, these first two studies begin to establish a distribution of effects where the central tendency is little difference. By taking a meta-scientific lens, I aim to map out what may be differential associations systematically compared to the many closely similar associations.

The next steps are to verify the boundaries of similarities by searching for what could be different, to contextualize dynamic and developmental processes that may be common across people or contextualized to specific groups, and to question whether causal processes are equivalent. Identifying factors that influence well-being over the life course will inform the design of interventions that can promote health and reduce suffering in vulnerable populations of all ages. It is especially impactful to search for what factors operate consistently across all people in addition to group-specific effective techniques. All in all, this research fills in many missing associations from the literature and generalizes key health, relationships, and personality research to people underrepresented in the psychology literature (e.g., transgender, nonbinary,

queer, asexual people). Importantly, and surprisingly based on how minority research is treated, the magnitude of differences was quite small, and the validity and generalizability of research was strong in the variables studied so far.

One association that was markedly different and should be attended to in further research was relationship power. The correlations between relationship power, select personality traits, and relationship satisfaction were quite different across different gender identities but not as largely different across sexual orientations. The literature on relationship power is especially nested in man-woman heterosexual dynamics that may not apply similarly for nonbinary people or other queer relationships. Taking into account gender identity, sexual orientation, and relationship structures will be important to disentangle the differential associations of relationship power. How personality relates to power and in turn relates to individual and relationship outcomes may be stronger in different-gender heterosexual relationships whereas same-gender or queer relationships may have weaker associations with power. Perhaps partners do not rate either partner as higher or lower because they both have the ability to ask for what they want and make concessions for their partner. Testing the Dyadic Power-Social Influence Model (Simpson et al., 2015) across different identities may yield one specific area where differential associations and lack of generalizability are found. Power is especially important because it has been intensely studied in the context of intimate partner violence, condom use, HIV risk, and systemic lack of power of women and SGD people in different parts of the world (Pulerwitz et al., 2018).

Limitations and Future Directions

First, I was unable to examine change over time or correlated change to examine growth processes. In order to investigate developmental questions, further assessments over more years

are required. These questions are still extremely important and deserve to be explored in future research. Very few longitudinal studies are conducted with large samples of SGM individuals (for select exceptions see Dyar et al., 2020; Ogolsky, 2009; Ogolsky et al., 2019), and even fewer with comparably sized groups that allow for well-powered subgroup analysis (for an exception see Whitton et al., 2021). So, even though I did not have long enough periods of time covered for change, our sample strategy and design were a large strength of the present research.

The two avenues to begin to examine the equivalence of developmental processes are to start a new longitudinal data collection of psychosocial variables and health that is more sensitive to sexual and gender diverse identities, and to utilize the imperfect secondary datasets that exist now over longer time periods with indicators of sexual and/or gender minority status. Given that most datasets with social and personality factors do not include expansive or inclusive definitions of gender identity, I propose next steps are to examine sexual orientation groups in secondary datasets with men and women as comparison points for the magnitude and direction of differences over time. However, ideally to continue to build out a systematic science, including longitudinal development, new data is necessary.

Second, the single-item measures of discrimination have unknown, potentially poor psychometric properties which contrasted with the rest of the scale measures that for the most part are commonly used and heavily validated. Alternative multi-item scales that have been validated would be preferable in future research (e.g., Krieger et al., 2012). Additionally, the identities investigated were limited based on sample size. Further research should expand the identities studied and consider the intersection of identities.

Similarities Hypothesis

Due to the emphasis on estimating effects between majority and marginalized groups, it is important to be clear on the theoretical framing by which I interpret these effects. Informing my theoretical thinking was the *Gender Similarities Hypothesis* (Hyde, 2005). The original version of the theory speaks of mean differences between men and women. However, the reasoning and the argument behind the hypothesis makes sense for processes (or associations) as well as for mean differences. Especially for putatively generalizable psychological science (like the association between conscientiousness and mortality; Bogg & Roberts, 2004) but have not been explicitly studied with a known queer sample. The arguments elucidated by Janet S. Hyde are that the importance of mean differences depends on the variable, the context, and the effect size (Hyde, 2005, 2014). In terms of the variable, differences should bear different weight based on expert understanding of the correlates that may lead to differences in outcomes that matter, like mental health, salary, and safety. Thus, the variable in which you find a difference matters.

Context speaks to the era in which the study is conducted, the political atmosphere, and the attitudes and beliefs of the region sampled from. Context is important because it might allow for better interpretation of *why* a difference might exist. Historical timing is part of this because unless an effect is found to be present in the same direction across all generations and cultures, then biology is less likely an explanation and culture is more likely. This is true because people are products of their time and place. Math ability is a great example of this. Math ability differences between boys and girls suggested boys had higher math ability in the early 20th century, but it was diminishing as girls—at least in the U.S. and other countries—were given better access and quality education (Feingold, 1988; Hyde, 1990; Hyde & Mertz, 2009). The pattern observed in the U.S. by the 21st century, i.e., little to no evidence of mean differences but

larger male variance in math ability, was not upheld across other cultures or countries (Feingold, 1994). To be consistent with biological explanations, the effect would need to be largely constant across time and context (Feingold, 1996). Overall, it has been established that context matters for mean differences.

In line with the thinking of methodologists, like Jacob Cohen, who argue for the quantification of an effect (via an effect size) over purely statistical significance testing (Cohen, 1990), Hyde calls for the meaning and the size of an effect to bear heavier interpretation than whether a *t*-test in a single sample is significant (Hyde, 2005). A single sample may find a statistically significant difference in a variable, but the size of the difference may be quite large or small in part dependent on sample size. Additionally, small samples may find a statistically significant difference that is not replicable. Furthermore, there is enough variation within a category (variance) and between repeated samples that it is expected that small mean differences will occur (Cohen, 1990). The effect size, including overlap between the categories of identity examined, are important to consider for meaningful interpretations. The importance of mean differences depends on the three things stated prior: variable, context, and effect size.

Lastly, differences often can be indicators of sociocultural or structural differences rather than inherent to group affiliation. For marginalized groups, like queer people, context will include specific stresses experienced by its members and the social communities that can act as their own cultures with different norms and reference points. As with other theories of multiculturalism, there is no singular culture for a group (Fowers & Richardson, 1996; Plaut, 2010). For example, there is no singular bisexual culture as it is made up of people from all over the world who have vastly different lived experiences suggesting within-group variation in any categorical group. Accordingly, like with mean differences we found that while large differences

in associations may be found, these differences were far rarer than the much more common finding of a small effect size of group difference. The same key qualifiers apply: variable, context, and effect size.

In summation, the *Gender Similarities Hypothesis* helps to inform my interpretation of differences. In the current studies, I began to systematically examine the prevalence, variation, and associations between groups of a range of psychological variables that have been unexamined in SGD people. I found that differences in experiences, like social support, are much less common than differences in exposures, like discrimination.

Recruiting Sexual and Gender Diverse People to Science

To first highlight the prevalence of who I speak of when I talk about sexual and gender diverse people, I refer to a conservative estimate of 10% of the world adult population (L. Anderson et al., 2021; U.S. Census Bureau, 2021). Differing estimates for single identities or combined identities range from 2 to 12% (L. Anderson et al., 2021; Wilson & Meyer, 2021); however, there is no single estimate for all those included under the queer umbrella. It is clear from population estimates that SGM identities are a significant portion of the population. Moreover, college campuses like the global population are becoming more multiracial, multiethnic, and queer (J. M. Jones, 2023; N. Jones et al., 2021; U.S. Census Bureau, 2021) so our psychology research must account for this shift. It is important to consider the inclusion of people from diverse backgrounds in our study of psychology, yet this is not always well-done (Buchanan et al., 2021; S. Roberts, 2022; S. O. Roberts et al., 2020).

a. Diversity Helps Address Research Questions

Once researchers adjust their recruitment strategies and design to account for SGM respondents, diversity can serve scientific goals. Generalizability should not be assumed without

empirical testing or careful consideration within our domain of expertise whether discrimination or differential treatment by others is likely to affect the studied association. Diverse samples with larger numbers from marginalized groups allow for direct statistical comparisons to test generalizability. Comparisons can be especially important to advance our understanding of similar or unique processes when we go beyond majority to minority comparisons and look at more groups in multiple ways. Direct comparisons, while not the only important scientific goal (Whitfield et al., 2008), offer a methodological opportunity. In relation to the current research, not only was it important to have diversity of gender identity and sexual orientation to average between SGM and non-SGM groups, but also to be able to evaluate the presence (or absence) of different associations between SGM subgroups (Ferlatte et al., 2020). While the simplest comparison is between marginalized and majority, it is well understood that SGM groups are not one monolithic group, and certain groups are at higher risk than others (e.g., transgender women have higher depression than sexual minority cisgender women; Ferlatte et al., 2020). Larger, more diverse samples, such as those obtainable through online recruitment (Junkins, Chehab, et al., 2023; Junkins, Pantin, et al., 2024), allow for more nuanced comparison of groups than those that rely on specifically targeted or in-person participation. Similarly, meta-analysis can better track when inequities begin to arise in one group if our data contain better descriptions of who was included. In sum, having large enough subsamples from diverse identities is an opportunity to do more nuanced science and systematically test the boundaries of theory to find where differences are large with directly comparable statistics.

b. Diversity is More Than Theory Testing

Secondly, research that is inclusive to diverse groups is ethical. It is not solely ethics or simply scientific reasons to include diverse people; it is both and they build on one another (S.

Roberts, 2022). While there are innumerable ways in which it is unethical to systematically exclude a portion of the population, I will walk through three examples. First, if there are direct benefits offered from research, like remuneration, and the eligibility lacks scientific justification for only focusing on cisgender men and women, then disallowing responses from gender diverse, transgender, or intersex people would mean benefits are not equally offered. As neuroscience research has had to reckon with left-handed people (Willems et al., 2014), all science needs to reckon with diverse sexual and gender identities. Psychologists need to design their surveys to not presume their sample is all cisgender binary people. In the case of consensually non-monogamous relationships, things like jealousy and alternative partners would be inappropriate to code as poor satisfaction. In the current study, I used scales to measure relationship satisfaction that avoided these questions. In future studies, inclusive protocols could consider ways in which binary gender and monogamy are assumed within scales.

Second, by increasing inclusion within research we change the relationship that marginalized groups have with science. Our survey advertisements were explicitly worded and geared to show our inclusion of all people left out of relationship science using imagery to key in SGD people. There have been significant past and persisting harms done against sexually diverse, gender diverse, racial or ethnic minority, lower socioeconomic status, and other underprivileged groups (e.g., Buchanan et al., 2021; Byrd et al., 2011; Tamlyn et al., 2023; Yates et al., 2020). Evidence shows that people want to lend their voice when they think it matters or can make a difference, especially people who know voices of those with their social identity are consistently excluded (Junkins, Chehab, et al., 2023). Most people only engage with science tangentially, through study participation or media reports, so we show our values by how we do

science. When our values show our inclusion of diverse groups, then we can shift how people see their place within psychological science.

Third, the downstream effects of diversifying samples and study designs are diversifying researchers and the lens by which we ask our questions. Once people can see that psychological science is a place where they can belong, then the hope is that people from more varied backgrounds and life experiences will pursue graduate school, academia, and/or become researchers or scientists (Johnson et al., 2021; Sheppard et al., 2023; Tilghman et al., 2021). In our research, we used a diversity lens to inform our questions, and as a result, we saw much larger engagement with our research from people with diverse sexual and gender identities. New and important questions will be addressed when we invite more people into science. And who we serve well will expand as our research teams expand.

In sum, the inclusion of diverse identities should be done in large part for ethical reasons. While the current research assessed the replicability of the associations between individual characteristics, social influences, and health across groups (a scientific goal), the research also seeks to address this for societal reasons. As we expect to see that environment leads to a lot of the differences seen in research, it is for ethical reasons that we should include people of all identities within research. By actively listening to the lesser-heard portions of our communities, we can do science, build theory, and give back all at once. Public engagement is a challenge, but it is how we go full circle to repay respondents and improve trust between academic institutions and marginalized voices. Overall, building trust with marginalized communities can help diversify the research pipeline.

Conclusion

Overall, the present research is part of the first steps to establish a robust science that systematically places variables within a common framework to see how each compare to other variables and across different SGM groups. The research strategy was designed to build from past research and represent diverse romantic relationships' functioning and health over time. Together, these aims further our understanding of personality, romantic relationship dynamics, and well-being among diverse people. The results showing such strong similarities imply exclusion from research based on sex, gender, or sexual orientation is a waste of resources and harms the representativeness of research. By establishing a large, long-running, diverse, broadly applicable dataset, I plan to expand the present research to tease apart what protects against negative influences on mental health and creates resiliency across all SGM groups. The major societal benefits of this research are equally representing sexual and gender diverse people, including queer, pansexual, asexual, bisexual, genderfluid, genderqueer, nonbinary, and many other experiences, in relationships and wellness research, reduce stigma for queer populations, and provide positive narratives for queer teens about the normalness of their identities.

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APPENDIX A: EXPECTED EFFECT SIZES FOR HYPOTHESES

Table A.1. Expected effect sizes pulled from meta-analyses or single studies for cross-sectional associations. Ranges are reported when the estimate was reported twice for different groups (i.e., correlation among men and correlation among women).

Variable 1	Variable 2	Citation	<i>r</i> (uncorrected for measurement error- if available)	Explicitly queer sample?
Relationship power	Attachment avoidance	(Overall et al., 2016)	-0.13 - -0.30	Hetero only
	Attachment anxiety	(Overall et al., 2016)	-0.14 - -0.42	Hetero only
	Neuroticism	(C. Anderson et al., 2012)	-0.28	No
	Extraversion	(C. Anderson et al., 2012)	0.49	No
	Openness	(C. Anderson et al., 2012)	0.26	No
	Agreeableness	(C. Anderson et al., 2012)	0.10	No
	Conscientiousness	(C. Anderson et al., 2012)	0.35	No
	Agency		NA	
	Communion		NA	
	Masculinity		NA	
	Femininity		NA	
	Social support		NA	
	Loneliness	(Waytz et al., 2015)	-0.57	No
Satisfaction with life/ Subjective well-being	Relationship power		NA	
	Neuroticism	(Anglim et al., 2020)	-0.39	No
	Extraversion	(Anglim et al., 2020)	0.32	No
	Openness	(Anglim et al., 2020)	0.08	No
	Agreeableness	(Anglim et al., 2020)	0.07	No
	Conscientiousness	(Anglim et al., 2020)	0.07	No
	Attachment avoidance	(Zhang et al., 2022)	-0.280	No
	Attachment anxiety	(Zhang et al., 2022)	-0.266	No

Table A.1 (cont.). Expected effect sizes pulled from meta-analyses or single studies for cross-sectional associations. Ranges are reported when the estimate was reported twice for different groups (i.e., correlation among men and correlation among women).

	Agency		NA	
	Communion		NA	
	Masculinity		NA	
	Femininity		NA	
	Social support		NA	
	Relationship satisfaction	(Proulx et al., 2007)	0.37	
	Loneliness	(Gonzalez Avilés et al., 2021)	-0.50	No
	Depression	(Gonzalez Avilés et al., 2021)	-0.68	No
Depression	Relationship power		NA	
	Neuroticism	(Kotov et al., 2010)	0.47	No
	Extraversion	(Kotov et al., 2010)	-0.25	No
	Openness	(Kotov et al., 2010)	-0.08	No
	Agreeableness	(Kotov et al., 2010)	-0.06	No
	Conscientiousness	(Kotov et al., 2010)	-0.36	No
	Agency	(Gonzalez et al., 2012)	-0.46	Yes
	Communion	(Gonzalez et al., 2012)	-0.08	Yes
	Masculinity		NA	
	Femininity		NA	
	Attachment avoidance	(Zhang et al., 2022)	0.278	No
	Attachment anxiety	(Zhang et al., 2022)	0.400	No
	Social support		NA	
	Relationship satisfaction		NA	
	Discrimination	(Dyar et al., 2020)	0.20	Yes
	Loneliness	(Gonzalez Avilés et al., 2021)	0.65	No
Relationship satisfaction	Relationship power	(Cross et al., 2019)	0.20 - 0.58	No
	Neuroticism	(Malouff et al., 2010)	-0.22	Hetero only
	Extraversion	(Malouff et al., 2010)	0.06	Hetero only
	Openness	(Malouff et al., 2010)	0.03	Hetero only
	Agreeableness	(Malouff et al., 2010)	0.15	Hetero only
	Conscientiousness	(Malouff et al., 2010)	0.12	Hetero only
	Attachment avoi.	(Zhang et al., 2022)	0.442	No

Table A.1 (cont.). Expected effect sizes pulled from meta-analyses or single studies for cross-sectional associations. Ranges are reported when the estimate was reported twice for different groups (i.e., correlation among men and correlation among women).

	Attachment anx.	(Zhang et al., 2022)	0.455	No
	Agency		NA	
	Communion		NA	
	Masculinity	(Ta, 2017)	0.13	No
	Femininity	(Ta, 2017)	0.28	No
	Social support		NA	
	Loneliness		NA	
Social support	Neuroticism	(Barańczuk, 2019)	-0.22	No
	Extraversion	(Barańczuk, 2019)	0.27	No
	Openness	(Barańczuk, 2019)	0.11	No
	Agreeableness	(Barańczuk, 2019)	0.25	No
	Conscientiousness	(Barańczuk, 2019)	0.20	No
Loneliness	Neuroticism	(Buecker et al., 2020)	0.358	No
	Extraversion	(Buecker et al., 2020)	-0.370	No
	Openness	(Buecker et al., 2020)	-0.107	No
	Agreeableness	(Buecker et al., 2020)	-0.243	No
	Conscientiousness	(Buecker et al., 2020)	-0.202	No
Perceived Stigma	Alternatives	(Doyle & Molix, 2015)	-0.10	Yes
	Commitment	(Doyle & Molix, 2015)	-0.13	Yes
	Investment	(Doyle & Molix, 2015)	-0.01	Yes
	Satisfaction	(Doyle & Molix, 2015)	-0.12	Yes

Table A.2. Expected effect sizes obtained for univariate latent growth using cross-time correlations or similar reliability measures of within-person between-time associations. The last column, explicitly queer sample, provides information on whether the sample was obviously described showing gender or sexual diversity. No implies these demographics weren't mentioned or only men and women or heterosexual people were reported in the sample. If available, effects from a shorter time interval were included here.

Variable	Citation	ρ or r between measures	Time interval	Explicitly queer sample?
Relationship power		NA		
Neuroticism	(B. W. Roberts & DelVecchio, 2000)	0.50		No
Extraversion	(B. W. Roberts & DelVecchio, 2000)	0.54		No
Openness	(B. W. Roberts & DelVecchio, 2000)	0.51		No
Agreeableness	(B. W. Roberts & DelVecchio, 2000)	0.54		No
Conscientiousness	(B. W. Roberts & DelVecchio, 2000)	0.51		No
Femininity/ masculinity	(B. W. Roberts & DelVecchio, 2000)	0.52		No
Attachment avoidance	(Khan et al., 2020)	0.49	18 months	No
Attachment anxiety	(Khan et al., 2020)	0.25	18 months	No
Agency (narratives)	(McAdams et al., 2006)	0.35	3 months	No
Communion (narratives)	(McAdams et al., 2006)	0.43	3 months	No
Social support	(S. Hu et al., 2022)	0.37	2 years	No
Loneliness	(Abdellaoui et al., 2019)	0.55	3-4 years	No
Relationship satisfaction	(Bühler et al., 2020)	0.78-0.82	4-6 months	No
Satisfaction with life/Subjective well-being	(Busseri & Sadava, 2013)	0.34	4-5 months	No
Depression	(Sarno et al., 2020)	0.56	6 months	Yes

Note. Only the first Roberts & DelVecchio (2000) estimates were ρ rather than r . The reported ρ was based on between-persons correlations across age rather than within-person across-time. However, these estimates were similar to some intraclass correlation coefficients found in other studies for similar variables, so I used the effects from Roberts & DelVecchio (2000) as it is the most used citation for longitudinal personality.

Table A.3. Expected effect sizes pulled from meta-analyses or single studies for correlation of among variables across time. Main results able to be found were correlations within-person between-time variable 1 and variable 2. If the full matrix was reported then a range is reported here, or if there were two different estimates for different portions of the sample a range is reported here.

Variable 1	Variable 2	Citation	Within-person cross-time r	Time interval	Correlated slopes or change	Explicitly queer sample?
Depression	Discrimination	(Dyar et al., 2020)	0.16	6 months		Yes
	Relationship involvement	(Whitton et al., 2021)	-0.11	6 months		Yes
	Relationship power		NA		NA	
	Neuroticism	(Wood et al., 2008)	0.41	3 months		No
	Extraversion	(Wood et al., 2008)	-0.39	3 months		No
	Openness	(Wood et al., 2008)	0.03	3 months		No
	Agreeableness	(Wood et al., 2008)	-0.31	3 months		No
	Conscientiousness	(Wood et al., 2008)	-0.20	3 months		No
	Agency		NA		NA	
	Communion		NA		NA	
	Masculinity	(Bromberger & Matthews, 1996)	0.14	3 years		
	Femininity	(Bromberger & Matthews, 1996)	-0.02	3 years		
	Attachment avoidance	(Wei et al., 2005)	0.01	5 months		No
	Attachment anxiety	(Wei et al., 2005)	0.26	5 months		No
	Social support	(Wood et al., 2008)	-0.34 - -0.46	3 months		
	Relationship satisfaction	(Fincham et al., 1997)	-0.43 - -0.33	18 months		No
	Loneliness	(Wei et al., 2005)	0.59	5 months		No
	Subjective well-being	(Joshnloo, 2022)	-0.32	3 years		No

Table A.3 (cont.). Expected effect sizes pulled from meta-analyses or single studies for correlation of among variables across time. Main results able to be found were correlations within-person between-time variable 1 and variable 2. If the full matrix was reported then a range is reported here, or if there were two different estimates for different portions of the sample a range is reported here.

Satisfaction with life/ Subjective well-being	Relationship power		NA		NA	
	Neuroticism	(Hill et al., 2012)		10 years	-0.09 - -0.14	Social well-being including integration, contribution, acceptance, and actualization.
	Extraversion	(Hill et al., 2012)		10 years	0.08 – 0.24	Social well-being including integration, contribution, acceptance, and actualization.
	Openness	(Hill et al., 2012)		10 years	0.08 – 0.21	Social well-being including integration, contribution, acceptance, and actualization.
	Agreeableness	(Hill et al., 2012)		10 years	0.05 – 0.17	Social well-being including integration, contribution, acceptance, and actualization.
	Conscientiousness	(Hill et al., 2012)		10 years	0.05 – 0.17	Social well-being.
	Attachment avoi.		NA		NA	
	Attachment anx.		NA		NA	

Table A.3 (cont.). Expected effect sizes pulled from meta-analyses or single studies for correlation of among variables across time. Main results able to be found were correlations within-person between-time variable 1 and variable 2. If the full matrix was reported then a range is reported here, or if there were two different estimates for different portions of the sample a range is reported here.

	Agency	(Stein & Newcomb, 1999)	0.57	8 years		Both measures used satisfaction with life items.
	Communion	NA				
	Masculinity	(Aube & Koestner, 1992)	0.42 – 0.47	19 years		Measured by adjustment including life skills.
	Femininity	(Aube & Koestner, 1992)	-0.22 - -0.42	19 years		Men
	Social support	(Hu et al., 2022)	0.12	2 years		No
	Relationship satisfaction		NA			
	Loneliness	(Rochelle, 2022)	-0.17	9 months		Chinese older adults
Relationship satisfaction	Neuroticism	(Taggart et al., 2019)	-0.02	4 months		No
	Extraversion	(Taggart et al., 2019)	-0.07	4 months		No
	Openness	(Taggart et al., 2019)	0.16	4 months		No
	Agreeableness	(Taggart et al., 2019)	0.23	4 months		No
	Conscientiousness	(Taggart et al., 2019)	-0.06	4 months		No

APPENDIX B: PRELIMINARY SAMPLE DEMOGRAPHICS AND RETENTION

Preliminary data

The survey was started in January 2022 with minimal recruitment efforts while I focused on any technical bugs and sought funding. Unpaid survey ads were placed in one subreddit (r/SampleSize) multiple times. In September 2022, we received funding from the Center for Social and Behavioral Sciences through the Small Health Grant mechanism (\$20,000) and so recruitment efforts increased. Funding is available until September 2023. Survey ads including participant compensation were placed in subreddits (r/SampleSize, r/queer, r/Marriage, r/AskMenAdvice, r/NonBinary, r/sex). A paid ad on Facebook was run as a trial for one week when we created a Facebook page for the study (<https://www.facebook.com/profile.php?id=100086994528193>) and had little to no posts or biographical content yet. A second trial on Facebook was done for one week once we created content for the page. Both proved to have little success ($N < 30$) and inspired hateful or rude comments. Switching over to Instagram (@power_relationship_study), I added old content, kept generating new content, and we boosted two simultaneous ads with different images for one week. Paid ads on Instagram proved highly successful with \$140 spent in 7 days recruiting more than 370 initial responses. A large number of participants do not make it past the demographics, and many do not go past the core survey. The average time to take the first assessment is 27 minutes. Later waves take an average of 11 minutes.

As of February 20, 2023, I received complete initial responses from 904 participants, of whom 188 have completed at least one follow-up survey and 33 have recruited their partner to participate as well. Two-thirds self-identified as SGM (67%). If I extrapolate the number of

responses we'll have with continuing paid ads on Instagram at that rate, we will have 1,300 new responses by May 2023 when the social media funds run out. Thus, we will have approximately 2,200 responses by May 2023. Based on current sample demographics, more than 50% are expected to be SGM. Before funding ends in September 2023, we will have continued free ads on the UIUC campus, on the Instagram account, and on the subreddits.

Table B.1. Current recruitment as of February 20, 2023.

Sample Sizes	Wave 1	Wave 2	Wave 3	Wave 4	Wave 5	Wave 6
Total N	904	188	86	68	48	10
Completed core survey N	695	188	86	68	48	10
Completed full survey N	586	188	86	68	48	10
% responded yes SGM	67.1%	32%	30%	31%	27%	10%

Timing of analysis

In order to complete longitudinal analyses for studies 2 and 3, the latest I will download the data is September 2024 affording me two years to collect 3 minimum assessments and up to 24 assessments in a large number of people.

Table B.2. Organized by the NIMHD Research Framework available online, these are the variables included in the POWER study.

Domains of Influence		POWER study variables & Levels of Influence
	Behavioral	Individual: extraversion, neuroticism, conscientiousness, agreeableness, open-mindedness; masculinity-femininity; agency-communion; and romantic attachment; open-ended responses to discrimination and coping Interpersonal: power; relationship satisfaction; relationship investment
	Physical/Built Environment	Interpersonal: Number of kids; Employment; Job title and type; Leadership role
	Sociocultural Environment	Individual: Age; SES; Education; Martial Status; Sex; Gender; Sexual orientation; Romantic orientation; SGM status Interpersonal: social support; social isolation; minority stress; places you experience discrimination; targeted characteristics of discrimination
	Health Care System	Individual: Insurance coverage
Health Outcomes		depression measured by depressive symptoms and suicidal ideation; well-being measured by satisfaction with life

Schedule of Deployment

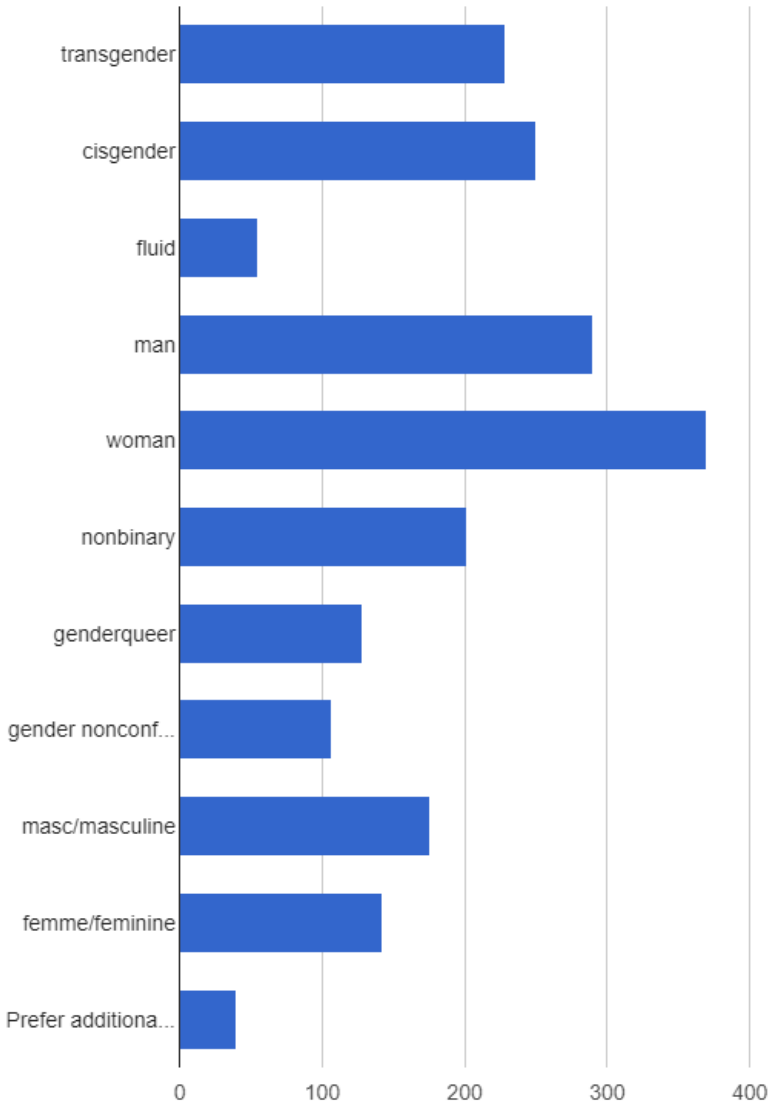
Demographics and consent will be given at the time of the first assessment. Consent was asked again for participants in October 2022 who were still taking the survey from when it was unfunded, some consented for the new paid survey and the rest had stopped participation. The paid period of our survey offers 40 people who have participated in their third month or beyond \$30 Amazon ecodes. The payments are available between October 2022 to September 2023. Each subsequent survey has a ‘verifying information’ to ask whether people have started or ended a relationship. If yes to either, then they are asked to fill out partner information again. Same procedure for if they say in life events that they lost a job, were demoted, or promoted. They will be asked again for company and job title. After the consent and demographics are the survey questionnaires.

Core survey measures will be given to participants every month. These measures include personality (BFI-2), relationship power (RPI), relationship satisfaction (CSI-RS and RAS), satisfaction with life or subjective well-being (SWL), and depressive symptoms (QIDS). Alternating months part 1 includes Agency-Communion and relationship investment (Rusbult inventory); it will be given every other month. Alternating months part 2 includes the attachment (ECR-romantic attachment), social support scale, and social isolation scale in the off months of part 1. The ‘checking in’ survey will be administered every third month; it includes Traditional masculinity-femininity, life events, and discrimination diary questions. In Table B.3, this information is summarized and displayed by event number including a count of the total items each assessment.

Table B.3. Schedule of survey instruments for POWER study. The headers are the number of events (event 1 is the initial survey, event 2 is the following month, event 3 is the next following month, and so on). If a measure is given at a specific event there is an X in the cell.

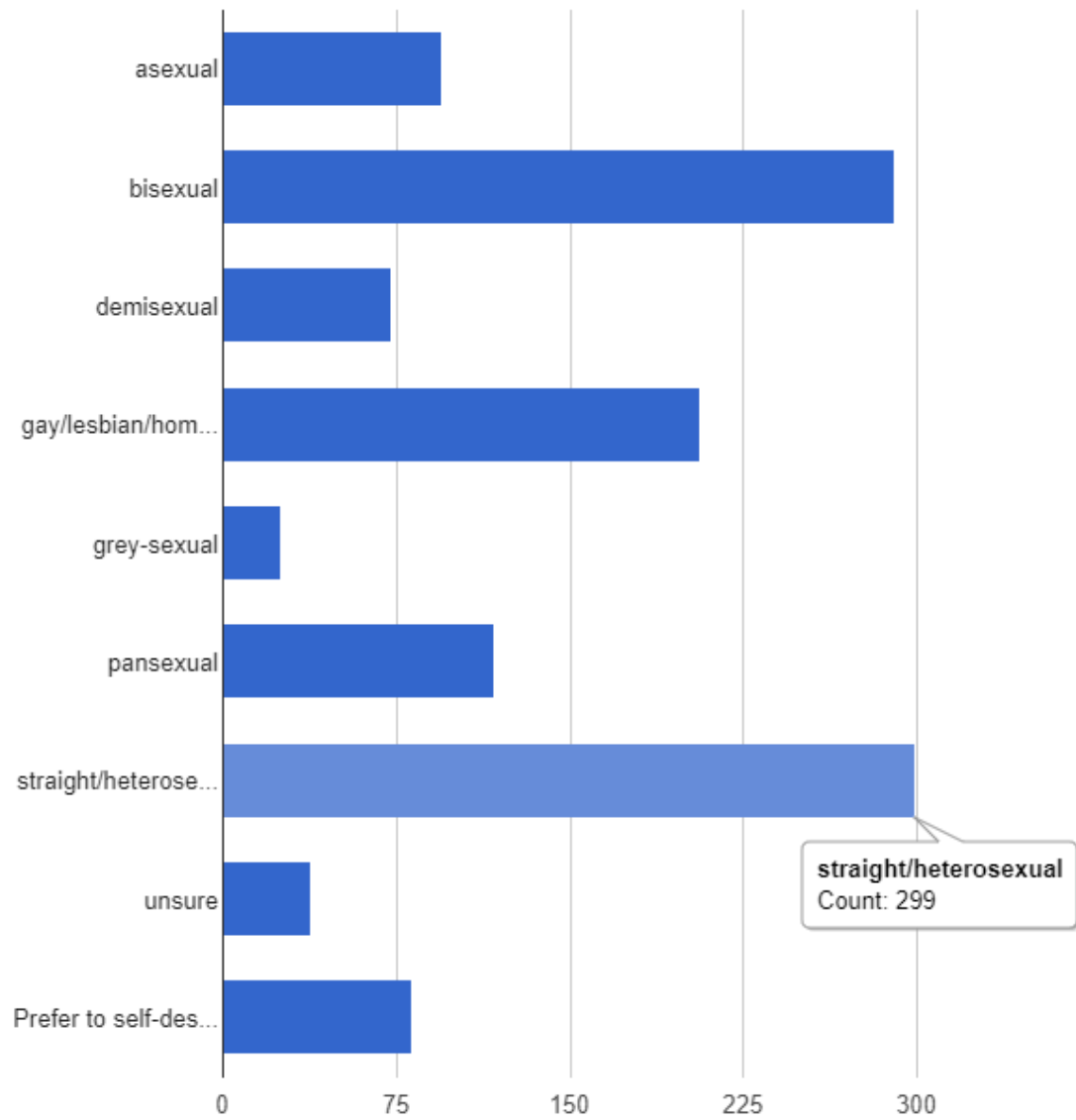
Measures	1	2	3	4	5	6	7	8	9	10	11	12
Big Five Inventory	X	X	X	X	X	X	X	X	X	X	X	X
Power measure	X	X	X	X	X	X	X	X	X	X	X	X
CSI relationship satisfaction	X	X	X	X	X	X	X	X	X	X	X	X
Relationship satisfaction	X	X	X	X	X	X	X	X	X	X	X	X
Subjective well-being	X	X	X	X	X	X	X	X	X	X	X	X
Depression	X	X	X	X	X	X	X	X	X	X	X	X
Relationship Investment scale	X		X		X		X		X		X	
Agency – Communion traits	X		X		X		X		X		X	
Attachment-romantic partner	X			X		X		X		X		X
Loneliness scale	X			X		X		X		X		X
Social support scale	X			X		X		X		X		X
Masculinity – femininity traits	X		X			X			X			X
Life events (yes/no)	X		X			X			X			X
Discrimination questions	X		X			X			X			X
Survey end	X	X	X	X	X	X	X	X	X	X	X	X
Number of items	306	122	215	169	122	215	165	169	215	169	165	219

Figure B.1. Sample demographics during preliminary data period (February 20, 2023).



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Figure B.1 (cont.). Sample demographics during preliminary data period (February 20, 2023).



APPENDIX C: STUDY 1 ADDITIONAL TABLE

Table C.1. The simulation results for estimating the required group size for comparing correlations between groups. The first four columns were specified in the run and remaining columns were output.

N per group	Group 1 r	Group 2 r	alpha	Estimate group 1 r	Estimate group 2 r	Difference in r	Confidence interval	p- value
Continuous normal								
50	0.25	0.25	.05	0.12	0.40	-0.29	[-0.67, 0.11]	.147
50	0.20	0.30	.05	0.16	0.17	-0.01	[-0.41, 0.39]	.928
50	0.10	0.30	.05	0.09	0.25	-0.16	[-0.54, 0.24]	.416
50	0.10	0.40	.05	-0.03	0.53	-0.56	[-0.91, -0.17]	.002
100	0.25	0.25	.05	0.22	0.42	-0.19	[-0.46, 0.06]	.135
100	0.20	0.30	.05	0.25	0.34	-0.09	[-0.35, 0.21]	.597
100	0.10	0.30	.05	-0.07	0.41	-0.47	[-0.71, -0.19]	.001
100	0.10	0.40	.05	0.09	0.32	-0.22	[-0.48, 0.04]	.081
200	0.25	0.25	.05	0.31	0.22	0.09	[-0.9, 0.27]	.338
200	0.20	0.30	.05	0.20	0.37	-0.17	[-0.35, 0.01]	.062
200	0.10	0.30	.05	0.14	0.12	0.02	[-0.17, 0.21]	.818
200	0.10	0.40	.05	0.14	0.45	-0.31	[-0.49, -0.14]	.000
300	0.25	0.25	.05	0.18	0.22	-0.04	[-0.21, 0.12]	.599
300	0.20	0.30	.05	0.22	0.17	0.05	[-0.12, 0.20]	.585
300	0.10	0.30	.05	0.09	0.30	-0.20	[-0.36, -0.04]	.012
300	0.10	0.40	.05	0.05	0.036	-0.31	[-0.46, -0.17]	.000
400	0.25	0.25	.05	0.30	0.13	0.17	[0.04, 0.30]	.015
400	0.20	0.30	.05	0.14	0.24	-0.10	[-0.23, 0.03]	.135
400	0.10	0.30	.05	0.19	0.33	-0.14	[-0.28, -0.01]	.033
400	0.10	0.40	.05	0.16	0.40	-0.24	[-0.37, -0.11]	.003
500	0.25	0.25	.05	0.29	0.27	0.01	[-0.10, 0.13]	.842

Table C.1 (cont.). The simulation results for estimating the required group size for comparing correlations between groups. The first four columns were specified in the run and remaining columns were output.

500	0.20	0.30	.05	0.16	0.22	-0.06	[-0.18, 0.06]	.310
500	0.10	0.30	.05	0.08	0.24	-0.15	[-0.27, -0.03]	.015
500	0.10	0.40	.05	0.14	0.42	-0.28	[-0.40, -0.19]	.000
600	0.25	0.25	.05	0.20	0.30	-0.09	[-0.21, 0.01]	.071
600	0.20	0.30	.05	0.11	0.32	-0.21	[-0.32, -0.10]	.000
600	0.10	0.30	.05	0.14	0.30	-0.15	[-0.27, -0.04]	.007
600	0.10	0.40	.05	0.13	0.41	-0.28	[-0.38, -0.17]	.000
700	0.25	0.25	.05	0.24	0.19	0.05	[-0.05, 0.15]	.328
700	0.20	0.30	.05	0.15	0.31	-0.16	[-0.26, -0.06]	.003
700	0.10	0.30	.05	0.15	0.23	-0.08	[-0.18, 0.02]	.147
700	0.10	0.40	.05	0.11	0.42	-0.31	[-0.41, -0.21]	.000
800	0.25	0.25	.05	0.24	0.20	0.04	[-0.05, 0.13]	.386
800	0.20	0.30	.05	0.16	0.33	-0.17	[-0.26, -0.08]	.000
800	0.10	0.30	.05	0.07	0.30	-0.23	[-0.32, -0.14]	.000
800	0.10	0.40	.05	0.12	0.36	-0.25	[-0.33, -0.15]	.000
900	0.25	0.25	.05	0.31	0.21	0.10	[0.01, 0.18]	.023
900	0.20	0.30	.05	0.19	0.26	-0.07	[-0.15, 0.02]	.139
900	0.10	0.30	.05	0.10	0.33	-0.23	[-0.31, -0.15]	.000
900	0.10	0.40	.05	0.13	0.36	-0.22	[-0.31, -0.14]	.000
1,000	0.25	0.25	.05	0.17	0.25	-0.08	[-0.17, -0.001]	.050
1,000	0.20	0.30	.05	0.22	0.33	-0.11	[-0.20, -0.02]	.016
1,000	0.10	0.30	.05	0.07	0.26	-0.18	[-0.27, -0.10]	.000
1,000	0.10	0.40	.05	0.13	0.39	-0.26	[-0.34, -0.18]	.000
1,500	0.25	0.25	.05	0.23	0.20	0.03	[-0.04, 0.09]	.440
1,500	0.20	0.30	.05	0.14	0.26	-0.12	[-0.19, -0.05]	.001
1,500	0.10	0.30	.05	0.08	0.27	-0.19	[-0.27, -0.12]	.000
1,500	0.10	0.40	.05	0.11	0.34	-0.23	[-0.30, -0.17]	.000
2,000	0.25	0.25	.05	0.23	0.25	-0.02	[-0.08, 0.04]	.560
2,000	0.20	0.30	.05	0.20	0.29	-0.09	[-0.15, -0.03]	.001

Table C.1 (cont.). The simulation results for estimating the required group size for comparing correlations between groups. The first four columns were specified in the run and remaining columns were output.

2,000	0.10	0.30	.05	0.11	0.29	-0.17	[-0.23, -0.11]	.000
2,000	0.10	0.40	.05	0.10	0.39	-0.29	[-0.35, -0.23]	.000
2,500	0.25	0.25	.05	0.27	0.22	0.06	[0.004, 0.11]	.035
2,500	0.20	0.30	.05	0.21	0.28	-0.07	[-0.11, -0.02]	.009
2,500	0.10	0.30	.05	0.12	0.27	-0.16	[-0.21, -0.10]	.000
2,500	0.10	0.40	.05	0.10	0.36	-0.26	[-0.31, -0.21]	.000
3,000	0.25	0.25	.05	0.22	0.24	-0.01	[-0.06, 0.03]	.564
3,000	0.20	0.30	.05	0.15	0.29	-0.14	[-0.19, -0.09]	.000
3,000	0.10	0.30	.05	0.11	0.27	-0.16	[-0.21, -0.12]	.000
3,000	0.10	0.40	.05	0.08	0.39	-0.31	[-0.35, -0.26]	.000
3,500	0.25	0.25	.05	0.21	0.23	-0.02	[-0.07, 0.02]	.314
3,500	0.20	0.30	.05	0.16	0.30	-0.13	[-0.18, -0.09]	.000
3,500	0.10	0.30	.05	0.09	0.28	-0.19	[-0.24, -0.15]	.000
3,500	0.10	0.40	.05	0.09	0.38	-0.29	[-0.34, -0.25]	.000
5,000	0.25	0.25	.05	0.24	0.24	-0.0009	[-0.04, 0.04]	.975
5,000	0.20	0.30	.05	0.19	0.29	-0.10	[-0.14, -0.07]	.000
5,000	0.10	0.30	.05	0.11	0.28	-0.17	[-0.21, -0.13]	.000
5,000	0.10	0.40	.05	0.08	0.38	-0.30	[-0.34, -0.26]	.000
10,000	0.25	0.25	.05	0.24	0.22	0.03	[-0.0002, 0.05]	.052
10,000	0.20	0.30	.05	0.20	0.29	-0.09	[-0.11, -0.06]	.000
10,000	0.10	0.30	.05	0.11	0.28	-0.17	[-0.20, -0.14]	.000
10,000	0.10	0.40	.05	0.10	0.38	-0.28	[-0.30, -0.25]	.000
Ordinal categorical								
50	0.25	0.25	.05	0.12	0.24	-0.12	[-0.59, 0.29]	.540
50	0.2	0.3	.05	0.14	0.16	-0.02	[-0.44, 0.40]	.886
50	0.1	0.3	.05	0.09	0.26	-0.16	[-0.59, 0.27]	.443
50	0.10	0.40	.05	0.13	0.35	-0.22	[-0.57, 0.21]	.361

Table C.1 (cont.). The simulation results for estimating the required group size for comparing correlations between groups. The first four columns were specified in the run and remaining columns were output.

100	0.25	0.25	.05	0.47	0.34	0.13	[-0.18, 0.41]	.415
100	0.2	0.3	.05	0.18	0.19	-0.01	[-0.28, 0.28]	.988
100	0.1	0.3	.05	0.04	0.24	-0.20	[-0.45, 0.10]	.207
100	0.10	0.40	.05	0.15	0.40	-0.25	[-0.48, 0.03]	.094
200	0.25	0.25	.05	0.31	0.13	0.17	[-0.02, 0.36]	.077
200	0.2	0.3	.05	0.17	0.34	-0.17	[-0.36, 0.012]	.076
200	0.1	0.3	.05	0.14	0.31	-0.17	[-0.35, 0.01]	.063
200	0.10	0.40	.05	0.14	0.44	-0.30	[-0.49, -0.09]	.004
300	0.25	0.25	.05	0.18	0.34	-0.16	[-0.31, 0.001]	.053
300	0.2	0.3	.05	0.14	0.33	-0.20	[-0.35, -0.04]	.018
300	0.1	0.3	.05	0.13	0.29	-0.16	[-0.31, 0.01]	.056
300	0.10	0.40	.05	0.04	0.30	-0.26	[-0.41, -0.10]	.001
400	0.25	0.25	.05	0.22	0.26	-0.04	[-0.18, 0.09]	.577
400	0.2	0.3	.05	0.19	0.32	-0.13	[-0.26, 0.01]	.057
400	0.1	0.3	.05	0.07	0.30	-0.23	[-0.37, -0.10]	.001
400	0.10	0.40	.05	0.13	0.41	-0.28	[-0.40, -0.15]	.000
500	0.25	0.25	.05	0.21	0.29	-0.08	[-0.20, 0.04]	.164
500	0.2	0.3	.05	0.16	0.30	-0.14	[-0.26, -0.03]	.007
500	0.1	0.3	.05	0.05	0.31	-0.25	[-0.37, -0.14]	.000
500	0.10	0.40	.05	0.12	0.36	-0.24	[-0.36, -0.13]	.000
600	0.25	0.25	.05	0.19	0.25	-0.06	[-0.17, 0.04]	.293
600	0.2	0.3	.05	0.17	0.28	-0.11	[-0.21, -0.003]	.047
600	0.1	0.3	.05	0.08	0.29	-0.21	[-0.33, -0.11]	.001
600	0.10	0.40	.05	0.11	0.36	-0.25	[-0.36, -0.15]	.000
700	0.25	0.25	.05	0.23	0.27	-0.04	[-0.14, 0.06]	.461
700	0.2	0.3	.05	0.19	0.29	-0.11	[-0.21, -0.01]	.026
700	0.1	0.3	.05	0.09	0.29	-0.19	[-0.29, -0.09]	.000
700	0.10	0.40	.05	0.05	0.37	-0.31	[-0.41, -0.22]	.000
800	0.25	0.25	.05	0.24	0.16	0.08	[-0.01, 0.18]	.101

Table C.1 (cont.). The simulation results for estimating the required group size for comparing correlations between groups. The first four columns were specified in the run and remaining columns were output.

800	0.2	0.3	.05	0.15	0.26	-0.11	[-0.20, -0.01]	.027
800	0.1	0.3	.05	0.02	0.30	-0.27	[-0.36, -0.18]	.000
800	0.10	0.40	.05	0.11	0.36	-0.26	[-0.35, -0.17]	.000
900	0.25	0.25	.05	0.25	0.24	0.01	[-0.07, 0.10]	.733
900	0.2	0.3	.05	0.21	0.30	-0.09	[-0.18, -0.01]	.041
900	0.1	0.3	.05	0.04	0.28	-0.23	[-0.32, -0.15]	.000
900	0.10	0.40	.05	0.10	0.31	-0.21	[-0.29, -0.12]	.000
1,000	0.25	0.25	.05	0.21	0.20	0.01	[-0.07, 0.10]	.765
1,000	0.2	0.3	.05	0.15	0.30	-0.15	[-0.23, -0.07]	.000
1,000	0.1	0.3	.05	0.07	0.26	-0.19	[-0.28, -0.10]	.000
1,000	0.10	0.40	.05	0.10	0.37	-0.26	[-0.35, -0.19]	.000
1,500	0.25	0.25	.05	0.20	0.23	-0.02	[-0.09, 0.04]	.451
1,500	0.20	0.30	.05	0.16	0.27	-0.11	[-0.17, -0.04]	.003
1,500	0.10	0.30	.05	0.12	0.28	-0.16	[-0.23, -0.09]	.000
1,500	0.10	0.40	.05	0.10	0.38	-0.27	[-0.34, -0.21]	.000
2,000	0.25	0.25	.05	0.21	0.24	-0.03	[-0.09, 0.03]	.339
2,000	0.20	0.30	.05	0.17	0.30	-0.13	[-0.18, -0.07]	.000
2,000	0.10	0.30	.05	0.10	0.26	-0.16	[-0.22, -0.10]	.000
2,000	0.10	0.40	.05	0.10	0.37	-0.26	[-0.32, -0.21]	.000
2,500	0.25	0.25	.05	0.22	0.23	-0.01	[-0.06, 0.04]	.699
2,500	0.20	0.30	.05	0.18	0.25	-0.07	[-0.13, -0.02]	.009
2,500	0.10	0.30	.05	0.11	0.29	-0.18	[-0.23, -0.12]	.000
2,500	0.10	0.40	.05	0.10	0.36	-0.26	[-0.31, -0.21]	.000
3,000	0.25	0.25	.05	0.22	0.25	-0.04	[-0.08, 0.01]	.127
3,000	0.20	0.30	.05	0.20	0.28	-0.08	[-0.12, -0.04]	.001
3,000	0.10	0.30	.05	0.11	0.29	-0.18	[-0.23, -0.14]	.000
3,000	0.10	0.40	.05	0.11	0.37	-0.26	[-0.31, -0.22]	.000
3,500	0.25	0.25	.05	0.22	0.21	0.01	[-0.03, 0.06]	.490
3,500	0.20	0.30	.05	0.18	0.25	-0.07	[-0.11, -0.02]	.001

Table C.1 (cont.). The simulation results for estimating the required group size for comparing correlations between groups. The first four columns were specified in the run and remaining columns were output.

3,500	0.10	0.30	.05	0.07	0.29	-0.22	[-0.26, -0.18]	.000
3,500	0.10	0.40	.05	0.10	0.37	-0.27	[-0.32, -0.23]	.000
5,000	0.25	0.25	.05	0.23	0.21	0.02	[-0.02, 0.05]	.424
5,000	0.20	0.30	.05	0.18	0.28	-0.10	[-0.14, -0.06]	.000
5,000	0.10	0.30	.05	0.08	0.28	-0.20	[-0.24, -0.16]	.000
5,000	0.10	0.40	.05	0.06	0.35	-0.29	[-0.32, -0.25]	.000
10,000	0.25	0.25	.05	0.24	0.24	-0.0003	[-0.03, 0.03]	.998
10,000	0.20	0.30	.05	0.19	0.27	-0.08	[-0.11, -0.06]	.000
10,000	0.10	0.30	.05	0.10	0.25	-0.15	[-0.17, -0.12]	.000
10,000	0.10	0.40	.05	0.08	0.37	-0.29	[-0.31, -0.26]	.000

APPENDIX D: STUDY 2 ADDITIONAL INFORMATION

Methods for Latent Growth Models

Univariate Growth

The group-level growth will be examined using latent growth curve multi-group modeling to determine whether defined groups differ from one another in the slopes (means and variances), intercepts (means and variances), and slope-intercept covariance. Mean differences will be calculated between intercept in group 1 and group 2 as well as slope in group 1 and group 2. These will be standardized as Cohen's *d* effect sizes. Variances will be calculated as variance ratios, group 1 variance divided by group 2 variance. Correlation differences will be calculated by standardizing the covariance among intercept and slope in each group and subtracting group 1 correlation by group 2 correlation. Results will be presented in histograms and other plots to evaluate the spread of calculated differences across all variables. These steps allow us to examine whether the growth processes differ between groups. The group variables will follow according to the sample sizes suggested by the precision analysis discussed below. We will consider sexual or gender identity group variables as well as relationship structure group variables. Groups with at least 800 people will have precise effect estimation (narrow confidence intervals). Before modeling the growth curves, time invariance will be assessed for each variable.

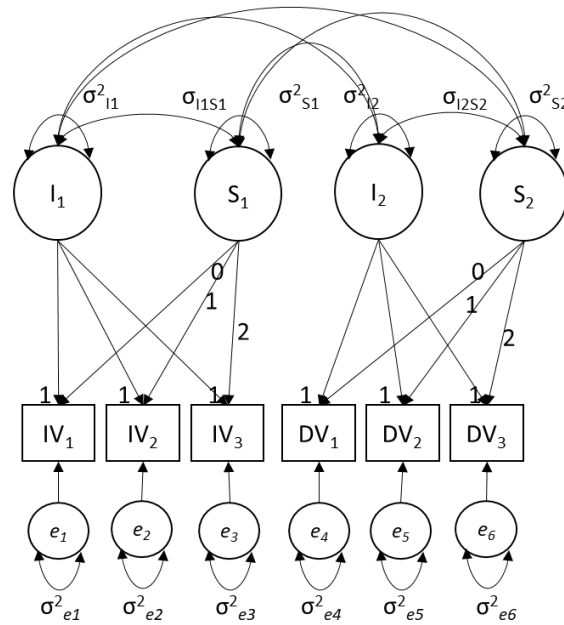
Linear growth will be specified for each variable with multiple groups specified. The intercept is measured by the indicators from the three waves that should be relatively equivalent time points (30 days with some variation based on which reminder they start the survey at). Each loading from the indicator to the latent intercept is fixed to 1. For the latent slope, the three indicators have fixed loadings with linear increase (0, 1, and 2). The variability in the time intervals between participants will be evaluated. If the standard deviation of number days

between assessments is very small, the time intervals will be fixed. If there is variation between people, then I will vary the actual time as the loadings which will serve to increase statistical power (Brandmaier et al., 2020). The above steps describe the way in which univariate growth will be examined.

Bivariate Growth

Bivariate growth models will be specified similarly to what was described for univariate growth. Instead of one variable intercept and slope, each model will decompose two variables' intercepts and slopes. The parameters examined will be the correlated change, meaning all cross-variable correlations between intercepts and slopes. To be explicit, cross-variable correlations include the variable 1 intercept – variable 2 intercept, variable 1 slope – variable 2 slope, variable 1 intercept – variable 2 slope, and variable 1 slope – variable 2 intercept correlations. The effect size differences between groups will be estimated to address the research question. The results for the research question looking at the differences between groups (correlations) will be presented in histograms to evaluate the spread of calculated differences across all variables.

Figure D1. Simplified statistical diagram for correlation of intercepts and slopes of two psychosocial variables shown for one group.

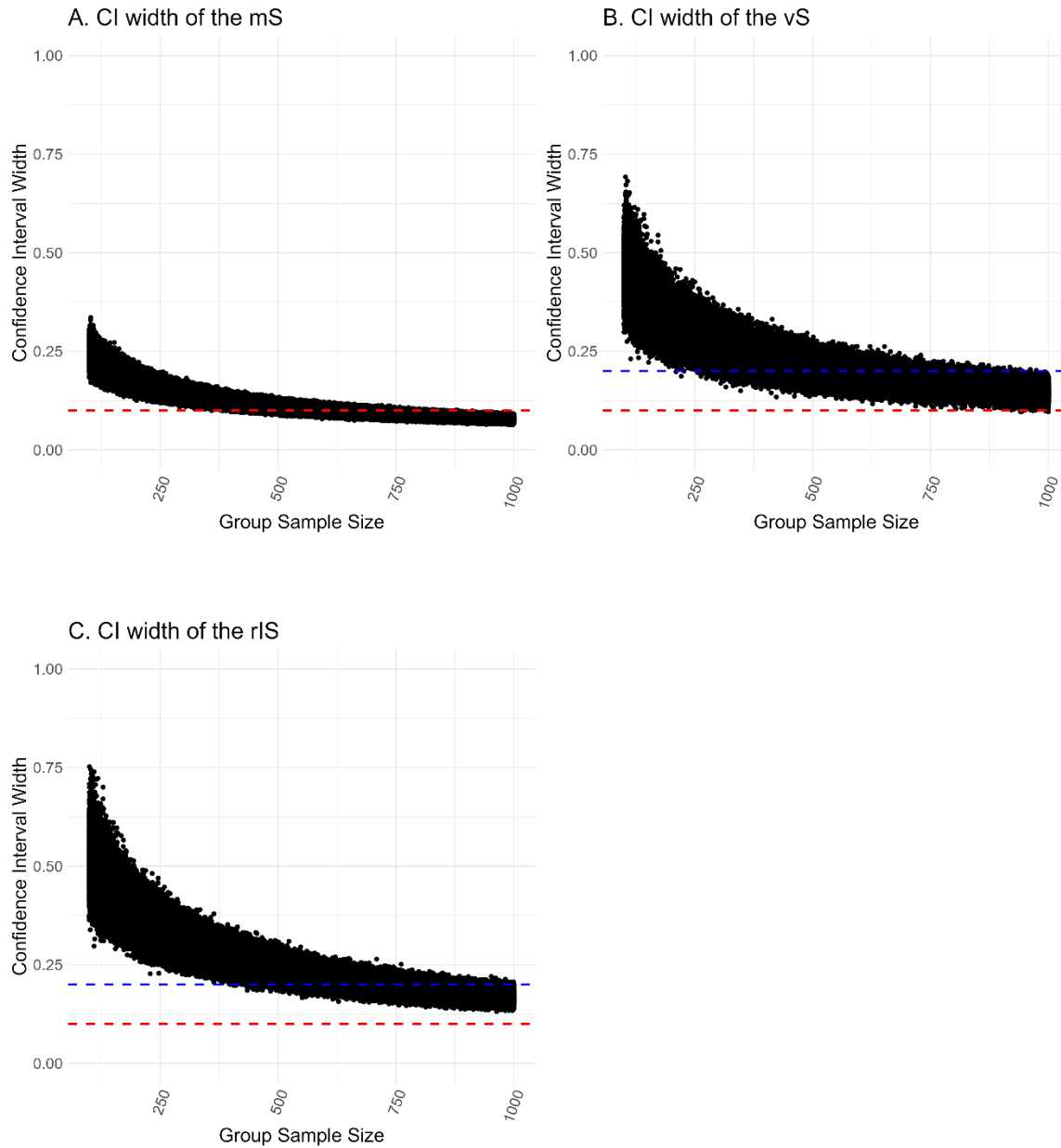


Statistical Precision Analysis. Simulations were run varying the specified parameters to assess linear growth in one variable and correlated change in two variables. Precision analysis for a confidence interval width of 0.20 was specified as the desired outcome. The resulting sample sizes per group needed are 800 people. Effect estimates in groups greater than 800 are therefore precise and smaller groups should be interpreted with caution.

Univariate growth statistical precision analysis

The analyses proposed here will be undertaken with 3 waves of data. General recommendations from methodological papers suggest sample sizes in the range of 300-450 per group for 80% power in longitudinal growth models assuming small growth and repeated measures (Fan, 2003; Xitao & Xiaotao, 2005). We ran simulations varying sample size, intercept mean, intercept variance, slope mean, slope variance, and intercept-slope covariance including the tests for differences between groups on each parameter, the sample size to estimate effects with narrow confidence intervals of 0.20 was 800 (Figure D1). In further detail the sample sizes varied were continuously sampled from 100 to 1,000 per group (total N was 200 to 2,000). The intercept and slope means as well as intercept and slope variances were distributed from 0.05 to 0.25. Covariance between intercept and slope were sampled from -0.40 to -0.10. These estimates were used in line with roughly normal effect sizes seen in other personality and related literature. The parameters as specified were iterated over with every combination. So, the statistical precision simulations were able to give an idea of the average sample size needed to find the effect sizes specified.

Figure D2. Results from precision analysis for the means, variances, and intercept-slope parameter to estimate the point at which the interval around the estimates is approaching 0.10 (red line) or 0.20 (blue line). The sample size of one group is shown on the x-axis. Effect sizes were varied in the simulations.



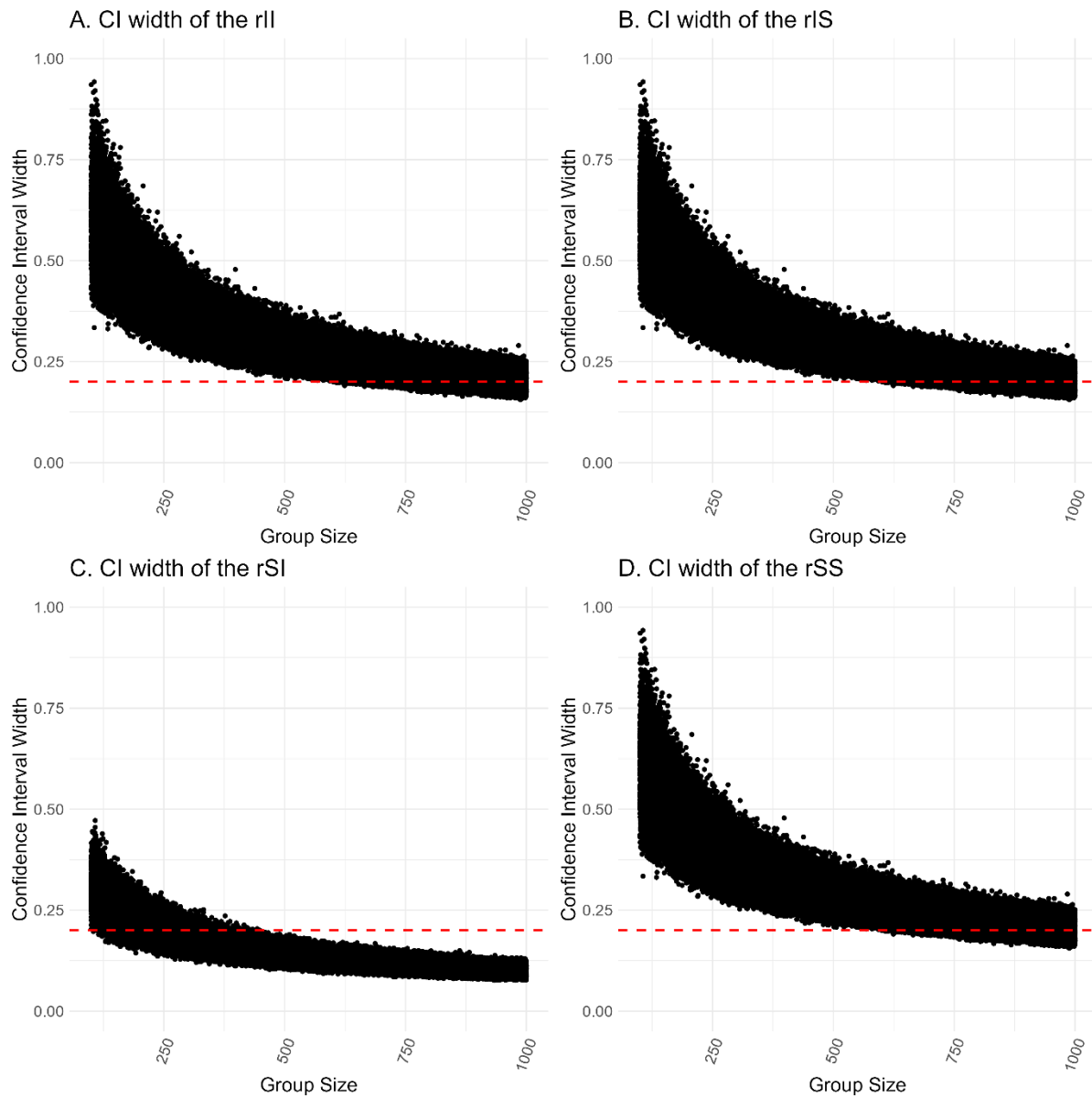
Bivariate growth statistical precision analysis

The statistical precision analysis was done by adding a second variable to the latent growth curve model simulated on univariate growth, namely the parameters of $rI-S$, $rS-S$, $rS-I$, and $rI-I$. These parameters were sampled from a continuous distribution ranging from -0.50 to

0.50. Samples sizes within groups were varied from 100 to 1,000. There were 100,000 simulations run to estimate these combinations.

The results showed that to have power to detect significant correlations between cross-variable latent intercepts and slopes ($p < .05$), a total sample size of 1,750 will be required with near equal group sizes of 875. At this sample size, there is still some uncertainty whether the correlation in each group will be significant.

Figure D3. The simulation results for estimating the required total sample size for precise estimates for differences in the bivariate correlations between groups. The parameters were sampled from a continuous distribution of effects. Variation in statistical power to detect correlation differences was more related to the univariate parameters than the effect sizes of the correlation difference.



Methods, Sample Information, and Main Text Results

Table D.1. Demographics by wave to show the retention.

Demographic	Wave 1	Wave 2	Wave 3
N	1,777	703	555
Age	27.20 (8.90)	27.76 (9.20)	27.84 (9.15)
US residence	89%	93%	93%
SES	4.74 (2.03)	4.75 (2.02)	4.72 (2.03)
Education			
High school	311	85	68
Vocational training	54	12	8
Associate's	110	35	28
Bachelor's or college	901	383	294
Graduate degree	395	184	154
Racial identity			
Asian	116	48	36
Black	93	45	33
Middle Eastern	10	3	1
Native or Indigenous Persons	13	3	3
White	1,216	497	403
Hispanic	9.5%	3.4%	2.7%
Sex assigned at birth			
Female	1,391	576	459
Male	362	118	91
Intersex	8	4	1
SGM	73%	77%	76%
Gender descriptor			
Cisgender	510	226	177
Transgender	499	217	173
Gender identity			
Genderqueer	710	304	241
Women	620	253	190
Men	363	119	104
Sexual orientation			
Plurisexual	983	407	317
Monosexual	644	231	190
Asexual	124	55	38
Romantic orientation			
Queerromantic	374	142	111
Bi/Panromantic	473	202	172
Heteroromantic	271	114	87
Homoromantic	250	109	85
Demiromantic	70	24	21
Aromantic	58	22	10

Table D.1 (cont.). Demographics by wave to show the retention.

Greyromantic	23	7	1
Polyromantic	47	14	10

Measurement Invariance

Table D.2. The measurement invariance of the study variables across time. Testing whether the thresholds and loadings are invariant across the three waves. An earlier study reported on invariance at time 1 across the identities compared in the current study (Junkins et al., 2023, *preprint*).

Model	χ^2	<i>df</i>	<i>p</i>	RMSEA	CFI	TLI	SRMR	Δ CFI	Δ RMSEA	Δ SRMR	Constraint
A	2882.684	162	0	0.129	0.847	0.813	0.085				baseline
A	994.849	210	0	0.061	0.956	0.958	0.085	0.109	-0.068	0	threshold
A	867.693	232	0	0.052	0.964	0.969	0.087	0.008	-0.009	0.002	threshold-loading
A facets	1987.576	153	0	0.109	0.897	0.866	0.069				baseline
A facets	714.008	201	0	0.05	0.971	0.972	0.069	0.074	-0.059	0	threshold
A facets	657.045	219	0	0.045	0.975	0.978	0.071	0.004	-0.005	0.002	threshold-loading
C	3418.64	162	0	0.141	0.847	0.813	0.087				baseline
C	2071.624	210	0	0.094	0.913	0.918	0.087	0.066	-0.047	0	threshold
C	1572.261	232	0	0.076	0.937	0.946	0.088	0.024	-0.018	0.001	threshold-loading
C facets	2175.179	153	0	0.114	0.905	0.877	0.068				baseline
C facets	1308.63	201	0	0.074	0.948	0.949	0.068	0.043	-0.04	0	threshold
C facets	1096.61	219	0	0.063	0.959	0.963	0.068	0.011	-0.011	0	threshold-loading
E	3665.94	162	0	0.146	0.8	0.756	0.098				baseline
E	2885.18	210	0	0.112	0.847	0.856	0.098	0.047	-0.034	0	threshold
E	2103.76	232	0	0.089	0.893	0.909	0.098	0.046	-0.023	0	threshold-loading
E facets	1211.914	153	0	0.083	0.94	0.922	0.054				baseline
E facets	974.375	201	0	0.062	0.956	0.957	0.054	0.016	-0.021	0	threshold
E facets	831.568	219	0	0.053	0.965	0.968	0.055	0.009	-0.009	0.001	threshold-loading
N	3642.178	162	0	0.146	0.877	0.849	0.081				baseline
N	2114.103	210	0	0.095	0.933	0.936	0.081	0.056	-0.051	0	threshold
N	1572.626	232	0	0.076	0.953	0.959	0.082	0.02	-0.019	0.001	threshold-loading
N facets	1994.916	153	0	0.109	0.935	0.916	0.058				baseline
N facets	1152.817	201	0	0.069	0.966	0.967	0.058	0.031	-0.04	0	threshold
N facets	969.502	219	0	0.058	0.973	0.976	0.059	0.007	-0.011	0.001	threshold-loading
O	2676.05	162	0	0.124	0.885	0.859	0.083				baseline

Table D.2 (cont.). The measurement invariance of the study variables across time. Testing whether the thresholds and loadings are invariant across the three waves. An earlier study reported on invariance at time 1 across the identities compared in the current study (Junkins et al., 2023, *preprint*).

O	1384.47	210	0	0.074	0.946	0.949	0.083	0.061	-0.05	0	threshold
O	990.261	232	0	0.057	0.965	0.97	0.084	0.019	-0.017	0.001	threshold-loading
O facets	1812.22	153	0	0.104	0.924	0.902	0.065				baseline
O facets	921.997	201	0	0.06	0.967	0.967	0.065	0.065	-0.044	0	threshold
O facets	726.331	219	0	0.048	0.977	0.979	0.066	0.01	-0.012	0.001	threshold-loading
Depression	49.312	15	0	0.048	0.992	0.985	0.024				baseline
Depression	55.488	25	0	0.035	0.993	0.992	0.024	0.001	-0.013	0	threshold
Depression	50.65	33	0.025	0.023	0.996	0.996	0.026	0.003	-0.012	0.002	threshold-loading
Power	28925.93	510	0	0.24	0.502	0.443	0.232				baseline
Power	15733.05	670	0	0.153	0.736	0.775	0.232	0.234	-0.087	0	threshold
Power	13404.65	708	0	0.136	0.777	0.821	0.233	0.041	-0.017	0.001	threshold-loading
Rel. satisfaction	543.548	42	0	0.111	0.985	0.978	0.033				baseline
Rel. satisfaction	170.705	70	0	0.039	0.997	0.997	0.033	0.012	-0.072	0	threshold
Rel. satisfaction	160.35	82	0	0.032	0.998	0.998	0.035	0.001	-0.007	0.002	threshold-loading
Subj. wellbeing	280.437	15	0	0.133	0.99	0.981	0.024				baseline
Subj. wellbeing	77.696	55	0.024	0.02	0.999	1	0.024	0.009	-0.113	0	threshold
Subj. wellbeing	89.073	63	0.017	0.02	0.999	1	0.027	0	0	0.003	threshold-loading

Table D.3. Cohen's d among study variables at time 1 between people who were retained until wave 3, wave 2 or only wave 1.

Variable	Group 1	Group 2	Cohen's d	2.5% CI	97.5% CI
E1	Wave 1	Wave 2	0.134377850	-0.0064	0.28
E1	Wave 1	Wave 3	0.078654592	-0.0200	0.18
E1	Wave 2	Wave 3	-0.053073724	-0.2100	0.10
A1	1	2	-0.163628495	-0.3300	-0.03
A1	1	3	-0.266573640	-0.3700	-0.16
A1	2	3	-0.093042128	-0.2400	0.05
C1	1	2	-0.008764183	-0.1600	0.15
C1	1	3	-0.181400208	-0.2900	-0.07
C1	2	3	-0.168627870	-0.3100	-0.02
N1	1	2	-0.032377474	-0.1800	0.11
N1	1	3	-0.071268944	-0.1800	0.03
N1	2	3	-0.038563596	-0.2000	0.10
O1	1	2	-0.183149587	-0.3300	-0.05
O1	1	3	-0.241695911	-0.3400	-0.14
O1	2	3	-0.057136801	-0.2100	0.09
relationshippower1	1	2	0.000168986	-0.1500	0.15
relationshippower1	1	3	-0.038983490	-0.1500	0.07
relationshippower1	2	3	-0.038832018	-0.1900	0.11
rel_satisfaction1	1	2	-0.075303890	-0.2300	0.07
rel_satisfaction1	1	3	-0.182486713	-0.2900	-0.08
rel_satisfaction1	2	3	-0.104540270	-0.2700	0.05
subj_wellbeing1	1	2	-0.012970182	-0.1500	0.13
subj_wellbeing1	1	3	-0.044991999	-0.1500	0.06
subj_wellbeing1	2	3	-0.033136725	-0.1800	0.11
depression1	1	2	0.018698818	-0.1300	0.17
depression1	1	3	-0.009897196	-0.1200	0.10
depression1	2	3	-0.029613347	-0.1900	0.12

Table D.4. Rank-order stability within each identity (cross-lagged correlations).

Variable	Time	SGM r	Non-SGM r	Monosexual r	Plurisexual r
E	W1~W2	0.901	0.885	0.864	0.911
	W2~W3	0.929	0.918	0.916	0.933
	W1~W3	0.907	0.879	0.882	0.902
A	W1~W2	0.894	0.804	0.831	0.897
	W2~W3	0.894	0.831	0.859	0.890
	W1~W3	0.869	0.698	0.794	0.839
C	W1~W2	0.890	0.895	0.874	0.905
	W2~W3	0.903	0.894	0.909	0.897
	W1~W3	0.889	0.862	0.876	0.880
N	W1~W2	0.883	0.902	0.900	0.885
	W2~W3	0.885	0.903	0.889	0.892
	W1~W3	0.876	0.877	0.864	0.874
O	W1~W2	0.896	0.827	0.877	0.879
	W2~W3	0.887	0.893	0.891	0.881
	W1~W3	0.864	0.835	0.864	0.852
Sociability	W1~W2	0.882	0.857	0.851	0.897
	W2~W3	0.902	0.910	0.890	0.907
	W1~W3	0.875	0.849	0.847	0.869
Assertiveness	W1~W2	0.847	0.837	0.817	0.851
	W2~W3	0.886	0.870	0.846	0.900
	W1~W3	0.867	0.866	0.846	0.874
Energy level	W1~W2	0.807	0.793	0.777	0.814
	W2~W3	0.845	0.803	0.820	0.852
	W1~W3	0.812	0.733	0.745	0.810
Compassion	W1~W2	0.792	0.696	0.756	0.766
	W2~W3	0.805	0.726	0.784	0.770
	W1~W3	0.749	0.615	0.677	0.722
Respectfulness	W1~W2	0.805	0.718	0.758	0.813
	W2~W3	0.804	0.736	0.711	0.834
	W1~W2	0.780	0.605	0.700	0.748
Trust	W1~W2	0.844	0.769	0.756	0.858
	W2~W3	0.862	0.851	0.864	0.854
	W1~W3	0.829	0.720	0.770	0.818
Organization	W1~W2	0.853	0.874	0.875	0.851
	W2~W3	0.869	0.882	0.875	0.867
	W1~W3	0.845	0.850	0.843	0.858
Productivity	W1~W2	0.822	0.814	0.806	0.838
	W2~W3	0.853	0.771	0.832	0.843
	W1~W3	0.824	0.750	0.832	0.801
Responsibility	W1~W2	0.793	0.836	0.751	0.830
	W2~W3	0.810	0.772	0.761	0.828
	W1~W3	0.777	0.748	0.713	0.776

Table D.4. (cont.). Rank-order stability within each identity (cross-lagged correlations).

Anxiety	W1~W2	0.831	0.871	0.839	0.846
	W2~W3	0.822	0.866	0.833	0.826
	W1~W3	0.813	0.781	0.784	0.824
N-depression	W1~W2	0.849	0.807	0.844	0.830
	W2~W3	0.867	0.814	0.849	0.852
	W1~W3	0.838	0.804	0.832	0.817
Emotional volatility	W1~W2	0.826	0.851	0.824	0.859
	W2~W3	0.831	0.836	0.821	0.861
	W1~W3	0.813	0.872	0.817	0.838
Intellectual curiosity	W1~W2	0.810	0.734	0.783	0.788
	W2~W3	0.813	0.858	0.836	0.793
	W1~W3	0.800	0.797	0.783	0.792
Aesthetic sensitivity	W1~W2	0.824	0.783	0.833	0.797
	W2~W3	0.882	0.813	0.863	0.858
	W1~W3	0.818	0.757	0.816	0.789
Creative imagination	W1~W2	0.811	0.780	0.777	0.814
	W2~W3	0.812	0.862	0.834	0.820
	W1~W3	0.778	0.756	0.777	0.773
Relationship power	W1~W2	0.758	0.750	0.737	0.771
	W2~W3	0.777	0.790	0.802	0.806
	W1~W3	0.705	0.758	0.748	0.724
Relationship satisfaction	W1~W2	0.723	0.801	0.730	0.735
	W2~W3	0.733	0.832	0.782	0.713
	W1~W3	0.606	0.713	0.695	0.584
Depression	W1~W2	0.690	0.748	0.756	0.682
	W2~W3	0.715	0.720	0.734	0.701
	W1~W3	0.704	0.712	0.734	0.703
Subjective wellbeing	W1~W2	0.828	0.781	0.787	0.832
	W2~W3	0.878	0.829	0.866	0.878
	W1~W3	0.826	0.761	0.802	0.837
<i>N</i> wave 1		1,303	462	644	983

Note. W1 = wave 1; W2 = wave 2; and W3 = wave 3.

Table D.4. (cont.). Rank-order stability within each identity (cross-lagged correlations).

Variable	Time	Cisgender r	Transgender r	Men r	Women r	Genderqueer r
E	W1~W2	0.919	0.879	0.864	0.928	0.895
	W2~W3	0.935	0.899	0.916	0.945	0.923
	W1~W3	0.936	0.883	0.910	0.938	0.883
A	W1~W2	0.892	0.876	0.811	0.877	0.900
	W2~W3	0.877	0.915	0.853	0.866	0.903
	W1~W3	0.854	0.870	0.783	0.833	0.865
C	W1~W2	0.912	0.894	0.886	0.908	0.880
	W2~W3	0.912	0.908	0.899	0.904	0.892
	W1~W3	0.894	0.881	0.840	0.902	0.880
N	W1~W2	0.900	0.856	0.880	0.914	0.863
	W2~W3	0.902	0.901	0.889	0.905	0.873
	W1~W3	0.889	0.868	0.857	0.899	0.866
O	W1~W2	0.861	0.909	0.897	0.871	0.877
	W2~W3	0.905	0.893	0.892	0.894	0.875
	W1~W3	0.884	0.878	0.862	0.856	0.859
Sociability	W1~W2	0.891	0.859	0.818	0.911	0.881
	W2~W3	0.921	0.880	0.906	0.925	0.889
	W1~W3	0.909	0.854	0.871	0.905	0.854
Assertiveness	W1~W2	0.864	0.854	0.850	0.863	0.835
	W2~W3	0.893	0.875	0.846	0.903	0.877
	W1~W3	0.902	0.862	0.850	0.892	0.852
Energy level	W1~W2	0.863	0.760	0.740	0.856	0.789
	W2~W3	0.874	0.801	0.787	0.861	0.838
	W1~W3	0.855	0.750	0.773	0.845	0.761
Compassion	W1~W2	0.793	0.792	0.716	0.745	0.819
	W2~W3	0.794	0.844	0.777	0.758	0.810
	W1~W3	0.740	0.750	0.652	0.718	0.748
Respectfulness	W1~W2	0.793	0.785	0.714	0.809	0.785
	W2~W3	0.758	0.866	0.742	0.788	0.800
	W1~W2	0.736	0.812	0.625	0.741	0.792
Trust	W1~W2	0.848	0.820	0.733	0.854	0.842
	W2~W3	0.875	0.861	0.868	0.853	0.869
	W1~W3	0.832	0.818	0.829	0.810	0.807
Organization	W1~W2	0.871	0.846	0.859	0.872	0.843
	W2~W3	0.887	0.883	0.875	0.875	0.862
	W1~W3	0.870	0.836	0.819	0.879	0.832
Productivity	W1~W2	0.840	0.824	0.838	0.844	0.800
	W2~W3	0.841	0.868	0.857	0.813	0.829
	W1~W3	0.822	0.818	0.806	0.817	0.796
Responsibility	W1~W2	0.848	0.807	0.761	0.839	0.786
	W2~W3	0.837	0.814	0.770	0.835	0.791
	W1~W3	0.808	0.797	0.719	0.783	0.761

Table D.4. (cont.). Rank-order stability within each identity (cross-lagged correlations).

Anxiety	W1~W2	0.850	0.825	0.831	0.872	0.828
	W2~W3	0.862	0.827	0.831	0.857	0.817
	W1~W3	0.804	0.807	0.824	0.825	0.796
N-depression	W1~W2	0.870	0.798	0.819	0.870	0.817
	W2~W3	0.861	0.867	0.803	0.865	0.872
	W1~W3	0.865	0.791	0.807	0.878	0.801
Emotional volatility	W1~W2	0.855	0.780	0.832	0.862	0.802
	W2~W3	0.885	0.826	0.868	0.861	0.785
	W1~W3	0.856	0.804	0.795	0.863	0.803
Intellectual curiosity	W1~W2	0.787	0.847	0.828	0.798	0.775
	W2~W3	0.829	0.847	0.849	0.867	0.775
	W1~W3	0.801	0.832	0.848	0.776	0.795
Aesthetic sensitivity	W1~W2	0.840	0.821	0.819	0.827	0.811
	W2~W3	0.880	0.894	0.816	0.879	0.883
	W1~W3	0.851	0.802	0.810	0.824	0.807
Creative imagination	W1~W2	0.810	0.844	0.759	0.789	0.836
	W2~W3	0.874	0.810	0.845	0.812	0.805
	W1~W3	0.815	0.821	0.721	0.790	0.780
Relationship power	W1~W2	0.750	0.748	0.732	0.735	0.775
	W2~W3	0.799	0.705	0.817	0.761	0.759
	W1~W3	0.770	0.675	0.749	0.713	0.693
Relationship satisfaction	W1~W2	0.835	0.621	0.656	0.833	0.674
	W2~W3	0.829	0.604	0.786	0.827	0.658
	W1~W3	0.752	0.547	0.704	0.673	0.591
Depression	W1~W2	0.689	0.688	0.688	0.734	0.669
	W2~W3	0.720	0.698	0.723	0.727	0.680
	W1~W3	0.751	0.613	0.600	0.776	0.682
Subjective wellbeing	W1~W2	0.859	0.799	0.823	0.823	0.814
	W2~W3	0.871	0.843	0.812	0.887	0.871
	W1~W3	0.849	0.803	0.743	0.816	0.841
<i>N</i> wave 1		510	499	363	620	710

Note. W1 = wave 1; W2 = wave 2; and W3 = wave 3.

Results for Univariate Latent Growth Models

In the following tables are the estimated means and variances per group per variable in the univariate latent growth models. In the main results we focus on the intercept differences that were originally preregistered as a key parameter of interest. Fit from the models are online on OSF.

Table D.5. Intercept means and variances from the growth models.

Model	Depression Mean	Depression Variance	Subjective well- being Mean	Subjective well- being Variance	Relationship satisfaction Mean	Relationship satisfaction Variance	Relationship power Mean	Relationship power Variance
SGM	7.446	6.537	3.994	1.736	3.745	0.382	4.197	0.397
Non-SGM	6.257	7.792	4.395	1.749	3.631	0.536	4.201	0.423
Monosexaul	6.415	9.493	4.276	1.833	3.673	0.422	4.149	0.364
Plurisexual	7.518	5.478	4.010	1.700	3.754	0.412	4.237	0.447
Transgender	7.944	6.165	3.810	1.839	3.789	0.364	4.107	0.442
Cisgender	6.491	6.129	4.309	1.827	3.756	0.462	4.265	0.384
Men	6.553	8.352	4.187	1.705	3.691	0.319	4.084	0.279
Women	6.717	7.124	4.274	1.806	3.680	0.574	4.291	0.406
Nonbinary	7.948	5.764	3.841	1.677	3.765	0.344	4.160	0.446

Table D.5. (cont.). Intercept means and variances from the growth models.

Model	E Mean	E Variance	Sociability Mean	Sociability Variance	Assertiveness Mean	Assertiveness Variance	Energy level Mean	Energy level Variance
SGM	3.003	0.439	2.800	0.805	2.946	0.678	3.271	0.486
Non-SGM	3.100	0.337	2.927	0.663	3.037	0.493	3.311	0.446
Monosexual	3.058	0.361	2.876	0.623	3.018	0.583	3.272	0.462
Plurisexual	3.062	0.434	2.868	0.861	3.000	0.641	3.315	0.472
Transgender	2.946	0.402	2.732	0.740	2.843	0.665	3.233	0.441
Cisgender	3.043	0.446	2.841	0.790	3.004	0.676	3.321	0.608
Men	3.059	0.389	2.876	0.622	3.067	0.578	3.259	0.395
Women	3.057	0.437	2.887	0.849	3.029	0.632	3.335	0.531
Nonbinary	2.951	0.429	2.747	0.786	2.867	0.695	3.249	0.466

Table D.5. (cont.). Intercept means and variances from the growth models.

Model	A Mean	A Variance	Compassion Mean	Compassion Variance	Respectfulness Mean	Respectfulness Variance	Trust Mean	Trust Variance
SGM	3.738	0.316	4.043	0.402	3.926	0.372	3.248	0.554
Non-SGM	3.677	0.302	3.847	0.364	3.903	0.396	3.284	0.488
Monosexual	3.667	0.286	3.860	0.398	3.869	0.443	3.276	0.424
Plurisexual	3.762	0.316	4.086	0.364	3.953	0.360	3.247	0.580
Transgender	3.730	0.286	4.051	0.388	3.884	0.318	3.259	0.518
Cisgender	3.826	0.315	4.099	0.391	4.052	0.331	3.323	0.581
Men	3.606	0.297	3.796	0.433	3.793	0.421	3.232	0.399
Women	3.784	0.297	4.048	0.333	4.002	0.383	3.302	0.565
Nonbinary	3.736	0.306	4.063	0.444	3.911	0.333	3.235	0.557

Table D.5. (cont.). Intercept means and variances from the growth models.

Model	C Mean	C Variance	Organization Mean	Organization Variance	Productivity Mean	Productivity Variance	Responsibility Mean	Responsibility Variance
SGM	3.209	0.432	3.166	0.740	3.100	0.553	3.362	0.468
Non-SGM	3.392	0.445	3.353	0.742	3.299	0.553	3.517	0.490
Monosexaul	3.347	0.433	3.339	0.729	3.256	0.544	3.447	0.447
Plurisexual	3.212	0.458	3.155	0.763	3.099	0.578	3.382	0.529
Transgender	3.120	0.453	3.066	0.774	3.021	0.587	3.275	0.506
Cisgender	3.323	0.451	3.239	0.778	3.209	0.575	3.518	0.484
Men	3.262	0.425	3.299	0.701	3.161	0.578	3.330	0.381
Women	3.370	0.483	3.294	0.788	3.272	0.613	3.545	0.556
Nonbinary	3.133	0.405	3.079	0.736	3.022	0.496	3.299	0.459

Table D.5. (cont.). Intercept means and variances from the growth models.

Model	N Mean	N Variance	Anxiety Mean	Anxiety Variance	(N) Depression Mean	(N) Depression Variance	Emotional volatility Mean	Emotional volatility Variance
SGM	3.464	0.482	3.895	0.517	3.247	0.695	3.249	0.692
Non-SGM	3.150	0.554	3.478	0.690	2.959	0.657	3.023	0.761
Monosexaul	3.208	0.548	3.559	0.667	3.014	0.686	3.051	0.731
Plurisexual	3.487	0.477	3.920	0.519	3.259	0.659	3.281	0.704
Transgender	3.557	0.444	3.980	0.461	3.347	0.624	3.323	0.682
Cisgender	3.325	0.548	3.766	0.587	3.082	0.755	3.127	0.818
Men	3.164	0.587	3.474	0.688	3.057	0.670	2.980	0.791
Women	3.317	0.511	3.742	0.548	3.018	0.726	3.158	0.749
Nonbinary	3.579	0.436	4.010	0.478	3.362	0.666	3.348	0.662

Table D.5. (cont.). Intercept means and variances from the growth models.

Model	O Mean	O Variance	Intellectual curiosity Mean	Intellectual curiosity Variance	Aesthetic sensitivity Mean	Aesthetic sensitivity Variance	Creative imagination Mean	Creative imagination Variance
SGM	4.147	0.324	4.299	0.393	4.220	0.437	3.921	0.466
Non-SGM	3.798	0.359	3.977	0.381	3.751	0.533	3.667	0.544
Monosexual	3.833	0.409	3.989	0.484	3.803	0.582	3.711	0.517
Plurisexual	4.204	0.291	4.368	0.337	4.285	0.376	3.958	0.464
Transgender	4.224	0.289	4.366	0.349	4.326	0.356	3.981	0.504
Cisgender	4.057	0.307	4.282	0.352	4.060	0.526	3.832	0.475
Men	3.879	0.473	4.042	0.581	3.856	0.614	3.743	0.502
Women	3.988	0.348	4.149	0.445	4.017	0.510	3.806	0.473
Nonbinary	4.232	0.250	4.382	0.285	4.337	0.337	3.975	0.488

Slope differences

In the following tables are the slope means and slope variances estimated in the multi-group latent growth models. Essentially all personality and social relationship variables showed zero change. Once the near zero means and standard deviations were transformed into Cohen's d 's to estimate mean differences between SGM, gender identity, and sexual orientation groups, we found slope mean differences ranged $0.002 < |d| < 0.768$. These should be taken with a metric ton of salt (see Figure D4). We do not expect these to replicate of a similar effect size; however, we are reporting them on the off chance that they are useful for study planning or hypothesis formation for longer timescale longitudinal research in the future.

Figure D.4. *The slope mean Cohen's d between each group. Likely these estimates are noise.*

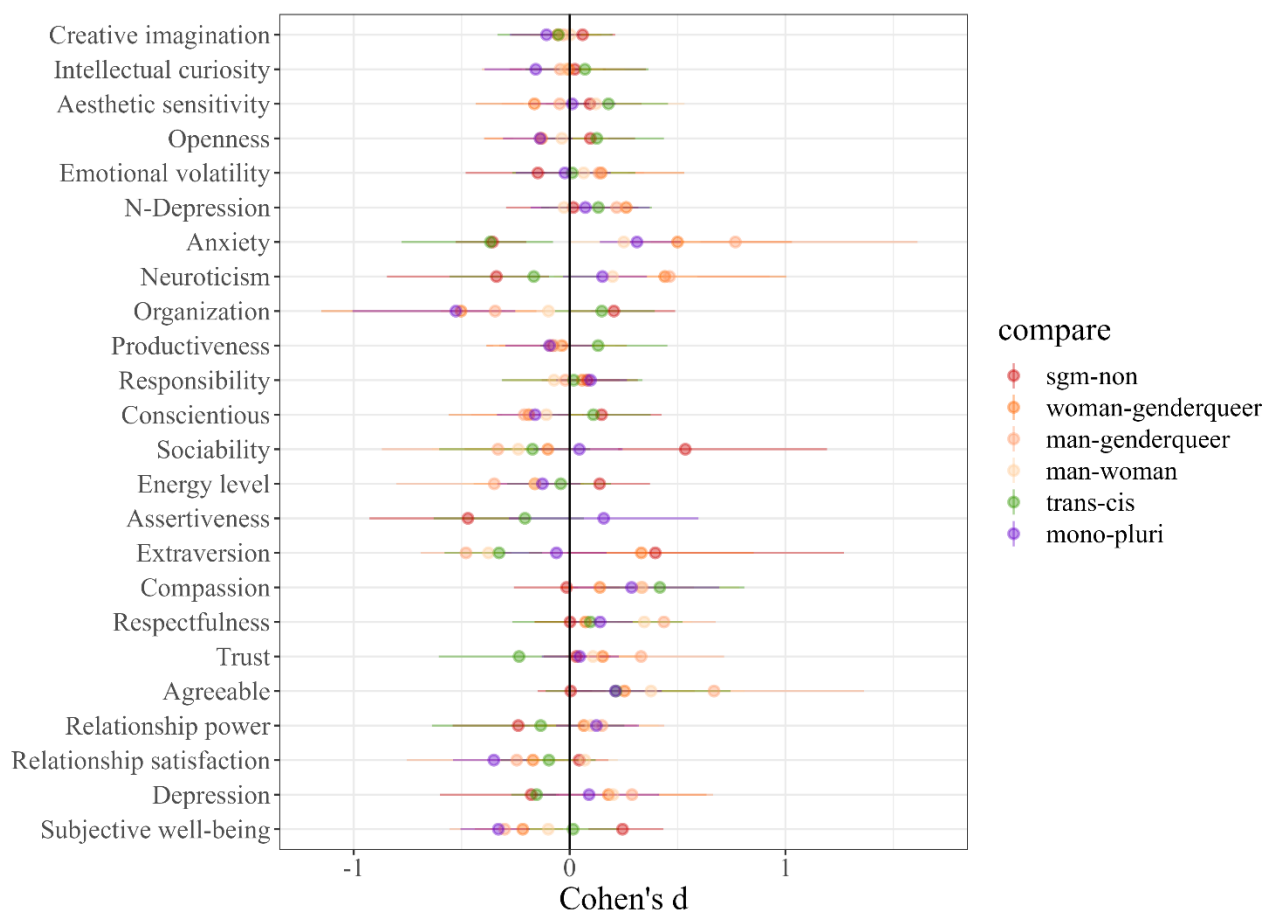


Table D.6. Slope means and variances from the growth models.

Model	Depression Mean	Depression Variance	Subjective well- being Mean	Subjective well- being Variance	Relationship satisfaction Mean	Relationship satisfaction Variance	Relationship power Mean	Relationship power Variance
SGM	-0.300	0.123	0.107	0.093	-0.011	0.032	-0.027	0.019
Non-SGM	-0.224	0.353	0.029	0.125	-0.020	0.068	0.001	0.012
Monosexaul	-0.246	0.411	0.022	0.191	-0.056	0.045	-0.008	0.011
Plurisexual	-0.286	0.124	0.130	0.031	0.013	0.034	-0.025	0.030
Transgender	-0.288	0.609	0.104	0.126	-0.020	0.024	-0.039	0.015
Cisgender	-0.202	0.074	0.100	0.038	-0.004	0.036	-0.028	0.006
Men	-0.165	0.766	0.040	0.153	-0.016	0.010	-0.007	0.020
Women	-0.288	0.082	0.075	0.105	-0.032	0.095	-0.019	0.015
Nonbinary	-0.348	0.188	0.132	0.049	0.007	0.015	-0.028	0.022

Table D.6. (cont.). Slope means and variances from the growth models.

Model	E Mean	E Variance	Sociability Mean	Sociability Variance	Assertiveness Mean	Assertiveness Variance	Energy level Mean	Energy level Variance
SGM	-0.003	0.003	0.015	0.007	-0.019	0.004	-0.012	0.009
Non-SGM	-0.021	0.003	-0.040	0.020	0.012	0.007	-0.031	0.032
Monosexaul	-0.010	0.002	0.002	0.009	-0.006	0.008	-0.025	0.026
Plurisexual	-0.006	0.009	-0.003	0.028	-0.016	0.005	-0.008	0.017
Transgender	-0.022	0.002	-0.007	0.011	-0.026	0.006	-0.019	0.017
Cisgender	-0.004	0.003	0.007	0.008	-0.010	0.014	-0.014	0.019
Men	-0.018	0.005	-0.014	0.016	0.005	0.008	-0.035	0.009
Women	0.002	0.001	0.010	0.010	-0.001	0.006	-0.018	0.016
Nonbinary	-0.002	0.000	0.018	0.010	-0.023	0.007	0.000	0.015

Table D.6. (cont.). Slope means and variances from the growth models.

Model	A Mean	A Variance	Compassion Mean	Compassion Variance	Respectfulness Mean	Respectfulness Variance	Trust Mean	Trust Variance
SGM	-0.015	0.002	-0.015	0.008	-0.013	0.008	-0.005	0.011
Non-SGM	-0.016	0.035	-0.013	0.028	-0.013	0.049	-0.011	0.064
Monosexaul	0.000	0.008	0.009	0.019	-0.003	0.032	0.002	0.026
Plurisexual	-0.020	0.013	-0.020	0.007	-0.026	0.026	-0.005	0.023
Transgender	-0.005	0.004	0.017	0.025	-0.005	0.007	-0.023	0.011
Cisgender	-0.017	0.004	-0.034	0.009	-0.012	0.008	0.004	0.022
Men	0.024	0.011	0.028	0.031	0.047	0.048	0.018	0.011
Women	-0.011	0.009	-0.013	0.005	-0.015	0.019	0.003	0.032
Nonbinary	-0.030	0.005	-0.032	0.035	-0.022	0.005	-0.021	0.021

Table D.6. (cont.). Slope means and variances from the growth models.

Model	C Mean	C Variance	Organization Mean	Organization Variance	Productivity Mean	Productivity Variance	Responsibility Mean	Responsibility Variance
SGM	-0.014	0.006	-0.003	0.009	-0.006	0.013	-0.024	0.013
Non-SGM	-0.027	0.014	-0.030	0.032	0.004	0.024	-0.035	0.024
Monosexaul	-0.030	0.019	-0.051	0.026	-0.015	0.011	-0.017	0.034
Plurisexual	-0.011	0.012	0.014	0.010	-0.002	0.028	-0.033	0.028
Transgender	-0.005	0.017	0.028	0.040	0.007	0.027	-0.036	0.016
Cisgender	-0.016	0.007	0.005	0.015	-0.009	0.012	-0.038	0.010
Men	-0.034	0.033	-0.042	0.057	-0.012	0.031	-0.029	0.021
Women	-0.019	0.008	-0.025	0.011	-0.003	0.012	-0.017	0.040
Nonbinary	-0.006	0.003	0.018	0.008	0.000	0.011	-0.027	0.017

Table D.6. (cont.). Slope means and variances from the growth models.

Model	N Mean	N Variance	Anxiety Mean	Anxiety Variance	(N) Depression Mean	(N) Depression Variance	Emotional volatility Mean	Emotional volatility Variance
SGM	-0.014	0.004	-0.026	0.004	-0.010	0.010	-0.001	0.014
Non-SGM	0.016	0.016	0.040	0.067	-0.012	0.017	0.014	0.014
Monosexaul	0.003	0.020	0.020	0.048	-0.005	0.017	-0.001	0.030
Plurisexual	-0.014	0.007	-0.030	0.007	-0.013	0.013	0.002	0.011
Transgender	-0.008	0.007	-0.023	0.007	-0.007	0.018	0.013	0.017
Cisgender	0.003	0.005	0.017	0.021	-0.020	0.012	0.012	0.019
Men	0.022	0.020	0.036	0.021	-0.002	0.020	0.019	0.074
Women	0.003	0.005	0.005	0.017	0.003	0.007	0.006	0.013
Nonbinary	-0.029	0.008	-0.050	0.011	-0.038	0.041	-0.008	0.012

Table D.6. (cont.). Slope means and variances from the growth models.

Model	O Mean	O Variance	Intellectual curiosity Mean	Intellectual curiosity Variance	Aesthetic sensitivity Mean	Aesthetic sensitivity Variance	Creative imagination Mean	Creative imagination Variance
SGM	-0.016	0.008	-0.026	0.007	0.003	0.017	-0.016	0.017
Non-SGM	-0.026	0.014	-0.028	0.009	-0.010	0.022	-0.027	0.056
Monosexaul	-0.029	0.012	-0.036	0.009	-0.003	0.021	-0.033	0.031
Plurisexual	-0.014	0.014	-0.019	0.018	-0.004	0.016	-0.015	0.026
Transgender	-0.007	0.008	-0.020	0.010	0.014	0.021	-0.016	0.017
Cisgender	-0.015	0.004	-0.027	0.011	-0.007	0.011	-0.011	0.014
Men	-0.025	0.018	-0.029	0.013	0.002	0.019	-0.021	0.071
Women	-0.021	0.008	-0.026	0.037	-0.010	0.008	-0.021	0.009
Nonbinary	-0.011	0.006	-0.026	0.004	0.008	0.020	-0.015	0.025

Results for Bivariate Latent Growth Models

The bivariate latent growth models were not reliably estimated. Because many of the variables lacked variance in growth, the correlations between such variables were outside the bounds of -1 to 1 . We provide the model results online but do not summarize them here. Cross-time correlations are available on OSF.

APPENDIX E: ORIGINAL PLANNED THREE STUDIES IN DETAIL

Study 1: CROSS-SECTIONAL ASSOCIATIONS OF PROTECTIVE AND RISK PSYCHOSOCIAL FACTORS ON MENTAL HEALTH

Studied in tandem, I seek to investigate psychosocial processes on mental health. In study 1, I will examine correlations between individual traits—including relationship power, Big Five, agency, and communion—and positive and negative social influences—including social support, relationship satisfaction, social isolation, and discrimination—with mental health outcomes—depressive symptoms and well-being. Research question 1 addresses the overall correlations. Based on previous research discussed in the introduction, the positive manifold holds that positive, or socially acceptable behaviors are positively endorsed and are positively related to one another. The positive manifold informs how I expect less studied relationships to play out. As a data quality check, the first research question will ensure the overall sample correlations are in line with our expectations of how individual characteristics and social influences relate to mental health.

Moreover, group differences in the psychosocial processes have not been comprehensively examined. Some evidence from the past literature suggests mean differences in the key study variables. For example, power balance is more likely to occur in lesbian/gay relationships than in heterosexual relationships (Kurdek, 2001, 2003; S. S. Rostosky & Riggle, 2017). Personality shows mostly small differences between people differentiated by their gender identity or their sexual orientation (Junkins, Pantin, et al., 2024), and only a few large differences found with neuroticism and its facets (anxiety and emotional volatility). Lastly, the outcomes of depressive symptoms and subjective well-being do not have consistent findings in terms of mean differences. The prevalence of depression follows that women and diverse gender or sexual

orientations show higher prevalence compared to men or heterosexual peers (Ferlatte et al., 2020; Kessler & Bromet, 2013). There seems to be little to no difference between men and women in subjective well-being based on small, mixed effects across meta-analyses using different constructs to measure well-being (Batz & Tay, 2018; Batz-Barbarich et al., 2018). Overall, the focus of past research has been on mean differences and not on process differences.

Research question 2 assesses whether the correlations are equivalent between different groups, in other words testing the expansion proposed to the *similarities hypothesis*. Pearson correlations will be calculated on either the aggregated mean scores or the latent factor scores (based on measurement invariance results described in analysis section). I will test the equivalence of parameters (Jöreskog, 1971; Sörbom, 1974) (means and correlations) across demographic variables—i.e., SGM status, gender, sexual orientation. Following statistical power analysis described below, I will need approximately 350 participants per group to have the statistical power to detect small mean differences and 600 participants per group to obtain correlation difference estimates closely matched to the population-specified difference estimate (Schönbrodt & Perugini, 2013). In short, mean differences and correlation differences will be examined to test our proposed expansion to the *similarities hypothesis*.

Hypothesis 1: Means are expected to differ in the small range mostly for individual traits and social influences ($|d| < 0.22$) and in the small to large range for mental health ($|d| < 0.44$).

Hypothesis 2: Correlations are expected to be equivalent across SGM status, gender identity, and/or sexual orientation.

Analysis

Each study variable will be measured either latently or as mean scores depending on measurement results. Research question 1 results will include the measurement results and the descriptive statistics including means and correlations in the full sample. Both procedures are specified next including the decision criteria for when we will use latent versus aggregate. For latent measurement, I will specify the respective items from the scales measuring the latent construct with the variances fixed to 1, means to 0, and the first item loading to be freely estimated.

Then I will run measurement invariance following either categorical or continuous data treatment. The decision to treat the data as continuous or categorical will bear on the number of levels of the items (i.e., 5 or more for continuous) and the distribution of the items. Highly skewed items with fewer levels will lead to treating the data as categorical, whereas approximately normal distributions and more levels will lead to specifying the data as continuous (Rhemtulla et al., 2012). A benefit to categorical is that the results will be closely aligned as continuous data treatment if they distribution truly is normal. Once one variable is treated categorically, they all will be for ease of communicating results in the measurement models. Categorical data treatment means I will specify the missing data mechanism as pairwise and the estimator as ULSMV. The chosen unweighted least squares estimator provides mean- and variance-adjusted chi-square statistics and robust standard errors, and it slightly outperforms WLSMV, a popular alternative choice that is mean- and variance-adjusted weighted least squares (Forero et al., 2009; Savalei & Rhemtulla, 2013; Yang-Wallentin et al., 2010). The measurement invariance steps will follow Svetina et al. (2020) by fitting a baseline unconstrained model followed by constrained thresholds and then constrained thresholds and loadings.

Fit between nested models will be compared with the cutoffs of $\Delta CFI \geq .01$ and $\Delta RMSEA \geq .015$ as changes in these goodness of fit indices greater than these cutoffs would suggest worsening fit (Chen, 2007; Cheung & Rensvold, 2002). Since both RMSEA and CFI are penalized for model complexity, I also compare change in SRMR based on the cutoff of $\Delta SRMR \geq .03$ (Hu & Bentler, 1999). SRMR might be sensitive to small sample sizes, so all three changes in goodness of fit indices are important to consider to allay concerns that the fit changing is simply due to decreases in model complexity with little change in chi-square test statistics (L. Hu & Bentler, 1999). Continuous data treatment will use FIML for missing data and MLR estimator. This estimator works with both complete and incomplete data and provides mean-adjusted chi-square statistics and standard errors (Asparouhov & Muthén, 2005). The steps of measurement invariance will follow Meredith (1993) by fitting a baseline unconstrained model followed by constrained loadings, constrained loadings and intercepts, and finally constrained loadings, intercepts, and residuals. Model comparisons will be judged using $\Delta\chi^2$, Δdf , and change in fit indices as described above. To run multi-group confirmatory factor analysis, I will use R-packages *lavaan* (Rosseel, 2012) and *semTools* (Jorgensen et al., 2021). In sum, if there are significant measurement variance issues, meaning failing to establish measurement invariance for at least two variables, then I will use the mean aggregated scores of the raw items that omits missing items per person to calculate the mean.

Once the variables have been created, I will calculate mean differences between groups. Using Cohen's *d* I will calculate the mean effect sizes for each study variable. Importantly, *p*-values will be calculated but the effect size and confidence interval are the main results of interest. Both will be provided in a table. Mean differences are considered small, medium, or large using these conventions: $0 \leq |d| < 0.22$ is non-existent to small; $0.22 \leq |d| < 0.44$ is

moderate; $|d| \geq 0.44$ is large. These conventions derive from comparisons of actual effects for personality (Allen & Robson, 2020) and across psychology (Hyde, 1990; Zell et al., 2015).

Then, I will calculate correlation tables with pairwise missingness, followed by the correlation differences between groups using bootstrap sample procedures. Correlation differences are calculated to address research question 2 between groups. The group variables under consideration will be gender identity, sexual orientation, and SGM status as able by the group-level sample size. Correlations will be compared for equivalence, $H_0: \rho_1 = \rho_2$. The bootstrap procedure in steps starts with the correlations from each bootstrap sample over 2,000 iterations are calculated for group 1 and group 2. The bootstrap samples are drawn from the data multiplied by 2,000 and drawn with equal number rows as the data. For example, a sample of 50 will yield 100,000 rows where 2,000 samples of 50 are randomly drawn. Next, the group-level correlations are subtracted to get the difference between each bootstrap sample's correlation. This is repeated 1 through the number of bootstrap samples specified, which allows for a confidence interval of the difference in correlations to be calculated. The confidence intervals will be calculated using Wilcox-Muska method rather than a Fisher's z transformation assuming independent groups and accounting for non-normality of the data and heteroscedasticity (Wilcox, 2009). The bootstrap procedures are conducted using *bootcorci* package (Rousselet et al., 2019a). A difference in correlations of 0.2 was determined to be meaningful as it relates to a conceptual change in correlation size from small to moderate or moderate to large (Cohen, 2013), whereas any smaller a difference ($D < 0.10$) is expected levels of noise as shown in the simulation below. The average psychology correlation is 0.21, and the range of most variables is $0.1 < r < 0.42$ (Lovakov & Agadullina, 2021). Again, a bigger difference than 0.20 would be meaningful here, and within the range of what we consider likely. An effect size calculation for

the difference in correlations can be done using Cohen's q (Cohen, 2013); however, it is reliant on a Fisher's z transformation. So, we seek other effect size estimates of correlation differences. The power analysis dictated below will set the thresholds for whether a group will be included in the analysis. Results for calculations of differences (means and correlations) will be presented in histograms to evaluate the spread of calculated differences across all variables.

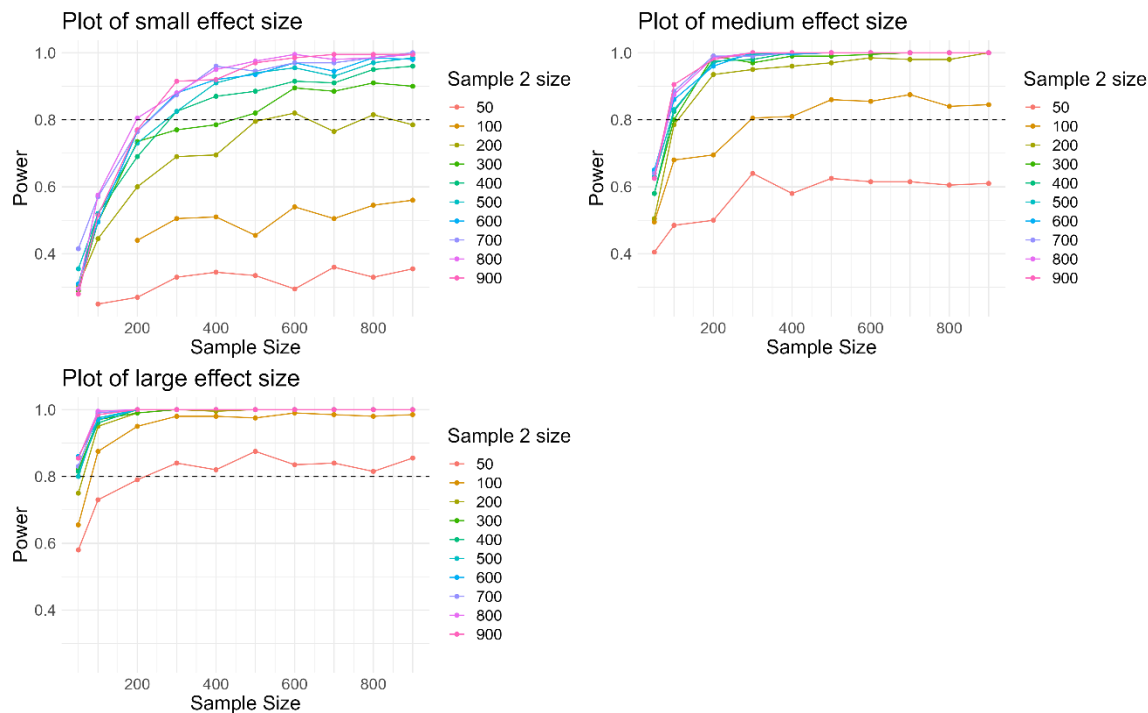
There are a couple alternative options to compare correlations that we have ruled out. One option is regression with a dichotomous group variable needing run for each comparison. The second option is Fisher's z transformation of the correlations and a F -test to signify whether differences are significant. Both have significant cons. Overall, the z transformation has not performed well in simulation studies suggesting an inflated Type I error (Wilcox, 2009), cannot handle a nonnormal distribution when the population correlation is not 0, and performs better with small samples than large ones (Berry & Mielke, 2000). In the current study, the regression option is not ideal because the formula ($y = x + \text{group} + \text{group} * x$) includes an interaction term that would necessitate the group variable as dichotomous and repeated through all group combinations. The interaction terms are harder to interpret and do not produce effect sizes that can be translated across studies. Also, a large sample size ($N > 2,000$) would still be required to account for multiple testing with all the group comparisons (Hughes, 2017). These are some drawbacks to two alternative approaches available for comparing the differences between two correlations. Thus, the bootstrap sample Wilcox-Muska adjusted confidence interval correlation differences will be used to assess equivalence of correlations between groups.

Statistical Precision Analysis

Statistical precision simulations were run for mean differences and correlation differences. The alpha threshold will be adjusted for multiple testing but were not in these

simulations. For the univariate analyses (mean differences), the number of tests are the same as the number of variables, 14, times the number of groups compared minus one ($k - 1$). For two groups, the correction to alpha is .004. For five groups, alpha is .0009 and ten groups, alpha is .0004. For the bivariate analyses (correlation differences), the effective number of tests is dependent upon the covariance of the variables (Derringer, 2018). There are 24 correlations to be estimated between traits or social influences with well-being and depression. Using Bonferroni correction, the correction is equal to 24 times the number of groups. A more lenient assessment estimating the effective number of tests without the actual correlation matrix is to count the amount of uniqueness among the 14 variables. Knowledge of the domains suggests correction for 16 tests is lenient. The real correction should be between $16 * N_{\text{groups}}$ and $24 * N_{\text{groups}}$ after we run *meff* on the actual data to correct alpha. In the lenient and Bonferroni case specified, the corrected alpha is either .003 or .002. Specifically, *meff*, or the effective number of tests, within each group will be calculated then added together to correct alpha. After multiple testing is accounted for, the power simulations were used to determine sample sizes at which estimates of differences are reliable.

Figure E.1. Simulations of needed sample sizes to detect group mean differences for small (top left), medium (top right), and large (bottom left) differences.

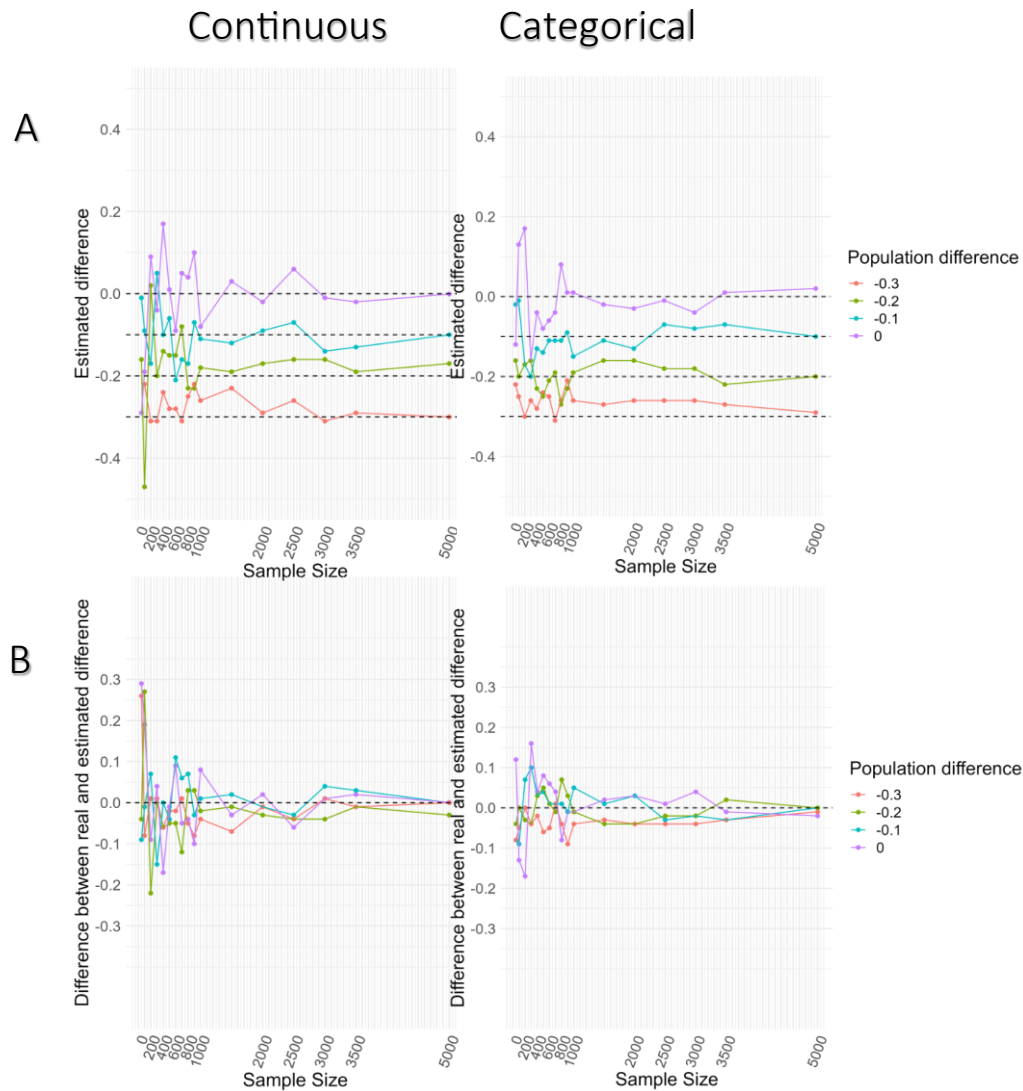


In order to estimate statistical power for the mean differences, I varied the sample size of each group and small ($d = 0.22$), medium ($d = 0.33$), or large ($d = 0.44$) Cohen's d to see at what sample size there is at least 80% power to detect small effects using *paramtest* package (Hughes, 2017). As shown in Figure E.1, to detect large effects groups size greater than 100 are appropriate, for medium effects group sizes greater than 200 are sufficient, and for small effects group sizes greater than 350 are suitable.

In order to estimate statistical precision for the correlation differences, I simulated data for two study variables specifying different population correlations and varying the sample sizes. Each time I simulated 2,000 bootstrap samples. In the first set, I simulated normally distributed data with means of 0 and standard deviations of 1. In the second set, I simulated ordinal non-normal data. I varied the correlation difference to be 0, 0.10, 0.20, or 0.30 with varying sample

sizes shown in the supplemental table (Table E1). Importantly, small sample sizes would allow a higher likelihood of falsely failing to reject the null (type II error) which is supportive of the present hypothesis. Therefore, the simulations were used to determine an appropriate sample size based on when the estimated bootstrap correlations reach similarity to the population parameters I specified. Thus, for each correlation comparison we require at least 600 people per group (confidence interval range of 0.20 shown in Table E1). In Figure E.2, the elements that were varied are displayed and the output of each run is recorded. Packages *faux* (DeBruine, 2021) and *bootcorci* (Rousselet et al., 2019b) were used to complete the simulation.

Figure E.2. The simulation results for estimating the required group size for comparing correlations between groups. In each case there is output for continuous normal data and ordinal non-normal data and all x-axes are group sample size. Panel A shows the estimated differences in correlations (each line should converge on population difference). Panel B shows the difference between the real and estimated correlation differences (all lines should converge on 0).



Study 2: GROWTH AND STABILITY OF KEY VARIABLES

The study design implemented here is meant to be especially sensitive to depression episodes and fluctuations in personality and social influences, meaning the timing of the surveys should show more variability (decline or increase) in our key variables. Depression recurs in 6-month intervals on average, so the survey is implemented monthly to capture variation in increasing and decreasing depressive symptoms (Kocsis et al., 2008; Solomon, 2000, p. 200). In addition, the within-person cross-time correlations for individual characteristics in 3 months is 0.35 or 0.55 one year apart. Social influences have similar correlations over time when taken multiple years apart (see Table A2). Closer to ideal measurement and more measurement occasions will aid in establishing growth patterns in the short term (Fleeson, 2007; Mroczek, 2007). Large meta-analyses have shown mean-level change and rank-order stability in each of the Big Five traits (B. W. Roberts et al., 2006; B. W. Roberts & DelVecchio, 2000). The results suggested a change in personality across the lifespan in the direction of maturity (in line with the social investment principle, meaning higher conscientiousness and extraversion alongside lower neuroticism (Caspi et al., 2005; B. W. Roberts et al., 2006). Rank-order consistency was also found such that people remained in relatively the same percentile compared to their peers across the changes over time (B. W. Roberts & DelVecchio, 2000). After these results, an explosion in personality development research was seen; accordingly, an update of these meta-analyses with new studies showed the effects of age versus time on personality development (Bleidorn et al., 2022). Furthermore, calls for focus on lower-order personality traits suggest that the development or change over time between facets within each trait might differ and lead to novel conclusions (Möttus et al., 2020). For example, in the 2006 meta-analysis of rank-order stability, Roberts and colleagues showed the results for social vitality and social dominance—two extraversion facets, separately. Social dominance showed more positive growth as people age

then leveled off around age 40, whereas vitality remained more stable (less growth) and then decreased in older age (B. W. Roberts et al., 2006). With facet-level specificity, nuances that are aggregated over when we assess higher-order constructs can be seen. So, we will explore facet-level personality growth and aggregate up if similar trends are seen. Many sources of longitudinal data prioritize brevity over specificity, so in that our design differs. By examining whether different patterns will emerge within each trait's facets or if each facet follows a similar trend as the higher-order trait we learn what changes and how, which aids future intervention efforts. This is true not only for personality but in all measured variables. Therefore, I expect the design to be sensitive to capturing change amongst individual traits, social influences, and health. Accordingly, the first research question is the univariate growth trends of the study variables to assess overall change in our data. The results will be used as descriptive information about the level of change observed in this short timeframe.

There is still need for longitudinal change and stability to be examined in more diverse samples and tested for equivalence across groups. The previous large personality meta-analyses were based on homogenous samples like much of psychology research (B. W. Roberts et al., 2006; B. W. Roberts & DelVecchio, 2000). This is true for personality variables but also for many other relationship and health constructs as much of what has been done is limited in terms of gender and sexual diversity (Junkins, Dugan, et al., 2024; McGorray et al., 2023), especially in longitudinal research. Pollitt et al. (2022) showed 7 in 53 quantitative studies (13%) with queer participants were longitudinal in the research surveyed from 2002 to 2021 in two relationship journals. Thus, the second research question will address longitudinal processes between SGM participants and non-SGM participants.

The group-level growth will be examined using latent growth curve multi-group modeling to determine whether defined groups differ from one another in the slopes (means and variances), intercepts (means and variances), and slope-intercept covariance. The group variables will follow according to the sample sizes suggested by the power analysis discussed below. I will use gender, sexual orientation, and SGM status as the group variables to consider and the specific identities with at least 600 people will be included for comparisons.

Hypothesis 3: In line with our *similarities hypothesis*, I expect little to no differences in the growth parameters between groups.

Analysis

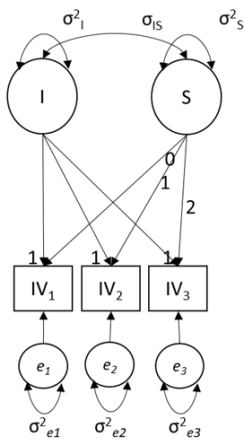
I will estimate change over time using latent growth curves in individual traits, social influences, and mental health (each variable modeled separately). For the measures of relationship power, Big Five, relationship satisfaction, depression, and subjective well-being, this will take a minimum of 3 months' time. For social support, social isolation, and discrimination, this will take a minimum of 6 months because of the schedule of deployment. The minimum sample size is 1,200 participants total based on simulations described below. With more than 3 waves of data, the results can be interpreted more confidently, and I can test non-linear trends (e.g., polynomial or exponential models) to examine more complex processes of change over time. Using latent growth models, I will estimate differences between groups and compare models for equivalence of parameters following the steps below. Age and age-squared are the only variables we will include as covariates as there are known differences in mean between ages on personality and mental health variables (B. W. Roberts et al., 2006). Before modeling the growth curves, time invariance will be assessed for each variable following the measurement invariance testing described in study 1.

The order of operations for examining whether growth is present in the data is stated next. First, no growth in the full data is fit. Thus, only a latent intercept is specified for the three measurement occasions. The loadings are fixed to 1 for each measurement occasion on the latent intercept. This model compared to the following linear growth tests whether there is any growth. Second, linear growth in the full data is fit (see Figure E.3). The intercept is measured by the indicators from the three waves that should be relatively equivalent time points (30 days with some variation based on which reminder they start the survey at). Each loading from the indicator to the latent intercept is fixed to 1. For the latent slope, the three indicators have fixed loadings with linear increase (0, 1, and 2). To address the overall sample growth trajectory (research question 1), I will interpret the slope mean, the correlation between intercept and slope, and the variance of the latent slope. If the case is that there is sufficient sample size with four or more measurement occasion, then non-linear growth will be tested starting with quadratic. The quadratic slope is added with the linear slope and the loading of the quadratic slope is the square of the linear slope (e.g., 0, 1, 4). If there are model convergence issues, the quadratic slope loadings will be parameterized with a middle wave as the reference (loading = 0), the quadratic slope variance will be fixed to 0, or the quadratic slope covariances with the intercept or linear slope will be fixed to 0. The variability in the time intervals between participants will be evaluated. Survey reminders occur twice, 4 and 8 days after their 30-day invitation to later assessments. If a person fails to return in the current month, they are invited to the following month. If the standard deviation of number days between assessments is very small, the time intervals will be fixed. If there is variation between people, then I will vary the actual time as the loadings which will serve to increase statistical power (Brandmaier et al., 2020). The above steps describe the way in which univariate growth will be examined.

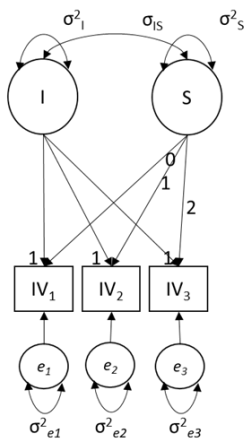
Using the best fitting model above, multiple groups trajectories will be examined to address research question 2. In this the basic parameters (loadings on latent intercept and slope) are the same as the steps above (see Figure E.3). The grouping variable will start with all parameters constrained (intercept mean, intercept variance, linear slope mean, linear slope variance, quadratic slope mean, and quadratic slope variance) and each will be freed one by one. Comparison in model fit will be done using chi-square difference test. A non-significant change in fit between unconstrained and constrained model ($p > .05$) suggests the constrained model fits best meaning that the parameter is equivalent between groups. As our hypothesis centers on effect size, the results for research question 2 looking at the differences between groups (means, variances, and correlations) will be presented in histograms to evaluate the spread of calculated differences across all variables. These steps will allow us to examine whether the growth processes differ between groups.

Figure E.3. Simplified statistical diagram for univariate linear growth curve of IVs with multiple groups.

Group 1: SGM



Group 2: non-SGM



An alternative to multiple group models is the latent growth mixture models that allow data to cluster by similarities rather than factor level (Ram & Grimm, 2009). I have excluded this modeling approach because it would not directly address the question of do people defined by their gender, sexual orientation, and similar demographics differ in their average change over time. Therefore, I will include this approach in future research as where I would like to go in determining how many average trajectories fit the data well, and then discovering who is doing well or poor.

Statistical Precision Analysis

The analyses proposed here will be undertaken with 3 waves of data. There are up to 12 waves planned. More than 3 waves of data allow for improved statistical power and the potential to evaluate more complex models (e.g., non-linear effects). General recommendations from methodological papers suggest sample sizes in the range of 300-450 per group for 80% power in longitudinal growth models assuming small growth and repeated measures (Fan, 2003; Xitao & Xiaotao, 2005). However, the addition of detecting differences in parameters between groups is important for research question 2. After running simulations varying sample size, intercept mean, intercept variance, slope mean, slope variance, and intercept-slope covariance including the tests for differences between groups on each parameter to address research question 2, the sample size to detect mean differences in slope and intercept is 1,100 (Figure E.4). This sample size allows us to detect differences the size of -0.20 or -0.30. Similar to study 1, we are interested in differences in correlations greater than 0.20. In further detail the sample sizes varied were continuously sampled from 100 to 1,000 per group (total N was 200 to 2,000). The intercept and slope means as well as intercept and slope variances were distributed from 0.05 to 0.25. Covariance between intercept and slope were sampled from -0.40 to -0.10. These estimates were used in line with roughly normal effect sizes seen in other personality and related literature. The parameters as specified were iterated over with every combination. So, the statistical precision simulations were able to give an idea of the average sample size needed to find the effect sizes I specified.

Figure E.4. Results from predicting combinations of effect sizes of the parameters of interest from a continuous distribution. The statistical power and sample size are shown as they relate to each other and to different values for the parameter in each plot. Effect sizes were varied -0.10, -0.20, to -0.30.

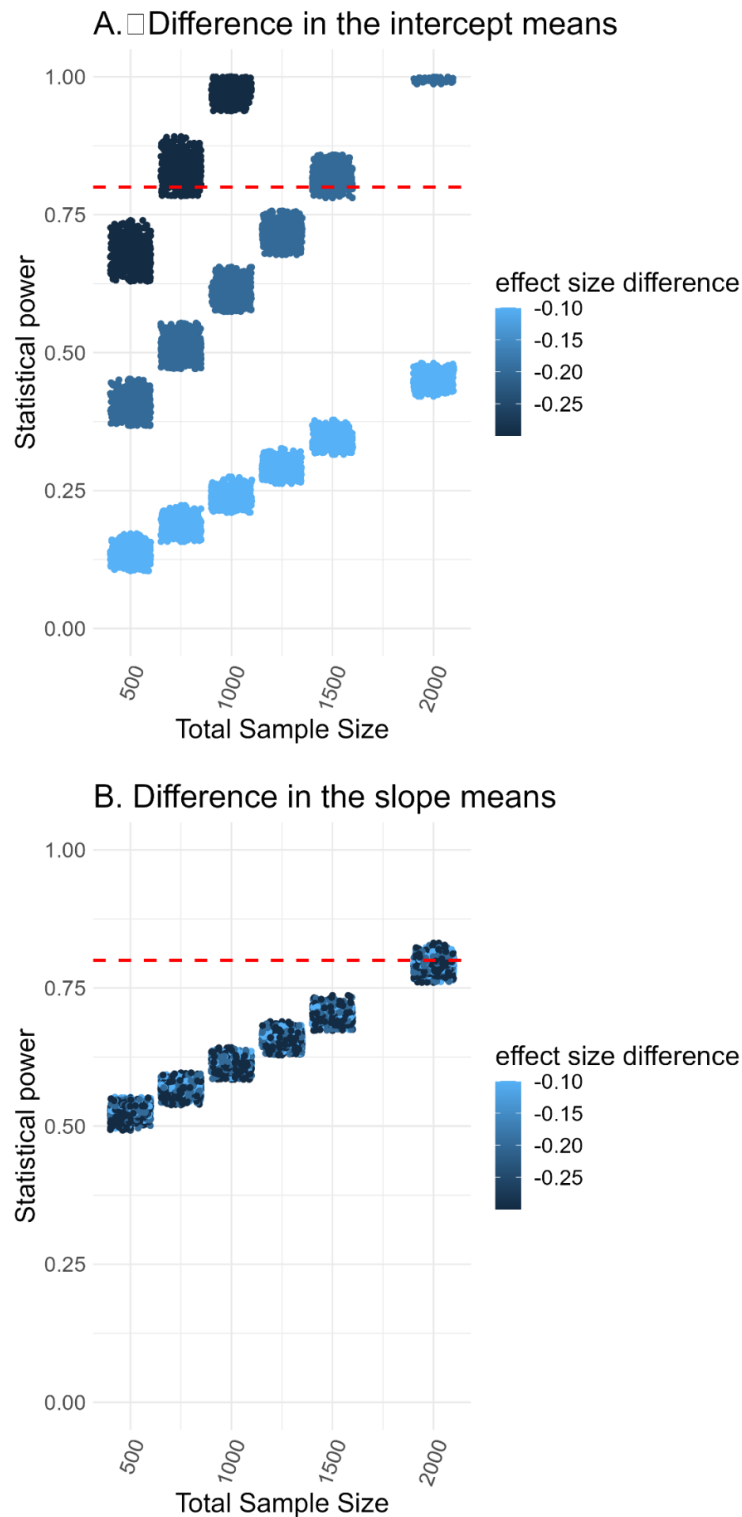


Figure E.4 (cont.). Results from predicting combinations of effect sizes of the parameters of interest from a continuous distribution. The statistical power and sample size are shown as they relate to each other and to different values for the parameter in each plot. Effect sizes were varied -0.10, -0.20, to -0.30.

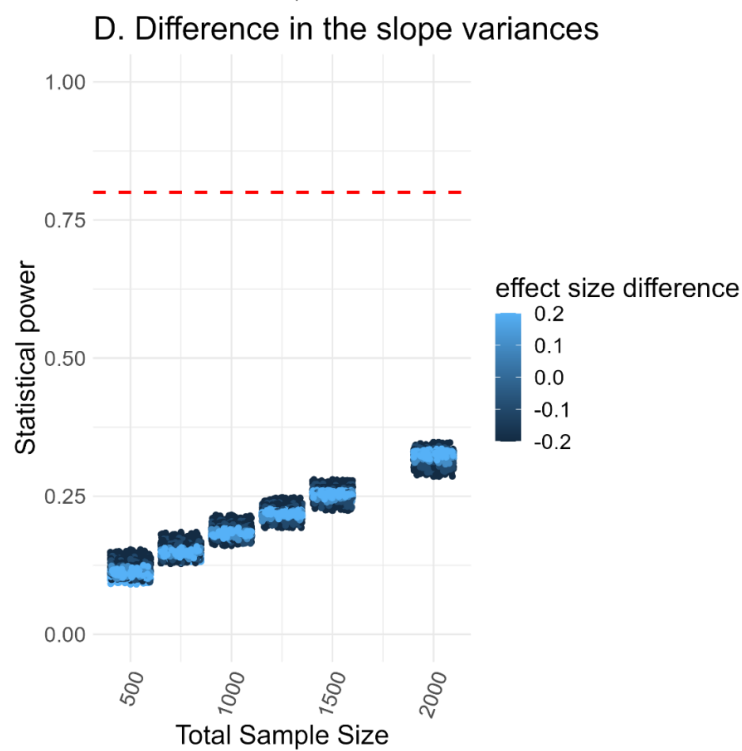
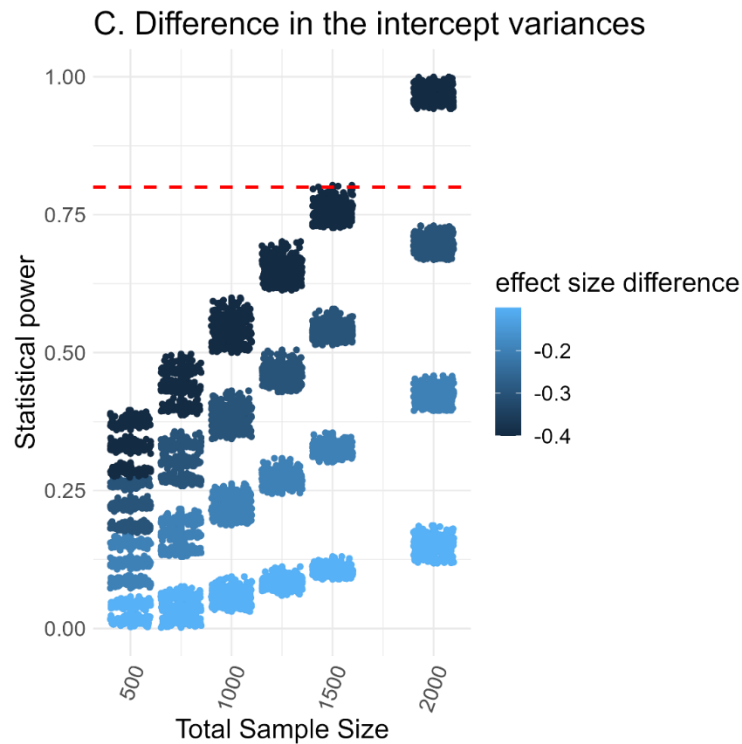
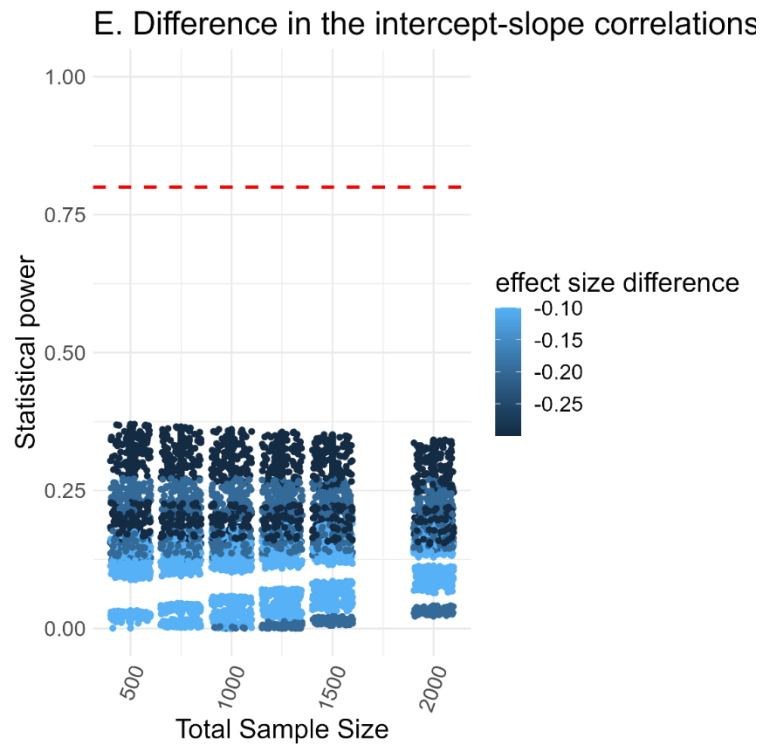


Figure E.4 (cont.). Results from predicting combinations of effect sizes of the parameters of interest from a continuous distribution. The statistical power and sample size are shown as they relate to each other and to different values for the parameter in each plot. Effect sizes were varied -0.10, -0.20, to -0.30.



Study 3: LONGITUDINAL PSYCHOSOCIAL PROCESSES ON MENTAL HEALTH

Lastly, I will expand on the prior studies to gain insight into the processes underlying the development of mental health. In other words, assessing which variables grow together with subjective well-being or depression over time and which grow apart. Multiple parameters will be explored, including the slopes correlation, the intercepts correlation, and the cross-variable intercept-slope correlations. One major benefit of our approach is that directionality is not assumed or being modeled. With correlated growth I am comparing parallel growth processes (Bollen & Curran, 2006; Duncan et al., 2013; McArdle, 2009). For descriptive or exploratory research, parallel growth processes make less assumptions not being tested and adequately allow for the processes of psychosocial development to be examined.

Assessing growth processes of mental health will be done in two research questions. First, the overall growth trajectory slopes between individual characteristics or social influences will be correlated with mental health outcomes. Next, I will address the equivalence of correlated growth in multiple groups. Specifically, the equivalence of the associations among the slopes and intercepts of the dependent variables (mental health) and independent variables (individual traits, social factors) will be tested among demographic variables—i.e., gender, sexual orientation, and SGM label.

Hypothesis 4: In line with the *Similarities Hypothesis*, the bivariate parameters will be equivalent across groups.

Analysis

Growth models will be specified similarly to what was described for study 2. Instead of one variable intercept and slope, each model will decompose two variables' intercepts and slopes. In study 3, the parameters examined will be the correlated change, meaning all cross-variable correlations between intercepts and slopes. To be explicit, cross-variable correlations include the variable 1 intercept – variable 2 intercept, variable 1 slope – variable 2 slope, variable 1 intercept – variable 2 slope, and variable 1 slope – variable 2 intercept correlations. The effect size differences between groups will be estimated to address research question 2. One key way to portray the results will be a histogram of the correlation differences. This will show whether our expectation holds: most correlation differences will be less than 0.20, meaning small to non-existent. The results for research question 2 looking at the differences between groups (correlations) will be presented in histograms to evaluate the spread of calculated differences across all variables.

Statistical Precision Analysis

The statistical precision analysis for study 3 was done by adding a second variable to the latent growth curve model simulated in study 2, namely the parameters of $rI-S$, $rS-S$, $rS-I$, and $rI-I$ are under consideration. These parameters were sampled from a continuous distribution ranging from -0.50 to 0.50. Samples sizes within groups were varied from 100 to 1,000. There were 100,000 simulations run to estimate these combinations.

I will correct for multiple testing using *meff* to account for the number of independent tests. The results showed that to have power to detect significant correlations between cross-variable latent intercepts and slopes ($p < .05$), a total sample size of 1,750 will be required with near equal group sizes of 875. At this sample size and effect size, there is still some uncertainty whether the correlation in each group will be significant. A correlation difference of 0.30 is more

certain to be significant at the same sample size. A correlation difference of 0.10, which is negligible is as likely as a difference of 0.20 around the same sample size to be significant. These results were similar for each of the bivariate parameters of interest. See Figure E.5 for how statistical power and sample size relates to the differences in the univariate parameters.

Figure E.5. The simulation results for estimating the required total sample size for significant differences in the bivariate correlations between groups. The parameters were sampled from a continuous distribution of effects. Variation in statistical power to detect correlation differences was more related to the univariate parameter differences than the effect sizes of the correlation difference. The color-graded dots show the univariate parameter differences which were all predicted at -0.10, -0.20, and -0.30 in three runs. The red line shows where 80% statistical power is.

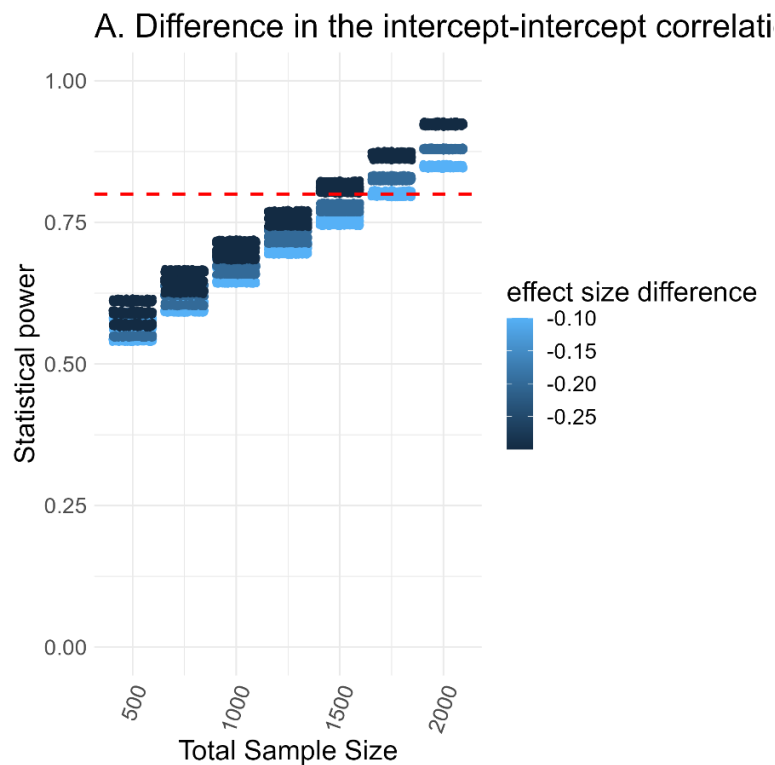


Figure E.5 (cont.). The simulation results for estimating the required total sample size for significant differences in the bivariate correlations between groups. The color-graded dots show the univariate parameter differences which were all predicted at -0.10, -0.20, and -0.30 in three runs. The red line shows where 80% statistical power is.

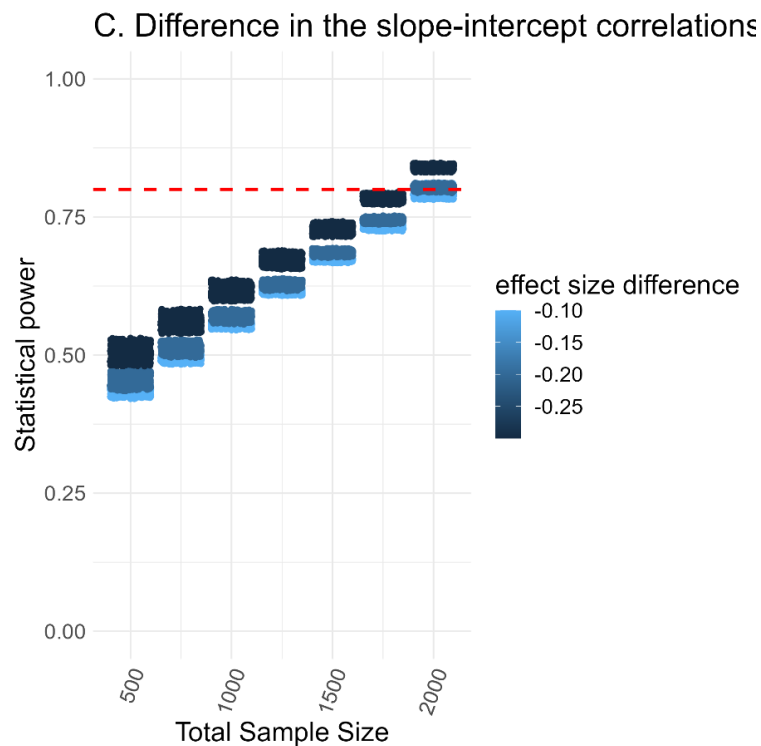
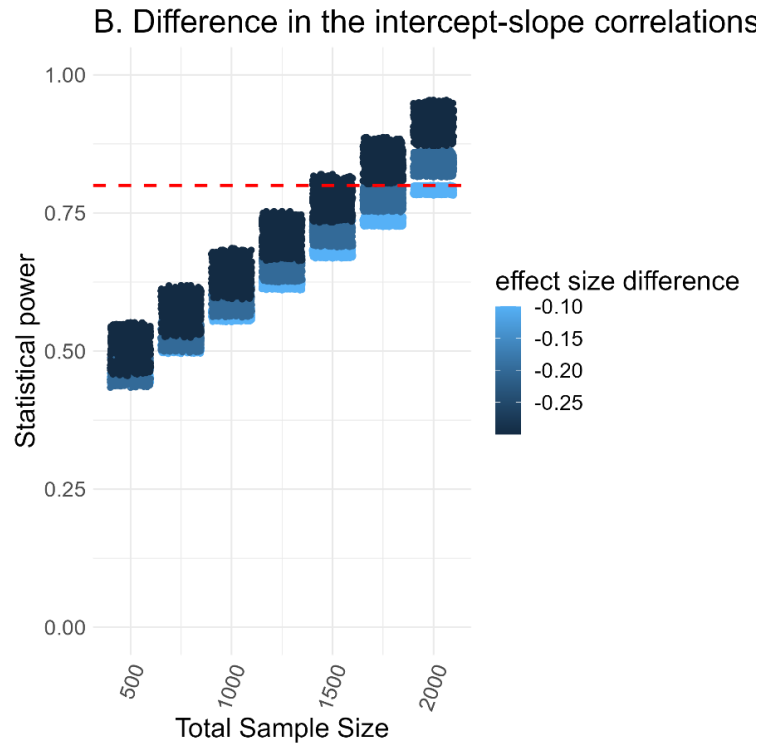


Figure E.5 (cont.). The simulation results for estimating the required total sample size for significant differences in the bivariate correlations between groups. The color-graded dots show the univariate parameter differences which were all predicted at -0.10, -0.20, and -0.30 in three runs. The red line shows where 80% statistical power is.

