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Examining sociodemographic variability in amount and type of interventions for autistic children

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Abstract:	Various intervention usage is associated with positive outcomes for autistic children. However, the intensity of these interventions tends to be below recommendations, especially for minoritized children. This study aimed to examine how average weekly intervention hours among children vary by sociodemographic factors. Regression analyses were conducted from 2,857 autistic participants' data included in the Simons Simplex Collection. Findings indicated the amount and type of intervention received varied by race, ethnicity, family income, and maternal education. This study marks an important step in documenting the extent of sociodemographic intervention disparities; and, helps to elucidate which therapy types are most readily underused and by which groups to help inform approaches to increase more equitable access.

Abstract

Various intervention usage is associated with positive outcomes for autistic children. However, the intensity of these interventions tends to be below recommendations, especially for minoritized children. This study aimed to examine how average weekly intervention hours among children vary by sociodemographic factors. Regression analyses were conducted from 2,857 autistic participants' data included in the Simons Simplex Collection. Findings indicated the amount and type of intervention received varied by race, ethnicity, family income, and maternal education. This study marks an important step in documenting the extent of sociodemographic intervention disparities; and, helps to elucidate which therapy types are most readily underused and by which groups to help inform approaches to increase more equitable access.

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Examining sociodemographic variability in amount and type of interventions for autistic children

Intervention during the preschool years plays a particularly vital role in beneficial outcomes for autistic children; thus, this early developmental period has the greatest potential for change (i.e., Zwaigenbaum et al., 2015). Not only is an early start to intervention essential for autistic children but the amount or dosage of intervention matters as well. Although intervention type and amount should be individualized based on specific characteristics of both the child and the family, intensive intervention is commonly recommended for young autistic children (Myers & Johnson, 2007). Research reveals positive outcomes in both social communication and language with at least 25 hours of intervention services per week (Dawson et al., 2010; Kasari et al., 2010) and children with higher ASD severity scores demonstrated increased developmental gains with higher numbers of intervention hours (Venker et al., 2013).

Unfortunately, the intensity of services for autistic children tends to be systematically below recommendations (Wise et al., 2010). Given disparate trends in ASD service access, the dosage of service use is also likely systematically lower for minoritized children (for a review see Smith et al., 2020); however, disparities in intervention dosage are an understudied topic.

Limitations in Research Examining Autism Intervention Disparities

Researchers have clearly documented unequal diagnostic timing, accuracy, and evaluation quality for minoritized groups (for a review see Angell et al., 2018). However, much less research has examined disparities in autism treatment. As evidence of this, a recent comprehensive literature review found only 11 studies documenting disparities in ASD service use and very few looking at intervention doses (Smith et al., 2020). The existing research also focuses on narrow age ranges and a limited type of intervention.

Limited Dosage of Intervention

In spite of the knowledge that the dosage of intervention clearly matters, most of the current research investigating disparities in intervention service usage focuses on dichotomous outcome variables such as “never used” or “have used” treatments at a single time point (i.e., Mire et al., 2018; Thomas et al., 2007). Because research has indicated the total number of hours dedicated to intervention services makes a difference, using a dichotomous variable might not paint an accurate picture of the extent of disparities. One study examining the dosage of treatment found that Asian and Hispanic children were likely to receive a smaller dose of in-school services than their White counterparts (Irvin et al., 2012).

Heterogeneity in ASD Intervention Types

Given the heterogeneous nature of ASD symptoms the field has identified many interventions for autistic individuals with documented empirical support. Most of the studies examining ASD service use disparities focus on a narrow subset of services (Smith et al., 2020). Only one known study looked at the demographic patterns of both type and amount of service usage across a range of services (e.g., ABA, occupational therapy [OT], and speech therapy [ST]; Irvin et al., 2012). Among a sample of 137 families, this study revealed that Hispanic children received less speech and occupational therapy compared to White peers specifically in the school context. Given the small sample of this study, future work needs to extend this comprehensive measurement approach to a larger, more representative sample and to examine a wider range of service types. Research reveals young children engage in a wide range of treatments across the developmental trajectory (Orinstein et al., 2014) and on average as many as 11 different treatments (Green et al., 2006).

Additional research estimates that 18% - 56% of children and adolescents with ASD have used psychotropic medications (Mandell et al., 2008) and medication emerges as one of the top five most common treatments for autism (Green et al., 2006). In spite of this information, much of the ASD service use disparities research has failed to examine sociodemographic differences in medication use. The few studies that do examine sociodemographic patterns in psychotropic medication use for autistic children found higher rates of medication usage for older children and White and Black children, as compared to Hispanic children (e.g., Coury et al., 2012). Although not specific to the ASD literature, related research has also documented that White children were more likely than both Hispanic and Black children to receive medications for behavioral conditions (Zito et al., 2007) and that psychotropic medication use was more common in boys, White children, and those lacking private health insurance (Chirdkiatgumchai et al., 2013). By examining service usage patterns among a wide range of intervention types, including psychotropic medications, one can take into account the service use disparities among the wide array of services that autistic children often access, including medication.

Intervention Age

One additional gap is that most studies focus on the birth to 6-year-old age range and fail to look at patterns among older school-aged children (e.g., Little et al., 2015; Nguyen et al., 2016). Examining patterns of service use disparities across development is important, given research documenting that service use patterns for autistic children vary by age for both behavioral (Thomas et al., 2007) and psychotropic interventions (Esbensen et al., 2009). Current research focusing on narrow age ranges might limit the understanding of intervention utilization disparities that might arise at distinct developmental periods.

Sociodemographic Variables

Finally, in spite of an understanding that a range of cultural factors influences the way families access ASD resources (Ravindran & Myers, 2011), most of the research documenting intervention disparities focuses narrowly on race and ethnicity (Smith et al., 2020). Studies have broadly examined the relation between sociodemographic (SES) factors in healthcare resources and education services (Durkin et al., 2017); however, SES is understudied with regard to examining patterns in ASD treatment access and dosage in spite of knowledge that it is strong determinants of variation in health status (Williams & Collins, 1995). Parental education and occupation have also been linked to service utilization for families of autistic children (Nguyen et al., 2016), but are not readily examined as targets of service access inequities.

Current Study

In sum, the existing research primarily examines a subset of intervention types and focuses mostly on a dichotomous usage variable to document the likelihood of service access. Further, the existing research on disparities mostly focuses on early childhood and often only examines patterns by race and ethnicity, as opposed to a broader range of ages and sociodemographic variables. To address these gaps in the literature, the current study examines how average weekly intervention hours among two specific age groups (birth to 5 years and 6- to 10 years) vary by a range of sociodemographic factors thought to contribute to disparities including, child sex assigned at birth, race/ethnicity, income, maternal occupation, and maternal education. The current study examines sociodemographic patterns in a range of different types of behavioral interventions (offered in both school and private sources), including speech, intensive, and occupational therapies, as well as psychotropic medication use.

Method

Participants

The current study analyzed data from 2,857 autistic participants included in the Simons Simplex Collection (SSC), a genetic database composed of data from autistic individuals representing 12 data collection sites across the U.S. (Fischbach & Lord, 2010). All participants provided consent in the original IRB-approved study.

Measures

Sociodemographic Variables

Sociodemographic data reveals the current study includes a high percentage of male (82.1%) participants, which is consistent with the documented sex split in ASD (Maenner et al., 2023). Participants were primarily non-Hispanic (83.4%) and White (81.5%; see Table 1). The Other racial category was a compilation of Native American, Native Hawaiian, More-than-one-race, and Other because of the small number of individuals in these categories. Although a broader problem in the research, it is not uncommon for genetic samples to include mostly White individuals (Hilton et al., 2009; Zamora et al., 2015); thus, this sample is consistent with what is often used in the field from a race/ethnicity distribution perspective. Other demographic data examined included annual household income ranges (≤ 50k = 13.8%; $51k-100k = 36.3%; and > $100k = 36%) and maternal education (Group 1: some high school/ ≤ ninth grade, 0.9%; Group 2: high school diploma or GED, 7.2%; Group 3: some college or associate degree, 26.7%; and Group 4: graduate or baccalaureate degree, 55.9%). Maternal occupation was categorized using 13 categories derived from the Nam-Powers-Boyd Occupation Status Scores (OSS; Nam & Boyd, 2004). Maternal education and occupation were used instead of paternal data because of documented higher levels of maternal involvement (Sharabi & Marom-Golan, 2018).

Examined Treatment Categories

Medication and behavioral treatment usage were obtained from a treatment history form and a medical history interview (MHI) completed by parents. The current study focused on examining variability in the following therapy types: speech therapy (ST), occupational therapy (OT), and intensive therapy (IT). OT/ST totals were both composites of hours from four categories: private one-on-one, private group, school one-on-one, and school group. Intensive therapy included ABA, AVB, PRT, DTT, and other intensive therapy categories (i.e., TEACH autism program and Floortime). Service use was examined in two age groups representing distinct periods in special education, i) birth through 5 years and ii) 6 to 10 years old. A total approximate number of weekly hours at the time of the study was generated for each therapy type (speech, occupational, intensive) across each age group (0-5 years, 6-10 years).

Psychotropic Variables

This study also quantified the number of medications parents reported their child using to treat behavior concerns. This included ADHD medication (i.e., stimulants), antidepressants, antiepileptics, mood stabilizers, sedatives, and tranquilizers. For each of these medications, children received a dichotomous score of yes or no to indicate lifetime usage for a maximum score of 6 (one point possible per medication type). Given a low incidence of medication usage in the birth to 2 range, the medication usage composite included ages 2 to 10 years.

Control Variables

Control variables were included in analyses to account for the variance in intervention service hours attributable to impairment variability. Given autistic children can demonstrate impairment in multiple domains, we controlled for i) autism severity using the Autism Diagnostic Observation Schedule, Second Edition (ADOS-II), ii) cognitive ability with the

Differential Ability Scales, Second Edition (DAS-II), and iii) adaptive skills based on the Vineland Adaptive Behavior Scale, Second Edition (VABS II).

The ADOS is a semi-structured standardized observation assessment that measures behaviors associated with ASD in social communication and restricted and repetitive behavior domains and has excellent psychometric properties (Lord et al., 2000). An overall total score was generated for each participant, with higher scores indicating more autistic symptoms. For this sample, the total ADOS indicated the sample had high levels of ASD symptoms (M = 15.38; SD = 5.21).

The General Conceptual Ability (GCA) score of the DAS-II measured participants' overall cognitive abilities. The DAS-II is reported to have strong specificity and reliability (Gordon & Elliott, 2001). The current sample had cognitive scores in the average range (M = 90.20; SD = 20.07).

The VABS II is a widely used parent-report measure with solid psychometric support (Sparrow et al., 2005) that quantifies adaptive abilities across Social, Communication, Daily Living, and Motor Skills domains to generate an overall Adaptive Behavior Composite (ABC) score. The current dataset had adaptive scores falling within the moderately low range (M = 72.92; SD = 12.03).

Analysis Plan

Participants in either 0-5 or 6-10 age groups who were missing substantial portions of sociodemographic and/or had no intervention therapy data were excluded. Individuals with sufficient data were retained and missing data was not replaced. Box plots were used to identify significant outliers for each outcome variable (Wallfish, 2006). Across the six outcome variables, we identified between 1 and 43 significant outliers per variable. These values were deleted from

the dataset and coded as missing in the analyses. No missing data was imputed. Given the variability in service need across participants, imputing data for missing values would likely result in misleading findings.

Analyses were conducted using SPSS version 28.0.1.0. An examination of normality revealed the outcome variables were significantly positively skewed. Transformation-corrected multiple variables (e.g., Log - OT 6-10, IT 6-10, Square root - IT Under 5) and the dichotomous medication variable were examined using linear regression. Three variables remained skewed regardless of the transformation and were analyzed using repeated-median regression, an analysis robust to an asymmetric distribution (Wichitaksorn et al., 2014). In all regression analyses, we examined if race, ethnicity, maternal education, maternal occupation, and annual household income predicted average weekly intervention amount or medication use after controlling for autism diagnostic, cognitive, and adaptive scores.

Results

Preliminary Analysis

Descriptive statistics for the average weekly intervention use variables (Table 2) revealed that OT was the lowest-utilized treatment service accessed across both age groups and that most participants used 0 to 1 type of psychotropic medication (Table 3). To justify the inclusion of impairment covariates the association with outcome variables was examined. The total VABS-II score (ABC) was significantly correlated with all outcome measures (Table 4). Both ADOS total score and GCA were significantly correlated with all behavioral therapy outcome measures, but not the number of medications.

Regression Analysis

Sex

The first linear regression examined the relation between treatment usage and sex. In this study, no sex differences were found in the average weekly amount of any services used in either age group (lowest $p = .130$) or for the utilization of psychotropic medications ($p = .139$; see Table 4).

Race/Ethnicity

Among those under 5 years, no significant differences were found between White children and any of the examined minoritized groups for any of the treatment types (lowest $p = .125$). In the 6-10-year-old range, Black children were significantly less likely to utilize occupational therapy at 6-10 years of age ($\beta = -.074$, $p = .029$) compared to White children and Asian children were significantly more likely ($\beta = .087$, $p = .011$). No significant difference in behavioral therapies was observed between non-Hispanic and Hispanic groups (lowest $p = .062$). Asian ($\beta = -.107$, $p < .001$) and the Other group ($\beta = -.062$, $p = .013$) were less likely than White children to use psychotropic medications. No significant differences were found between White and African American children in terms of their use of psychotropic medicines ($p = .123$; Table 4). Results also indicated that non-Hispanic children were more likely to use psychotropic medications compared to Hispanic children ($\beta = -.065$, $p = .010$; Table A.4).

Maternal Occupation/Education

Results indicated no significant differences related to maternal occupation and amount of intervention services or psychotropic medication use for either age group (lowest $p = .255$).

For maternal education, among the younger age group, higher maternal education was related to more speech ($\beta = .114$, $p = .026$) and intensive therapy ($\beta = .084$, $p = .027$), but not occupational therapy ($\beta = .046$, $p = .135$). For the older age group, no differences were found related to maternal education and any of the examined services (lowest $p = .092$).

Annual Family Income

An examination of the relation between treatment usage and household annual income revealed a significant difference in speech therapy for children under 5 years (β = .227, $p < .001$), such that the higher the income level, the more weekly average speech therapy hours used. No other significant differences were found for income level at this younger age range. Similar to the younger age group, in the 6-10-year-old age range, higher income was also significantly associated with more speech therapy (β =.137, p = .006). Additionally, for 6-10-year-olds, we found children with higher annual incomes were more likely to utilize occupational therapy services (β = .078, p = .030).

Discussion

Examining the extent of disparities in intervention utilization among autistic children has great merit considering the direct relation between the amount of intervention and positive child outcomes (e.g., Dawson et al., 2010; Kasari et al., 2010). The current study expanded prior research by examining how a broader set of sociodemographic variables, beyond race/ethnicity (i.e., maternal occupation, maternal education, annual household income, child sex), relate to the approximate number of weekly hours of a wide range of intervention types (i.e., speech, occupational, and intensive therapy, as well as psychotropic medications). The dosage of intervention use was examined across development by examining both early childhood (birth-5 years) and school age (6-10 years) age ranges.

Sociodemographic Disparities in Treatment Dosage

The results from this study demonstrate the pervasive nature of sociodemographic disparities in dosage of intervention use across developmental age and intervention type after taking into account age, cognitive, adaptive scores, and symptom levels. More specifically, this

study found that compared to White and higher-income peers, children from racially minoritized groups and from lower-income groups, used fewer hours of behavioral therapy. Although the difference between White and Black and White and Asian children represented a small effect, this aligns with previous research but documents this in more detail by examining an approximate total hour amount across two developmental periods (e.g., Nguyen et al., 2016; Mire et al., 2018).

Disparities in Medication Usage

Medication utilization among autistic children is increasingly high (Esbensen et al., 2009), thus examining sociodemographic patterns in usage is timely. Results from this study showed higher psychotropic medication use among non-Hispanic compared to Hispanic autistic children and higher among White autistic children compared to racially minoritized populations (i.e., Asian and Other groups). Similarly, these were both observed as a small effect, but this data also aligns with research from the general public documenting that medication usage is higher among White children than among racial and ethnic minoritized children (e.g., Coury et al., 2012; Leslie et al., 2003) and replicates similar findings among autistic children (Quebles et al., 2020). Research needs to examine whether this finding represents an overuse of medications by White families or an underuse among minoritized families, a highly debated topic in the literature (i.e., Leslie et al., 2003). Those viewing this as an underuse issue would categorize this as another example of systemic racial/ethnic disparities in obtaining comprehensive medical care (i.e., Quebles et al., 2020); however, other research that highlights the systemic rise in medication use among autistic children without sufficient data to support the appropriateness of this choice for treating ASD, indicates that more might not necessarily be better (Park et al.,

2016). Research also shows that with regard to stimulant medications, overuse is more common among White individuals (Pilkinton & Cannatella, 2012).

This study expanded upon the literature that focuses primarily on young children by examining disparities among a wider age range that included two distinct developmental periods (e.g., Irvin et al., 2012; Little et al., 2015; Nguyen et al., 2016; Zweiganbaum et al., 2015). Although the disparities in service use were consistent for speech therapy across the developmental groups, most of the other therapy types examined demonstrated more variable patterns between the two age ranges. This highlights the importance of examining development periods distinctly and not assuming consistent patterns across age groups.

Limitations and Future Directions

Based on results previously found in the literature, it was hypothesized that all sociodemographics would be related to intervention usage (for a review see Angell et al., 2018). While we did see effects for race, ethnicity, and annual income, we did not observe effects for child sex or maternal occupation. Of note, it is possible that the examined sample has insufficient education variability to sufficiently answer this question (i.e., more than half of this sample fell in the high education group graduate or baccalaureate degree). Similarly, the sample population included a large number of mothers with higher-rated occupation codes. It is not uncommon for research to emphasize Western, Educated, Industrialized, Rich, and Democratic (WEIRD) samples (Henrich et al., 2010), and particularly common for ASD genetics research to have less diverse samples (Zamora et al., 2015). Thus, while this sample is consistent with much-related research, limited sample diversity represents a broader issue and introduces challenges when trying to document disparities comprehensively. The sample also might not have widely represented the broad spectrum of autistic girls, as there was an underrepresentation of

cognitively impaired females in the current sample. Future related research should prioritize an emphasis on both large, as well as, increasingly diverse datasets.

Future research in this domain would also benefit from investigating the difference in hour dosage between even more narrow types of therapy. Although not possible with the current dataset, examining private and public services as separate groups within ST and OT or looking at specific types of intensive therapies might reveal even more striking income-based disparities. In line with this research, Irvin et al. (2012) found no significant sociodemographic patterns for broad OT but noticed meaningful differences when examining private versus public OT. That said, the comprehensive examination of a wide range of therapy types in this study is an advancement upon previous research and helps narrow down the treatment domains with significant inequities. A final potential study limitation includes the possibility of a recall bias when parents were asked to report on the number of services received. Self-reported data are particularly susceptible to this kind of error when reporting on services received after multiple years have passed (Lance & Vandenberg 2009). Future research might focus on deriving service amount usage from service provider databases. Additionally, as the field has observed some promising changes in terms of diagnostic disparities (Maenner et al., 2023), this research should be replicated using an updated dataset as newer ones become available to determine if progress is also made in terms of treatment use disparities.

Summary

This study expands upon previous research demonstrating evidence of disparities in treatment access by examining the nuances of service use amount across a range of different service types and across sociodemographic groups. The study's strengths include a broader age range of participants and a more thorough look at a range of intervention types, including a

medication component. This marks an important step in the identification of disparities; however, more research is still needed to determine why these disparities continue to occur and how to reduce them (Kilborne et al., 2006). Future research should emphasize helping to improve access to services for minoritized groups of autistic children. Systematic efforts must be made to gain a deeper understanding of how individual (parent), interpersonal, and societal factors may all play a role in parents' accessing treatment for their children.

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Table 1

Participant Sociodemographic and Severity Information

	n	*% of sample*
Sociodemographic Information		
Child Race		
White	2,178	81.5
Black	105	3.7
Asian	99	3.5
Other	322	11.3
Child Ethnicity		
Non-Hispanic	2,385	83.4
Hispanic	319	11.2
Child Sex		
Male	2,346	82.1
Female	358	12.5
Income		
>20-50K	394	13.8
51-100K	1,038	36.3
101-160K+	1,029	36.0
Mother Education		
some-hs, less-ninth, up-ninth	26	0.9
high-school, GED	207	7.2
some-college, associate	764	26.7
graduate, baccalaureate	1,597	55.9
Severity Covariates	*Mean*	*SD*
ADOS Total Score	15.38	5.21
Adaptive Scores (VABS-II)	72.92	12.03
Cognitive Scores (DAS-II)	90.20	20.07

Table 2 (original)

Weekly Average Hours of Intervention Descriptive Data

Type of Intervention	*n*	Min. Hours	Max. Hours	*M* Hours	*SD*
Speech					
Under 5	2276	.00	100.00	2.17	4.19
6-10	1692	.00	100.00	1.74	3.30
Occupational					
Under 5	2018	.00	60.00	1.41	2.04
6-10	1485	.00	38.25	1.17	1.29
Intensive					
Under 5	1279	.00	80.00	11.54	11.05
6-10	719	.00	50.50	8.46	10.42

Table 3

Psychotropic Medication Use

Number of Medications	Frequency	Percent
0	1597	59.1
1	582	21.5
2	312	11.5
3	154	5.7
4	44	1.6
5+	13	0.4

Table 4

Correlations with Confidence Intervals Between Therapy Usage Outcomes Among Combined Age Groups and Covariates

Variable	ST<5	ST 6-10	OT<5	OT 6-10	IT<5	IT 6-10	Meds	ADOS	GCA
ST <5									
ST 6-10	.418** [.38, .46]								
OT <5	.393** [.35, .43]	.105** [.05, .16]							
OT 6-10	.307** [.26, .36]	.181** [.13, .23]	.556** [.51, .59]						
IT <5	.159** [.10, .21]	.229** [.16, .29]	.152** [.10, .21]	.148** [.07, .22]					
IT 6-10	.128** [.04, .21]	.145** [.06, .23]	0.091 [.00, .18]	.137** [.04, .23]	.633** [.57, .69]				
Meds	-0.001 [-.04, .04]	-0.017 [-.06, .03]	0.007 [-.04, .05]	-0.031 [-.08, .02]	.060* [.00, .11]	-0.072 [-.16, .01]			
ADOS	.045* [.00, .09]	0.047 [.00, .10]	.075** [.03, .12]	0.046 [-.01, .10]	.235** [.18, .29]	.274** [.19, .35]	0.004 [-.04, .04]		
GCA	-0.048 [-.10, .00]	-0.019 [-.08, .04]	-.088** [-.14, -.04]	-.102** [-.17, -.04]	-.097** [-.16, -.03]	-.214** [-.32, -.10]	-0.032 [-.08, .01]	-.360** [-.40, -.32]	
ABC	0.015 [-.03, .06]	-0.03 [-.08, .02]	-.047* [-.09, .00]	-.054* [-.11, .00]	-.099** [-.16, -.04]	-.210** [-.29, 0.13]	-.208** [-.25, -.17]	-.405** [-.44, -.37]	.451** [.42, .49]

Note. ST = Speech Therapy, OT = Occupational Therapy, IT = Intensive Therapy, Meds = Psychotropic Therapy; age range: <5 = birth to 5 years old, 6-10 = ages 6 to 10 years old. ADOS = Autism Diagnostic Schedule, GCA = General Conceptual Ability (DAS-II), ABC = Adaptive Behavior Composite (VABS II). Values in square brackets indicate the 95% confidence intervals for each correlation.

*indicates correlation is significant at a level of $p < .05$ (2-tailed)

**indicates correlation is significant at a level of $p < .01$ (2-tailed)

Table 5

Unstandardized Coefficients and Confidence Intervals from Regression Analyses Between Sociodemographic Factors and Therapy Usage

	ST			OT			Meds
Child Age in Years	Under 5	6-10	Under 5	6-10	Under 5	6-10	All Ages
Child Sex	.077 [-.09, .24]	.045 [-.14, .23]	.002 [-.11, .11]	.010 [-.05, .61]	.053 [-.08, .64]	-.019 [-18, 13]	-.033 [-.23, .03]
Child Race/Ethnicity							
White vs. Asian	-.239 [-.56, .09]	.197 [-.18, .57]	.148 [-.06, .35]	.087* [.04, .28]	.008 [-.52, .66]	-.058 [-.46, .16]	-.107** [-.89, -.37]
White vs. Black	-.021 [-.32, .28]	-.085 [-.43, .26]	-.053 [-.26, .15]	-.074* [-.22, -.01]	-.012 [-.83, .59]	.036 [-.24, .47]	-.035 [-.45, .05]
White vs. Other	.008 [-.18, .19]	.201 [-.01, .41]	.097 [-.03, .22]	.039 [-.03, .10]	-.015 [-.46, .31]	.032 [-.14, .23]	-.193* [-.35, -.04]
Non-Hispanic vs. Hispanic	.015 [-.17, .20]	-.019 [-.23, .19]	-.059 [-.18, .06]	-.041 [-.10, .03]	-.048 [-.61, .14]	.069 [-.09, .27]	-.201* [-.35, -.05]
Maternal Occupation	-.003 [-.01, .01]	.000 [-.01, .01]	.001 [-.01, .01]	.025 [-.00, .01]	.016 [-.02, .03]	.024 [-.01, .01]	.026 [-.00, .01]
Annual Income	.227** [.14, .32]	.137** [.04, .23]	.047 [-.01, .11]	.078* [.00, .06]	.052 [-.06, .32]	.072 [-.04, .15]	.033 [-.02, .11]
Maternal Education	.114* [.01, .22]	.020 [-.09, .13]	.025 [-.04, .09]	-.061 [-.06, .00]	.084* [.03, .46]	.024 [-.09, .13]	-.005 [-.08, .07]

Note: Grayed columns represent skewed variables that were analyzed using repeated-mean regression, whereas white columns were normalized with transformations and analyzed using typical linear regression. Values in square brackets indicate the 95% confidence intervals.

*indicates significant at a level of $p < .05$

**indicates significance at a level of $p < .01$