Investigating the Effects of Birth Order on Mental Well-Being

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Abstract

Mental health is a significant factor in overall health as it affects the risk for many conditions. One possible contributor is birth order; some research suggests that later-borns experience higher mental well-being than first-borns. According to intersectionality theories and the multiple jeopardy hypothesis, being a member of multiple marginalized groups can also result in interactive detrimental effects. Additional research suggests that people with various mental health conditions experience different effects on their mental health, which influences intervention design. This correlational study conducted on university students (n = 115) aimed to replicate the effects of birth order on mental well-being and explore which particular aspects of mental well-being may be affected by birth order. The study filled a gap by recruiting a sample with more women and people of immigrant backgrounds. Per the intersectionality theory, it also aimed to determine whether there is an interaction effect between being a first-born, coming from an immigration background, and identifying as a woman on mental well-being. Neither a replication of the birth order effect nor an interaction effect between birth order, gender, and immigration background were found. Exploratory analyses suggest that only children experience more Positive Relations With Others than later-borns. This protective effect seems to only apply to non-immigrants as they exhibit higher Self-Acceptance than people of immigrant backgrounds. Future studies may dissect this potential interaction between birth order and immigrant background.

Background & Significance

The importance of mental health has risen in recent years, especially in developed countries. Mental illness now affects a significant portion of the U.S.—22.8% of adults suffer from mental illness while 17% of youth experience mental health disorders (National Alliance on Mental Illness, 2023). Mental health is a key factor in overall health as it affects the risk for chronic conditions such as diabetes or cardiovascular disease (CDC, 2023). Known risk factors for mental illness include adverse childhood experiences, certain medical conditions, as well as social factors like loneliness and isolation (CDC, 2023). To this date, however, there are still sociocultural factors that have not been thoroughly explored, including birth order, immigration background, and gender.

Birth Order

Effects on Personality

Sulloway (1996) revised and popularized the idea that the mechanism behind different siblings' family roles and personalities is the competition for parental investment. First-borns would be more likely to follow their parents' expectations and values because they received more attention from their parents. They would become more responsible, organized, and academically achieving, which is associated with conscientiousness (Healey & Ellis, 2006). On the other hand, later-borns would struggle with finding their own family role. They would identify less with their parents and older siblings and thus become the unconventional, liberal "rebels" in their family (Healey & Ellis, 2006).

Studies on the effects of birth order and personality are extensive and have yielded mixed results. Black et al. (2018) found that in a sample of Swedish men, earlier-borns were more emotionally stable, socially outgoing, and took more initiative than later-borns. Consequently,

first-borns were more likely to work in managerial and leadership positions (Black et al., 2018). The findings of Healy & Ellis (2006) and Dixon et al. (2008) also fit into Sulloway's model, with first-borns exhibiting higher conscientiousness and later-borns displaying more extraversion and openness.

In 1983 however, Ernst & Angst reviewed 40 years of previous research on birth order and echoed the findings of Olneck & Bills (1979): most personality effects were confounded with socioeconomic status and family size—an effect of the between-family designs that were used by many of the researchers. Although some within-family studies did in fact support Sulloway's hypothesis (Sulloway, 2010; Sulloway, 1999; Paulhus et al., 1999; Dixon et al., 2008), the study conducted by Bleske-Rechek & Kelley (2013) utilized a within-family design along with independent self-reports from 69 pairs of both first-born and later-born siblings and found no difference in personality. Parents' reports of their children's personality traits did not differ either (Bleske-Rechek & Kelley, 2013). Finally, a study combining between- and within-family designs found no lasting effects of birth order on personality in a sample of 20,000 people (Rohrer et al., 2015).

Effects on Mental Well-Being

Research on how birth order and these family contexts shape mental well-being is more limited. In a study of 2,886 young adults, mostly male, Fullerton et al. (1989) found that male first-borns scored higher on the negative feelings subscale of psychological well-being than other-borns when controlling for socioeconomic status. This subscale is correlated with psychological distress, including anxiety (Fullerton et al., 1989). Dohrenwend & Dohrenwend (1966) add that in anxiety-arousing situations, first-borns showed more psychiatric symptoms when they are unable to share the experience with others. In a study of 3,744 Japanese children

from Tokyo, later-borns exhibited higher prosocial behavior and resilience while displaying fewer total difficulties, conduct problems, and hyperactivity than first-borns (Fukuya et al., 2021). Lawson & Mace (2010) supported this finding in British children—the presence of older siblings predicted higher childhood mental health, while the arrival of younger siblings indicated increased emotional and conduct difficulties. Chandola & Tiwari (2016) achieved similar findings in Indian participants as well: in a comparison between 20 patients with psychiatric symptoms and 20 healthy patients, male first-borns had significantly higher psychiatric morbidity than any other group. First-borns also exhibited statistically significant higher scores in emotional instability compared to last-borns and only children (Chandola & Tiwari, 2016).

Learned Prosocial Behavior in Younger Siblings

One possible mechanism behind the effect of birth order on mental well-being is that older siblings provide social benefits to younger ones (Lawson & Mace, 2010; Fukuya et al., 2021). Since children spend more time with their siblings than with their parents in daily life, early sibling interactions promote thought regulation and understanding of emotions. Conflicts during play promote prosocial behaviors like problem-solving, teaching, sharing, and cooperation. In other words, later-borns have more opportunities for in-depth social development from an early age.

Family Responsibility, Pressure, and Stress for Older Siblings

Another explanation is that older siblings are expected to serve as a secure base of attachment or complementary caretaker for their younger siblings (Fukuya et al., 2021). While this benefits later-borns, these older siblings may suffer from this family dynamic as they are subject to increased parental pressure and responsibility. Conduct problems can also arise in response to the stress of a changing home environment—per Adler's dethronement theory, first-

borns may feel jealousy after receiving less parental attention and interactions than the later-borns (McHale et al., 2012).

Gender. The negative effects of being a first-born could be more pronounced for women as they report about twice as much depressive and anxious symptomatology compared to men (Johns Hopkins Medicine, 2024) and may also score higher on neuroticism (Eysenck & Eysenck, 1975; Viken et al., 1994), a predictor of poorer mental well-being. In a similar fashion to first-borns, women are persistently under pressure to cater to domestic labor and other family responsibilities that can generate significant amounts of stress, especially in conjunction with work commitments (Austen & Birch, 2000; Somashekher, 2018).

Immigration Backgrounds & Mental Health

With the increasing rate of globalization, there will be more immigrants and families with immigrant backgrounds. The American Immigration Council (2021) finds that 13.6% of U.S. residents are foreign-born and the United Nations Regional Information Centre for Western Europe (2023) estimates that 5.3% of people in the European Union are non-EU citizens. Even more people identify with a migrant background due to their family history—twenty-seven percent (Organisation for Economic Cooperation and Development, 2018). Moving to a new country often involves bureaucratic whirlwinds, language barriers, cultural differences, raising families, and economic difficulty. These effects can have a long-lasting impact on subsequent generations as well.

Current research on immigrant mental health is limited. Counter-intuitively, many researchers have found a so-called healthy migrant effect: many foreign-born populations show better health than native-born populations (Ali, 2002; McKay et al., 2003; Perez, 2002). This finding seems to diminish over time, however, and is less established for mental health (Elshahat

et al., 2022). A possible explanation for the healthy migrant effect may be selection bias—those who are able to immigrate might already be pre-selected to be more resilient (Lee, 1996).

Nevertheless, migrating and adjusting to a new country places significant stress on people, particularly for women (Furnham & Bochner, 1986; Furnham & Shiekh, 1993). Another possibility is that many first-generation immigrants come from cultures that hold a stigma against mental health issues, so mental health challenges might be interpreted under somatic symptoms and go underreported (Millet et al., 2022).

The immigrant paradox describes the issue of mental health in second- and third-generation immigrants in comparison to the first (parent) generation. Montazer & Wheaton (2011) demonstrated that in immigrant families of low economic development, mental health problems increased across generations. In a review of immigration and mental health, Alegria et al. (2017) found that U.S.-born Asian-Americans had higher psychiatric rates than foreign-born Asians. The same difference was discovered between U.S.-born and foreign-born Latinos (Alegria et al, 2017). These findings became less clear and more inconclusive when broken down by ethnic subgroup (Alegria et al., 2017).

Cultural Factors

Many immigrants come from cultures that may be more vulnerable to mental health problems. Kim et al. (2019) reviewed culture-specific factors that affect the mental health of children of immigrants and found that Chinese-American parents stress academic achievement, often at the expense of adolescent mental health (Kim et al., 2015). These expectations and results may differ depending on birth order: in Japanese culture, first-borns are required to behave more mature and responsible while taking care of younger siblings (Holloway &

Behrens, 2002), resulting in a stricter upbringing for first-borns (Power et al., 1992), which leads to poorer mental well-being (Fukuya et al., 2021).

Specific Aims

Aspects Of Mental Well-Being

While birth order may have mixed effects on personality, it could be a predictor of higher mental health in later-borns through social benefits and lower mental health in first-borns through parental pressure and dethronement. Previous studies, however, have not yet explored the specific aspects of mental well-being that are affected by birth order. Research has shown that people affected by psychological disorders experience different impacts on well-being (Honey et al., 2015; Goodman et al., 2019). For example, people with depression respond less strongly to negative events than healthy people while people with social anxiety disorder feel persistently low levels of positive emotions in both social and non-social contexts (Goodman et al., 2019). Oftentimes, trauma survivors lead purposeful, appreciative lives upon overcoming and coping with their traumatic or stressful experiences (Goodman et al., 2019). These differences are factors in designing effective interventions for people with different conditions (Goodman et al., 2019). Similarly, it would be helpful to explore how different aspects of mental well-being may be impacted by birth order.

Intersectionality

One common theme that has emerged in this literature review is that being a first-born, woman, or having an immigrant background can all be associated with some form of increased family pressure. These pressures can emerge in the form of domestic labor, academic achievement, or caretaking, which then have a detrimental effect on well-being (Fukuya et al., 2021; Austen & Birch, 2000; Kim et al., 2015). The colloquial term “eldest [immigrant] daughter syndrome” has also been coined to summarize the challenging family context of the increased responsibilities and stressors for young girls (Tricaso, 2023). It is possible that gender and

immigrant background interact and moderate the effect of birth order on mental well-being; the effects might be amplified under certain conditions. Intersectionality theories explain how a person's multiple social identities interact and lead to opportunities and oppressions that are not necessarily brought about by the separate social identities on their own (Taylor, 2019). For instance, black women may face forms of unique discrimination that are not experienced by white women or black men (United Way of the National Capital Area, 2023). In line with this framework, the multiple jeopardy hypothesis predicts that the negative effect of being a member of multiple marginalized social groups is higher than the additive negative effect of all those social groups (King, 1998). Kern et al. (2020) examined the relationship between low socioeconomic status (SES), immigrant background, and gender to observe their effects on mental well-being. In the sample of over 100,000 adolescents from various European countries, the negative effects of low SES, immigrant background, and being a girl were additive and not interactive (Kern et al., 2020).

This Study

Current research on the effects of birth order on mental well-being has expressed the need for a larger sample of women and people with immigrant backgrounds. Additionally, previous birth order studies focused on children (Fukuya et al., 2021; Lawson & Mace, 2010) or were conducted several decades ago (Fullerton et al., 1989), so there is a need to assess whether those birth order effects have longer-lasting effects on adults in a modern context.

My current study aims to bridge some of the gaps by exploring the effects of birth order on different aspects of mental well-being in adults. I will also test the multiple jeopardy hypothesis with the factors of birth order, immigration background, and gender on mental well-being. Here are the specific aims and hypotheses:

(1) Replicate the negative effects of birth order on aspects of mental well-being in adults, particularly in a sample with more women and people with immigrant backgrounds.

H1: Overall, first-borns will report lower mental well-being than later-borns.

H2: First-borns with immigrant backgrounds will report lower mental well-being than later-borns with immigrant backgrounds.

(2) Explore how birth order affects the different aspects of mental well-being.

(3) Test the multiple jeopardy hypothesis with the factors birth order, immigrant background, and gender on mental well-being.

H3: Immigration background and gender moderate the negative effect of birth order on mental well-being; first-born daughters with immigrant backgrounds will report the lowest mental well-being out of all groups.

Methods

Participants

Usable data was collected from n = 115 students at the University of San Francisco (USF). Of the sample, 27 participants identified as male, 83 participants identified as female, three participants identified as non-binary, and one participant declined to provide an answer about their gender. Participant ages ranged from 18-26 years, with the majority of participants falling within the 18-21 range (M = 18.9, SD = 1.40). The ethnic breakdown is as follows: two participants identified as American Indian, Native American, Alaska Native, or Indigenous; 41 participants identified as Asian; 18 participants identified as Black or African American; 17 participants identified as Hispanic or Latino/a/x; one participant identified as Middle Eastern or North African; one participant identified as Native Hawaiian or other Pacific Islander; 31 participants identified as White; four participants identified as some other ethnicity. Regarding birth order, 40 participants identified as first-borns, 61 participants identified as later-borns, and 14 participants identified as only children. Eighty participants had an applicable immigration background (1st, 1.5th, 2nd, or 3rd generation immigrant background) and 35 participants had no applicable immigration background.

Students were mostly recruited from the USF General Psychology course. Students had to complete a set number of hours of research participation for the class—participants were given 30 minutes of class credit for participating in this study. Alternatively, students were able to opt out of the assignment by writing a research report instead. Other participants were recruited from announcements that were sent out by various USF student organizations.

Design & Materials

Participants completed the study in the form of an online Qualtrics survey. First, participants viewed a consent form outlining the potential risks, benefits, confidentiality, compensation, and broad overview of the study. After completing the survey, participants were debriefed and automatically given course credit. The following sections describe the scales used in the order in which they appeared on the survey.

Ryff Psychological Well-Being Scale (Ryff PWB)

The 42-item Ryff Psychological Well-Being Scale is a construct of well-being and happiness (Ryff, 1989). Participants rate how strongly they agree or disagree with 42 statements on a 7-point Likert scale. The Psychological Well-Being Scale consists of six different subscales and produces subscores for each: autonomy (e.g., "I have confidence in my opinions, even if they are contrary to the general consensus"), environmental mastery (e.g., "In general, I feel I am in charge of the situation in which I live"), personal growth (e.g., "I think it is important to have new experiences that challenge how you think about yourself and the world"), positive relations with others (e.g., "People would describe me as a giving person, willing to share my time with others"), purpose in life (e.g., "Some people wander aimlessly through life, but I am not one of them"), and self-acceptance (e.g., "When I look at the story of my life, I am pleased with how things have turned out"). Each subscale has a total of 7-49, and the scale has a total score of 42-294.

The scale has been used with U.S. adults of all ages, including students (Fatemeh & Valiolah, 2012) and people from lower-income backgrounds (Ryff & Keyes, 1995; Curhan et al., 2014). The scale has also been validated in a diverse range of non-Western populations, including Asian Americans, Asian international students, and Latino students (Iwamoto & Liu,

2010; Bahamon et al., 2019). Thus, this scale is expected to be a valid and reliable construct of mental well-being for this study.

Patient Health Questionnaire (PHQ-9)

The PHQ-9 is a nine-item questionnaire used to screen for the presence and severity of depression (Kroenke et al., 2001). Participants are asked to respond how often they have experienced certain relevant symptoms over the past two weeks (e.g., "Little interest or pleasure in doing things", "Trouble concentrating on things, such as reading the newspaper or watching television"). Question nine, which assesses suicidal ideation, was omitted due to concerns about mandated reporting. The PHQ-9 has been tested for its reliability and validity and is used for both clinical and research purposes (Kroenke et al., 2001).

Generalized Anxiety Disorder Scale (GAD-7)

The GAD-7 is a seven-item questionnaire that assesses presence and severity of generalized anxiety disorder (Spitzer et al., 2006**)**. Participants are asked to respond how often they have experienced certain relevant symptoms over the past two weeks (e.g., "Feeling nervous, anxious, or on edge", "Trouble relaxing"). The GAD-7 has been tested for its reliability and validity in the general population (Loewe et al., 2008).

Demographics Questionnaire, Immigrant Background, and Birth Order

The demographics questionnaire consisted of 10-12 questions, depending on certain question responses. Questions first asked about participants' age, sex, gender, race, and ethnicity. To assess and control for socioeconomic status, participants were asked about their parents' or guardians' education level as college students have not yet finished their education and are more reliant on their parents' or guardians' income. To determine immigrant background, participants were asked whether they themself, one of their parents, or one of their grandparents was born in

a foreign country. Birth order is determined by whether a participant identifies as the only child, first-born, a middle-born, or last-born. For exploratory analyses, participants were also asked how many younger and older siblings they have, if applicable.

Results

All analyses were conducted on Jamovi. For comparisons involving mental well-being, I corrected the alpha level to .0167 to account for the multiple comparisons. For the main analyses, 14 only children were excluded, resulting in a subsample of 101 participants. Birth order was collapsed into two levels: first-borns and later-borns. Immigrant background was collapsed into two levels as well, with participants being classified as having an immigrant background if they themselves, one of their parents, or one of their grandparents were born in a foreign country.

Testing Mental Well-Being Between First-Borns and Later-borns

To test H1, I conducted a one-way analysis of variance (ANOVA) to compare first-borns and later-borns regarding the three measures of mental well-being that I used. For first-borns, the mean scores for Ryff PWB, PHQ-9, and GAD-7 were M = 192, SD = 32.9; M = 8.45, SD = 5.05; and M = 8.88, SD = 5.42, respectively. For later-borns, corresponding scores were M = 192, SD = 29.0; M = 8.97; SD = 5.97; and M = 7.70, SD = 5.85, respectively. There were no significant differences between the first-borns and later-borns in Ryff PWB (F(1, 76.1) = 0.00, p = 1.000), PHQ-9 (F(1, 92.6) = 0.21, p = .641), or GAD-7 (F(1, 87.9) = 1.06, p = .307).

Testing Mental Well-Being Between First-Borns and Later-Borns Among People with Immigrant Backgrounds

To test H2, I conducted another one-way ANOVA. This time, I limited the subsample to participants who had any applicable immigrant background (1^{st}, 1.5^{th}, 2^{nd}, or 3^{rd} generation immigrant background) and compared first-borns and later-borns regarding the three measures of

mental well-being. For first-borns, the mean scores for Ryff PWB, PHQ-9, and GAD-7 were M = 188, SD = 33.8; M = 9.03, SD = 5.23; M = 8.93, SD = 5.36, respectively. For later-borns, the corresponding scores were M = 190, SD = 29.2; M = 8.95. SD = 5.64; M = 7.93, SD = 5.73, respectively. There were no significant differences between the first-borns and later-borns in Ryff PWB (F(1, 54.7) = 0.12, p = .733), PHQ-9 (F(1, 63.1) = 0.00, p = .950), or GAD-7 (F(1, 62.8) = 0.56, p = .456).

Testing for an Interaction Between Birth Order, Gender, and Immigrant Background on Mental Well-Being

To Test H3, I conducted an ANOVA to examine the effects of birth order, gender, and immigrant background on the three measures of mental well-being. The descriptives and F-ratios are summarized in Table 1. No main effects of birth order, gender, or immigrant background crossed the alpha level of .0167. No significant interaction between immigration background * birth order, immigration background * birth gender, birth order * gender, or immigration background * birth order * gender was found.

Table 1

Descriptives and ANOVA Results by Factor and Mental Well-Being Scale

	Ryff PWB		PHQ-9		GAD-7	
	F	*p*	*F*	*p*	*F*	*p*
Birth order	0.02	.876	0.30	.583	0.16	.691
Gender	0.01	.933	0.71	.400	4.04	.047
Immigration background	0.78	.379	0.08	.785	0.45	.503
Immigration background * birth order	0.04	.835	0.01	.941	0.24	.623
Immigration background * gender	0.00	.959	0.10	.757	0.06	.801

Birth order * gender	0.02	.894	0.03	.855	0.28	.600
Birth order * gender * immigration background	0.18	.671	1.91	.171	0.10	.749

Exploratory Analyses

Exploratory analyses were conducted on the full participant pool, including only children. Thus, birth order had three levels: only child, first-born, and later-born.

To achieve the second aim, a one-way ANOVA was conducted to explore whether birth order affected any of the six subscores of the Ryff PWB Scale (Autonomy, Environmental Mastery, Personal Growth, Positive Relations With Others, Purpose in Life, Self-Acceptance). As shown in Table 2 and Figure 1, there was a statistically significant difference in Positive Relations With Others between at least two of the birth order groups ($F(2, 37) = 4.12$, $p = .024$). Post-hoc analyses using the Games-Howell test revealed a significant difference between only children and later-borns, with only children ($M = 34.8$, $SD = 6.15$) scoring higher than later-borns ($M = 29.6$, $SD = 6.57$), (M difference = 5.16, $p = .029$). No significant differences were found between only children and first-borns ($p = .281$) or later-borns and first-borns ($p = .296$). Exact confidence intervals were not provided by Jamovi.

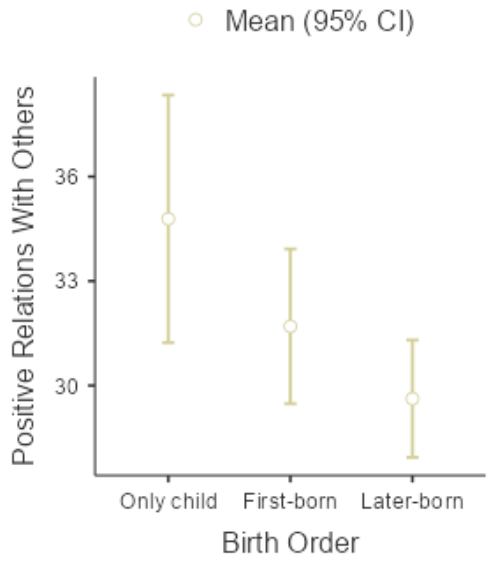
Table 2

One-Way ANOVA (Welch's)

	F	*df1*	*df2*	*p*
Autonomy	0.759	2	35.4	0.476
Environmental Mastery	0.881	2	36.0	0.423
Personal Growth	0.780	2	33.2	0.467
Positive Relations With Others	4.116	2	37.0	0.024
Purpose in Life	0.212	2	33.0	0.810
Self-Acceptance	0.684	2	35.1	0.511

Figure 1

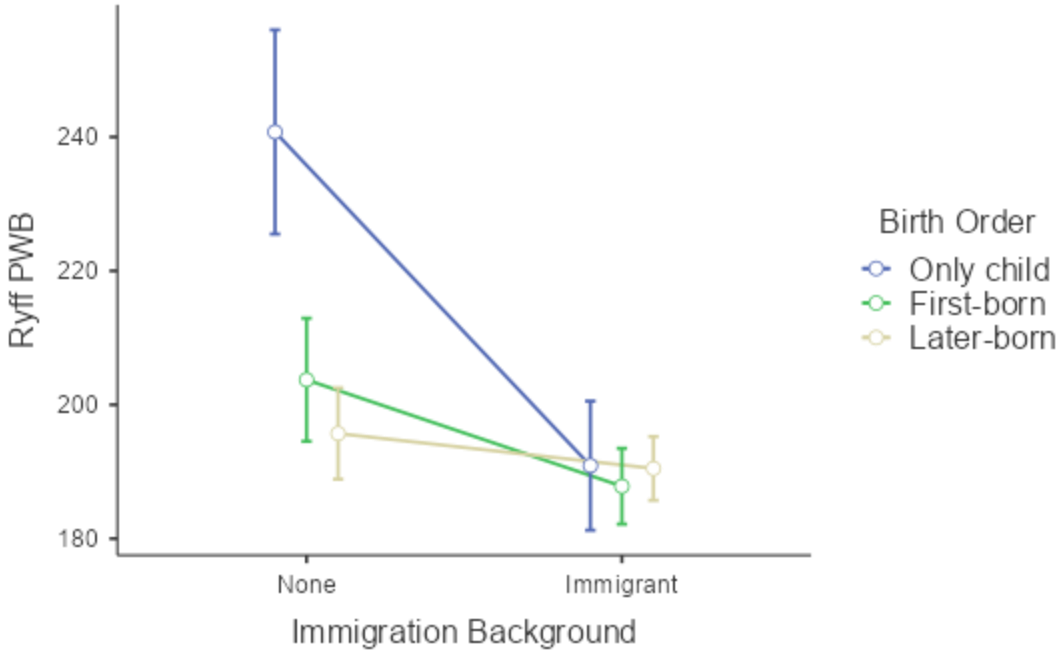
Ryff Subscore by Birth Order Group



Another ANOVA was conducted to explore whether birth order and immigrant background affected Ryff PWB scores. There was a significant main effect of immigration background, $F(1) = 9.85$, $p = .002$. People with immigrant backgrounds reported lower Ryff Psychological Well-Being ($M = 190$, $SD = 31.1$) than non-immigrants ($M = 203$, $SD = 30.7$). There was no significant main effect for birth order, $F(2) = 2.64$, $p = .041$. The interaction between birth order and immigration background was insignificant, $F(2) = 2.55$, $p = .083$.

Figure 2

Means and Estimated Marginal Means of Ryff PWB by Immigrant Background



Additionally, an independent samples Welch's t-test revealed significant differences in Self-Acceptance subscores of the Ryff PWB Scale depending on their immigrant background, $t(113) = 2.28$, $p = .025$, *Cohen's d* = 0.462. People with immigrant backgrounds ($M = 30.0$, $SD = 7.88$) reported lower self-acceptance than non-immigrants ($M = 33.0$, $SD = 8.10$).

More exploratory analyses were conducted on the subsample of participants that identified as non-immigrants or 3rd-generation immigrants. A one-way ANOVA revealed a significant effect of birth order on GAD-7 scores, $F(2, 20) = 6.73$, $p = .006$. Post-hoc Games-Howell analyses revealed that only children ($M = 2.50$, $SD = 2.81$) reported lower GAD-7 scores than first-borns ($M = 8.25$, $SD = 5.46$), M difference = -5.75, $p = .013$, and later-borns ($M = 7.56$, $SD = 5.86$) M difference = -5.056, $p = .016$. A one-way ANOVA replicated the effect of birth order on the Positive Relations With Others subscore of the Ryff PWB Scale, $F(2, 15) = 4.19$, $p = .036$. Post-hoc Games-Howell analyses revealed that only children ($M = 37.0$, $SD = 5.90$)

reported higher Positive Relations With Others scores than later-borns (M = 29.1, SD = 7.09), M difference = 7.85, p = .049.

Lastly, an independent samples Welch's t-test found a significant difference in GAD-7 scores based on gender, $t(64) = -3.43$, p = .001. Women (M = 8.47, SD = 5.81) reported more generalized anxiety scores than men (M = 5.04, SD = 4.00).

Discussion

The main analyses conducted to test H1 and H2 suggested that among people with siblings, first-borns do not have lower mental well-being than later-borns. This finding holds up among the subsample of people with immigrant backgrounds as well. Thus, my hypotheses H1 and H2 were not supported. There was no interaction effect between birth order, gender, and immigrant background among participants who had siblings, and so H3 and the multiple jeopardy hypothesis were not supported in the main analyses as well—gender and immigrant background did not appear to moderate any effect of birth order on mental well-being. A main effect of gender on GAD-7 scores was found, supporting existing findings that women report more anxiety symptoms than men.

Exploratory analyses that included only children, however, showed that only children appear to benefit from some mental health advantages—only children scored higher on the Positive Relations With Others subscale of the Ryff PWB Scale than later-borns. Additionally, there was a main effect of immigrant background on Ryff PWB, with non-immigrants reporting higher scores than people with immigrant backgrounds. A close inspection of Figure 1, however, revealed that this effect seemed to be driven by non-immigrant only children showing better mental well-being than immigrant later-borns—the protective benefit of being an only child appeared to be absent in people of immigrant backgrounds. While this interaction was not

significant, it is important to note that there were 14 only children in the sample. A sample with more statistical power and may have observed a significant interaction. Further analysis of this trend highlighted that in the general sample, people of immigrant backgrounds scored lower than non-immigrants on the Self-Acceptance subscale of the Ryff PWB scale—it is possible that aspects of the immigrant experience can be detrimental to a person's sense of self-acceptance, which could be a reason why only children from immigrant backgrounds did not experience the protective effect.

Further analyses were conducted on the subsample of non-immigrants or 3rd-generation immigrants to explore the only child benefit among those who are more removed from the immigrant experience. Third-generation immigrants were included in this analysis due to the rationale that if a person's immigrant background connection is merely due to a grandparent, then they would likely have a stronger connection to their host culture than their immigrant culture. Analyses showed that in this subsample, only children reported less generalized anxiety symptoms (GAD-7) than both first-borns and later-borns. Only children still scored higher on the Positive Relations With Others subscale than later-borns in this subsample.

This pattern of exploratory birth order effects gives preliminary support to some intersectional hypotheses. Only children from non-immigrant backgrounds appear to have lower anxiety and report more Positive Relations With Others, but this mental health benefit is weaker or not found in only children of immigrant backgrounds. This may be due to them having less Self-Acceptance, possibly due to discrimination or other cultural factors.

Future studies may be pointed at this only child benefit. Studies could be conducted on larger samples with more only children and immigrants to determine if the mental health benefit of being an only child is moderated by whether the person has an immigrant background. Further

research with the Ryff PWB Scale would then allow us to determine whether those effects may be driven by differences in Self-Acceptance or Positive Relations With Others.

A limitation of this study is the sample size, which was low-powered for observing interaction effects. A closer dissection of what cultural factors related to the immigrant experience could have yielded a more accurate or precise factor in the multiple jeopardy hypothesis. It may have been inappropriate to combine 1st-generation to 3rd-generation immigrants into one category for this study's purpose. One alternative factor could be acculturation level, as different immigrants experience various levels of closeness with their host culture, which could in return affect their level of Self-Acceptance or Positive Relations With Others. A related concept is the parent-child acculturation gap in immigrant families, which can lead to similar conflicts.

Overall, the pattern found in this study's exploratory analyses points at a different but interesting direction for future research and highlights a possible intersection that has not been thoroughly explored.

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