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**The Immigrant Paradox in the Problem Behaviors of Youth in the United States: A Meta-Analysis**

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**Abstract**

This meta-analysis synthesizes the empirical data on problem behaviors among foreign- (G1) and U.S-born (G2+) youth and explores the effects of immigrant status on youth internalizing and externalizing problems. A random effects meta-regression with robust variance estimates summarized effect sizes for internalizing and externalizing problems across 91 studies ( $N = 179,315$ ,  $M_{age} = 13.98$ ). Results indicated that G1 youth reported significantly more internalizing problems ( $g = .06$ ), and fewer externalizing problems than G2+ youth ( $g = -.06$ ). Gender, sample type, and publication type moderated the effects. The findings provide a first-step towards reconciling mixed support for the immigrant paradox by identifying for whom and under what conditions the immigrant experience serves as a risk or protective factor for youth.

*Keywords:* immigrant paradox, immigration, acculturation, youth, mental health

## **The Immigrant Paradox in the Problem Behaviors of Youth in the United States: A Meta-Analysis**

The primary purpose of this meta-analysis was to synthesize the current literature on problem behaviors among foreign- and native-born youth in the United States (U.S.) and explore whether being foreign-born is a risk or protective factor for U.S. youth. That is, we were interested in understanding to what extent internalizing problems (i.e., internally-focused problems) which commonly include mood- and anxiety-related symptoms, and externalizing problems (i.e., externally-focused problems) that are typically comprised of rule-breaking and aggressive behaviors, were related to immigrant status (Cosgrove et al., 2011).

Immigrant youth and their families face significant challenges in adapting to a new host culture. When compared to their native-born peers, their problem behaviors typically reflect one of two patterns: *immigrant risk* or *immigrant advantage*. Immigrant risk theory (also referred to as the *migration morbidity hypothesis* or *acculturation strain theory*) is based on a long-standing presumption that the migration process places youth at risk for problem behaviors (see Berry, 2006 for review). Specifically, foreign-born, or first-generation, youth (G1) are more vulnerable to problem behaviors than second-generation (i.e., United States [U.S.]-born with at least one foreign-born parent) and other native-born peers (G2+) due to the stress associated with poverty, discrimination, and adaptation to new cultural and linguistic norms (Bhugra, 2004). In support of this theory, G1 adolescents often report more internalizing problems, such as depression and anxiety, than G2+ youth (Katsiaficas et al., 2013), and acculturative stress predicts these negative outcomes (Sirin et al., 2013).

Conversely, *immigrant advantage* theory (also referred to as the *immigrant paradox*) reflects an emerging pattern where despite fewer economic and social resources and the stress

associated with acculturation, G1 youth report fewer problem behaviors than G2+ youth (García Coll & Marks, 2012). Support for this theory is documented in the population health literature where immigrant status is used as a proxy for adaptation over time (Filion et al., 2018; Marks et al., 2014). The theory proposes that G1 youth report fewer problem behaviors than their G2+ peers because aspects of their natal culture buffer the stress associated with adapting to the host country (Crosnoe, 2012; Unger, 2014).

The big question that has perplexed the field for the past two decades is whether there is an immigrant paradox in youth problem behaviors (García Coll & Marks, 2012). That is, is being foreign-born an advantage for youth despite the potential challenges they face? Currently, it is unclear which theory better explains the experiences of youth in the U.S. Existing narrative reviews report mixed findings with some concluding that G1 youth are at elevated risk for problem behaviors (Kouider et al., 2014), whereas others argue the reverse (Lipsicas & Mäkinen, 2010; Stevens & Vollebergh, 2008). A recent meta-analysis of children and adolescents in Europe found that G1 youth are often at higher risk for internalizing and externalizing problems than their native-born peers; however, the effects of immigrant status on problem behaviors were small and moderated by the youths' age, length of stay in the host country, and the country's prevailing immigration policies (Dimitrova et al., 2016). Thus, more clarity is needed on the extent to which existing evidence supports each theory and what factors may explain these contradictory findings.

### **Moderating Factors**

One explanation for this ambiguity in the literature is that the effects of immigrant status on problem behaviors may vary by problem type. Frequently, G1 youth have higher rates of internalizing problems, such as depression and anxiety, and lower rates of externalizing

problems, such as delinquency, smoking, and substance use, when compared to their G2+ peers (e.g., Bowe, 2017; Degboe et al., 2012). In a systematic comparison of problem behaviors among native-born versus immigrant youth in Europe, Kouider et al (2014) found higher rates of internalizing problems in immigrant youth, but similar rates of externalizing problems. This could be attributed to the fact that internalizing problems often stem from feeling socially marginalized, which may be more common in G1 youth (Potochnick & Perreira, 2010). On the other hand, externalizing problems may be heightened in G2+ youth who have fewer family protective factors than their G1 counterparts and increased vulnerability to pressure from deviant native-born peers (Greenman & Xie, 2008).

Youth characteristics, such as ethnicity, socioeconomic status (SES), developmental stage, and gender, may also moderate the relation between immigrant status and youth problem behaviors (Duihof et al., 2020; Sam et al., 2008). Ethnicity and SES may determine the frequency and type of contact immigrant youth have with the mainstream culture (Salas-Wright et al., 2016). For some ethnic groups, the process of adaption follows an “upward” social trajectory, and over time they are exposed to fewer risks for internalizing and externalizing problems, such as poverty and discrimination. However, other ethnic groups often arrive with few resources and settle in poor, ethnically segregated inner-city neighborhoods, which may lead to cycles of continued poverty and “downward” mobility (Castro et al., 2010; Portes & Zhou, 1993). Given the diversity of U.S. immigrant youth population in terms of ethnicity (i.e., as of 2017, 54% of all immigrant youth are Latino/Hispanic origin, 17% of Asian origin, 16% non-Hispanic White, 9% non-Hispanic Black, and 4% Others) and SES (i.e., 25% of G1 youth and 22% of G2 youth live in poverty), these youth characteristics were of particular interest for this review (Child Trends, 2018).

Studies also show that developmental stage and gender are important moderating factors. There is evidence of age differences in immigrant risk and advantage. Specifically, G1 pre-adolescents have more internalizing problems than their G2+ peers, whereas G2+ adolescents have more externalizing problems than their G1 peers (Dimitrova et al., 2016; García Coll & Marks, 2012). There are also gender differences in problem behaviors among immigrant youth. Studies show that G2+ males report more problem behaviors than their G1 and G2+ female counterparts, and G2+ males are at higher risk for problem behaviors than their G1 male peers (Schwartz et al., 2014; Stevens et al., 2015). These factors may contribute to the conflicting findings in the literature.

Finally, differences in study methodology may produce inconsistent findings across studies. Research carried out with nationally-representative samples may diverge from studies drawing on community samples because they represent different demographic and geographic groups (Duong et al., 2016). Discrepancies among informants in reported levels of problem behavior may also produce different patterns in the data (Stevens & Vollebergh, 2008). For example, immigrant youth tend to report higher rates of internalizing problems than their parents, whereas there is more consistency across informants for externalizing problems (Fung & Lau, 2010). Moreover, published studies may be biased towards larger effect sizes, whereas unpublished studies are biased towards smaller effects (Rothstein et al., 2005).

### **Study Purpose and Rationale**

As the country with the largest number of immigrants (48 million) and an ever increasing immigrant population (International Organization for Migration, 2013; Pison, 2019), it is not surprising that the U.S. is the source of most research on the immigrant paradox in youth problem behaviors (Sam et al., 2008). Yet, to our knowledge, no studies have synthesized the

existing literature to clarify the overall effects of immigration on U.S. youth problem behaviors and whether being foreign-born is a risk or protective factor for these youth. This gap in the literature is notable in light of research suggesting that while foreign-born youth typically present with more problem behaviors than their native peers, this pattern may not generalize to the United States (Stevens et al., 2015). Moreover, advancement in the field is hampered by the absence of aggregate empirical data and effect-size benchmarks with which researchers can refer to accurately conceptualize and interpret their findings (Funder & Ozer, 2019). Therefore, the purpose of the current meta-analysis was to synthesize the current literature on problem behaviors among foreign- and native-born youth in the U.S. and explore the effects of immigrant status on internalizing and externalizing problems, including potential moderating factors. The goal was to understand if existing data showed more support for the immigrant risk or immigrant advantage theory.

Finally, given that immigrant youth and children of immigrants now make up a quarter of all U.S. youth (Child Trends, 2018), including 16.7 million G2+ youth and 2.9 million G1 youth, a better understanding of the sociocultural trends associated with youth problem behaviors may reveal new and important areas for health promotion and intervention. After all, if adopting American cultural values and practices contribute to worsening developmental outcomes for immigrant youth, then policies based on the notion that ‘integration is better’ may undermine the cultural capital of foreign-born youth and fail to meet the needs of their native-born peers (López Blasco & McNeish, 2003).

The current meta-analysis followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Moher et al., 2009). As previous reviews suggest distinct effects for internalizing and externalizing problems (Dimitrova et al., 2016;

Kouider et al., 2014), our primary analysis focused on differences in overall effect sizes for each of these problem behaviors in G1 and G2+ youth. Then, moderator analyses were conducted to examine the conditions under which differences in immigrant status may affect youth problem behaviors. Specifically, we analyzed the moderating effects of problem type, youth characteristics, and study methodology on the relations among immigrant status and internalizing and externalizing problems. As findings from existing reviews have been mixed, our meta-analytic review was exploratory in nature; hence, neither the protocol nor *a priori* hypotheses of the meta-analytic review were pre-registered. However, support for *immigrant risk* theory is suggested if G1 youth show more internalizing and/or externalizing problems compared to G2+ youth. On the other hand, support for *immigrant advantage* theory is suggested if G2+ youth show more internalizing and/or externalizing problems compared to G1 youth.

## Method

### Literature Search

We conducted a full-text electronic literature search using PsycINFO, PubMed, Social Sciences Citation Index, and ProQuest Dissertation and Theses Global and entered terms that represented constructs associated with *immigrant advantage* and *immigrant risk* (“epidemiological paradox” or “immigrant paradox” or “hispanic paradox” or “immigrant” or “accultur\*”), AND *psychological adjustment* (“mental health” or “psychiatric disorder” or “psychological distress” or “emotional distress” or “psychopathology” or “problem behavior” or “behavioral problem\*” or “externalizing” or “internalizing” or “well-being” or “stress” or “coping” or “adapt\*” or “adjust\*” or “risk” or “delinquen\*” or “depress\*” or “anxi\*” or “substance\*” or “drug\*” or “alcohol\*” or “smoking\*”), AND *youth* (“child\*” or “adolescent” or “youth”). The literature search included all studies published up to August 15, 2019 and was

limited to research conducted in the United States, in English, and with youth aged 18 years old and younger. Our electronic search was supplemented with a manual search of reference lists from related reviews and meta-analyses. References for all eligible studies were scanned for additional studies. Unpublished studies were included to address potential concerns about publication bias (Rothstein et al., 2005).

### **Inclusion Criteria**

The meta-analysis included published and unpublished studies (e.g., descriptive reports, survey studies, interventions, etc.) that met the following criteria:

- (1) As we were interested in comparing internalizing and externalizing problems of G1 and G2+ youth, we included studies of youth whose mean age was 18 years or less.
- (2) Consistent with the operationalization of youth problem behaviors in prior reviews (e.g., Dimitrova et al., 2016; Kouider et al., 2014), studies were included if they reported at least one measure of internalizing or externalizing problems. Studies that only used a broad measure of distress or acculturative stress were excluded.
- (3) Studies were included if sufficient information was provided for immigrant status to be coded. Marks et al. (2014) argue that differences in the operationalization of immigrant status and reference groups leads to equivocal results across studies. Thus, to ensure consistency in this review, youth identified as foreign-born or first-generation were coded as G1 youth, whereas youth identified as U.S.-born or second-or-later generation were coded as G2+ youth.
- (4) Studies were included if a comparison between G1 and G2+ youth was conducted for at least one indicator of internalizing or externalizing problems, and there was sufficient information to estimate effect size.

To ensure independence of data and adequate power in our analyses, we included the published versions of studies that resulted from dissertations, theses, etc., and excluded studies that analyzed a subset of another study's sample.

The first and fourth authors and five trained undergraduate assistants screened the studies for inclusion in the meta-analysis. Of the 11,989 articles generated from the database search, 2,225 were excluded as they were duplicates, 8,073 were excluded based on the abstracts and titles, and 1,608 were excluded based the full text information (see Figure 1 for details). Eighty-three studies met the inclusion criteria and an additional eight were identified through reference trails. Overall, 91 studies and 220 effect sizes ( $k$ ) were included in the meta-analysis (*range of  $k$  per study = 1–15; mean = 2.42*).

### **Coding of Studies**

In each study, problem type, youth characteristics, and methodology were identified and used as descriptive and moderator variables. For intervention studies, only baseline (pre-intervention) data was included in this meta-analysis; for longitudinal studies, only data from the earliest wave of the study was included.

First, studies were coded for problem type: broadband problems (i.e., internalizing problems, externalizing problems) and narrowband problems (i.e., specific problem behaviors) (Achenbach & Rescorla, 2001). Consistent with recent psychopathology taxonomies, internalizing problems included measures of depression, anxiety, trauma-related behaviors, somatic problems, and suicidal behaviors; externalizing problems included conduct problems, delinquency, and substance use (Kotov et al., 2017).

Second, youth characteristics were coded for generational status (G1 vs. G2+ youth), ethnicity (Asian, Black, Latino, White, Others, Combined), gender (predominantly male or

female), SES (low SES: yes, no), and developmental stage (childhood [ $\leq 10$  years], early adolescence [11–13 years], and middle-to-late adolescence [14–18 years]).

Finally, study methodology was coded for type of sample (nationally representative, non-representative), informant (self-, other-report), and publication status (published, unpublished). A study was considered nationally representative if it was stated that the sample was derived from a national population cohort; otherwise studies were considered non-representative.

To ensure reliable coding, the first and fourth authors independently coded a random selection of 22 studies (24.2% of the total). Based on Cicchetti's (1994) guidelines, our reliability was excellent, with kappa = .90 and discrepant codes were discussed until 100% agreement was reached.

### **Meta-analytic Approach**

#### **Effect Size Estimation**

Standardized mean difference ( $d$ ) in internalizing and externalizing problems between G1 and G2+ youth were calculated using outcome means and standard deviations or proportions. When this information was not available,  $d$  was estimated using  $t$ -tests and correlation coefficients (Lipsey & Wilson, 2001). The effect sizes were then converted to Hedges's  $g$  to attenuate their upward bias in small samples. All effect size calculations were performed using Comprehensive Meta-Analysis (Version 3) software (Borenstein et al., 2015). A positive effect size indicates higher levels of internalizing and/or externalizing problems among G1 youth; a negative effect size indicates higher levels of internalizing and/or externalizing problems in G2+ youth. Consistent with current research on psychological methods, we utilized Gignac et al.'s (2016)'s guidelines for individual differences research to interpret the magnitude of effects for the standardized mean difference ( $g$ ) (i.e., .10 as small, .20 as medium, and above .30 as large).

### **Overall Meta-analysis with Robust Variance Estimates**

Forty percent of the studies provided multiple effect sizes of interest. To account for the dependence of effect sizes, we adopted the robust variance estimation technique using the `robumeta` R package (RVE; Fisher & Tipton, 2015). This approach has multiple advantages: (a) it handles dependence in effect sizes from the same studies, (b) it provides valid standard errors of estimates without requiring knowledge of the correlation structure of the dependent estimates, and (c) it requires fewer assumptions and less computational power than alternative approaches such as multilevel random-effect models (Hedges et al., 2010; Tanner-Smith et al., 2016). Given that correlated effects were prevalent in our study, we implemented correlated effects weights (Tanner-Smith et al., 2016). Because the number of studies was smaller than 40 in some analyses, small sample adjustments of degrees of freedom were applied to all analyses (Hedges et al., 2010). Two parameters of heterogeneity were estimated: an overall measure of between studies heterogeneity ( $\tau^2$ ) and a ratio of true heterogeneity to total variance across the observed effect sizes ( $I^2$ ). The value of  $I^2$  ranges from 0% to 100% and indicates the proportion of variance in the meta-analysis that is attributable to study heterogeneity (Borenstein et al., 2017).

### **Moderator Analyses**

We used the RVE approach to perform separate hypothesis tests for the effects of each moderator. Categorical moderators with two levels (e.g., sample type: representative vs. non-representative) were dummy coded and entered into meta-regression equations. The significance test corresponding to the regression coefficient for the predictor variable in these models can be interpreted as a test of whether the variable is a significant moderator. For categorical moderators with more than two levels, we followed the recommendations of Tanner-Smith et al. (2016) and performed an omnibus test using the `clubSandwich` R package (Pustejovsky, 2017), with degrees

of freedom approximated by the Hotelling's  $T^2_Z$  method. This test produces an  $F$  value that indicates whether there is a difference among all levels of the moderator. When small sample corrections are implemented, and degrees of freedom are smaller than 4, RVE results should not be trusted (Tanner-Smith et al., 2016). Therefore, all moderator subcategories that had a  $df < 4$  were excluded from the final analyses.

When calculating weights, meta-analysis with RVE requires an estimate of within-study effect size correlation (i.e., the average correlation among dependent effect sizes). The default value in *robumeta* is  $r = .80$ ; however, to determine whether average effect size differed when assuming .00, .20, .40, .60, .80, or 1.00 correlations ( $\rho$ ), additional sensitivity analyses were applied for both overall and moderator analyses (Tanner-Smith et al., 2016). Sensitivity analyses demonstrated that results generally did not vary much for various values of  $\rho$  between 0 and 1; therefore, results using the default value ( $r = .80$ ) were reported.

## Results

### Descriptive Statistics

As summarized in Appendix A, 91 studies met the inclusion criteria. There was a total of 179,315 participants across all studies (range = 28 to 50,947). Participants' mean age was 13.98 years old (mean age range 4.53–17.01). The majority were female (54.4%). About half of the studies focused only on Latinx (47.3%), and the rest included exclusively Asians (15.4%), Afro-Caribbeans (Blacks) (3.3%), Middle Easterners (2.2%), Whites (2.0%), or youth of other ethnic backgrounds (1.1%). The remaining studies included multiple ethnic groups (30%). Over a quarter of the studies focused on predominantly low SES immigrants youth (25.3%), while 38.5% of the studies did not specify participant SES.

An equal number of studies examined internalizing problems (37.4%) and externalizing

problems (37.4%) exclusively, and 25% investigated both problems. Narrowband problems included depression (41.8%), conduct problems or delinquency (27.5%), anxiety (18.7%), substance use (28.6%), trauma-related problems (4.4%), and suicidal behaviors (6.6%). About 27% only assessed outcomes using broad or combined measures of problem behaviors (e.g., composite measure of externalizing problems). Most studies (86.8%) relied exclusively on self-report of problem behaviors; few involved parent (9.9%) or other informant (3.3%) reports.

We included 25 studies based on nationally-representative datasets, including large epidemiological studies; the remaining 66 were non-representative community samples. Most studies were published (79.1%).

### **Main Analysis**

This meta-analysis first addressed whether broadband internalizing and externalizing problems varied depending on whether they were foreign-born (G1) or U.S.-born (G2+). Of the 91 studies, 58 ( $k = 117$ ) compared internalizing problems in G1 vs. G2+ youth; 57 ( $k = 103$ ) compared externalizing problems in G1 vs. G2+ youth. Under the RVE model, the average effect size was positive and significant for internalizing problems, which indicates that G1 youth showed more internalizing problems than G2+ youth,  $g = .06$ , 95% CI [-.12, -.01],  $p = .02$  (see Table 1). In contrast, for externalizing problems, the average effect size was negative and significant, which indicates that G1 youth showed fewer externalizing behaviors than G2+ youth,  $g = -.06$ , 95% CI [.01, .11],  $p = .02$  (see Table 2). These findings suggested a small, but significant, *immigrant risk* for internalizing problems and *immigrant advantage* for externalizing problems. However, the  $I^2$  index was 70.20% for internalizing problems and 74.87% for externalizing problems, indicating substantial variation across studies due to heterogeneity rather than chance. Thus, effects for internalizing and externalizing outcomes may be moderated by one

or more factors.

### **Moderator Analyses**

As the overall meta-analysis indicated considerable heterogeneity across the studies, we conducted additional analyses to assess whether problem type, youth characteristics, and study methodology moderated the relation between immigrant status and youth internalizing and externalizing problems (see Tables 1 and 2).

#### ***Problem Type***

Results showed that narrowband problem type was not a significant moderator of the relation between immigrant status and internalizing,  $k = 98$ ,  $F(24.40) = 1.46$ ,  $p = .25$ , or externalizing problems,  $k = 103$ ,  $F(29.20) = 2.47$ ,  $p = .06$ .

#### ***Youth Characteristics***

For internalizing problems, gender significantly moderated the relation between immigrant status and youth problem behaviors,  $k = 103$ ,  $F(26.70) = 3.30$ ,  $p = .05$ . G1 youth showed significantly more internalizing problems than G2+ youth when studies had predominantly female samples,  $k = 60$ ,  $g = .07$ , 95% CI [.01, .14],  $p = .02$ , whereas, no significant effects were found with predominantly males samples,  $k = 43$ ,  $g = .05$ , 95% CI [-.07, .17],  $p = .37$ . There were no significant moderation effects for ethnicity,  $k = 63$ ,  $F(17.50) = 2.17$ ,  $p = .14$ , developmental stage,  $k = 112$ ,  $F(18.30) = 2.47$ ,  $p = .09$ , or SES,  $k = 63$ ,  $F(22.30) = 2.71$ ,  $p = .09$ .

For externalizing problems, gender significantly moderated the relation between immigrant status and youth problem behaviors,  $k = 82$ ,  $F(28.00) = 6.59$ ,  $p = .01$ . G1 youth showed significantly fewer externalizing problems than G2+ youth when studies had predominantly male samples,  $k = 31$ ,  $g = -.14$ , 95% CI [-.23, -.06],  $p = .00$ ; however, the effects

were not significant for studies with predominantly females samples,  $k = 51$ ,  $g = -.01$ , 95% CI  $[-.10, .08]$ ,  $p = .82$ . There were no significant moderation effects for ethnicity,  $k = 56$ ,  $F(18.40) = 1.75$ ,  $p = .20$ , developmental stage,  $k = 92$ ,  $F(20.80) = 6.59$ ,  $p = .27$ , and SES,  $k = 33$ ,  $F(18.30) = 1.08$ ,  $p = .36$ .

### ***Study Methodology***

For internalizing problems, sample type significantly moderated the relation between immigrant status and youth problem behaviors,  $k = 117$ ,  $F(24.90) = 4.41$ ,  $p = .02$ . G1 youth showed more internalizing problems than G2+ youth when studies used non-representative samples,  $k = 89$ ,  $g = .08$ , 95% CI  $[.14, .00]$ ,  $p = .00$ ; whereas, effects were not significant for studies that used representative samples,  $k = 28$ ,  $g = .01$ , 95% CI  $[-.12, .14]$ ,  $p = .88$ . There were no significant moderation effects for informant type,  $k = 117$ ,  $F(21.60) = 3.03$ ,  $p = .07$ , and publication type,  $k = 117$ ,  $F(23.90) = 3.04$ ,  $p = .07$ .

For externalizing problems, sample type,  $k = 103$ ,  $F(30.20) = 7.82$ ,  $p = .00$ , and publication type,  $k = 103$ ,  $F(9.17) = 4.82$ ,  $p = .04$ , significantly moderated the relation between immigrant status and problem behaviors. G1 youth showed significantly fewer externalizing problems than G2+ youth when studies used representative samples,  $k = 39$ ,  $g = -.14$ , 95% CI  $[-.22, -.07]$ ,  $p = .00$ ; whereas, effects were not significant for studies that used non-representative samples,  $k = 64$ ,  $g = -.02$ , 95% CI  $[-.10, .05]$ ,  $p = .51$ , G1 youth demonstrated significantly fewer externalizing problems than G2+ youth in published studies,  $k = 81$ ,  $g = -.07$ , 95% CI  $[-.13, -.01]$ ,  $p = .03$ ; however, effects were not significant for non-published studies,  $k = 22$ ,  $g = -.05$ , 95% CI  $[-.22, .11]$ ,  $p = .48$ . Informant type was not a significant moderator,  $k = 103$ ,  $F(21.60) = 3.03$ ,  $p = .07$ .

### **Publication Bias**

To test whether our meta-analysis was impacted by “missing” studies, we created funnel plots and performed Egger’s tests for asymmetry and used the trim-and-fill method to evaluate the sensitivity of the overall effect sizes to the publication bias due to “missing” studies (see Figures 2 and 3). These analyses were conducted with the metafor R package (Viechtbauer, 2010) because robumeta did not provide such a function.

A visual inspection of the funnel plots and the Egger’s tests indicated that effect sizes for the funnel plots were generally distributed in a symmetrical manner across the funnels and not significant for publication bias for internalizing problems,  $z = 1.11$ ,  $p = 0.27$ , or externalizing problems,  $z = 1.57$ ,  $p = .12$  (Egger et al., 1997).

In contrast, the trim and fill analysis indicated that 10 effect sizes were required to be imputed to create a symmetrical funnel plot for externalizing problems; however, the overall effect was still significant, adjusted  $g = -.16$ , 95% CI  $[-.21, -.11]$ ,  $p < .001$ . The results indicate that our overall effect size estimate for externalizing problems was relatively robust to potential “missing” studies. For internalizing problems, 16 effect sizes were needed to be imputed to create a symmetrical funnel plot, and the overall effect was non-significant, adjusted  $g = .01$ , 95% CI  $[-.03, .06]$ ,  $p = .55$ . This finding raises the possibility of bias in our results for internalizing problems due to “missing” studies (Duval & Tweedie, 2000).

### **Supplemental Analyses**

A known limitation of the research on immigrant youth problem behaviors is that studies vary in their operationalization of immigrant status (Marks et al., 2014); that is, some studies identify youth by *generational status* (e.g., first-, second-, third generation immigrant, etc.), whereas others identify youth by *birth place* (e.g., foreign-born vs. US-born). To maximize the number of eligible studies and present a more comprehensive review of the literature, a broad

coding scheme (i.e., foreign-born vs. US-born) was used in the current meta-analysis to operationalize immigrant status. As such, the G2+ group comprised all US-born youth, including second-generation (G2) youth with at least one immigrant parent, and third-generation (G3) youth with two native-born parents. However, such a broad coding scheme could obscure variations in *generational status* (e.g., G1 vs. G2 or G2 vs. G3+) effects on internalizing and externalizing problems that would provide a more nuanced understanding of how the adaptation process impacts youth outcomes.

To test the robustness of our primary analyses, we addressed two potential concerns related to our sample. First, our analysis may have been confounded by the presence of “non-immigrant” G3+ youth in our G2+ sample. Second, we were not able to address potential nuances in our primary analysis that may arise across *generational status* (i.e., G1 vs. G2 and G2 vs. G3+).

Therefore, first we divided the studies into those that excluded G3+ youth (G1 vs. G2) and those that included G3+ youth (G1 vs. G2+). Then we conducted a moderator analysis to compare the average effect sizes of these two groups (i.e., G1 vs. G2 and G1 vs. G2+) for both internalizing and externalizing problems. The results showed no significant differences for internalizing,  $k = 103$ ,  $F(30.00) = 3.03$ ,  $p = .06$ , or externalizing problems,  $k = 117$ ,  $F(31.30) = 3.03$ ,  $p = .06$  by sample type (see Table 3). Thus, the findings suggest that operationalizing immigrant status as foreign-born vs. U.S.-born (G1 vs. G2+), and including the G3+ youth in our sample, was not a confounding factor in our analysis.

In addition, to explore the potential effects of *generational status* (i.e., G1 vs. G2, G2 vs. G3+) on youth internalizing and externalizing problems, we analyzed a small subset of 19 studies that included separate data for G1, G2, and G3+ youth (20.8% of the overall sample) and

grouped them by generational status: G1 vs. G2 and G2 vs. G3+ (see Table 4). The overall meta-analysis for this subset of studies indicated that the average effect size was not significant for internalizing problems ( $n = 8$ ),  $k = 39$ ,  $g = .00$ , 95% CI [-.08, .09],  $p = .91$ , suggesting there was no difference in the rates of internalizing problems among earlier- and later-generation youth. For externalizing problems ( $n = 14$ ), the average effect size was negative and significant,  $k = 59$ ,  $g = -.08$ , 95% CI [-.14, -.03],  $p = .01$ , indicating that later-generation youth (i.e., G2 youth in the G1 vs. G2 comparison and G3+ youth in the G2 vs. G3+ group) showed more externalizing problems than earlier-generation youth (i.e., G1 youth in the G1 vs. G2 comparison and G2 youth in the G2 vs. G3+ group). We then conducted a moderator analysis to test whether youth problem behaviors varied by generational status (G1 vs. G2 and G2 vs. G3+). For internalizing problems, there were no significant moderator effects by generational status,  $k = 39$ ,  $F(5.20) = .13$ ,  $p = .88$ . For externalizing problems, we found a significant moderator effect of *generational status* on externalizing problems; that is, there were significant differences in the average effect sizes between the G1 vs. G2 and G2 vs. G3+ groups,  $k = 59$ ,  $F(9.39) = 5.26$ ,  $p = .03$ . G1 youth showed marginally fewer externalizing problems than G2 youth,  $k = 29$ ,  $g = -.11$ , 95% CI [-.22, .00],  $p = .06$ ; however, the effect of generational status on externalizing problems was not significant for the G2 vs. G3+ youth subsample,  $k = 30$ ,  $g = -.06$ , 95% CI [-.14, .02],  $p = .11$ . Overall, the supplemental analyses suggest a significant but small immigrant advantage for externalizing problems by generational status, and no significant generational effects for internalizing problems.

### Discussion

This meta-analysis represents the first known attempt to quantitatively synthesize the literature on immigrant status and problem behaviors of U.S. youth, and explore whether being

foreign-born is a risk or protective factor for U.S. youth. Specifically, we assessed G1 youth experienced more (or fewer) internalizing and externalizing problems compared to G2+ youth, and identified factors that might moderate these effects. Our goal was to understand if existing data showed more support for the immigrant risk or immigrant advantage theory.

Overall, support for existing theories on the effects of immigrant status on youth problem behaviors was primarily dependent on the type of problem behavior under investigation. We found support for *immigrant risk* theory for youth internalizing problems and *immigrant advantage* theory for youth externalizing problems. Moreover, gender and sample type significantly moderated the link between immigrant status and youth internalizing and externalizing problems. These results suggest that the impact of the immigration experience on youth depends in part, on *who* or *what* is being studied. This finding is consistent with the *specific risk pathway* hypothesis which proposes that the salience of a particular risk factor at different points in development influence the kind of problem behaviors individuals experience (Grant et al., 2003).

Consistent with *immigrant risk* theory, G1 youth reported more internalizing problems than did G2+ youth. Foreign-born youth may be at increased risk for internalizing problems, such as depression and anxiety, which are frequently associated with acculturative stress (Sirin et al., 2013). Moreover, many G1 youth are adversely affected by discrimination in the form of social exclusion or bullying by peers which can produce internalizing problems (Katsiaficas et al., 2013; Maynard et al., 2016). Compared to G2+ youth, G1 youth are less likely to seek help due to stigma surrounding mental health issues and more likely to face financial, insurance, and language barriers to health care when emotionally distressed (Derr, 2015), placing them further at risk for internalizing problems.

On the other hand, G2+ youth appeared to be at greater risk for externalizing problems than G1 youth. Adherence to natal cultural values may serve as a protective factor to enhance G1 youth's resistance to deviant peer behaviors. Compared to G2+ youth, G1 youth tend to associate less with American peers and consequently experience less peer pressure for substance use and delinquent behavior (Bacio et al., 2013). In addition, G1 youth may benefit from close family relationships characterized by less frequent intergenerational conflict and more parental monitoring – two salient protective factors against youth substance use (Prado et al., 2009; Salas-Wright et al., 2016).

Consistent with current research, gender significantly moderated the relation between immigrant status and youth problem behaviors. Studies with predominantly female samples showed a stronger *immigrant risk* for internalizing problems, whereas studies with predominantly male samples demonstrated a larger *immigrant advantage* for externalizing problems. These patterns support previous findings that show females are at increased risk for internalizing problems (Avenevoli et al., 2015), whereas males are at increased risk for externalizing problems (Leadbeater et al., 1999).

In addition, our meta-analysis found that sample type significantly moderated the relation between immigrant status and youth problem behavior. For example, in studies with non-representative samples, the results suggested an *immigrant risk* where G1 youth reported more internalizing problems than G2+ youth. In contrast, in studies with representative samples there appeared to be an *immigrant advantage*, where G1 youth showed fewer externalizing problems than G2+ youth. Hence, sample representativeness could explain some of the mixed conclusions in the literature (Duong et al., 2016; Goodman et al., 1997). Moreover, because most studies using nationally representative samples (72%) assessed externalizing problems rather than

internalizing problems, a measurement effect could also be driving the results. Unfortunately, there was insufficient data to disentangle these effects.

Evidence of publication bias also appeared across the studies. Our moderator analysis for externalizing problems showed that published studies had effects that were larger in magnitude than unpublished studies. In addition, the trim-and-fill analysis indicated that our overall effect size estimate for internalizing problems may have been inflated due to missing studies. Therefore, given potential publication biases, the existing evidence base should be interpreted with caution.

Although the current meta-analysis adds to our understanding of the *immigrant risk* and *immigrant advantage* theories, several caveats should be noted. First, immigrant status is frequently used in the literature as a brief index of adaptation to one's host country; however it is not an adequate measure of the complex acculturation processes that directly impact youth problem behaviors (Salant & Lauderdale, 2003). Contemporary theories emphasize the bidirectional, multidimensional nature of acculturation, which is not reflected in linear assimilation theories that have been used to explain the immigrant advantage (Sam & Berry, 2010). To capture the dynamic effects of immigration on youth outcomes, longitudinal studies that measure individuals' acculturation, ethnic identity, and adherence to natal cultural values across time are needed (Marks et al., 2014). Nonetheless, because existing research frames the immigrant paradox as a population-level phenomenon and uses generational status as a proxy for adaptation, our findings reflect the current state of the literature.

Second, as mentioned above, we operationalized immigrant status in terms of birth place (e.g., foreign-born vs. U.S.-born) to maximize the number of studies eligible for our meta-analysis. This strategy allowed for a more comprehensive survey of the literature and provided

sufficient power to test multiple moderating factors. However, one limitation is that our definition may have obscured nuances in the literature and skewed our main conclusions. To address this concern, we conducted supplemental analyses that examined whether the way in which immigrant status was operationalized might influence our main results. Overall, the pattern of results was consistent with our primary analyses. It suggested robust support for an immigrant advantage in youth externalizing problems; however, there were some null findings for the effects of generational status on internalizing behaviors. It should be noted that the non-significant effect was derived from analyses based on a small, non-random subset of studies (8 studies out of a total of 91 studies) and thus difficult to interpret. Nonetheless, the findings are consistent with the potential publication bias that we identified among our sample of studies for internalizing problems and could reflect this bias. Therefore, researchers should be attentive to how immigrant status and generational reference groups are defined when interpreting our results and those of other studies in the literature. The field would likely benefit from moving toward a more uniform definition of these constructs.

Third, the outcome and moderator variables were modest approximations of the underlying constructs we examined and, together with a smaller sample size ( $n$ ) for some of our moderator analyses, may have led to attenuated effects in our analyses. For example, our operationalization of ethnicity and SES may not have fully captured the complex dynamics underlying the concepts of ‘upward’ and ‘downward’ mobility in the adaptation process that could influence youth outcomes (Castro et al., 2010; Portes & Zhou, 1993). In addition, we excluded studies that measured general distress or acculturative stress as youth outcomes and instead focused our analysis on youth internalizing and externalizing problems. While highly relevant to existing theories, our outcomes of interest are somewhat distal indicators in the

adaptation process. Furthermore, we used broad ethnic categories, such as Latino and Asian, to represent immigrant groups because there were insufficient data to analyze effects by ethnic subgroups. This is problematic as there is heterogeneity in ethnic subgroup experiences that could produce differential effects. For example, Eitle et al. (2009) found that U.S.-born Mexican and Cuban adolescents drink more alcohol than their foreign-born peers; but this was not apparent in the Puerto Rican subsample. Unfortunately, such approximations are inevitable until there are more studies conducted with ethnic subgroups.

Fourth, we did not examine other moderators that could potentially explain divergent findings across studies. For example, none of the eligible studies explicitly included involuntary migrants or refugees. Studies show that refugee children have elevated levels of psychological morbidity, including post-traumatic stress disorder, depression, and anxiety (Lustig et al., 2004). Reasons for leaving one's country of origin may influence the effects of immigration on youth problem behaviors, and some argue that it is the effect of involuntary migration that drives evidence for *immigrant risk* (Lustig et al., 2004; Stevens & Vollebergh, 2008). Similarly, age of immigration and length of U.S. residence could moderate the link between immigrant status and youth problem behaviors (e.g., Breslau et al., 2009). Foreign-born youth who immigrate to the U.S. in early childhood are more similar to U.S.-born youth with immigrant parents in their level of acculturation and experience with the mainstream culture than they are to foreign-born youth who immigrated as adolescents (Lui, 2015). Therefore, the effects of immigration on problem behaviors between first- and second-generation youth may depend on when immigrants who constitute the first-generation reference group arrived in the U.S. Unfortunately, there were insufficient studies with complete data to conduct such moderator analyses.

Although *immigrant advantage theory* has received significant attention over the past

decade, its paradoxical nature has produced divergent patterns in the literature and made it difficult to draw any definitive conclusions. To begin to reconcile these discrepant findings, we carried out this meta-analysis. Our results highlight two important trends: the impact of immigration on youth internalizing and externalizing problems are variable, and these relationships are likely context-dependent. Explanatory theories of selective assimilation and specificity of risk support this pattern of findings and underscore the importance of identifying specific risk pathways in future research. At the same time, our study identifies methodological limitations in the current literature that may partially obscure the complex interplay of risk and protective factors underlying the immigrant experience.

In conclusion, this meta-analytic review allowed us to synthesize the current research and provides a first-step towards reconciling discrepancies found in the literature. The analysis revealed substantial heterogeneity across studies and identified for whom and under what conditions the immigrant risk and immigrant advantage theories might be supported. Although existing studies reveal important trends, the current review highlights the need to move beyond immigrant status as a predictor variable and to instead disaggregate potential risk mechanisms underlying the immigrant experience. By developing a more nuanced understanding of the effects of immigration on youth problem behaviors, including identifying processes that help or hinder developmental outcomes, we can be more targeted in improving youth resilience through mental health and educational policy.

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**Table 1***Overall Meta-analysis and Moderator Analyses for Internalizing Problems for Foreign-Born (G1) vs. U.S.-Born (G2+) Youth*

<b>Variables</b>	<i>g</i>	<i>SE</i>	<i>F</i>	<i>t</i>	<i>df</i>	95 % CI	<i>p</i>	<i>n</i>	<i>k</i>	$\tau^2$	$I^2$ (%)
<b>Overall Internalizing Problems</b>	.06*	.03		2.52	51.50	.01 .11	.02	58	117	.03	70.20
<b>Problem Type<sup>1</sup></b>			1.46		24.40		.25	55	98	.02	59.78
Anxiety	.11	.05		1.97	10.62	-.01 .23	.08	16	25		
Depression	.04	.03		1.21	30.89	-.03 .11	.24	40	51		
Combined	.02	.05		.41	11.19	-.09 .13	.69	15	22		
<b>Youth Characteristics</b>											
<b>Ethnicity<sup>2</sup></b>			2.17		17.50		.14	40	63	.02	60.45
Asian	.08	.05		1.49	8.12	-.04 .20	.17	10	17		
Latinx	.06	.04		1.54	25.70	-.02 .13	.14	31	46		
<b>Gender</b>			3.30*		26.70		.05	54	103	.03	69.49
Predominantly Female	.07*	.03		2.46	34.90	.01 .14	.02	40	60		
Predominantly Male	.05	.06		.93	12.74	-.07 .17	.37	17	43		
<b>Developmental Stage</b>			2.47		18.30		.09	56	112	.02	63.35
Childhood	.02	.06		.30	5.30	-.13 .16	.78	7	12		
Early Adolescence	.01	.04		.34	14.24	-.07 .10	.74	18	39		
Middle-Late Adolescence	.10**	.04		2.84	26.81	.03 .18	.01	31	61		
<b>Low Socioeconomic Status</b>			2.71		22.30		.09	37	63	.02	64.96
No	.09*	.04		2.21	18.63	.00 .18	.04	21	39		
Yes	.05	.05		.90	13.29	-.06 .16	.39	16	24		
<b>Study Methodology</b>											
<b>Sample Type</b>			4.41*		24.90		.02	58	117	.03	68.90
Non-representative	.08**	.03		3.02	40.17	.03 .14	.00	45	89		
Representative	.01	.06		.15	11.02	-.12 .14	.88	13	28		
<b>Informant</b>			3.03		21.60		.07	58	117	.03	70.49

Self-report	.06*	.03		2.41	45.44	.01	.12	.02	51	94		
Other-report	.05	.07		.75	5.71	-.12	.23	.49	9	23		
Publication Type			3.04		23.90			.07	58	117	.03	70.43
Published	.06*	.03		2.23	40.40	.01	.12	.03	46	89		
Unpublished	.06	.05		1.16	10.50	-.05	.18	.27	12	28		

Note. *n* = number of studies; *k* = number of effect size estimates; *g* = Hedges’s *g* estimate; *F* values = Omnibus test statistics with small sample correction and approximated degrees of freedom of the effects of moderators; *p* corresponds to the *F* value for moderators, or *t* value for individuals levels of a moderator. *CI* = confidence interval. *CD* = Conduct Disorder. The number of effect size estimates and studies often do not add up as expected because some studies provided multiple effect size estimates and/or did not provide data for a level of a moderator. Positive effect sizes indicate poorer mental health outcomes for foreign-born (i.e., immigrant risk), and negative effect sizes indicate poorer mental health outcomes for U.S.-born (i.e., immigrant advantage).

<sup>1</sup>Trauma-related problems and suicidality were excluded from the final analysis as their *df* < 4. <sup>2</sup>Only Asian and Latinxs were included in this analysis as *df* < 4 for the other ethnic groups.

\**p* ≤ .05. \*\**p* < .01.

**Table 2***Overall Meta-analysis and Moderator Analyses for Externalizing Problems for Foreign-Born (G1) vs. U.S.-Born (G2+) Youth*

<b>Variables</b>	<i>g</i>	<i>SE</i>	$\beta_1 / F$	<i>t</i>	<i>df</i>	95 % CI	<i>p</i>	<i>n</i>	<i>k</i>	$\tau^2$	$I^2$ (%)
<b>Overall Externalizing Problems</b>	-.06*	.03		-2.33	49.30	-.12    -.01	.02	57	103	.03	74.87
<b>Problem Type</b>			2.74		29.20		.06	57	103	.02	72.48
CD/Delinquency	-.02	.04		-.37	19.90	-.10    .07	.71	26	40		
Substance Use	-.10*	.04		-2.56	19.47	-.19    -.02	.02	26	42		
Combined	-.08	.06		-1.53	11.96	-.20    .04	.15	16	21		
<b>Youth Characteristics</b>											
Ethnicity <sup>1</sup>			1.75		18.40		.20	38	56	.03	66.06
Asian	.06	.07		.82	9.09	-.10    .22	.44	12	17		
Latinx	-.07	.04		-1.74	22.72	-.15    .01	.10	27	39		
Gender			6.59**		28.00		.01	48	82	.03	73.61
Predominantly Female	-.01	.04		-.22	25.52	-.10    .08	.82	31	51		
Predominantly Male	-.14**	.04		-3.70	15.70	-.23    -.06	.00	19	31		
Developmental Stage			1.4		20.80		.27	54	92	.03	74.11
Childhood	.02	.06		.35	6.43	-.11    .15	.74	8	10		
Early Adolescence	-.07	.04		-1.74	23.25	-.14    .01	.10	26	43		
Middle-Late Adolescence	-.07	.06		-1.20	15.42	-.20    .06	.25	20	39		
Low Socioeconomic Status			1.08		18.30		.36	33	48	.03	75.96
No	-.02	.05		-.36	17.92	-.13    .09	.72	21	35		
Yes	-.08	.06		-1.46	10.07	-.21    .04	.17	12	13		
<b>Study Methodology</b>											
Sample Type			7.82**		30.20		.00	57	103	.02	69.95
Non-representative	-.02	.04		-.66	31.96	-.10    .05	.51	39	64		
Representative	-.14**	.04		-3.97	15.40	-.22    -.07	.00	18	39		
Informant			3.03		21.60		.07	57	103	.03	74.57

Self-report	-.08*	.03		-2.52	39.41	-.14	-.02	.02	46	87		
Other-report	.01	.05		.13	9.33	-.11	.12	.90	11	16		
Publication Type			4.82*		9.17			.04	57	103	.03	75.10
Published	-.07*	.03		-2.19	39.94	-.13	-.01	.03	45	81		
Unpublished	-.05	.07		-.74	8.65	-.22	.11	.48	12	22		

Note. *n* = number of studies; *k* = number of effect size estimates; *g* = Hedges’s *g* estimate; *F* values = Omnibus test statistics with small sample correction and approximated degrees of freedom of the effects of moderators; *p* corresponds to the *F* value for moderators, or *t* value for individuals levels of a moderator. *CI* = confidence interval. *CD* = Conduct Disorder. The number of effect size estimates and studies often do not add up as expected because some studies provided multiple effect size estimates and/or did not provide data for a level of a moderator. Positive effect sizes indicate poorer mental health outcomes for foreign-born (i.e., immigrant risk), and negative effect sizes indicate poorer mental health outcomes for U.S.-born (i.e., immigrant advantage).

<sup>1</sup>Only Asian and Latinxs were included in this analysis as *df* < 4 for the other ethnic groups.

\**p* ≤ .05. \*\**p* < .01.

**Table 3**

*Comparison of Effect Sizes for G1 vs. G2 and G1 vs. G2+ (Foreign- vs. U.S.-born) for Internalizing and Externalizing Problems*

<i>Variables</i>	<i>g</i>	<i>SE</i>	<i>F</i>	<i>t</i>	<i>df</i>	<i>95 % CI</i>		<i>p</i>	<i>n</i>	<i>k</i>	$\tau^2$	$I^2$ (%)
<b>Internalizing Problems</b>												
Immigrant Sample			3.03		30.00			.06	58	117	.03	69.04
G1 vs. G2	.05	.45		1.18	14.50	-.04	.15	.26	17	34		
G1 vs. G2+	.07*	.03		2.21	35.88	.01	.13	.03	41	83		
<b>Externalizing Problems</b>												
Immigrant Sample			3.03		31.30			.06	57	103	.03	69.04
G1 vs. G2	-.08	.04		-1.98	16.20	-.17	.01	.07	20	40		
G1 vs. G2+	-.06	.04		-1.53	32.15	-.13	.02	.14	37	63		

*Note.* *n* = number of studies; *k* = number of effect size estimates; *g* = Hedges's *g* estimate; *F* values = Omnibus test statistics with small sample

correction and approximated degrees of freedom of the effects of moderators; *p* corresponds to the *F* value for moderators, or *t* value for

individuals levels of a moderator. *CI* = confidence interval.

\**p* ≤ .05. \*\**p* < .01.

**Table 4***Comparison of Effect Sizes for G1 vs. G2 and G2 vs. G3 for Internalizing and Externalizing Problems*

<b>Variables</b>	<i>g</i>	<i>SE</i>	<i>F</i>	<i>t</i>	<i>df</i>	<i>95 % CI</i>		<i>p</i>	<i>n</i>	<i>k</i>	$\tau^2$	<i>I</i> <sup>2</sup> (%)
<b>Internalizing Problems</b>	.00	.04		.12	6.30	-.08	.09	.91	8	39	.03	71.68
Generational Status			.13		5.20			.88				
G1 vs. G2	-.02	.07		-.32	6.25	-.20	.15	.76	8	20		
G2 vs. G3+	.03	.06		.54	6.14	-.12	.18	.61	8	19		
<b>Externalizing Problems</b>	-.08**	.03		-3.22	11.00	-.14	-.03	.01	14	59	.03	78.24
Generational Status			5.26*		9.39			.03	14	59	.02	70.91
G1 vs. G2	-.11	.05		-2.15	10.32	-.22	.00	.06	14	29		
G2 vs. G3+	-.06	.03		-1.73	10.46	-.14	.02	.11	14	30		

*Note.* *n* = number of studies; *k* = number of effect size estimates; *g* = Hedges's *g* estimate; *F* values = Omnibus test statistics with small sample

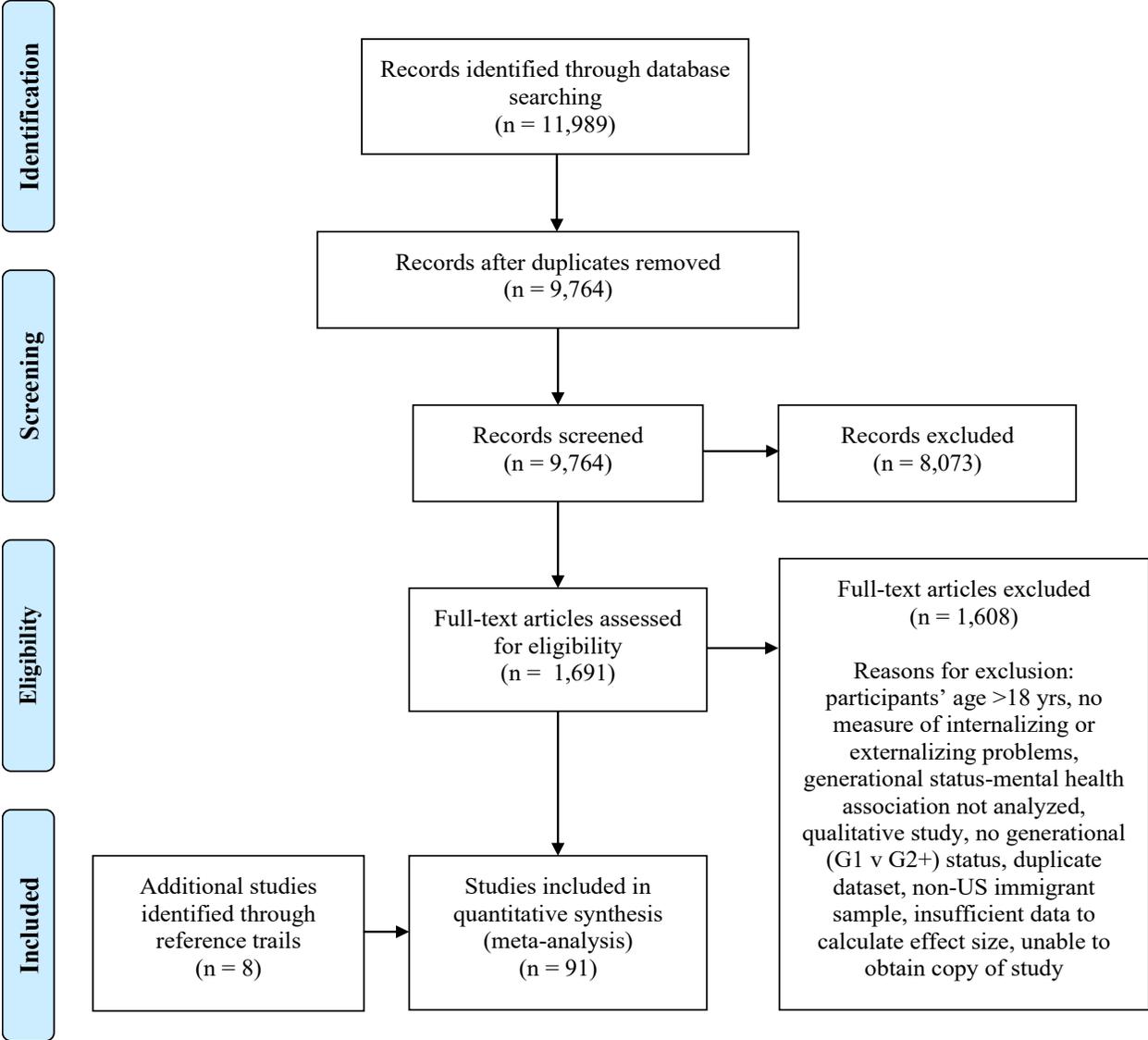
correction and approximated degrees of freedom of the effects of moderators; *p* corresponds to the *F* value for moderators, or *t* value for

individuals levels of a moderator. *CI* = confidence interval.

\**p* ≤ .05. \*\**p* < .01.

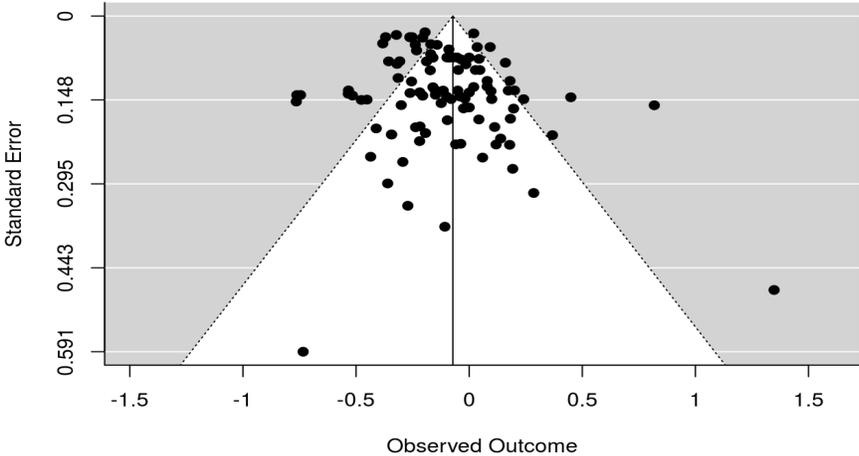
Figure 1

PRISMA Flow Diagram of Search and Identification of Studies



**Figure 2**

*Funnel Plot with Trim and Fill Analysis for Studies Examining the Effect of Immigrant Status on Externalizing Problems*



**Figure 3**

*Funnel Plot with Trim and Fill Analysis for Studies Examining the Effect of Immigrant Status on Internalizing Problems*

