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## Personality and cognitive errors in the Healthy Aging in Neighborhoods of Diversity across the Life Span study

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## ABSTRACT

This study examines the association between personality and cognitive errors in the Healthy Aging in Neighborhoods of Diversity across the Life Span study, a sample diverse across race (Black, White) and SES (above, below 125% of the federal poverty line). Participants (N = 1062) completed a comprehensive personality questionnaire and were administered a brief mental status screener of cognitive errors. Higher neuroticism was associated with more cognitive errors, whereas higher openness and conscientiousness were associated with fewer errors. These associations were independent of age, sex, race, poverty status, and education and were generally not moderated by these factors. These findings support the associations between personality and cognition across race and SES.

Cognitive function is an important marker of health in older adulthood. Sufficient cognitive function is needed to live independently (Portacolone, Rubinstein, Covinsky, Halpern, & Johnson, 2019), adhere to medication regimens (Dolansky et al., 2016), and maintain social health (Yin, Lassale, Steptoe, & Cadar, 2019) and a good quality of life (Stites, Harkins, Rubright, & Karlawish, 2018). Poor cognitive function can be a risk factor or marker of impending impairment, such as mild cognitive impairment or dementia (Choe et al., 2020). For better outcomes in older adulthood, it is critical to maintain good cognitive function starting at least as early as middle adulthood (Livingston et al., 2020). For example, worse cognitive performance in middle adulthood is associated with greater risk of dementia in older adulthood (Knopman et al., 2018). It is likewise important to identify contextual and individual factors associated with better cognition and whether risk and protective factors vary across demographic groups.

Five Factor Model (FFM) personality traits (McCrae & John, 1992) (hereafter personality refers to personality traits defined by the FFM) have been associated with significant cognitive outcomes (Kaup, Harmell, & Yaffe, 2019; Terracciano et al., 2014; Wilson et al., 2015). Indeed, a recent meta-analysis indicated that higher neuroticism is associated with greater risk of developing Alzheimer's disease and related dementias (ADRD) (Aschwanden et al., 2021). The same meta-

analysis found that higher conscientiousness is associated with lower risk of incident ADRD. The evidence is less consistent for extraversion, openness, and agreeableness and ADRD, although each of these traits tends to be protective when aggregated across studies (Aschwanden et al., 2021). Further, prior to dementia, personality is associated with transitions to more mild cognitive deficits. Higher neuroticism and lower conscientiousness, for example, are associated with greater risk of transitioning from normal cognition to mild cognitive impairment (e.g., Yoneda et al., 2023) and from subjective cognitive decline to objective cognitive impairment (e.g., Aschwanden et al., 2022).

Personality traits have been associated with cognition even when cognition is measured with a brief screener of mental status. Higher neuroticism, for example, has been associated with worse mental status measured with either the AD8 (Best, Cruitt, Oltmanns, & Hill, 2021; Buchanan & Loveday, 2018) or the informant-rated IQ CODE (Jorm et al., 1996). Higher neuroticism and lower conscientiousness, as well as lower openness, have been associated with worse mental status measured with the Telephone Interview for Cognitive Status (Luchetti, Terracciano, Stephan, & Sutin, 2016) and the Mini-Mental State Examination (Martin, Baenziger, Macdonald, Siegler, & Poon, 2009). These traits have further been associated with cognitive complaints used to screen for dementia, reported by the self and by a knowledgeable

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informant (Slavin et al., 2010). As such, personality traits, particularly neuroticism, conscientiousness, and openness, are associated with cognition, whether measured with a full cognitive battery or a brief cognitive screener.

Previous research on personality and cognition has sometimes lacked diverse samples. There is evidence, however, that associations are similar across racial groups. Findings from the Baltimore Longitudinal Study of Black Aging (BSBA), for example, indicate similar patterns of association between personality and cognitive function among Black participants as is observed for White participants (Aiken-Morgan et al., 2012). Further, findings from the Health and Retirement Study (HRS) indicate that the association between personality and cognition is similar across Black and White participants (Sutin et al., 2019). In contrast to race, there is some evidence that the association between personality and cognition may vary by socioeconomic factors. Higher conscientiousness and lower neuroticism, for example, are more strongly associated with better episodic memory performance in countries with lower gross domestic product (GDP); openness was associated with better memory performance regardless of GDP (Luchetti, Terracciano, Stephan, Aschwanden, & Sutin, 2021). This pattern is consistent with the resource substitution hypothesis, which suggests that personality traits may be a beneficial resource in environments with fewer economic resources (Damian, Su, Shanahan, Trautwein, & Roberts, 2015). Other evidence, however, suggests that traits related to neuroticism (i.e., traits related to the tendency to feel distressing emotions) and conscientiousness (i.e., traits related to the tendency to be responsible and reliable) are associated with lower risk of dementia more strongly among individuals from families with higher SES backgrounds (Chapman et al., 2020). Given that there are significant differences in the incidence and prevalence of dementia by race (Mehta & Yeo, 2017) and SES (Arapakis, Brunner, French, & McCauley, 2021), there may be differences in the associations between personality and cognition prior to dementia. The present study addresses the associations between personality and cognitive errors in a sample with socioeconomic diversity, as well as racial diversity, to examine the role of SES as well as race in the association between personality and cognition. It is possible that multiple disadvantaged statuses may amplify the association of personality on cognition. It is also possible that personality may serve as a psychological resource that bolsters cognition in the face of other risk factors.

Under the broad domain of each personality trait are more specific traits or facets (Costa & McCrae, 1995). Facets of personality are useful to identify which aspects of the broad domains of personality are most closely associated with outcomes (McClendon, Bogdan, Jackson, & Oltmanns, 2021). Similar to the broad domains, personality facets have been associated with aspects of cognitive function (e.g., Chapman et al., 2017; Graham & Lachman, 2014). A related literature has likewise found specific personality facets to be associated with aspects of intelligence (Anglim et al., 2022). A facet-level approach can help identify processes specific to traits that may explain the association with cognition. For example, the dutifulness facet of conscientiousness, a measure of the tendency to be responsible and reliable, is a consistent facet-level predictor of AD/DRD, whereas the order facet of conscientiousness, a measure of how organized and tidy an individual generally is, is not as consistently associated with dementia risk (e.g., Sutin et al., 2018; Terracciano et al., 2022; Terracciano et al., 2014). This difference suggests that interpersonal aspects of conscientiousness may help to preserve cognition with age, whereas organizational aspects of conscientiousness may be less important for cognition. Further, the negative mood aspects of neuroticism (e.g., anxiety, depression) tend to be more consistently associated with performance on intelligence tests than aspects of neuroticism related to self-consciousness (Anglim et al., 2022). This pattern suggests that the negative emotionality aspects of neuroticism may interfere with performance during cognitive testing. Finally, of the six facets of openness, only openness to ideas, a measure of intellectual curiosity and interest in new ideas, is associated with dementia

risk (Terracciano et al., 2022; Terracciano et al., 2014). This pattern suggests that aspects of openness related to imagination and fantasy and interest in art are less relevant for cognitive health, whereas actively pursuing new ways of thinking is protective. Relatively few studies have examined the association between personality facets and cognition especially in diverse samples.

We used data from the Healthy Aging in Neighborhoods of Diversity across the Life Span (HANDLS) study to examine the association between personality domains and facets and cognition, measured as cognitive errors on a brief mental status screener. We examined the main effect of personality and how much of the association between personality and cognitive errors was due to socioeconomic factors, specifically education and poverty status. Poverty status at enrollment in HANDLS was defined as below or above 125% of the federal poverty line in 2003 (the Health and Human Services poverty level was \$18,400 for a family of four in 2003 dollars; the 125% poverty threshold was thus \$23,000; Evans et al., 2010). We expected that higher neuroticism would be associated with more cognitive errors, whereas higher openness and conscientiousness would be associated with fewer cognitive errors. We did not expect an association between either extraversion or agreeableness and cognitive errors because the association between these two traits and cognition in the literature is less consistent than for the other three traits (e.g., Graham & Lachman, 2014; Luchetti et al., 2016; Yoneda et al., 2023). We then tested whether the domain-level associations varied by sociodemographic characteristics (age, sex, race, poverty status, education). Because the HANDLS sample was relatively balanced across race (Black, White) and poverty status (below, above), we also tested exploratory three-way interactions to examine whether the association between personality and cognitive errors varied across SES and race. Finally, we examined facet-level associations to determine if there were specific components of the traits that drove the domain-level associations.

## 1. Method

### 1.1. Participants and procedure

Detailed information about HANDLS can be found in Evans and colleagues (2010). Briefly, HANDLS is a longitudinal sample that was established to disentangle the effects of race and socioeconomic status (SES) on health. The original HANDLS sample was middle-aged adults (30–64) at enrollment and was an area probability sample using a factorial design that crossed race (50% Black/50% White) with poverty status (50% below/50% above 125% of the federal poverty line). The baseline (Wave 1) of HANDLS was conducted between August 2004 and March 2009. HANDLS participants completed the same measure of cognitive errors at Wave 4 (September 2013–September 2017) and Wave 5 (September 2017–March 2020); the measure of personality was administered at Wave 5. We used data from the cognitive screener at both Wave 4 and Wave 5 to make full use of the available data to provide more reliable estimates. A total of 1062 participants had data available on personality and cognition and the relevant sociodemographic factors to be included in the present analysis. Among White participants,  $n = 276$  were above (26.0% of the total sample) and  $n = 120$  were below (11.3% of the total sample) 125% of the poverty line. Among Black participants,  $n = 388$  were above (36.5% of the total sample) and  $n = 278$  were below (26.2% of the total sample) 125% of the poverty line. Participants were compensated with a gift card. The ultimate sample size was determined by available funding for the personality assessment. Specifically, participants were tested until funds for compensation were

depleted. Participants were not preselected for testing or randomized. The sample size exceeded the minimum target of 1000 participants that was estimated to have >80% power to detect an effect as small as 0.05 at  $p < .01$ .<sup>1</sup> Compared to the full HANDLS sample ( $N = 3720$ ), participants with data for the current analysis ( $n = 1062$ ) were more likely to be female ( $\chi^2 = 28.37, p < .001$ ), Black ( $\chi^2 = 8.08, p = .004$ ), above 125% of the poverty line ( $\chi^2 = 8.80, p = .003$ ), and had more years of education ( $d = 0.18, p < .001$ ) than participants without data ( $n = 2658$ ). There was no difference in age ( $d = 0.09, p = .071$ ).

### 1.2. Measures

**Personality traits.** Five-factor personality traits were measured with the NEO-PI-3 First Half (McCrae & Costa, 2010). This 120-item personality questionnaire measures the five broad domains and 30 more specific facets (six per domain) of personality. Participants rated each item from 1 (*strongly disagree*) to 5 (*strongly agree*). Raw scores were converted to t-scores based on combined age and sex norms in the Manual. Note that the measure is self-report, so all traits and facets should be interpreted as how the participant sees themselves. The NEO-PI-3 First Half is protected by copyright and cannot be distributed. It is available from PAR (<https://www.parinc.com/Products/Pkey/275>).

**Cognitive errors.** The Short Portable Mental Status Questionnaire (Pfeiffer, 1975) was used as a measure of cognitive errors. The SPMSQ included 10 items that assessed basic orientation and memory. Each item was scored as correct (=0) or incorrect (=1) and the sum of incorrect responses was taken as a measure of cognition. As such, this interviewer-administered questionnaire is a measure of cognitive errors. More errors indicated worse function. This measure is available in the Appendix of the original article (Pfeiffer, 1975).

**Sociodemographic covariates.** Sociodemographic covariates were age in years, sex (0 = male, 1 = female), race (0 = White, 1 = Black), poverty status (0  $\geq$  125% of federal poverty line, 1 < 125% of federal poverty line), and education in years.

### 1.3. Analytic approach

Since two repeated assessments of cognitive errors were available, multilevel modeling was used to make use of all available data to provide the most robust and reliable estimate of the associations. Cognitive errors were modeled at level 1 as a repeated measure. Since personality was unrelated to the slope of errors over the relatively short follow-up interval, the analysis focused on the intercept, which can be interpreted as the average association between personality and cognitive errors. Model 1 controlled for age, sex, and race. Model 2 was Model 1 with education. Model 3 was Model 2 with poverty status. Because of the skew of the distribution of cognitive errors, we further did a robustness check by dichotomizing cognitive errors into any errors (=1) versus no errors (=0) and used logistic regression to test the association between personality and likelihood of making any cognitive errors. We did this analysis separately for the Wave 4 and Wave 5 cognitive data.

Exploratory analyses tested for an interaction between each trait and age, sex, race, poverty status, and education to evaluate the generalizability of the associations across sociodemographic groups (25 interactions tested). Additional exploratory analyses tested three-way interactions (trait  $\times$  race  $\times$  poverty status) to evaluate whether differences in the association between being above or below the poverty line differed by race (5 interactions tested). Finally, we also report Models 1–3 for the facets. We report the p-value to three decimal places to allow readers to make their own judgments about significance. For

<sup>1</sup> This study was not preregistered. Because of the nature of the sample, data cannot be distributed publicly but is available through an application process (<https://handls.nih.gov/06Coll.htm>). Scripts for the analysis are in Supplemental Material.

interpretation, we focus on p-values < 0.01 due to the multiple testing. Analyses were done using SPSS 28.0.

## 2. Results

Descriptive statistics are in Table 1. Bivariate correlations among study variables are in Supplementary Table S1, partial correlations accounting for age are in Supplementary Table S2, and bivariate correlations by race are in Supplementary Table S3. The primary results are in Table 2. Neuroticism, Openness, and Conscientiousness had the expected associations with cognitive errors, adjusted for age, sex, and race: Higher Conscientiousness and Openness were associated with fewer errors on the cognitive task, whereas higher Neuroticism was associated with more errors (Model 1). Surprisingly, higher Extraversion and Agreeableness were also associated with fewer errors. The inclusion of education in the model attenuated the association between the traits and cognitive errors (Model 2); education accounted for about 40% of the association between personality and cognitive errors. The associations were nearly identical with the addition of poverty status (Model 3). The pattern of associations was similar when the dichotomous coding of cognitive errors was the outcome at both Wave 4 (Supplementary Table S4) and Wave 5 (Supplementary Table S5). The correlation

**Table 1**  
Descriptive statistics for all study variables.

Variable	Mean (standard deviation) or % (n)
Age (years)	60.18 (8.88)
Sex (female)	61.6% (654)
Race (Black)	62.7% (666)
Poverty status (below)	37.5% (398)
Education (years)	12.37 (2.61)
Cognitive errors	0.66 (0.75)
Wave 4 (any errors) <sup>a</sup>	50.6% (531)
Wave 4 (no errors) <sup>a</sup>	49.4% (518)
Wave 5 (any errors) <sup>b</sup>	50.8% (504)
Wave 5 (no errors) <sup>b</sup>	49.2% (489)
Neuroticism	47.20 (11.64)
Extraversion	47.41 (10.32)
Openness	48.77 (11.16)
Agreeableness	47.85 (11.07)
Conscientiousness	49.71 (12.09)
N1: Anxiety	49.63 (11.64)
N2: Angry Hostility	47.27 (12.58)
N3: Depression	50.56 (12.15)
N4: Self-Consciousness	44.23 (11.76)
N5: Impulsiveness	44.18 (11.00)
N6: Vulnerability	50.84 (13.53)
E1: Warmth	48.70 (13.62)
E2: Gregariousness	44.41 (12.09)
E3: Assertiveness	53.34 (12.08)
E4: Activity	45.76 (8.43)
E5: Excitement Seeking	48.42 (11.96)
E6: Positive Emotions	48.90 (12.21)
O1: Fantasy	51.16 (10.02)
O2: Aesthetics	52.11 (11.26)
O3: Feelings	45.14 (12.62)
O4: Actions	48.69 (12.54)
O5: Ideas	47.88 (11.17)
O6: Values	49.21 (11.62)
A1: Trust	39.10 (11.88)
A2: Straightforwardness	50.70 (11.73)
A3: Altruism	53.21 (13.18)
A4: Compliance	46.65 (13.89)
A5: Modesty	46.56 (11.88)
A6: Tender-Mindedness	56.97 (14.16)
C1: Competence	51.75 (13.75)
C2: Order	54.43 (13.02)
C3: Dutifulness	42.22 (12.46)
C4: Achievement Striving	54.50 (12.70)
C5: Self-Discipline	48.37 (12.79)
C6: Deliberation	47.18 (11.78)

Note.  $N = 1062$ . <sup>a</sup>  $n = 1049$  for Wave 4 cognitive errors. <sup>b</sup>  $n = 993$  for Wave 5 cognitive errors.

**Table 2**  
Association Between Personality Traits and Cognitive Errors.

Personality Trait	Model 1			Model 2			Model 3		
	Estimate	SE	p	Estimate	SE	p	Estimate	SE	p
<i>Domains</i>									
N: Neuroticism	0.11	0.02	<0.001	0.06	0.02	<0.001	0.06	0.02	<0.001
E: Extraversion	-0.10	0.02	<0.001	-0.06	0.02	<0.001	-0.06	0.02	<0.001
O: Openness	-0.14	0.02	<0.001	-0.08	0.02	<0.001	-0.08	0.02	<0.001
A: Agreeableness	-0.11	0.02	<0.001	-0.06	0.02	<0.001	-0.06	0.02	<0.001
C: Conscientiousness	-0.08	0.02	<0.001	-0.06	0.02	0.002	-0.06	0.02	<0.001
<i>Facets</i>									
N1: Anxiety	0.05	0.02	0.008	0.02	0.02	0.258	0.02	0.02	0.282
N2: Angry Hostility	0.10	0.02	<0.001	0.06	0.02	<0.001	0.05	0.02	0.003
N3: Depression	0.12	0.02	<0.001	0.08	0.02	<0.001	0.07	0.02	<0.001
N4: Self-Consciousness	0.08	0.02	<0.001	0.04	0.02	0.017	0.04	0.02	0.028
N5: Impulsiveness	0.02	0.02	0.371	0.01	0.02	0.478	0.01	0.02	0.618
N6: Vulnerability	0.10	0.02	<0.001	0.06	0.02	0.002	0.05	0.02	0.003
E1: Warmth	-0.10	0.02	<0.001	-0.05	0.02	0.005	-0.05	0.02	0.010
E2: Gregariousness	-0.04	0.02	0.054	-0.01	0.02	0.745	0.00	0.02	0.896
E3: Assertiveness	-0.10	0.02	<0.001	-0.07	0.02	<0.001	-0.07	0.02	<0.001
E4: Activity	-0.06	0.02	<0.001	-0.05	0.02	0.008	-0.05	0.02	0.009
E5: Excitement Seeking	0.01	0.02	0.451	0.00	0.02	0.950	0.00	0.02	0.931
E6: Positive Emotions	-0.08	0.02	<0.001	-0.05	0.02	0.008	-0.05	0.02	0.009
O1: Fantasy	-0.06	0.02	0.002	-0.02	0.02	0.287	-0.02	0.02	0.347
O2: Aesthetics	-0.07	0.02	<0.001	-0.02	0.02	0.254	-0.02	0.02	0.260
O3: Feelings	-0.08	0.02	<0.001	-0.04	0.02	0.012	-0.04	0.02	0.013
O4: Actions	-0.08	0.02	<0.001	-0.03	0.02	0.059	-0.03	0.02	0.118
O5: Ideas	-0.12	0.02	<0.001	-0.07	0.02	<0.001	-0.08	0.02	<0.001
O6: Values	-0.12	0.02	<0.001	-0.08	0.02	<0.001	-0.07	0.02	<0.001
A1: Trust	-0.11	0.02	<0.001	-0.06	0.02	<0.001	-0.06	0.02	<0.001
A2: Straightforwardness	-0.05	0.02	<0.001	-0.04	0.02	0.042	-0.04	0.02	0.044
A3: Altruism	-0.08	0.02	<0.001	-0.04	0.02	0.013	-0.04	0.02	0.019
A4: Compliance	0.00	0.02	0.800	0.02	0.02	0.340	0.02	0.02	0.347
A5: Modesty	-0.04	0.02	0.021	-0.03	0.02	0.060	-0.04	0.02	0.046
A6: Tender-Mindedness	-0.09	0.02	<0.001	-0.06	0.02	<0.001	-0.06	0.02	<0.001
C1: Competence	-0.12	0.02	<0.001	-0.09	0.02	<0.001	-0.08	0.02	<0.001
C2: Order	0.00	0.02	0.813	-0.01	0.02	0.711	-0.01	0.02	0.585
C3: Dutifulness	-0.07	0.02	<0.001	-0.04	0.02	<0.001	-0.04	0.02	0.010
C4: Achievement Striving	-0.05	0.02	0.005	-0.03	0.02	0.097	-0.03	0.02	0.105
C5: Self-Discipline	-0.05	0.02	0.008	-0.03	0.02	0.082	-0.03	0.02	0.087
C6: Deliberation	-0.05	0.02	0.009	-0.04	0.02	0.039	-0.04	0.02	0.039

Note.  $N = 1062$ . Model 1 controlled for age, sex, and race. Model 2 is Model 1 also controlling for education. Model 3 is Model 2 also controlling for poverty status.

between estimates for the associations from the multilevel models and the estimates from the logistic regressions ranged from 0.88 (Model 1) to 0.95 (Models 2 and 3) for Wave 4 and from 0.89 (Model 1) to 0.96 (Models 2 and 3) for Wave 5.

There was no evidence that the association between personality and cognitive errors was moderated by sociodemographic characteristics: None of the interactions was significant (Supplementary Table S6). As such, the association between personality and cognitive errors was similar across age, males and females, Black and White participants, participants above and below 125% of the poverty line, and across education. The exploratory analysis, however, indicated a significant three-way interaction between conscientiousness, race, and poverty status ( $b = -0.20$ ,  $SE = 0.08$ ,  $p = .007$ ; Supplementary Table S7). Breaking down the interaction, it was apparent that White participants below 125% of the poverty line had a strikingly different pattern of association than the other three groups. Specifically, Conscientiousness was protective in every group except for White participants below 125% of the poverty line ( $b = 0.04$ ,  $SE = 0.06$ ,  $p = .549$ ). Of note, the protective association was similar for White participants above 125% of the poverty line ( $b = -0.10$ ,  $SE = 0.03$ ,  $p = .003$ ) as for Black participants below 125% of the poverty line ( $b = -0.08$ ,  $SE = 0.04$ ,  $p = .017$ ). The exploratory analysis also suggested a similar pattern for a three-way interaction between Neuroticism, race, and poverty status that did not meet the  $p < .01$  threshold ( $b = 0.16$ ,  $SE = 0.07$ ,  $p = .030$ ). The pattern, though, was the same as for Conscientiousness, with Neuroticism associated with fewer cognitive errors among White participants below 125% of the poverty line, whereas the expected positive association

between Neuroticism and more errors was apparent in the other three groups.

Finally, the facet-level analysis indicated which specific components of each domain were and were not associated with cognitive errors. For Neuroticism, the domain-level association was primarily driven by Angry Hostility, Depression, and Vulnerability, whereas the associations between Anxiety and Self-consciousness and cognitive errors were accounted for by education; Impulsiveness was unrelated to cognitive errors. Most facets of Extraversion were associated with fewer errors, including Warmth, Assertiveness, Activity, and Positive emotions; Gregariousness and Excitement-seeking were unrelated to it. All facets of Openness were associated with fewer cognitive errors in Model 1, but only Ideas and Values remained significant in Models 2 and 3. Four facets of Agreeableness (Trust, Straightforwardness, Altruism, Tender Mindedness) were associated with fewer cognitive errors in Model 1; Trust and Tender mindedness remained significant in Models 2 and 3. Finally, all facets of Conscientiousness except Order were significant in Model 1 but only Competence and Dutifulness remained significant in Models 2 and 3.

### 3. Discussion

The present study used a socioeconomically and racially diverse sample of community-dwelling adults to examine the association between personality and cognition, measured as errors on a brief cognitive screener. Consistent with the literature, lower Neuroticism and higher Conscientiousness and Openness were associated with better cognition

(i.e., fewer errors); Extraversion and Agreeableness were also associated with fewer cognitive errors. None of the interactions with the socio-demographic characteristics was significant, which indicated that the associations were similar across age, sex, race, poverty status, and education, except for a provocative exploratory three-way interaction between Conscientiousness, race, and poverty status. Finally, the facet-level analysis indicated the specific components of the traits most responsible for the domain-level associations.

Personality traits have been associated consistently with aspects of cognition (Curtis, Windsor, & Soubelet, 2015; Sutin et al., 2019) and with significant cognitive outcomes, including risk of incident dementia (Aschwanden et al., 2021). These associations tend to be most apparent for neuroticism, openness, and conscientiousness. There are several reasons why these traits may be associated with cognition. Higher neuroticism and lower conscientiousness, for example, are associated with health-risk behaviors that are harmful to cognition, including physical inactivity (Sutin et al., 2016), substance use (Hakulinen et al., 2015), and poor sleep quality (Gamaldo et al., 2020). These traits are also associated with clinical risk factors, including greater disease burden (Jokela, Hakulinen, Singh-Manoux, & Kivimäki, 2014) and worse mental health outcomes (Kotov, Gamez, Schmidt, & Watson, 2010), which are harmful to cognition. These traits, particularly openness, are further associated with greater engagement in cognitively stimulating activities, such as reading (Rohrer & Lucas, 2018) and complex work environments (Judge & Zapata, 2015), that may help support cognitive function.

The association between both extraversion and agreeableness and cognitive errors was more surprising. Both traits tend to be unrelated to overall cognitive function (Graham et al., 2021), although extraversion tends to be associated with better performance on tasks that require verbal ability (Sutin et al., 2019). Both traits may also have a small protective association with dementia risk when pooled across studies (Aschwanden et al., 2021). Extraversion and agreeableness are the interpersonal traits within the FFM (Barford, Zhao, & Smillie, 2015). Social health has emerged recently as a critical factor for cognitive health (Luchetti et al., 2020). As such, individuals higher in extraversion or agreeableness might have fewer cognitive errors because their interpersonal tendencies support better social health.

The present study took a systematic approach to examine whether the associations were consistent across sociodemographic groups. The two-way interactions indicated that the associations were not moderated by age, sex, race, poverty status, or education, which indicated that the associations did not vary across these demographic groups in the present sample. If further replicated, the associations between personality and cognition may generalize across populations. These results are consistent with the literature on personality and cognition that indicates similar associations across Black and White populations (Aiken-Morgan et al., 2012; Sutin et al., 2019). The results are in contrast, however, with the resource substitution hypothesis that suggests that personality may be a useful psychological resource when financial resources are scarce (Damian et al., 2015). In the present research, traits had similar associations with cognitive errors across both education and poverty status.

The one exception was an interesting three-way interaction for conscientiousness and race and poverty status that was found in the exploratory analyses. Specifically, the expected association was observed in three out of the four groups, except for White participants below 125% of the federal poverty line. In this case, the association was in the opposite direction of what would be expected: Conscientiousness was associated with more cognitive errors, whereas it was associated with fewer cognitive errors in the other three groups (a similar pattern emerged for neuroticism, with neuroticism associated with better rather than worse cognition in this group).

Interactions are difficult to replicate (Sherman & Pashler, 2019), and the exploratory three-way interaction for conscientiousness should be interpreted with caution until replicated. Still, the results point to the possibility that specific traits may operate differently in different

contexts (Judge & Zapata, 2015). White adults living below 125% of the federal poverty line may face different challenges where being more responsible and disciplined is not as advantageous for cognition as it is in other contexts. It is notable, though, that the two groups that may have been the most different – White adults above 125% of the poverty line and Black adults below 125% of the poverty line – had statistically similar associations between conscientiousness and cognitive errors. It will be important to replicate this interaction to determine its robustness.

The facet-level analyses suggested the specific components of each broad domain most associated with cognitive errors. Given the consistent association between depression and cognition and dementia risk (Kuring, Mathias, & Ward, 2020), trait Depression was the facet of neuroticism most associated with more cognitive errors. Other aspects of negative emotionality, including Angry hostility and Vulnerability to stress, were also associated with more cognitive errors. Trait Anxiety, however, was unrelated to cognitive errors after controlling for education and poverty status, which was expected to be associated with cognitive errors given that it is correlated with trait depression and associated with dementia risk (Sutin et al., 2018). For extraversion, most facets were associated with fewer cognitive errors, which suggests that the content of this trait is broadly associated with better cognition, and particularly Assertiveness, Positive emotions, Activity, and Warmth. Education and poverty status accounted for most of the association between the facets of openness and fewer cognitive errors. Still, Ideas and Values remained significant after controlling for these factors. The Ideas facet of openness refers to the tendency to be interested in intellectual activities and pursuits and such pursuits are associated consistently with lower risk of dementia (Yates, Ziser, Spector, & Orrell, 2016), as is openness to ideas (Terracciano et al., 2022; Terracciano et al., 2014). Among the facets of agreeableness, general tendencies to be trusting and to have sympathy for others were associated with fewer cognitive errors, which may reflect the healthier social connections for individuals higher in agreeableness that are also supportive of cognitive health. Finally, Competence and Dutifulness were the facets of conscientiousness associated with fewer cognitive errors. Individuals who report themselves to be high in competence feel equipped and in control of their lives. Dutifulness is an interpersonal component of conscientiousness that is often overlooked in the association between this domain and health and cognition. Yet, dutifulness – the tendency to feel responsible to others – is associated with general cognitive function (Sutin, Aschwanden, Stephan, & Terracciano, 2022) and lower dementia risk (Terracciano et al., 2022; Terracciano et al., 2014), although it has less consistent associations with intelligence (Anglim et al., 2022). This component of conscientiousness, along with competence, may drive the association at the domain level for this trait.

There are two patterns among the facets that are worth pointing out. First, none of the impulsivity-related traits (impulsiveness, excitement-seeking, self-discipline, deliberation) was associated with cognitive errors. Such null results are somewhat unexpected on the one hand because these facets tend to be related to clinical and behavioral factors that increase risk of poor cognitive outcomes (e.g., smoking; Terracciano & Costa, 2004). On the other hand, these facets also tend to be unrelated to dementia risk (e.g., Terracciano et al., 2022; Terracciano et al., 2014) and intelligence (Anglim et al., 2022). The current findings suggest that they are unrelated to cognitive errors. Second, the strongest facet-level association within four of the five domains was similar to associations reported previously for verbal fluency: depression (neuroticism), assertiveness (extraversion), ideas (openness), and tender-mindedness (agreeableness) (Sutin et al., 2011). This pattern suggests that these components of the broad domains may be the most relevant for cognitive function. The one exception was for conscientiousness, where achievement striving and self-discipline were the facets of conscientiousness associated with verbal fluency, not competence or dutifulness.

The present study had several strengths, including a sample diverse across race and SES, a comprehensive personality measure that assessed

facets as well as the broad domains, and two assessments of cognitive errors. There are also limitations to consider for future research. First, although the sample was balanced to compare Black and White adults, adults of other races and ethnicities were not included, and thus future research is needed to further examine the generalizability of the associations. The results do suggest generalizability across some socio-demographic groups, but the sample is still limited to specific populations who live in the United States. More research is needed to determine generalizability to other populations, particularly populations in middle- and low-income countries. Larger sample sizes may also be needed to ensure adequate power to detect modest differences across populations. Second, although there were two assessments of cognitive errors, recent research has highlighted the need for more than two cognitive assessments to reliably identify the association between personality and change in cognition (Sutin et al., 2023). And, indeed, personality was unrelated to change in cognition in the current analysis. Future research would benefit from additional longitudinal assessments of cognition. Third, only a brief measure of cognitive errors was used to assess cognition; future research could examine specific domains of cognition with detailed measures. Given that the measure in the current study was a measure of cognitive errors, not cognitive function more generally, generalization of findings from this brief mental status screener to cognitive function more broadly should be made cautiously. Finally, it will be critical to replicate the exploratory three-way interaction between conscientiousness, race, and poverty status to determine its robustness and then, if it does replicate, the reasons why conscientiousness may be harmful for White adults living below 125% of the federal poverty line. It may be possible, for example, that responses to economic circumstances for White individuals may shape the expression of conscientiousness in ways that do not support healthier cognition as in other populations. There were 120 White participants below the poverty line, and 42 of these participants were high in conscientiousness and 78 low in conscientiousness. It is thus necessary to replicate this finding with a larger sample. Despite these limitations, the present research indicates that personality is associated with cognitive errors, that the associations are largely similar across race and SES and other sociodemographic characteristics, and it identifies specific components of the broad domains that help give insight into the personality-cognition associations.

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## CRediT authorship contribution statement

**Angelina R. Sutin:** Study design and conceptualization, Data collection, Data analysis, Manuscript writing – first draft. **Alyssa A. Gamaldo:** Writing – review & editing. **Antonio Terracciano:** Conceptualization, Methodology, Writing – review & editing. **Michele K. Evans:** Funding acquisition, Methodology, Writing – review & editing. **Alan B. Zonderman:** Conceptualization, Methodology, Project administration, Writing – review & editing.

## Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence

the work reported in this paper.

## Appendix A. Supplementary material

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.jrp.2023.104449>.

## References

- Aiken-Morgan, A. T., Bichsel, J., Allaire, J. C., Savla, J., Edwards, C. L., & Whitfield, K. E. (2012). Personality as a source of individual differences in cognition among older African Americans. *Journal of Research in Personality*, 46(5), 465–471. <https://doi.org/10.1016/j.jrp.2012.04.006>
- Anglim, J., Dunlop, P. D., Wee, S., Horwood, S., Wood, J. K., & Marty, A. (2022). Personality and intelligence: A meta-analysis. *Psychological Bulletin*, 148(5–6), 301–336. <https://doi.org/10.1037/bul0000373>
- Arapakis, K., Brunner, E., French, E., & McCauley, J. (2021). Dementia and disadvantage in the USA and England: Population-based comparative study. *BMJ Open*, 11(10), e045186.
- Aschwanden, D., Strickhouser, J. E., Luchetti, M., Stephan, Y., Sutin, A. R., & Terracciano, A. (2021). Is personality associated with dementia risk? A meta-analytic investigation. *Ageing Research Reviews*, 67, Article 101269. <https://doi.org/10.1016/j.arr.2021.101269>
- Aschwanden, D., Sutin, A. R., Lederermann, T., Luchetti, M., Stephan, Y., Sesker, A. A., ... Terracciano, A. (2022). Subjective cognitive decline: Is a resilient personality protective against progression to objective cognitive impairment? Findings from two community-based cohort studies. *Journal of Alzheimer's Disease*, 89(1), 87–105. <https://doi.org/10.3233/JAD-220319>
- Barford, K. A., Zhao, K., & Smillie, L. D. (2015). Mapping the interpersonal domain: Translating between the Big Five, HEXACO, and Interpersonal Circumplex. *Personality and Individual Differences*, 86, 232–237. <https://doi.org/10.1016/j.paid.2015.05.038>
- Best, R. D., Cruitt, P. J., Oltmanns, T. F., & Hill, P. L. (2021). Neuroticism predicts informant reported cognitive problems through health behaviors. *Ageing and Mental Health*, 25(12), 2191–2199. <https://doi.org/10.1080/13607863.2020.1839857>
- Buchanan, T., & Loveday, C. (2018). Informant personality is associated with ratings of memory problems in older adults. *American Journal of Alzheimer's Disease and Other Dementias*, 33(7), 479–489. <https://doi.org/10.1177/1533317518790540>
- Chapman, B. P., Benedict, R. H., Lin, F., Roy, S., Federoff, H. J., & Mapstone, M. (2017). Personality and performance in specific neurocognitive domains among older persons. *American Journal of Geriatric Psychiatry*, 25(8), 900–908. <https://doi.org/10.1016/j.jagp.2017.03.006>
- Chapman, B. P., Huang, A., Peters, K., Horner, E., Manly, J., Bennett, D. A., & Lapham, S. (2020). Association between high school personality phenotype and dementia 54 years later in results from a national US sample. *JAMA Psychiatry*, 77(2), 148–154. <https://doi.org/10.1001/jamapsychiatry.2019.3120>
- Choe, Y. M., Lee, B. C., Choi, I. G., Suh, G. H., Lee, D. Y., Kim, J. W., & Initiative, A. S. D. N. (2020). MMSE subscale scores as useful predictors of AD conversion in mild cognitive impairment. *Neuropsychiatric Disease and Treatment*, 16, 1767–1775. <https://doi.org/10.2147/NDT.S263702>
- Costa, P. T., & McCrae, R. R. (1995). Domains and facets: Hierarchical personality assessment using the revised NEO personality inventory. *Journal of Personality Assessment*, 64(1), 21–50. [https://doi.org/10.1207/s15327752jpa6401\\_2](https://doi.org/10.1207/s15327752jpa6401_2)
- Curtis, R. G., Windsor, T. D., & Soubelet, A. (2015). The relationship between Big-5 personality traits and cognitive ability in older adults – A review. *Neuropsychology, Development, and Cognition B Aging Neuropsychology and Cognition*, 22(1), 42–71. <https://doi.org/10.1080/13825585.2014.888392>
- Damian, R. I., Su, R., Shanahan, M., Trautwein, U., & Roberts, B. W. (2015). Can personality traits and intelligence compensate for background disadvantage? Predicting status attainment in adulthood. *Journal of Personality and Social Psychology*, 109(3), 473–489. <https://doi.org/10.1037/pspp0000024>
- Dolansky, M. A., Hawkins, M. A., Schaefer, J. T., Sattar, A., Gunstad, J., Redle, J. D., ... Hughes, J. W. (2016). Association between poorer cognitive function and reduced objectively monitored medication adherence in patients with heart failure. *Circulation and Heart Failure*, 9(12). <https://doi.org/10.1161/CIRCHEARTFAILURE.116.002475>
- Evans, M. K., Lepkowski, J. M., Powe, N. R., LaVeist, T., Kuczmarski, M. F., & Zonderman, A. B. (2010). Healthy aging in neighborhoods of diversity across the life span (HANDLS): Overcoming barriers to implementing a longitudinal, epidemiologic, urban study of health, race, and socioeconomic status. *Ethnicity and Disease*, 20, 267–275.
- Gamaldo, A. A., Sardina, A. L., Sutin, A. R., Cruz, T. E., Salas, R. M. E., Gamaldo, C. E., ... Andel, R. (2020). Personality as it relates to sleep habits in Black adults. *Sleep Health*, 6, 232–239.
- Graham, E. K., James, B. D., Jackson, K. L., Willroth, E. C., Luo, J., Beam, C. R., ... Mroczek, D. K. (2021). A coordinated analysis of the associations among personality traits, cognitive decline, and dementia in older adulthood. *Journal of Research in Personality*, 93, Article 104100. <https://doi.org/10.1016/j.jrp.2021.104100>
- Graham, E. K., & Lachman, M. E. (2014). Personality traits, facets and cognitive performance: Age differences in their relations. *Personality and Individual Differences*, 59, 89–95. <https://doi.org/10.1016/j.paid.2013.11.011>

- Hakulinen, C., Hintsanen, M., Munafò, M. R., Virtanen, M., Kivimäki, M., Batty, G. D., & Jokela, M. (2015). Personality and smoking: Individual-participant meta-analysis of nine cohort studies. *Addiction*, *110*, 1844–1852. <https://doi.org/10.1111/add.13079>
- Jokela, M., Hakulinen, C., Singh-Manoux, A., & Kivimäki, M. (2014). Personality change associated with chronic diseases: Pooled analysis of four prospective cohort studies. *Psychological Medicine*, *44*(12), 2629–2640. <https://doi.org/10.1017/S0033291714000257>
- Jorm, A. F., Broe, A. A., Creasey, H., Sulway, M. R., Dent, O., Fairley, M. J., ... Tennant, C. (1996). Further data on the validity of the informant questionnaire on cognitive decline in the elderly (IQCODE). *International Journal of Geriatric Psychiatry*, *11*(2), 131–139.
- Judge, T. A., & Zapata, C. P. (2015). The person–situation debate revisited: Effect of situation strength and trait activation on the validity of the big five personality traits in predicting job performance. *Academy of Management Journal*, *58*, 1149–1179. <https://doi.org/10.5465/amj.2010.0837>
- Kaup, A. R., Harmell, A. L., & Yaffe, K. (2019). Conscientiousness is associated with lower risk of dementia among black and white older adults. *Neuroepidemiology*, *52*(1–2), 86–92. <https://doi.org/10.1159/000492821>
- Knopman, D. S., Gottesman, R. F., Sharrett, A. R., Tapia, A. L., DavisThomas, S., Windham, B. G., ... Mosley, T. H., Jr. (2018). Midlife vascular risk factors and midlife cognitive status in relation to prevalence of mild cognitive impairment and dementia in later life: The atherosclerosis risk in communities study. *Alzheimer's and Dementia*, *14*(11), 1406–1415. <https://doi.org/10.1016/j.jalz.2018.03.011>
- Kotov, R., Gamez, W., Schmidt, F., & Watson, D. (2010). Linking “Big” personality traits to anxiety, depressive, and substance use disorders: A meta-analysis. *Psychological Bulletin*, *136*, 768–821.
- Kuring, J. K., Mathias, J. L., & Ward, L. (2020). Risk of Dementia in persons who have previously experienced clinically-significant depression, anxiety, or PTSD: A systematic review and meta-analysis. *Journal of Affective Disorders*, *274*, 247–261. <https://doi.org/10.1016/j.jad.2020.05.020>
- Livingston, G., Huntley, J., Sommerlad, A., Ames, D., Ballard, C., Banerjee, S., ... Mukadam, N. (2020). Dementia prevention, intervention, and care: 2020 report of the Lancet Commission. *Lancet*, *396*(10248), 413–446. [https://doi.org/10.1016/S0140-6736\(20\)30367-6](https://doi.org/10.1016/S0140-6736(20)30367-6)
- Luchetti, M., Terracciano, A., Aschwanden, D., Lee, J. H., Stephan, Y., & Sutin, A. R. (2020). Loneliness is associated with risk of cognitive impairment in the Survey of Health, Ageing and Retirement in Europe. *International Journal of Geriatric Psychiatry*, *35*(7), 794–801. <https://doi.org/10.1002/gps.5304>
- Luchetti, M., Terracciano, A., Stephan, Y., Aschwanden, D., & Sutin, A. R. (2021). Personality and memory: A multilevel analysis across 27 countries from the Survey of Health, Ageing and Retirement in Europe. *Psychological Science*, *32*, 1047–1057. <https://doi.org/10.1177/0956797621993101>
- Luchetti, M., Terracciano, A., Stephan, Y., & Sutin, A. R. (2016). Personality and cognitive decline in older adults: Data from a longitudinal sample and meta-analysis. *Journals of Gerontology B Psychological Sciences and Social Sciences*, *71*, 591–601. <https://doi.org/10.1093/geronb/gbu184>
- Martin, P., Baenziger, J., Macdonald, M., Siegler, I. C., & Poon, L. W. (2009). Engaged lifestyle, personality, and mental status among centenarians. *Journal of Adult Development*, *16*(4), 199–208. <https://doi.org/10.1007/s10804-009-9066-y>
- McClendon, J., Bogdan, R., Jackson, J. J., & Oltmanns, T. F. (2021). Mechanisms of Black-White disparities in health among older adults: Examining discrimination and personality. *Journal of Health Psychology*, *26*(7), 995–1011. <https://doi.org/10.1177/1359105319860180>
- McCrae, R. R., & Costa, P. T. (2010). NEO inventories for the NEO personality inventory-3, NEO five-factor inventory-3, and NEO personality inventory-revised professional manual. PAR.
- McCrae, R. R., & John, O. P. (1992). An introduction to the five-factor model and its applications. *Journal of Personality*, *60*(2), 175–215.
- Mehta, K. M., & Yeo, G. W. (2017). Systematic review of dementia prevalence and incidence in United States race/ethnic populations. *Alzheimer's and Dementia*, *13*(1), 72–83. <https://doi.org/10.1016/j.jalz.2016.06.2360>
- Pfeiffer, E. (1975). A short portable mental status questionnaire for the assessment of organic brain deficit in elderly patients. *Journal of the American Geriatrics Society*, *23*(10), 433–441. <https://doi.org/10.1111/j.1532-5415.1975.tb00927.x>
- Portacolone, E., Rubinstein, R. L., Covinsky, K. E., Halpern, J., & Johnson, J. K. (2019). The precarity of older adults living alone with cognitive impairment. *Gerontologist*, *59*(2), 271–280. <https://doi.org/10.1093/geront/gmx193>
- Rohrer, J. M., & Lucas, R. E. (2018). Only so many hours: Correlations between personality and daily time use in a representative German panel. *Collabra Psychology*, *4*(1). <https://doi.org/10.1525/collabra.112>
- Sherman, R.A., Pashler, H. (2019). Powerful moderator variables in behavioral science? Don't bet on them (Version 3). <<https://doi.org/https://doi.org/10.31234/osf.io/c65wm>>.
- Slavin, M. J., Brodaty, H., Kochan, N. A., Crawford, J. D., Trollor, J. N., Draper, B., & Sachdev, P. S. (2010). Prevalence and predictors of “subjective cognitive complaints” in the Sydney Memory and Ageing Study. *American Journal of Geriatric Psychiatry*, *18*(8), 701–710.
- Stites, S. D., Harkins, K., Rubright, J. D., & Karlawish, J. (2018). Relationships between cognitive complaints and quality of life in older adults with mild cognitive impairment, mild Alzheimer disease dementia, and normal cognition. *Alzheimer's Disease and Associated Disorders*, *32*(4), 276–283. <https://doi.org/10.1097/WAD.0000000000000262>
- Sutin, A. R., Aschwanden, D., Stephan, Y., & Terracciano, A. (2022). The association between facets of conscientiousness and performance-based and informant-rated cognition, affect, and activities in older adults. *Journal of Personality*, *90*, 121–132. <https://doi.org/10.1111/jopy.12657>
- Sutin, A. R., Brown, J., Luchetti, M., Aschwanden, D., Stephan, Y., & Terracciano, A. (2023). Five-factor model personality traits and the trajectory of episodic memory: Individual-participant meta-analysis of 471,821 memory assessments from 120,640 participants. *Journal of Gerontology B Psychological Sciences and Social Sciences*, *78*, 421–433. <https://doi.org/10.1093/geronb/gbac154>
- Sutin, A. R., Stephan, Y., Damian, R. I., Luchetti, M., Strickhouser, J. E., & Terracciano, A. (2019a). Five-factor model personality traits and verbal fluency in 10 cohorts. *Psychology and Aging*, *34*, 362–373. <https://doi.org/10.1037/pag0000351>
- Sutin, A. R., Stephan, Y., Luchetti, M., Artese, A., Oshio, A., & Terracciano, A. (2016). The five factor model of personality and physical inactivity: A meta-analysis of 16 samples. *Journal of Research in Personality*, *63*, 22–28. <https://doi.org/10.1016/j.jrp.2016.05.001>
- Sutin, A. R., Stephan, Y., Luchetti, M., & Terracciano, A. (2019b). Five-factor model personality traits and cognitive function in five domains in older adulthood. *BMC Geriatrics*, *19*(1), 343. <https://doi.org/10.1186/s12877-019-1362-1>
- Sutin, A. R., Stephan, Y., & Terracciano, A. (2018a). Facets of conscientiousness and risk of dementia. *Psychological Medicine*, *48*, 974–982. <https://doi.org/10.1017/S0033291717002306>
- Sutin, A. R., Stephan, Y., & Terracciano, A. (2018b). Psychological distress, self-beliefs, and risk of cognitive impairment and dementia. *Journal of Alzheimer's Disease*, *65*(3), 1041–1050. <https://doi.org/10.3233/JAD-180119>
- Sutin, A. R., Terracciano, A., Kitner-Triolo, M. H., Uda, M., Schlessinger, D., & Zonderman, A. B. (2011). Personality traits prospectively predict verbal fluency in a lifespan sample. *Psychology and Aging*, *26*(4), 994–999. <https://doi.org/10.1037/a0024276>
- Terracciano, A., & Costa, P. T., Jr (2004). Smoking and the five-factor model of personality. *Addiction*, *99*, 472–481.
- Terracciano, A., Piras, M. R., Sutin, A. R., Delitala, A., Curreli, N. C., Balaci, L., ... Fiorillo, E. (2022). Facets of personality and risk of cognitive impairment: Longitudinal findings in a rural community from Sardinia. *Journal of Alzheimer's Disease*, *88*, 1651–1661. <https://doi.org/10.3233/JAD-220400>
- Terracciano, A., Sutin, A. R., An, Y., O'Brien, R. J., Ferrucci, L., Zonderman, A. B., & Resnick, S. M. (2014). Personality and risk of Alzheimer's disease: New data and meta-analysis. *Alzheimer's and Dementia*, *10*, 179–186. <https://doi.org/10.1016/j.jalz.2013.03.002>
- Wilson, R. S., Boyle, P. A., Yu, L., Segawa, E., Sytsma, J., & Bennett, D. A. (2015). Conscientiousness, dementia related pathology, and trajectories of cognitive aging. *Psychology and Aging*, *30*(1), 74–82. <https://doi.org/10.1037/pag000013>
- Yates, L. A., Ziser, S., Spector, A., & Orrell, M. (2016). Cognitive leisure activities and future risk of cognitive impairment and dementia: Systematic review and meta-analysis. *International Psychogeriatrics*, *28*(11), 1791–1806. <https://doi.org/10.1017/S1041610216001137>
- Yin, J., Lassale, C., Steptoe, A., & Cadar, D. (2019). Exploring the bidirectional associations between loneliness and cognitive functioning over 10 years: The English longitudinal study of ageing. *International Journal of Epidemiology*, *48*(6), 1937–1948. <https://doi.org/10.1093/ije/dyz085>
- Yoneda, T., Graham, E., Lozinski, T., Bennett, D. A., Mroczek, D., Piccinin, A. M., ... Muniz-Terrera, G. (2023). Personality traits, cognitive states, and mortality in older adulthood. *Journal of Personality and Social Psychology*, *124*(2), 381–395. <https://doi.org/10.1037/pspp0000418>

Supplementary Table S1

*Correlations among study variables*

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1. Age (years)	--										
2. Sex (female)	0.030	--									
3. Race (Black)	-0.033	-0.031	--								
4. Poverty status (below)	-.068*	-.092**	.114**	--							
5. Education in years	.086**	0.033	-.077*	-.253**	--						
6. Cognitive errors	0.024	-.111**	.086**	.161**	-.256**	--					
7. Neuroticism	-.201**	-.080**	-.154**	.133**	-.252**	.135**	--				
8. Extraversion	-0.049	-0.008	.120**	-.075*	.248**	-.154**	-.488**	--			
9. Openness	-0.047	0.035	-.061*	-.162**	.431**	-.232**	-.218**	.455**	--		
10. Agreeableness	.165**	-.198**	-0.044	-.066*	.232**	-.142**	-.369**	.156**	.218**	--	
11. Conscientiousness	0.012	-0.051	.213**	-0.021	.132**	-.076*	-.602**	.405**	.167**	.328**	--
12. N1: Anxiety	-.111**	-.138**	-.156**	0.052	-.145**	0.055	.752**	-.339**	-.073*	-.101**	-.384**
13. N2: Angry Hostility	-.204**	-0.021	-0.035	.174**	-.242**	.147**	.665**	-.289**	-.229**	-.501**	-.343**
14. N3: Depression	-.168**	-0.024	-.110**	.126**	-.225**	.145**	.814**	-.416**	-.199**	-.249**	-.476**
15. N4: Self-Consciousness	-.120**	-.062*	-.144**	.103**	-.203**	.110**	.728**	-.498**	-.260**	-.235**	-.452**
16. N5: Impulsiveness	-.089**	-0.041	-.104**	0.029	-0.022	0.010	.572**	-.168**	0.057	-.207**	-.458**
17. N6: Vulnerability	-.179**	-.063*	-.124**	.085**	-.244**	.112**	.818**	-.411**	-.232**	-.328**	-.535**
18. E1: Warmth	.110**	-.069*	0.008	-.133**	.263**	-.153**	-.428**	.677**	.391**	.411**	.365**
19. E2: Gregariousness	0.057	-.120**	-0.008	-.088**	.160**	-0.041	-.294**	.651**	.246**	.175**	.184**
20. E3: Assertiveness	-0.035	0.017	.132**	-0.035	.218**	-.153**	-.385**	.631**	.296**	-0.043	.346**
21. E4: Activity	-.154**	.082**	-0.007	-0.044	.111**	-.128**	-.122**	.383**	.151**	-0.028	0.058
22. E5: Excitement Seeking	-.174**	.231**	.093**	0.050	-0.049	-0.005	-.084**	.492**	.147**	-.208**	.064*
23. E6: Positive Emotions	-0.015	-.153**	.184**	-0.021	.181**	-.087**	-.382**	.661**	.363**	.234**	.379**
24. O1: Fantasy	-0.014	.096**	-.088**	-.104**	.215**	-.121**	-.087**	.272**	.625**	0.004	-0.016
25. O2: Aesthetics	-0.012	-.073*	.078*	-0.057	.268**	-.084**	-.162**	.328**	.731**	.218**	.165**



26. O3: Feelings	-.080**	-0.028	-.128**	-.080**	.248**	-.148**	.125**	.192**	.577**	.064*	-0.048
27. O4: Actions	-0.026	0.028	0.021	-.157**	.261**	-.122**	-.240**	.359**	.551**	.151**	.165**
28. O5: Ideas	-0.036	.109**	-0.020	-.073*	.308**	-.201**	-.223**	.313**	.689**	.138**	.198**
29. O6: Values	-0.010	0.011	-.115**	-.156**	.312**	-.199**	-.228**	.234**	.538**	.232**	.144**
30. A1: Trust	.085**	-0.044	-.181**	-.122**	.292**	-.170**	-.304**	.335**	.317**	.533**	.167**
31. A2: Straightforwardness	.139**	-.202**	0.037	-0.010	.065*	-0.041	-.253**	-0.019	-0.032	.636**	.286**
32. A3: Altruism	0.019	-.168**	0.001	-.078*	.204**	-.123**	-.325**	.326**	.325**	.662**	.398**
33. A4: Compliance	.227**	-.082**	.092**	-0.004	0.058	0.023	-.318**	0.020	-0.039	.596**	.199**
34. A5: Modesty	.063*	-.093**	-.207**	0.001	0.052	-.075*	.100**	-.282**	-.081**	.459**	-.124**
35. A6: Tender-Mindedness	0.016	-.104**	.092**	-0.023	.148**	-.125**	-.176**	.193**	.309**	.585**	.222**
36. C1: Competence	0.021	-0.037	.154**	-.108**	.191**	-.142**	-.576**	.395**	.217**	.324**	.759**
37. C2: Order	-0.057	-.113**	.159**	.082**	-0.035	0.037	-.183**	.130**	0.003	.101**	.634**
38. C3: Dutifulness	0.052	-0.038	0.012	-0.041	.156**	-.101**	-.393**	.275**	.155**	.334**	.678**
39. C4: Achievement Striving	-.068*	-0.012	.243**	-0.009	.089**	-0.030	-.446**	.443**	.194**	.176**	.751**
40. C5: Self-Discipline	0.044	0.020	.208**	-0.016	.088**	-0.044	-.552**	.343**	.128**	.216**	.789**
41. C6: Deliberation	.063*	-0.033	.099**	-0.010	.080**	-0.053	-.377**	.110**	0.010	.239**	.563**

	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	22.
12. N1: Anxiety	--										
13. N2: Angry Hostility	.328**	--									
14. N3: Depression	.548**	.427**	--								
15. N4: Self-Consciousness	.465**	.380**	.530**	--							
16. N5: Impulsiveness	.314**	.278**	.339**	.294**	--						
17. N6: Vulnerability	.566**	.473**	.624**	.536**	.378**	--					
18. E1: Warmth	-.235**	-.372**	-.354**	-.382**	-.141**	-.373**	--				
19. E2: Gregariousness	-.157**	-.293**	-.248**	-.251**	-.117**	-.210**	.406**	--			
20. E3: Assertiveness	-.302**	-.092**	-.357**	-.428**	-.128**	-.366**	.286**	.216**	--		
21. E4: Activity	-.139**	-0.043	-.094**	-.197**	0.014	-.067*	.140**	.067*	.160**	--	
22. E5: Excitement Seeking	-.132**	0.055	-0.048	-.126**	-0.060	-0.059	.067*	.185**	.191**	.155**	--
23. E6: Positive Emotions	-.226**	-.255**	-.343**	-.367**	-.129**	-.341**	.459**	.325**	.325**	.109**	.072*
24. O1: Fantasy	-0.054	-.073*	-.109**	-.097**	.074*	-.098**	.244**	.139**	.134**	.107**	.132**
25. O2: Aesthetics	-0.039	-.210**	-.137**	-.223**	0.056	-.144**	.325**	.214**	.185**	.062*	0.048
26. O3: Feelings	.198**	0.048	.072*	-0.010	.197**	0.039	.179**	0.018	.174**	.152**	-0.009
27. O4: Actions	-.179**	-.191**	-.209**	-.206**	-0.035	-.209**	.243**	.310**	.196**	.075*	.191**
28. O5: Ideas	-.091**	-.213**	-.172**	-.245**	-0.051	-.203**	.222**	.144**	.275**	.085**	.143**
29. O6: Values	-.122**	-.206**	-.192**	-.176**	-0.032	-.260**	.240**	.094**	.131**	.090**	0.054
30. A1: Trust	-.138**	-.406**	-.237**	-.211**	-.089**	-.232**	.399**	.330**	.098**	.115**	-0.016
31. A2: Straightforwardness	-.109**	-.214**	-.204**	-.120**	-.244**	-.227**	.175**	0.034	-.077*	-.080**	-.223**
32. A3: Altruism	-.097**	-.357**	-.232**	-.283**	-.148**	-.314**	.481**	.167**	.156**	0.031	-0.040
33. A4: Compliance	-.117**	-.481**	-.189**	-.165**	-.231**	-.213**	.184**	.153**	-.143**	-.079*	-.167**
34. A5: Modesty	.110**	-0.056	.121**	.157**	.062*	0.040	-0.053	-.147**	-.263**	-.093**	-.253**
35. A6: Tender-Mindedness	0.004	-.211**	-.123**	-.201**	-0.054	-.198**	.267**	.070*	.108**	0.022	-0.008
36. C1: Competence	-.377**	-.369**	-.440**	-.453**	-.358**	-.531**	.384**	.148**	.347**	.110**	0.043
37. C2: Order	-.096**	-0.050	-.159**	-.154**	-.192**	-.162**	.104**	0.013	.126**	0.021	0.010
38. C3: Dutifulness	-.232**	-.242**	-.308**	-.270**	-.306**	-.371**	.288**	.147**	.214**	0.035	0.022
39. C4: Achievement Striving	-.305**	-.217**	-.364**	-.395**	-.273**	-.403**	.308**	.191**	.371**	.083**	.156**

40. C5: Self-Discipline	-.350**	-.291**	-.446**	-.423**	-.436**	-.486**	.292**	.159**	.310**	0.029	.105**
41. C6: Deliberation	-.253**	-.283**	-.278**	-.196**	-.355**	-.292**	.162**	.117**	.077*	-0.033	-.079**

	23.	24.	25.	26.	27.	28.	29.	30.	31.	32.	33.
23. E6: Positive Emotions	--										
24. O1: Fantasy	.200**	--									
25. O2: Aesthetics	.299**	.318**	--								
26. O3: Feelings	.195**	.273**	.317**	--							
27. O4: Actions	.216**	.223**	.331**	.081**	--						
28. O5: Ideas	.217**	.306**	.467**	.249**	.254**	--					
29. O6: Values	.218**	.239**	.178**	.228**	.232**	.207**	--				
30. A1: Trust	.251**	.119**	.208**	.143**	.246**	.223**	.249**	--			
31. A2: Straightforwardness	.096**	-.089**	-0.005	-.062*	-0.031	-0.035	.104**	.145**	--		
32. A3: Altruism	.334**	.157**	.280**	.168**	.183**	.181**	.236**	.280**	.346**	--	
33. A4: Compliance	.103**	-.075*	0.059	-.166**	0.048	-0.001	-0.027	.201**	.286**	.222**	--
34. A5: Modesty	-.163**	-.159**	-0.041	-0.015	-0.046	-.103**	.066*	.073*	.190**	.085**	.137**
35. A6: Tender-Mindedness	.210**	.084**	.279**	.190**	.138**	.234**	.206**	.165**	.224**	.430**	.138**
36. C1: Competence	.349**	.061*	.168**	0.018	.159**	.190**	.210**	.164**	.253**	.403**	.174**
37. C2: Order	.179**	-.104**	0.052	0.000	-0.011	0.032	0.027	-0.025	.107**	.186**	0.027
38. C3: Dutifulness	.240**	0.039	.114**	-0.026	.149**	.162**	.136**	.189**	.286**	.325**	.203**
39. C4: Achievement Striving	.418**	0.039	.200**	-0.037	.202**	.174**	.133**	.096**	.146**	.334**	.064*
40. C5: Self-Discipline	.276**	-0.001	.129**	-.064*	.148**	.176**	.075*	.120**	.197**	.283**	.135**
41. C6: Deliberation	.122**	-.092**	0.029	-.092**	0.050	.100**	0.032	.172**	.222**	.142**	.247**

	34.	35.	36.	37.	38.	39.	40.	41.
34. A5: Modesty	--							
35. A6: Tender-Mindedness	.109**	--						
36. C1: Competence	-.109**	.255**	--					
37. C2: Order	-0.058	.126**	.312**	--				
38. C3: Dutifulness	0.014	.146**	.438**	.283**	--			
39. C4: Achievement Striving	-.200**	.194**	.547**	.384**	.407**	--		
40. C5: Self-Discipline	-.149**	.170**	.555**	.396**	.433**	.562**	--	
41. C6: Deliberation	-0.006	0.035	.346**	.209**	.305**	.227**	.309**	--

Supplementary Table S2

Partial Correlations among study variables controlling for age

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1. Age (years)	--										
2. Sex (female)	--	--									
3. Race (Black)	--	-0.029	--								
4. Poverty status (below)	--	-0.090**	0.113**	--							
5. Education in years	--	0.031	-0.075*	-0.249**	--						
6. Cognitive errors	--	-0.111**	0.086**	0.163**	-0.260**	--					
7. Neuroticism	--	-0.075*	-0.164**	0.122**	-0.240**	0.143**	--				
8. Extraversion	--	-0.007	0.118**	-0.078*	0.254**	-0.153**	-0.509**	--			
9. Openness	--	0.037	-0.063*	-0.166**	0.437**	-0.231**	-0.232**	0.454**	--		
10. Agreeableness	--	-0.206**	-0.039	-0.056	0.221**	-0.148**	-0.348**	0.167**	0.229**	--	
11. Conscientiousness	--	-0.051	0.213**	-0.021	0.132**	-0.076*	-0.612**	0.406**	0.167**	0.330**	--
12. N1: Anxiety	--	-0.134**	-0.162**	0.046	-0.137**	0.058	0.750**	-0.347**	-0.079*	-0.085**	-0.385**
13. N2: Angry Hostility	--	-0.015	-0.043	0.164**	-0.230**	0.155**	0.651**	-0.306**	-0.244**	-0.484**	-0.348**
14. N3: Depression	--	-0.019	-0.117**	0.117**	-0.214**	0.151**	0.808**	-0.431**	-0.210**	-0.228**	-0.481**
15. N4: Self-Consciousness	--	-0.059*	-0.149**	0.096**	-0.195**	0.113**	0.724**	-0.508**	-0.268**	-0.219**	-0.454**
16. N5: Impulsiveness	--	-0.038	-0.108**	0.023	-0.014	0.012	0.568**	-0.173**	0.053	-0.196**	-0.459**
17. N6: Vulnerability	--	-0.058	-0.131**	0.074*	-0.233**	0.118**	0.812**	-0.427**	-0.245**	-0.308**	-0.541**
18. E1: Warmth	--	-0.072*	0.012	-0.126**	0.256**	-0.156**	-0.417**	0.688**	0.399**	0.401**	0.366**
19. E2: Gregariousness	--	-0.122**	-0.006	-0.084**	0.156**	-0.042	-0.289**	0.656**	0.249**	0.168**	0.183**
20. E3: Assertiveness	--	0.018	0.131**	-0.038	0.222**	-0.153**	-0.400**	0.631**	0.295**	-0.038	0.347**
21. E4: Activity	--	0.088**	-0.012	-0.056	0.126**	-0.125**	-0.159**	0.380**	0.146**	-0.003	0.061*
22. E5: Excitement Seeking	--	0.240	0.088**	0.039	-0.034	-0.001	-0.123**	0.492**	0.141**	-0.185	0.067*
23. E6: Positive Emotions	--	-0.153	0.183**	-0.022	0.183**	-0.087**	-0.394**	0.661**	0.363**	0.240	0.379**
24. O1: Fantasy	--	0.096**	-0.088**	-0.105**	0.217**	-0.121**	-0.091**	0.272**	0.625**	0.006	-0.016
25. O2: Aesthetics	--	-0.072*	0.078**	-0.058	0.270**	-0.084**	-0.168**	0.328**	0.731**	0.223**	0.165**

26. O3: Feelings	--	-0.026	-0.131**	-0.086**	0.256**	-0.146**	0.111**	0.189**	0.576**	0.078*	-0.047
27. O4: Actions	--	0.028	0.020	-0.159**	0.264**	-0.122**	-0.250**	0.359**	0.551**	0.157**	0.165**
28. O5: Ideas	--	0.110**	-0.021	-0.075*	0.312**	-0.200**	-0.235**	0.312**	0.688**	0.145**	0.198**
29. O6: Values	--	0.011	-0.116**	-0.157**	0.314**	-0.199**	-0.235**	0.234**	0.538**	0.237**	0.144**
30. A1: Trust	--	-0.046	-0.179**	-0.117**	0.287**	-0.173**	-0.294**	0.341**	0.323**	0.528**	0.166**
31. A2: Straightforwardness	--	-0.208**	0.042	-0.001	0.054	-0.044	-0.232**	-0.012	-0.026	0.628**	0.287**
32. A3: Altruism	--	-0.169**	0.002	-0.077*	0.203**	-0.123**	-0.328**	0.327**	0.326**	0.668**	0.398**
33. A4: Compliance	--	-0.091**	0.102**	0.011	0.040	0.017	-0.285**	0.032	-0.029	0.581**	0.201**
34. A5: Modesty	--	-0.096**	-0.206**	0.005	0.047	-0.076*	0.116**	-0.280**	-0.079*	0.456**	-0.125**
35. A6: Tender-Mindedness	--	-0.104**	0.093**	-0.022	0.147**	-0.126**	-0.177**	0.194**	0.310**	0.590**	0.221**
36. C1: Competence	--	-0.038	0.154**	-0.106**	0.190**	-0.143**	-0.584**	0.397**	0.218**	0.325**	0.759**
37. C2: Order	--	-0.112**	0.158**	0.078*	-0.030	0.038	-0.198**	0.128**	0.00	0.112**	0.635**
38. C3: Dutifulness	--	-0.040	0.014	-0.038	0.152**	-0.102**	-0.391**	0.278**	0.158**	0.330**	0.679**
39. C4: Achievement Striving	--	-0.010	0.241**	-0.013	0.095**	-0.028	-0.471**	0.441**	0.191**	0.191**	0.753**
40. C5: Self-Discipline	--	0.019	0.210**	-0.013	0.085**	-0.045	-0.555**	0.346**	0.130**	0.211**	0.789**
41. C6: Deliberation	--	-0.035	0.101**	-0.006	0.075*	-0.055	-0.372**	0.113**	0.013	0.232**	0.563**

	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	22.
12. N1: Anxiety	--										
13. N2: Angry Hostility	0.314**	--									
14. N3: Depression	0.540**	0.407**	--								
15. N4: Self-Consciousness	0.458**	0.366**	0.521**	--							
16. N5: Impulsiveness	0.307**	0.267**	0.330**	0.286**	--						
17. N6: Vulnerability	0.558**	0.453**	0.613**	0.527**	0.369**	--					
18. E1: Warmth	-0.226**	-0.360**	-0.342**	-0.374**	-0.133**	-0.361**	--				
19. E2: Gregariousness	-0.151**	-0.288**	-0.242**	-0.246**	-0.113**	-0.203**	.403**	--			
20. E3: Assertiveness	-0.308**	-0.102**	-0.368**	-0.435**	-0.132**	-0.379**	.291**	.219**	--		
21. E4: Activity	-0.159**	-0.077*	-0.123**	-0.219**	0.000	-0.097**	.160**	.077*	.156**	--	
22. E5: Excitement Seeking	-0.155**	0.020	-0.079*	-0.150**	-0.077*	-0.093**	.088**	.199**	.188**	.131**	--
23. E6: Positive Emotions	-0.229**	-0.263**	-0.350**	-0.371**	-0.131**	-0.350**	.464**	.327**	.325**	.108**	.070*
24. O1: Fantasy	-0.056	-0.078*	-0.113**	-0.099**	0.073*	-0.103**	.247**	.140**	.133**	.106**	.131**
25. O2: Aesthetics	-0.040	-0.217**	-0.141**	-0.226**	0.055	-0.148**	.329**	.215**	.185**	.061*	.047
26. O3: Feelings	0.191**	0.033	0.060*	-0.020	0.191**	.025	.190**	.023	.172**	.142**	-.023
27. O4: Actions	-0.183**	-0.201**	-0.217**	-0.211**	-0.037	-0.217**	.248**	.312**	.196**	.072*	.189**
28. O5: Ideas	-0.095**	-0.225**	-0.181**	-0.251**	-0.054	-0.213**	.227**	.146**	.274**	.080**	.139**
29. O6: Values	-0.124**	-0.212**	-0.196**	-0.178**	-0.033	-0.266**	.243**	.095**	.131**	.090**	.053
30. A1: Trust	-0.130**	-0.398**	-0.226**	-0.203**	-0.082**	-0.221**	.394**	.327**	.102**	.130*	-.001
31. A2: Straightforwardness	-0.095**	-0.192**	-0.185**	-0.105**	-0.235**	-0.207**	.162**	.026	-.073*	-.060*	-.204**
32. A3: Altruism	-0.095**	-0.361**	-0.233**	-0.283**	-0.147**	-0.316**	.482**	.167**	.157**	.034	-.037
33. A4: Compliance	-0.095**	-0.455**	-0.157**	-0.142**	-0.217**	-0.180**	.164**	.144**	-.138**	-.046	-.133**
34. A5: Modesty	0.118**	-0.044	0.134**	0.166**	0.068*	.053	-.060*	-.151**	-.262**	-.084**	-.246**
35. A6: Tender-Mindedness	0.006	-0.212**	-0.123**	-0.200**	-0.053	-0.198**	.267**	.069*	.109**	.025	-.006
36. C1: Competence	-0.378**	-0.372**	-0.443**	-0.454**	-0.358**	-0.536**	.384**	.147**	.348**	.115**	.048
37. C2: Order	-0.104**	-0.063*	-0.171**	-0.162**	-0.198**	-0.176**	.111**	.016	.124**	.012	.000
38. C3: Dutifulness	-0.228**	-0.236**	-0.304**	-0.266**	-0.303**	-0.368**	.284**	.145**	.217**	.043	.032
39. C4: Achievement Striving	-0.315**	-0.236**	-0.382**	-0.407**	-0.281**	-0.423**	.318**	.196**	.370**	.073*	.147**



40. C5: Self-Discipline	-0.348**	-0.289**	-0.445**	-0.421**	-0.434**	-.487**	.289**	.157**	.312**	.036	.115**
41. C6: Deliberation	-0.248**	-0.276**	-0.272**	-0.190**	-0.351**	-.286**	.156**	.114**	.080**	-.023	-.069*

	23.	24.	25.	26.	27.	28.	29.	30.	31.	32.	33.
23. E6: Positive Emotions	--										
24. O1: Fantasy	0.200**	--									
25. O2: Aesthetics	0.299**	0.318**	--								
26. O3: Feelings	0.194**	0.273**	0.317**	--							
27. O4: Actions	0.215**	0.223**	0.331**	0.080**	--						
28. O5: Ideas	0.217**	0.306**	0.467**	0.247**	0.253**	--					
29. O6: Values	0.218**	0.239**	0.178**	0.228**	0.232**	0.207**	--				
30. A1: Trust	0.253**	0.121**	0.210**	0.151**	0.249**	0.227**	0.251**	--			
31. A2: Straightforwardness	0.099**	-0.088**	-0.003	-0.051	-0.028	-0.031	0.106**	0.135**	--		
32. A3: Altruism	0.335**	0.157**	0.280**	0.170**	0.184**	0.182**	0.237**	0.279**	0.347**	--	
33. A4: Compliance	0.110**	-0.074*	0.063*	-0.152**	0.055	0.008	-0.025	0.187**	0.264**	.223**	--
34. A5: Modesty	-0.162**	-0.158**	-0.040	-0.010	-0.044	-0.101**	0.066*	0.068*	0.184**	.084**	.127**
35. A6: Tender-Mindedness	0.211**	0.085**	0.279**	0.192**	0.138**	0.234**	0.206**	0.165**	0.224**	.430**	.138**
36. C1: Competence	0.349**	0.061*	0.168**	0.019	0.160**	0.191**	0.210**	0.163**	0.253**	.403**	.173**
37. C2: Order	0.179**	-0.105**	0.051	-0.004	-0.013	0.030	0.026	-0.020	0.116**	.188**	.041
38. C3: Dutifulness	0.241**	0.040	0.115**	-0.022	0.150**	0.164**	0.137**	0.185**	0.282**	.325**	.197**
39. C4: Achievement Striving	0.418**	0.038	0.200**	-0.042	0.201**	0.172**	0.132**	0.102**	0.158**	.336**	.081**
40. C5: Self-Discipline	0.277**	0.000	0.130**	-0.061	0.149**	0.178**	0.076*	0.117**	0.193**	.283**	.129**
41. C6: Deliberation	0.123**	-0.092**	0.030	-0.087**	0.051	0.103**	0.033	0.167**	0.216**	.141**	.239**

	34.	35.	36.	37.	38.	39.	40.	41.
34. A5: Modesty	--							
35. A6: Tender-Mindedness	0.109**	--						
36. C1: Competence	-0.111**	0.255**	--					
37. C2: Order	-0.055	0.127**	0.314**	--				
38. C3: Dutifulness	0.010	0.146**	0.437**	0.287**	--			
39. C4: Achievement Striving	-0.197**	0.195**	0.550**	0.382**	0.412**	--		
40. C5: Self-Discipline	-0.152**	0.170**	0.554**	0.399**	0.431**	0.567**	--	
41. C6: Deliberation	-0.010	0.034	0.346**	0.214**	0.303**	0.232**	0.307**	--

Supplementary Table S3A

*Correlations among study variables by race (White)*

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1. Age (years)	--										
2. Sex (female)	0.070	--									
3. Poverty status (below)	-0.056	-.117*	--								
4. Education in years	0.078	0.029	-.272**	--							
5. Cognitive errors	-0.001	-.192**	.137**	-.368**	--						
6. Neuroticism	-.283**	-.143**	.197**	-.270**	0.097	--					
7. Extraversion	-0.019	-0.020	-0.094	.301**	-.174**	-.481**	--				
8. Openness	-0.043	0.038	-.206**	.505**	-.270**	-.186**	.477**	--			
9. Agreeableness	.121*	-.192**	-0.053	.253**	-.116*	-.334**	.152**	.183**	--		
10. Conscientiousness	0.065	-0.028	-0.055	.118*	-0.091	-.533**	.379**	0.090	.292**	--	
11. N1: Anxiety	-.229**	-.188**	.154**	-.153**	0.010	.760**	-.298**	-0.039	-0.043	-.282**	--
12. N2: Angry Hostility	-.259**	-0.064	.245**	-.264**	.111*	.663**	-.290**	-.210**	-.519**	-.303**	.308**
13. N3: Depression	-.256**	-0.080	.161**	-.240**	.116*	.852**	-.421**	-.167**	-.221**	-.442**	.611**
14. N4: Self-Consciousness	-.180**	-.111*	.104*	-.176**	0.078	.750**	-.521**	-.225**	-.194**	-.423**	.519**
15. N5: Impulsiveness	-.100*	-0.093	0.023	-0.012	-0.018	.595**	-.216**	0.060	-.215**	-.478**	.299**
16. N6: Vulnerability	-.211**	-.102*	.168**	-.336**	.123*	.821**	-.398**	-.234**	-.314**	-.487**	.583**
17. E1: Warmth	.140**	-0.093	-.177**	.328**	-.171**	-.444**	.713**	.409**	.433**	.387**	-.196**
18. E2: Gregariousness	0.058	-.107*	-0.098	.177**	-0.037	-.334**	.729**	.271**	.154**	.224**	-.162**
19. E3: Assertiveness	0.019	0.045	-0.050	.270**	-.214**	-.419**	.649**	.331**	-0.070	.336**	-.287**
20. E4: Activity	-.173**	0.087	-0.085	.130**	-.141**	-.112*	.346**	.116*	-0.059	0.024	-.195**
21. E5: Excitement Seeking	-.183**	.168**	0.081	-0.057	0.032	-0.044	.457**	.127*	-.211**	0.043	-.143**
22. E6: Positive Emotions	-0.002	-.136**	-0.031	.240**	-.128*	-.343**	.687**	.439**	.260**	.295**	-.121*
23. O1: Fantasy	0.025	0.098	-.169**	.337**	-.171**	-.149**	.307**	.726**	0.022	-0.020	-0.087
24. O2: Aesthetics	-0.022	-0.080	-.099*	.325**	-.125*	-0.095	.349**	.768**	.167**	0.075	0.038
25. O3: Feelings	-0.095	-0.069	-.115*	.315**	-.213**	.131**	.257**	.627**	.108*	-0.048	.223**

26. O4: Actions	0.004	0.058	-.159**	.284**	-.173**	-.267**	.393**	.586**	.100*	0.086	-.199**
27. O5: Ideas	-0.057	.155**	-.165**	.383**	-.225**	-.195**	.382**	.746**	.123*	.142**	-0.079
28. O6: Values	-0.028	-0.002	-.143**	.422**	-.209**	-.195**	.260**	.610**	.226**	.124*	-0.074
29. A1: Trust	.118*	-0.028	-.204**	.399**	-.181**	-.360**	.363**	.337**	.543**	.208**	-.158**
30. A2: Straightforwardness	.161**	-.176**	0.059	0.030	0.000	-.204**	-.112*	-.135**	.641**	.230**	-0.047
31. A3: Altruism	-0.017	-.140**	-0.054	.234**	-0.090	-.268**	.344**	.309**	.679**	.323**	0.000
32. A4: Compliance	.200**	-0.047	-0.062	0.075	-0.003	-.371**	0.038	-0.026	.624**	.191**	-.141**
33. A5: Modesty	-0.017	-.182**	0.066	0.032	-0.049	0.088	-.237**	-.102*	.538**	-0.058	.111*
34. A6: Tender-Mindedness	-0.053	-.125*	0.011	.154**	-.105*	-0.046	.178**	.321**	.555**	.147**	.114*
35. C1: Competence	0.048	0.003	-.145**	.204**	-.137**	-.545**	.406**	.207**	.274**	.736**	-.312**
36. C2: Order	-0.027	-.118*	0.060	-0.045	0.034	-.099*	.125*	-0.065	0.048	.620**	-0.043
37. C3: Dutifulness	.128*	-0.054	-0.070	.170**	-.132**	-.367**	.255**	0.086	.340**	.683**	-.155**
38. C4: Achievement Striving	-0.049	0.028	-0.045	0.052	-0.033	-.346**	.404**	.164**	.147**	.716**	-.184**
39. C5: Self-Discipline	.106*	0.034	-0.044	0.046	-0.010	-.510**	.295**	0.034	.159**	.779**	-.308**
40. C6: Deliberation	0.064	0.002	0.001	0.086	-.121*	-.343**	0.088	-0.026	.262**	.561**	-.161**

	12.	13.	14.	15.	16.	17.	18.	19.	20	21.	22.
12. N2: Angry Hostility	--										
13. N3: Depression	.468**	--									
14. N4: Self-Consciousness	.381**	.570**	--								
15. N5: Impulsiveness	.326**	.387**	.366**	--							
16. N6: Vulnerability	.454**	.679**	.541**	.400**	--						
17. E1: Warmth	-.406**	-.386**	-.402**	-.192**	-.393**	--					
18. E2: Gregariousness	-.289**	-.304**	-.320**	-.171**	-.239**	.507**	--				
19. E3: Assertiveness	-0.092	-.389**	-.481**	-.188**	-.439**	.347**	.290**	--			
20. E4: Activity	-0.073	-0.084	-.148**	0.071	-0.041	.112*	.127*	.120*	--		
21. E5: Excitement Seeking	.104*	0.031	-.143**	-0.076	0.008	0.038	.190**	.185**	.144**	--	
22. E6: Positive Emotions	-.277**	-.346**	-.354**	-.154**	-.275**	.495**	.434**	.319**	.120*	0.067	--
23. O1: Fantasy	-.123*	-.170**	-.133**	0.052	-.180**	.264**	.162**	.186**	0.096	.107*	.285**
24. O2: Aesthetics	-.188**	-0.086	-.148**	0.096	-.122*	.340**	.239**	.196**	0.052	0.022	.378**
25. O3: Feelings	0.070	0.060	-0.011	.200**	0.044	.230**	.099*	.169**	.138**	0.022	.288**
26. O4: Actions	-.233**	-.218**	-.217**	-0.063	-.245**	.275**	.322**	.274**	0.031	.206**	.252**
27. O5: Ideas	-.165**	-.132**	-.258**	-0.025	-.215**	.270**	.179**	.361**	.119*	.136**	.299**
28. O6: Values	-.219**	-.151**	-.145**	-0.026	-.249**	.288**	.111*	.160**	0.036	0.043	.277**
29. A1: Trust	-.489**	-.284**	-.271**	-.117*	-.268**	.466**	.335**	0.092	0.092	-0.060	.370**
30. A2: Straightforwardness	-.195**	-.139**	-0.092	-.265**	-.204**	.152**	-0.045	-.157**	-.132**	-.234**	-0.023
31. A3: Altruism	-.363**	-.202**	-.223**	-.107*	-.312**	.509**	.204**	.170**	-0.014	-0.035	.347**
32. A4: Compliance	-.606**	-.234**	-.171**	-.275**	-.230**	.218**	.150**	-.173**	-0.061	-.156**	.134**
33. A5: Modesty	-0.076	.118*	.187**	0.010	0.036	-0.034	-.135**	-.264**	-0.047	-.215**	-.136**
34. A6: Tender-Mindedness	-0.090	-0.026	-.111*	0.027	-.138**	.260**	0.039	.120*	-0.040	-0.035	.258**
35. C1: Competence	-.368**	-.425**	-.483**	-.361**	-.505**	.421**	.183**	.397**	0.057	0.064	.295**
36. C2: Order	0.044	-.114*	-0.091	-.168**	-0.089	.099*	0.045	0.089	0.023	0.067	.119*
37. C3: Dutifulness	-.259**	-.293**	-.266**	-.315**	-.378**	.319**	.151**	.205**	0.015	-0.039	.231**
38. C4: Achievement Striving	-.184**	-.276**	-.334**	-.237**	-.351**	.324**	.231**	.371**	0.086	.126*	.284**

39. C5: Self-Discipline	-.228**	-.433**	-.407**	-.474**	-.459**	.262**	.176**	.291**	-0.030	0.085	.215**
40. C6: Deliberation	-.291**	-.284**	-.171**	-.405**	-.241**	.197**	.146**	0.042	-0.046	-.139**	0.082

	23.	24.	25.	26.	27.	28.	29.	30.	1.	32.	33.
23. O1: Fantasy	--										
24. O2: Aesthetics	.437**	--									
25. O3: Feelings	.369**	.417**	--								
26. O4: Actions	.347**	.367**	.136**	--							
27. O5: Ideas	.449**	.538**	.332**	.329**	--						
28. O6: Values	.372**	.263**	.316**	.296**	.310**	--					
29. A1: Trust	.168**	.229**	.189**	.226**	.269**	.296**	--				
30. A2: Straightforwardness	-.162**	-0.096	-.115*	-0.089	-.114*	0.031	.126*	--			
31. A3: Altruism	.162**	.244**	.225**	.136**	.211**	.278**	.340**	.304**	--		
32. A4: Compliance	-0.076	0.032	-.135**	0.055	-0.017	0.030	.294**	.297**	.251**	--	
33. A5: Modesty	-.135**	-0.052	-0.013	-0.064	-.138**	-0.007	0.038	.312**	.182**	.228**	--
34. A6: Tender-Mindedness	.155**	.275**	.290**	.104*	.258**	.209**	.131**	.203**	.440**	0.069	.206**
35. C1: Competence	0.088	.130**	0.053	.168**	.217**	.187**	.229**	.151**	.350**	.157**	-.115*
36. C2: Order	-.108*	-0.037	0.015	-.136**	-0.043	0.033	-0.012	0.029	.124*	-0.027	-0.017
37. C3: Dutifulness	-0.004	0.068	-0.030	0.093	.121*	0.098	.179**	.278**	.298**	.229**	.099*
38. C4: Achievement Striving	0.041	.150**	-0.004	.168**	.160**	.147**	.155**	0.050	.300**	0.042	-.142**
39. C5: Self-Discipline	0.001	0.011	-0.097	0.096	0.089	0.039	.108*	.175**	.157**	.107*	-0.061
40. C6: Deliberation	-0.083	0.007	-.127*	-0.007	0.065	0.023	.226**	.276**	.128*	.306**	-0.006



	34.	35.	36.	37.	38.	39.	40.
34. A6: Tender-Mindedness	--						
35. C1: Competence	.216**	--					
36. C2: Order	0.091	.263**	--				
37. C3: Dutifulness	.132**	.403**	.279**	--			
38. C4: Achievement Striving	.142**	.531**	.354**	.397**	--		
39. C5: Self-Discipline	0.074	.523**	.381**	.451**	.476**	--	
40. C6: Deliberation	-0.040	.351**	.172**	.304**	.201**	.311**	--

Supplementary Table S3B

*Correlations among study variables by race (Black)*

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1. Age (years)	--										
2. Sex (female)	0.003	--									
3. Poverty status (below)	-0.069	-0.073	--								
4. Education in years	.089*	0.032	-.236**	--							
5. Cognitive errors	0.045	-0.056	.162**	-.157**	--						
6. Neuroticism	-.154**	-0.045	.126**	-.266**	.191**	--					
7. Extraversion	-0.066	0.006	-.088*	.224**	-.160**	-.477**	--				
8. Openness	-0.055	0.030	-.124**	.344**	-.196**	-.275**	.461**	--			
9. Agreeableness	.192**	-.206**	-0.067	.211**	-.155**	-.417**	.171**	.248**	--		
10. Conscientiousness	-0.011	-0.057	-0.043	.184**	-.101**	-.632**	.401**	.268**	.381**	--	
11. N1: Anxiety	-0.038	-.115**	0.020	-.167**	.112**	.735**	-.349**	-.127**	-.159**	-.421**	--
12. N2: Angry Hostility	-.167**	0.006	.139**	-.230**	.179**	.673**	-.285**	-.254**	-.493**	-.371**	.341**
13. N3: Depression	-.113**	0.010	.129**	-.232**	.185**	.778**	-.399**	-.247**	-.283**	-.485**	.484**
14. N4: Self-Consciousness	-.089*	-0.037	.132**	-.256**	.155**	.701**	-.465**	-.318**	-.279**	-.445**	.404**
15. N5: Impulsiveness	-.089*	-0.013	0.052	-0.045	0.043	.545**	-.113**	0.043	-.212**	-.430**	.306**
16. N6: Vulnerability	-.165**	-0.043	0.059	-.186**	.124**	.811**	-.405**	-.252**	-.353**	-.551**	.538**
17. E1: Warmth	.089*	-0.052	-.108**	.205**	-.142**	-.422**	.655**	.379**	.397**	.362**	-.270**
18. E2: Gregariousness	0.057	-.129**	-.081*	.146**	-0.043	-.273**	.603**	.226**	.189**	.167**	-.158**
19. E3: Assertiveness	-0.067	0.004	-0.052	.195**	-.132**	-.334**	.606**	.286**	-0.014	.324**	-.287**
20. E4: Activity	-.145**	.079*	-0.024	.102**	-.121**	-.135**	.417**	.182**	-0.011	.081*	-.112**
21. E5: Excitement Seeking	-.164**	.277**	0.016	-0.030	-0.043	-.090*	.510**	.178**	-.202**	0.047	-.104**
22. E6: Positive Emotions	-0.014	-.160**	-0.052	.165**	-.089*	-.382**	.631**	.334**	.237**	.394**	-.264**
23. O1: Fantasy	-0.048	.091*	-0.046	.089*	-0.072	-0.061	.268**	.525**	-0.017	0.020	-0.055
24. O2: Aesthetics	0.000	-0.064	-0.047	.230**	-0.067	-.200**	.299**	.716**	.265**	.210**	-.079*
25. O3: Feelings	-.077*	-0.008	-0.037	.177**	-.087*	.089*	.176**	.535**	0.024	-0.003	.151**

26. O4: Actions	-0.044	0.008	-.162**	.248**	-.092*	-.219**	.334**	.532**	.188**	.216**	-.163**
27. O5: Ideas	-0.021	0.075	-0.009	.236**	-.182**	-.258**	.265**	.635**	.148**	.256**	-.108**
28. O6: Values	-0.003	0.014	-.148**	.198**	-.178**	-.297**	.244**	.465**	.232**	.210**	-.199**
29. A1: Trust	0.055	-0.065	-0.043	.185**	-.142**	-.328**	.367**	.293**	.528**	.217**	-.182**
30. A2: Straightforwardness	.125**	-.218**	-0.060	.103**	-0.075	-.287**	0.045	0.066	.637**	.324**	-.147**
31. A3: Altruism	0.040	-.184**	-.092*	.188**	-.143**	-.373**	.321**	.349**	.655**	.457**	-.161**
32. A4: Compliance	.252**	-.100**	0.012	0.058	0.026	-.264**	-0.012	-0.041	.589**	.180**	-.079*
33. A5: Modesty	.104**	-0.055	0.004	0.042	-0.064	0.060	-.285**	-.095*	.414**	-.099*	0.061
34. A6: Tender-Mindedness	0.065	-.087*	-0.060	.160**	-.152**	-.251**	.189**	.319**	.616**	.246**	-0.046
35. C1: Competence	0.013	-0.055	-.118**	.213**	-.171**	-.585**	.370**	.253**	.375**	.762**	-.397**
36. C2: Order	-0.070	-.105**	0.068	-0.004	0.017	-.211**	.104**	.083*	.153**	.623**	-.096*
37. C3: Dutifulness	0.005	-0.027	-0.028	.150**	-.084*	-.417**	.291**	.217**	.331**	.697**	-.288**
38. C4: Achievement Striving	-0.071	-0.025	-0.034	.161**	-0.064	-.486**	.450**	.263**	.223**	.751**	-.344**
39. C5: Self-Discipline	0.014	0.023	-0.039	.162**	-.100**	-.561**	.353**	.246**	.281**	.780**	-.343**
40. C6: Deliberation	0.069	-0.050	-0.035	.091*	-0.023	-.387**	.107**	0.053	.233**	.554**	-.299**

	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	22.
12. N2: Angry Hostility	--										
13. N3: Depression	.394**	--									
14. N4: Self-Consciousness	.379**	.486**	--								
15. N5: Impulsiveness	.240**	.291**	.225**	--							
16. N6: Vulnerability	.486**	.572**	.518**	.348**	--						
17. E1: Warmth	-.346**	-.330**	-.373**	-.103**	-.361**	--					
18. E2: Gregariousness	-.297**	-.210**	-.207**	-.082*	-.194**	.330**	--				
19. E3: Assertiveness	-.086*	-.314**	-.367**	-0.062	-.291**	.238**	.166**	--			
20. E4: Activity	-0.026	-.104**	-.231**	-0.018	-.085*	.160**	0.033	.190**	--		
21. E5: Excitement Seeking	0.026	-.088*	-.094*	-0.034	-.087*	.087*	.185**	.179**	.163**	--	
22. E6: Positive Emotions	-.235**	-.318**	-.347**	-.083*	-.365**	.443**	.259**	.301**	.109**	0.049	--
23. O1: Fantasy	-0.040	-.078*	-.094*	0.075	-0.055	.230**	.122**	.115**	.115**	.167**	.171**
24. O2: Aesthetics	-.224**	-.166**	-.266**	0.041	-.147**	.314**	.197**	.162**	0.071	0.056	.223**
25. O3: Feelings	0.025	0.058	-0.042	.176**	0.009	.145**	-0.041	.213**	.162**	-0.010	.177**
26. O4: Actions	-.160**	-.201**	-.198**	-0.012	-.181**	.220**	.302**	.136**	.101**	.178**	.190**
27. O5: Ideas	-.253**	-.212**	-.245**	-0.075	-.202**	.181**	.116**	.213**	0.065	.153**	.167**
28. O6: Values	-.205**	-.253**	-.236**	-0.058	-.302**	.205**	.081*	.139**	.125**	.082*	.221**
29. A1: Trust	-.368**	-.246**	-.223**	-.106**	-.256**	.363**	.334**	.151**	.131**	0.043	.238**
30. A2: Straightforwardness	-.227**	-.250**	-.134**	-.225**	-.239**	.193**	.092*	-0.025	-0.050	-.223**	.174**
31. A3: Altruism	-.355**	-.257**	-.326**	-.174**	-.321**	.467**	.145**	.150**	0.053	-0.044	.337**
32. A4: Compliance	-.392**	-.142**	-.143**	-.190**	-.186**	.160**	.158**	-.145**	-.089*	-.191**	0.056
33. A5: Modesty	-0.057	.091*	.097*	0.061	0.002	-0.065	-.163**	-.232**	-.122**	-.255**	-.126**
34. A6: Tender-Mindedness	-.291**	-.178**	-.244**	-.091*	-.223**	.274**	.092*	.081*	0.057	-0.006	.157**
35. C1: Competence	-.369**	-.437**	-.415**	-.340**	-.535**	.366**	.131**	.291**	.142**	0.008	.354**
36. C2: Order	-.111**	-.167**	-.165**	-.187**	-.188**	.108**	-0.009	.121**	0.022	-0.055	.181**
37. C3: Dutifulness	-.230**	-.321**	-.275**	-.301**	-.369**	.267**	.145**	.222**	0.045	0.059	.250**
38. C4: Achievement Striving	-.236**	-.403**	-.404**	-.269**	-.413**	.311**	.178**	.341**	.088*	.147**	.464**

39. C5: Self-Discipline	-.338**	-.437**	-.405**	-.391**	-.486**	.324**	.157**	.293**	0.067	.091*	.271**
40. C6: Deliberation	-.274**	-.260**	-.194**	-.310**	-.314**	.136**	.100*	.082*	-0.025	-0.056	.123**

	23.	24.	25.	26.	27.	28.	29.	30.	31.	32.	33.
23. O1: Fantasy	--										
24. O2: Aesthetics	.234**	--									
25. O3: Feelings	.184**	.264**	--								
26. O4: Actions	.132**	.303**	0.049	--							
27. O5: Ideas	.183**	.413**	.184**	.197**	--						
28. O6: Values	.112**	.126**	.139**	.190**	.118**	--					
29. A1: Trust	0.056	.225**	0.076	.273**	.187**	.185**	--				
30. A2: Straightforwardness	-0.026	0.062	-0.015	0.009	0.029	.170**	.175**	--			
31. A3: Altruism	.156**	.309**	.136**	.213**	.163**	.214**	.251**	.374**	--		
32. A4: Compliance	-0.061	0.067	-.170**	0.041	0.015	-0.050	.173**	.275**	.206**	--	
33. A5: Modesty	-.216**	-0.007	-0.063	-0.029	-.090*	.078*	0.036	.133**	0.035	.121**	--
34. A6: Tender-Mindedness	0.048	.274**	.147**	.159**	.222**	.227**	.223**	.234**	.427**	.169**	.088*
35. C1: Competence	0.067	.179**	0.029	.152**	.181**	.265**	.177**	.318**	.441**	.165**	-0.060
36. C2: Order	-.080*	.100*	0.025	0.072	.097*	0.056	0.015	.156**	.229**	0.040	-0.032
37. C3: Dutifulness	0.073	.147**	-0.020	.185**	.193**	.169**	.205**	.293**	.341**	.187**	-0.031
38. C4: Achievement Striving	.078*	.216**	-0.007	.227**	.203**	.182**	.141**	.203**	.369**	0.043	-.168**
39. C5: Self-Discipline	0.032	.198**	0.004	.183**	.261**	.152**	.205**	.207**	.374**	.128**	-.142**
40. C6: Deliberation	-.085*	0.032	-0.048	.085*	.131**	0.060	.171**	.180**	.152**	.197**	0.028

	34.	35.	36.	37.	38.	39.	40.
34. A6: Tender-Mindedness	--						
35. C1: Competence	.263**	--					
36. C2: Order	.129**	.316**	--				
37. C3: Dutifulness	.154**	.464**	.289**	--			
38. C4: Achievement Striving	.199**	.532**	.365**	.428**	--		
39. C5: Self-Discipline	.210**	.554**	.371**	.433**	.583**	--	
40. C6: Deliberation	0.069	.328**	.214**	.307**	.216**	.286**	--

Supplemental Table S4

*Association Between Personality Traits and Wave 4 Cognitive Errors*

Personality Trait	Model 1			Model 2			Model 3		
	OR	95% CI	p	OR	SE	p	OR	SE	p
<b>Domains</b>									
N: Neuroticism	1.26	1.13, 1.41	<.001	1.14	1.01, 1.28	.033	1.13	1.01, 1.27	.048
E: Extraversion	.74	.65, .83	<.001	.82	.72, .94	.004	.83	.73, .94	.004
O: Openness	.67	.59, .75	<.001	.78	.68, .89	<.001	.78	.69, .90	<.001
A: Agreeableness	.71	.63, .80	<.001	.78	.69, .88	<.001	.78	.69, .88	<.001
C: Conscientiousness	.87	.78, .96	.008	.92	.83, 1.03	.152	.92	.83, 1.03	.157
<b>Facets</b>									
N1: Anxiety	1.13	1.01-1.26	.030	1.06	.95, 1.19	.297	1.06	.95, 1.19	.312
N2: Angry Hostility	1.25	1.13-1.39	<.001	1.15	1.04, 1.28	.010	1.14	1.02, 1.27	.018
N3: Depression	1.23	1.11-1.37	<.001	1.14	1.02, 1.27	.025	1.12	1.01, 1.26	.037
N4: Self-Consciousness	1.18	1.06, 1.31	.003	1.08	.96, 1.21	.177	1.07	.96, 1.20	.219
N5: Impulsiveness	1.01	.90, 1.13	.844	1.00	.89, 1.12	.986	1.00	.89, 1.12	.963
N6: Vulnerability	1.19	1.08, 1.30	<.001	1.09	.98, 1.20	.103	1.08	.98, 1.20	.114
E1: Warmth	.81	.74, .89	<.001	.88	.80, .97	.013	.89	.80, .98	.019
E2: Gregariousness	.92	.83, 1.02	.105	.98	.88, 1.09	.710	.99	.88, 1.10	.796
E3: Assertiveness	.78	.70, .87	<.001	.85	.76, .95	.004	.85	.76, .95	.003
E4: Activity	.74	.64, .86	<.001	.79	.68, .92	.003	.79	.68, .92	.003
E5: Excitement Seeking	1.05	.94, 1.16	.419	1.03	.92, 1.15	.585	1.03	.92, 1.15	.646
E6: Positive Emotions	.80	.72, .89	<.001	.86	.77, .96	.007	.68	.77, .96	.008
O1: Fantasy	.82	.72, .92	.002	.90	.78, 1.02	.102	.90	.78, 1.03	.116
O2: Aesthetics	.85	.76, .95	.005	.97	.86, 1.09	.603	.97	.86, 1.09	.614
O3: Feelings	.81	.73, .89	<.001	.88	.79, .98	.018	.88	.79, .98	.019
O4: Actions	.86	.78, .95	.004	.96	.86, 1.06	.407	.97	.87, 1.08	.532
O5: Ideas	.71	.63, .80	<.001	.80	.70, .90	<.001	.79	.70, .90	<.001
O6: Values	.70	.62, .78	<.001	.77	.69, .87	<.001	.78	.69, .88	<.001



A1: Trust	.74	.66, .82	<.001	.81	.72, .91	<.001	.82	.73, .92	<.001
A2: Straightforwardness	.90	.81, 1.01	.063	.92	.82, 1.03	.164	.92	.83, 1.03	.169
A3: Altruism	.77	.70, .85	<.001	.83	.75, .92	<.001	.83	.75, .92	<.001
A4: Compliance	1.00	.91, 1.09	.969	1.02	.93, 1.12	.715	1.02	.92, 1.12	.724
A5: Modesty	.87	.78, .97	.014	.88	.79, .98	.024	.88	.78, .98	.020
A6: Tender-Mindedness	.81	.74, .89	<.001	.85	.78, .94	<.001	.85	.78, .93	<.001
C1: Competence	.80	.73, .88	<.001	.86	.78, .94	.002	.86	.78, .95	.003
C2: Order	1.03	.94, 1.14	.527	1.03	.93, 1.14	.565	1.02	.93, 1.13	.641
C3: Dutifulness	.86	.78, .95	.003	.91	.82, 1.01	.078	.91	.82, 1.01	.078
C4: Achievement Striving	.94	.85, 1.04	.201	.99	.89, 1.09	.793	.99	.89, 1.10	.806
C5: Self-Discipline	.91	.83, 1.01	.075	.95	.86, 1.06	.351	.95	.86, 1.06	.358
C6: Deliberation	.93	.84, 1.04	.198	.96	.87, 1.08	.523	.96	.87, 1.08	.526

*Note.* N=1049. Model 1 controlled for age, sex, and race. Model 2 is Model 1 also controlling for education. Model 3 is Model 2 also controlling for poverty status.

Supplemental Table S5

*Association Between Personality Traits and Wave 5 Cognitive Errors*

Personality Trait	Model 1			Model 2			Model 3		
	OR	95% CI	p	OR	SE	p	OR	SE	p
<b>Domains</b>									
N: Neuroticism	1.35	1.20, 1.52	<.001	1.20	1.06, 1.36	.004	1.19	1.05, 1.35	.007
E: Extraversion	.80	.70, .91	<.001	.92	.80, 1.05	.220	.92	.81, 1.06	.242
O: Openness	.72	.64, .82	<.001	.88	.77, 1.01	.078	.89	.78, 1.02	.095
A: Agreeableness	.80	.71, .90	<.001	.89	.78, 1.02	.083	.89	.78, 1.02	.088
C: Conscientiousness	.84	.75, .94	.002	.90	.80, 1.01	.075	.90	.80, 1.01	.081
<b>Facets</b>									
N1: Anxiety	1.18	1.06, 1.33	.004	1.10	.98, 1.24	.113	1.10	.97, 1.24	.124
N2: Angry Hostility	1.29	1.15, 1.43	<.001	1.17	1.04, 1.31	.007	1.15	1.03, 1.29	.014
N3: Depression	1.34	1.20, 1.49	<.001	1.22	1.08, 1.37	<.001	1.21	1.07, 1.36	.002
N4: Self-Consciousness	1.22	1.09, 1.37	<.001	1.11	.99, 1.25	.080	1.10	.98, 1.24	.107
N5: Impulsiveness	1.04	.92, 1.17	.526	1.02	.90, 1.15	.756	1.02	.90, 1.15	.816
N6: Vulnerability	1.25	1.13, 1.38	<.001	1.14	1.02, 1.26	.017	1.13	1.02, 1.26	.020
E1: Warmth	.86	.78, .94	.002	.95	.86, 1.05	.323	.96	.87, 1.06	.413
E2: Gregariousness	.95	.86, 1.06	.367	1.03	.92, 1.15	.605	1.04	.93, 1.16	.514
E3: Assertiveness	.82	.73, .91	<.001	.90	.80, 1.01	.077	.90	.80, 1.01	.071
E4: Activity	.86	.74, 1.00	.057	.93	.79, 1.09	.388	.93	.80, 1.10	.405
E5: Excitement Seeking	1.02	.91, 1.14	.733	1.01	.90, 1.14	.873	1.00	.89, 1.13	.961
E6: Positive Emotions	.83	.75, .93	.001	.91	.81, 1.02	.118	.91	.81, 1.02	.120
O1: Fantasy	.94	.83, 1.07	.362	1.06	.93, 1.22	.382	1.07	.93, 1.23	.347
O2: Aesthetics	.85	.76, .95	.005	.98	.86, 1.11	.714	.98	.86, 1.11	.712
O3: Feelings	.86	.77, .95	.004	.94	.85, 1.06	.321	.94	.84, 1.06	.318
O4: Actions	.86	.77, .95	.004	.97	.87, 1.09	.613	.98	.88, 1.10	.784
O5: Ideas	.76	.68, .86	<.001	.88	.77, .99	.041	.87	.77, .99	.036
O6: Values	.73	.64, .82	<.001	.81	.72, .92	.001	.82	.72, .93	.002

A1: Trust	.78	.69, .87	<.001	.87	.77, .98	.027	.88	.78, .99	.031
A2: Straightforwardness	.96	.86, 1.07	.440	.98	.87, 1.10	.748	.98	.87, 1.10	.764
A3: Altruism	.85	.77, .94	.001	.93	.84, 1.03	.174	.94	.84, 1.04	.207
A4: Compliance	1.02	.92, 1.12	.723	1.04	.94, 1.15	.399	1.04	.94, 1.15	.401
A5: Modesty	.92	.82, 1.02	.122	.92	.82, 1.04	.176	.92	.82, 1.03	.159
A6: Tender-Mindedness	.87	.79, .95	.002	.92	.84, 1.01	.087	.92	.84, 1.01	.087
C1: Competence	.80	.72, .88	<.001	.86	.78, .95	.004	.87	.79, .96	.007
C2: Order	1.01	.91, 1.11	.877	1.01	.91, 1.12	.907	1.00	.90, 1.11	.996
C3: Dutifulness	.90	.81, .99	.041	.96	.86, 1.07	.453	.96	.86, 1.07	.454
C4: Achievement Striving	.88	.79, .97	.013	.93	.83, 1.03	.173	.93	.83, 1.04	.186
C5: Self-Discipline	.89	.80, .99	.029	.94	.84, 1.05	.252	.94	.84, 1.05	.269
C6: Deliberation	.88	.79, .98	.025	.91	.81, 1.02	.120	.91	.81, 1.02	.121

*Note.*  $N=993$ . Model 1 controlled for age, sex, and race. Model 2 is Model 1 also controlling for education. Model 3 is Model 2 also controlling for poverty status.

Supplemental Table S6

*Models for the Interaction Between Each Personality Domain and Sociodemographic Factor on Cognitive Errors*

	Neuroticism			Extraversion			Openness			Agreeableness			Conscientiousness		
	Est	SE	p	Est	SE	p	Est	SE	p	Est	SE	p	Est	SE	p
	<u>Age</u>														
Age	.05	.02	.003	.04	.02	.032	.03	.02	.063	.05	.02	.003	.04	.02	.017
Sex	-.10	.04	.003	-.11	.04	.002	-.11	.04	.002	-.14	.04	<.001	-.11	.04	.001
Race	.14	.04	<.001	.13	.04	<.001	.11	.04	.001	.11	.04	.001	.14	.04	<.001
Poverty Status	.11	.04	.003	.12	.04	.001	.11	.04	.002	.12	.04	.001	.12	.04	<.001
Wave	-.12	.02	<.001	-.12	.02	<.001	-.12	.02	<.001	-.12	.02	<.001	-.12	.02	<.001
Education	-.15	.02	<.001	-.15	.02	<.001	-.14	.02	<.001	-.15	.02	<.001	-.16	.02	<.001
Trait	.06	.02	<.001	-.06	.02	.002	-.08	.02	<.001	-.06	.02	<.001	-.05	.02	.003
Trait x Age	.00	.02	.879	.02	.02	.164	.03	.02	.069	-.01	.02	.643	.02	.02	.347
	<u>Sex</u>														
Age	.05	.02	.003	.04	.02	.023	.04	.02	.042	.05	.02	.003	.04	.02	.012
Sex	-.10	.04	.003	-.11	.04	.001	-.11	.04	.002	-.14	.04	<.001	-.12	.04	<.001
Race	.14	.04	<.001	.13	.04	<.001	.11	.04	.001	.11	.04	.001	.14	.04	<.001
Poverty Status	.11	.04	.003	.11	.04	.002	.11	.04	.002	.12	.04	.001	.12	.04	.001
Wave	-.12	.02	<.001	-.12	.02	<.001	-.12	.02	<.001	-.12	.02	<.001	-.12	.02	<.001
Education	-.15	.02	<.001	-.15	.02	<.001	-.13	.02	<.001	-.15	.02	<.001	-.16	.02	<.001
Trait	.08	.05	.099	-.14	.05	.006	-.12	.05	.018	-.07	.05	.196	-.14	.05	.005
Trait x Sex	-.02	.04	.607	.06	.03	.084	.03	.03	.333	.00	.04	.944	.06	.04	.063
	<u>Race</u>														
Age	.05	.02	.004	.04	.02	.031	.03	.02	.044	.05	.02	.003	.04	.02	.015
Sex	-.10	.04	.003	-.11	.04	.001	-.11	.04	.002	-.14	.04	<.001	-.12	.04	<.001
Race	.13	.04	<.001	.13	.04	<.001	.11	.04	.001	.11	.04	.001	.14	.04	<.001
Education	-.15	.02	<.001	-.15	.02	<.001	-.13	.02	<.001	-.15	.02	<.001	-.16	.02	<.001
Poverty Status	.11	.04	.002	.12	.04	.001	.11	.04	.002	.12	.04	.001	.12	.04	.001
Wave	-.12	.02	<.005	-.12	.02	<.001	-.12	.02	<.001	-.12	.02	<.001	-.12	.02	<.001
Trait	-.05	.06	.377	-.06	.06	.271	-.09	.05	.098	.03	.06	.553	-.09	.06	.150
Trait x Race	.07	.03	.039	.03	.03	.932	.01	.03	.792	-.06	.03	.075	.02	.04	.582
	<u>Poverty Status</u>														

Age	.05	.02	.002	.04	.02	.031	.04	.02	.043	.05	.02	.003	.04	.02	.015	
Sex	-.10	.04	.004	-.11	.04	.001	-.11	.04	.002	-.14	.04	<.001	-.12	.04	<.001	
Race	.14	.04	<.001	.13	.04	<.001	.11	.04	.002	.11	.04	.001	.14	.04	<.001	
Poverty Status	.11	.04	.002	.12	.02	.001	.11	.04	.002	.12	.04	.001	.012	.04	.001	
Wave	-.12	.02	<.001	-.12	.02	<.001	-.12	.02	<.001	-.12	.02	<.001	-.12	.02	<.001	
Education	-.15	.02	<.001	-.15	.02	<.001	-.13	.02	<.001	-.15	.02	<.001	-.16	.02	<.001	
Trait	.13	.05	.013	-.09	.05	.066	-.10	.05	.056	.00	.05	.921	-.07	.05	.151	
Trait x Poverty	-.05	.04	.163	.03	.04	.451	.02	.04	.626	-.05	.03	.155	.01	.04	.698	
							<u>Education</u>									
Age	.05	.02	.003	.04	.02	.031	.03	.02	.051	.05	.02	.003	.04	.02	.020	
Sex	-.10	.04	.003	-.11	.04	.001	-.11	.04	.002	-.14	.04	<.001	-.12	.04	<.001	
Race	.14	.04	<.001	.13	.04	<.001	.12	.04	<.001	.12	.04	.001	.14	.04	<.001	
Poverty Status	.11	.04	.003	.12	.04	.001	.11	.04	.002	.12	.04	.001	.12	.04	<.001	
Wave	-.12	.02	<.001	-.12	.02	<.001	-.12	.02	<.001	-.12	.02	<.001	-.12	.02	<.001	
Education	-.15	.02	<.001	-.15	.02	<.001	-.14	.02	<.001	-.15	.02	<.001	-.16	.02	<.001	
Trait	.06	.02	<.001	-.06	.02	.001	-.08	.02	<.001	-.06	.02	<.001	-.06	.02	.001	
Trait x Education	-.01	.02	.560	.00	.02	.937	.01	.02	.421	.02	.02	.303	.03	.02	.103	

Note. N=1062.

Supplemental Table S7

*Models for the Three-Way Interaction Between Each Personality Domain and Sociodemographic Factor on Cognitive Errors*

	Neuroticism			Extraversion			Openness			Agreeableness			Conscientiousness		
	Est	SE	p	Est	SE	p	Est	SE	p	Est	SE	p	Est	SE	p
Sex	-.10	.04	.003	-.11	.04	.001	-.11	.04	.002	-.14	.04	<.001	-.11	.04	.001
Race	.25	.11	.020	.20	.11	.068	.13	.11	.211	.17	.11	.106	.22	.11	.044
Poverty	.30	.14	.027	.21	.13	.112	.14	.13	.269	.18	.13	.150	.24	.13	.072
Age	.05	.02	.004	.04	.02	.027	.04	.02	.042	.05	.02	.002	.04	.02	.013
Education	-.15	.02	<.001	-.15	.02	<.001	-.13	.02	<.001	-.15	.02	<.001	-.16	.02	<.001
Wave	-.12	.02	<.001	-.12	.02	<.001	-.12	.02	<.001	-.12	.02	<.001	-.11	.02	<.001
Trait	.35	.17	.038	-.34	.17	.046	-.19	.16	.240	.14	.02	.414	-.55	.18	.003
Race X Poverty	-.10	.08	.187	-.05	.08	.503	-.02	.08	.803	.04	.17	.573	-.06	.08	.422
Trait x Race	-.13	.10	.201	.15	.10	.135	.06	.10	.553	-.09	.10	.388	.29	.11	.007
Trait x Poverty	-.31	.12	.010	.21	.12	.081	.08	.12	.493	-.08	.12	.500	.35	.13	.007
Trait x Race x Poverty	.16	.07	.030	-.11	.07	.117	-.04	.07	.569	.02	.07	.747	-.20	.08	.007

Note. N=1062.

## SPSS script for analysis

**\*\*Main effects with age, sex, and race\*\***

```
MIXED cogtot WITH sex race Zage_pers wave Zneotn  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race Zage_pers wave Zneotn | SSTYPE(3)  
/METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid)  
COVTYPE(VC) SOLUTION.
```

```
MIXED cogtot WITH sex race Zage_pers wave Zneote  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race Zage_pers wave Zneote | SSTYPE(3)  
/METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid)  
COVTYPE(VC) SOLUTION.
```

```
MIXED cogtot WITH sex race Zage_pers wave Zneoto  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race Zage_pers wave Zneoto | SSTYPE(3)  
/METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid)  
COVTYPE(VC) SOLUTION.
```

```
MIXED cogtot WITH sex race Zage_pers wave Zneota  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race Zage_pers wave Zneota | SSTYPE(3)  
/METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid)  
COVTYPE(VC) SOLUTION.
```

```
MIXED cogtot WITH sex race Zage_pers wave Zneotc  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race Zage_pers wave Zneotc | SSTYPE(3)  
/METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid)  
COVTYPE(VC) SOLUTION.
```

```
MIXED cogtot WITH sex race Zage_pers wave Zneotn1  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race Zage_pers wave Zneotn1 | SSTYPE(3)  
/METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid)  
COVTYPE(VC) SOLUTION.
```

```
MIXED cogtot WITH sex race Zage_pers wave Zneotn2  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)
```

SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race Zage\_pers wave Zneotn2 | SSTYPE(3)  
/METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid)  
COVTYPE(VC) SOLUTION.

MIXED cogtot WITH sex race Zage\_pers wave Zneotn3  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race Zage\_pers wave Zneotn3 | SSTYPE(3)  
/METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid)  
COVTYPE(VC) SOLUTION.

MIXED cogtot WITH sex race Zage\_pers wave Zneotn4  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race Zage\_pers wave Zneotn4 | SSTYPE(3)  
/METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid)  
COVTYPE(VC) SOLUTION.

MIXED cogtot WITH sex race Zage\_pers wave Zneotn5  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race Zage\_pers wave Zneotn5 | SSTYPE(3)  
/METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid)  
COVTYPE(VC) SOLUTION.

MIXED cogtot WITH sex race Zage\_pers wave Zneotn6  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race Zage\_pers wave Zneotn6 | SSTYPE(3)  
/METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid)  
COVTYPE(VC) SOLUTION.

MIXED cogtot WITH sex race Zage\_pers wave Zneote1  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race Zage\_pers wave Zneote1 | SSTYPE(3)  
/METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid)  
COVTYPE(VC) SOLUTION.

MIXED cogtot WITH sex race Zage\_pers wave Zneote2  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race Zage\_pers wave Zneote2 | SSTYPE(3)  
/METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid)  
COVTYPE(VC) SOLUTION.

MIXED cogtot WITH sex race Zage\_pers wave Zneote3  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)



PCONVERGE(0, ABSOLUTE) /FIXED=sex race Zage\_pers wave Zneote3 | SSTYPE(3)  
/METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid)  
COVTYPE(VC) SOLUTION.

MIXED cogtot WITH sex race Zage\_pers wave Zneote4  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race Zage\_pers wave Zneote4 | SSTYPE(3)  
/METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid)  
COVTYPE(VC) SOLUTION.

MIXED cogtot WITH sex race Zage\_pers wave Zneote5  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race Zage\_pers wave Zneote5 | SSTYPE(3)  
/METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid)  
COVTYPE(VC) SOLUTION.

MIXED cogtot WITH sex race Zage\_pers wave Zneote6  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race Zage\_pers wave Zneote6 | SSTYPE(3)  
/METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid)  
COVTYPE(VC) SOLUTION.

MIXED cogtot WITH sex race Zage\_pers wave Zneoto1  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race Zage\_pers wave Zneoto1 | SSTYPE(3)  
/METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid)  
COVTYPE(VC) SOLUTION.

MIXED cogtot WITH sex race Zage\_pers wave Zneoto2  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race Zage\_pers wave Zneoto2 | SSTYPE(3)  
/METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid)  
COVTYPE(VC) SOLUTION.

MIXED cogtot WITH sex race Zage\_pers wave Zneoto3  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race Zage\_pers wave Zneoto3 | SSTYPE(3)  
/METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid)  
COVTYPE(VC) SOLUTION.

MIXED cogtot WITH sex race Zage\_pers wave Zneoto4  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race Zage\_pers wave Zneoto4 | SSTYPE(3)

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/METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid)
COVTYPE(VC) SOLUTION.
MIXED cogtot WITH sex race Zage_pers wave Zneoto5
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)
PCONVERGE(0, ABSOLUTE) /FIXED=sex race Zage_pers wave Zneoto5 | SSTYPE(3)
/METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid)
COVTYPE(VC) SOLUTION.
```

```
MIXED cogtot WITH sex race Zage_pers wave Zneoto6
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)
PCONVERGE(0, ABSOLUTE) /FIXED=sex race Zage_pers wave Zneoto6 | SSTYPE(3)
/METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid)
COVTYPE(VC) SOLUTION.
```

```
MIXED cogtot WITH sex race Zage_pers wave Zneota1
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)
PCONVERGE(0, ABSOLUTE) /FIXED=sex race Zage_pers wave Zneota1 | SSTYPE(3)
/METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid)
COVTYPE(VC) SOLUTION.
```

```
MIXED cogtot WITH sex race Zage_pers wave Zneota2
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)
PCONVERGE(0, ABSOLUTE) /FIXED=sex race Zage_pers wave Zneota2 | SSTYPE(3)
/METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid)
COVTYPE(VC) SOLUTION.
```

```
MIXED cogtot WITH sex race Zage_pers wave Zneota3
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)
PCONVERGE(0, ABSOLUTE) /FIXED=sex race Zage_pers wave Zneota3 | SSTYPE(3)
/METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid)
COVTYPE(VC) SOLUTION.
```

```
MIXED cogtot WITH sex race Zage_pers wave Zneota4
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)
PCONVERGE(0, ABSOLUTE) /FIXED=sex race Zage_pers wave Zneota4 | SSTYPE(3)
/METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid)
COVTYPE(VC) SOLUTION.
```

```
MIXED cogtot WITH sex race Zage_pers wave Zneota5
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)
PCONVERGE(0, ABSOLUTE) /FIXED=sex race Zage_pers wave Zneota5 | SSTYPE(3)
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/METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid)
COVTYPE(VC) SOLUTION.
MIXED cogtot WITH sex race Zage_pers wave Zneota6
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)
PCONVERGE(0, ABSOLUTE) /FIXED=sex race Zage_pers wave Zneota6 | SSTYPE(3)
/METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid)
COVTYPE(VC) SOLUTION.
```

```
MIXED cogtot WITH sex race Zage_pers wave Zneotc1
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)
PCONVERGE(0, ABSOLUTE) /FIXED=sex race Zage_pers wave Zneotc1 | SSTYPE(3)
/METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid)
COVTYPE(VC) SOLUTION.
```

```
MIXED cogtot WITH sex race Zage_pers wave Zneotc2
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)
PCONVERGE(0, ABSOLUTE) /FIXED=sex race Zage_pers wave Zneotc2 | SSTYPE(3)
/METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid)
COVTYPE(VC) SOLUTION.
```

```
MIXED cogtot WITH sex race Zage_pers wave Zneotc3
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)
PCONVERGE(0, ABSOLUTE) /FIXED=sex race Zage_pers wave Zneotc3 | SSTYPE(3)
/METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid)
COVTYPE(VC) SOLUTION.
```

```
MIXED cogtot WITH sex race Zage_pers wave Zneotc4
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)
PCONVERGE(0, ABSOLUTE) /FIXED=sex race Zage_pers wave Zneotc4 | SSTYPE(3)
/METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid)
COVTYPE(VC) SOLUTION.
```

```
MIXED cogtot WITH sex race Zage_pers wave Zneotc5
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)
PCONVERGE(0, ABSOLUTE) /FIXED=sex race Zage_pers wave Zneotc5 | SSTYPE(3)
/METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid)
COVTYPE(VC) SOLUTION.
```

```
MIXED cogtot WITH sex race Zage_pers wave Zneotc6
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)
PCONVERGE(0, ABSOLUTE) /FIXED=sex race Zage_pers wave Zneotc6 | SSTYPE(3)
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/METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid)  
COVTYPE(VC) SOLUTION.

**\*\*Main effects with education\*\***

MIXED cogtot WITH sex race povstat Zage\_pers zeduc wave Zneotn  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race Zage\_pers zeduc wave Zneotn | SSTYPE(3)  
/METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid)  
COVTYPE(VC) SOLUTION.

MIXED cogtot WITH sex race povstat Zage\_pers zeduc wave Zneote  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race Zage\_pers zeduc wave Zneote | SSTYPE(3)  
/METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid)  
COVTYPE(VC) SOLUTION.

MIXED cogtot WITH sex race povstat Zage\_pers zeduc wave Zneoto  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race Zage\_pers zeduc wave Zneoto | SSTYPE(3)  
/METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid)  
COVTYPE(VC) SOLUTION.

MIXED cogtot WITH sex race povstat Zage\_pers zeduc wave Zneota  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race Zage\_pers zeduc wave Zneota | SSTYPE(3)  
/METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid)  
COVTYPE(VC) SOLUTION.

MIXED cogtot WITH sex race povstat Zage\_pers zeduc wave Zneotc  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race Zage\_pers zeduc wave Zneotc | SSTYPE(3)  
/METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid)  
COVTYPE(VC) SOLUTION.

MIXED cogtot WITH sex race povstat Zage\_pers zeduc wave Zneotn Zneote Zneoto Zneota  
Zneotc /CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10)  
SCORING(1) SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0,  
ABSOLUTE) PCONVERGE(0, ABSOLUTE) /FIXED=sex race Zage\_pers zeduc wave Zneotn  
Zneote Zneoto Zneota Zneotc | SSTYPE(3) /METHOD=ML /PRINT=SOLUTION TESTCOV  
/RANDOM=INTERCEPT | SUBJECT(hndid) COVTYPE(VC) SOLUTION.

MIXED cogtot WITH sex race povstat Zage\_pers zeduc wave Zneotn1  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race Zage\_pers zeduc wave Zneotn1 | SSTYPE(3)  
/METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid)  
COVTYPE(VC) SOLUTION.

MIXED cogtot WITH sex race povstat Zage\_pers zeduc wave Zneotn2  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race Zage\_pers zeduc wave Zneotn2 | SSTYPE(3)  
/METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid)  
COVTYPE(VC) SOLUTION.

MIXED cogtot WITH sex race povstat Zage\_pers zeduc wave Zneotn3  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race Zage\_pers zeduc wave Zneotn3 | SSTYPE(3)  
/METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid)  
COVTYPE(VC) SOLUTION.

MIXED cogtot WITH sex race povstat Zage\_pers zeduc wave Zneotn4  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race Zage\_pers zeduc wave Zneotn4 | SSTYPE(3)  
/METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid)  
COVTYPE(VC) SOLUTION.

MIXED cogtot WITH sex race povstat Zage\_pers zeduc wave Zneotn5  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race Zage\_pers zeduc wave Zneotn5 | SSTYPE(3)  
/METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid)  
COVTYPE(VC) SOLUTION.

MIXED cogtot WITH sex race povstat Zage\_pers zeduc wave Zneotn6  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race Zage\_pers zeduc wave Zneotn6 | SSTYPE(3)  
/METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid)  
COVTYPE(VC) SOLUTION.

MIXED cogtot WITH sex race povstat Zage\_pers zeduc wave Zneote1  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race Zage\_pers zeduc wave Zneote1 | SSTYPE(3)  
/METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid)  
COVTYPE(VC) SOLUTION.

MIXED cogtot WITH sex race povstat Zage\_pers zeduc wave Zneote2  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race Zage\_pers zeduc wave Zneote2 | SSTYPE(3)  
/METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid)  
COVTYPE(VC) SOLUTION.

MIXED cogtot WITH sex race povstat Zage\_pers zeduc wave Zneote3  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race Zage\_pers zeduc wave Zneote3 | SSTYPE(3)  
/METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid)  
COVTYPE(VC) SOLUTION.

MIXED cogtot WITH sex race povstat Zage\_pers zeduc wave Zneote4  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race Zage\_pers zeduc wave Zneote4 | SSTYPE(3)  
/METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid)  
COVTYPE(VC) SOLUTION.

MIXED cogtot WITH sex race povstat Zage\_pers zeduc wave Zneote5  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race Zage\_pers zeduc wave Zneote5 | SSTYPE(3)  
/METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid)  
COVTYPE(VC) SOLUTION.

MIXED cogtot WITH sex race povstat Zage\_pers zeduc wave Zneote6  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race Zage\_pers zeduc wave Zneote6 | SSTYPE(3)  
/METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid)  
COVTYPE(VC) SOLUTION.

MIXED cogtot WITH sex race povstat Zage\_pers zeduc wave Zneoto1  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race Zage\_pers zeduc wave Zneoto1 | SSTYPE(3)  
/METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid)  
COVTYPE(VC) SOLUTION.

MIXED cogtot WITH sex race povstat Zage\_pers zeduc wave Zneoto2  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race Zage\_pers zeduc wave Zneoto2 | SSTYPE(3)  
/METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid)  
COVTYPE(VC) SOLUTION.

MIXED cogtot WITH sex race povstat Zage\_pers zeduc wave Zneoto3  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race Zage\_pers zeduc wave Zneoto3 | SSTYPE(3)  
/METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid)  
COVTYPE(VC) SOLUTION.

MIXED cogtot WITH sex race povstat Zage\_pers zeduc wave Zneoto4  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race Zage\_pers zeduc wave Zneoto4 | SSTYPE(3)  
/METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid)  
COVTYPE(VC) SOLUTION.

MIXED cogtot WITH sex race povstat Zage\_pers zeduc wave Zneoto5  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race Zage\_pers zeduc wave Zneoto5 | SSTYPE(3)  
/METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid)  
COVTYPE(VC) SOLUTION.

MIXED cogtot WITH sex race povstat Zage\_pers zeduc wave Zneoto6  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race Zage\_pers zeduc wave Zneoto6 | SSTYPE(3)  
/METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid)  
COVTYPE(VC) SOLUTION.

MIXED cogtot WITH sex race povstat Zage\_pers zeduc wave Zneota1  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race Zage\_pers zeduc wave Zneota1 | SSTYPE(3)  
/METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid)  
COVTYPE(VC) SOLUTION.

MIXED cogtot WITH sex race povstat Zage\_pers zeduc wave Zneota2  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race Zage\_pers zeduc wave Zneota2 | SSTYPE(3)  
/METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid)  
COVTYPE(VC) SOLUTION.

MIXED cogtot WITH sex race povstat Zage\_pers zeduc wave Zneota3  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race Zage\_pers zeduc wave Zneota3 | SSTYPE(3)  
/METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid)  
COVTYPE(VC) SOLUTION.

MIXED cogtot WITH sex race povstat Zage\_pers zeduc wave Zneota4  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race Zage\_pers zeduc wave Zneota4 | SSTYPE(3)  
/METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid)  
COVTYPE(VC) SOLUTION.

MIXED cogtot WITH sex race povstat Zage\_pers zeduc wave Zneota5  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race Zage\_pers zeduc wave Zneota5 | SSTYPE(3)  
/METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid)  
COVTYPE(VC) SOLUTION.

MIXED cogtot WITH sex race povstat Zage\_pers zeduc wave Zneota6  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race Zage\_pers zeduc wave Zneota6 | SSTYPE(3)  
/METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid)  
COVTYPE(VC) SOLUTION.

MIXED cogtot WITH sex race povstat Zage\_pers zeduc wave Zneotc1  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race Zage\_pers zeduc wave Zneotc1 | SSTYPE(3)  
/METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid)  
COVTYPE(VC) SOLUTION.

MIXED cogtot WITH sex race povstat Zage\_pers zeduc wave Zneotc2  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race Zage\_pers zeduc wave Zneotc2 | SSTYPE(3)  
/METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid)  
COVTYPE(VC) SOLUTION.

MIXED cogtot WITH sex race povstat Zage\_pers zeduc wave Zneotc3  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race Zage\_pers zeduc wave Zneotc3 | SSTYPE(3)  
/METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid)  
COVTYPE(VC) SOLUTION.

MIXED cogtot WITH sex race povstat Zage\_pers zeduc wave Zneotc4  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race Zage\_pers zeduc wave Zneotc4 | SSTYPE(3)  
/METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid)  
COVTYPE(VC) SOLUTION.



MIXED cogtot WITH sex race povstat Zage\_pers zeduc wave Zneotc5  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race Zage\_pers zeduc wave Zneotc5 | SSTYPE(3)  
/METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid)  
COVTYPE(VC) SOLUTION.

MIXED cogtot WITH sex race povstat Zage\_pers zeduc wave Zneotc6  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race Zage\_pers zeduc wave Zneotc6 | SSTYPE(3)  
/METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid)  
COVTYPE(VC) SOLUTION.

**\*\*Main effects with education and poverty status\*\***

MIXED cogtot WITH sex race povstat Zage\_pers zeduc wave Zneotn  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race povstat Zage\_pers zeduc wave Zneotn |  
SSTYPE(3) /METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT |  
SUBJECT(hndid) COVTYPE(VC) SOLUTION.

MIXED cogtot WITH sex race povstat Zage\_pers zeduc wave Zneote  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race povstat Zage\_pers zeduc wave Zneote |  
SSTYPE(3) /METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT |  
SUBJECT(hndid) COVTYPE(VC) SOLUTION.

MIXED cogtot WITH sex race povstat Zage\_pers zeduc wave Zneoto  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race povstat Zage\_pers zeduc wave Zneoto |  
SSTYPE(3) /METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT |  
SUBJECT(hndid) COVTYPE(VC) SOLUTION.

MIXED cogtot WITH sex race povstat Zage\_pers zeduc wave Zneota  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race povstat Zage\_pers zeduc wave Zneota |  
SSTYPE(3) /METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT |  
SUBJECT(hndid) COVTYPE(VC) SOLUTION.

MIXED cogtot WITH sex race povstat Zage\_pers zeduc wave Zneotc  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)

PCONVERGE(0, ABSOLUTE) /FIXED=sex race povstat Zage\_pers zeduc wave Zneotc |  
SSTYPE(3) /METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT |  
SUBJECT(hndid) COVTYPE(VC) SOLUTION.

MIXED cogtot WITH sex race povstat Zage\_pers zeduc wave Zneotn Zneote Zneoto Zneota  
Zneotc /CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10)  
SCORING(1) SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0,  
ABSOLUTE) PCONVERGE(0, ABSOLUTE) /FIXED=sex race povstat Zage\_pers zeduc wave  
Zneotn Zneote Zneoto Zneota Zneotc | SSTYPE(3) /METHOD=ML /PRINT=SOLUTION TESTCOV  
/RANDOM=INTERCEPT | SUBJECT(hndid) COVTYPE(VC) SOLUTION.

MIXED cogtot WITH sex race povstat Zage\_pers zeduc wave Zneotn1  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race povstat Zage\_pers zeduc wave Zneotn1 |  
SSTYPE(3) /METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT |  
SUBJECT(hndid) COVTYPE(VC) SOLUTION.

MIXED cogtot WITH sex race povstat Zage\_pers zeduc wave Zneotn2  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race povstat Zage\_pers zeduc wave Zneotn2 |  
SSTYPE(3) /METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT |  
SUBJECT(hndid) COVTYPE(VC) SOLUTION.

MIXED cogtot WITH sex race povstat Zage\_pers zeduc wave Zneotn3  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race povstat Zage\_pers zeduc wave Zneotn3 |  
SSTYPE(3) /METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT |  
SUBJECT(hndid) COVTYPE(VC) SOLUTION.

MIXED cogtot WITH sex race povstat Zage\_pers zeduc wave Zneotn4  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race povstat Zage\_pers zeduc wave Zneotn4 |  
SSTYPE(3) /METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT |  
SUBJECT(hndid) COVTYPE(VC) SOLUTION.

MIXED cogtot WITH sex race povstat Zage\_pers zeduc wave Zneotn5  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race povstat Zage\_pers zeduc wave Zneotn5 |  
SSTYPE(3) /METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT |  
SUBJECT(hndid) COVTYPE(VC) SOLUTION.

MIXED cogtot WITH sex race povstat Zage\_pers zeduc wave Zneotn6  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)

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PCONVERGE(0, ABSOLUTE) /FIXED=sex race povstat Zage_pers zeduc wave Zneotn6 |
SSTYPE(3) /METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT |
SUBJECT(hndid) COVTYPE(VC) SOLUTION.
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```
MIXED cogtot WITH sex race povstat Zage_pers zeduc wave Zneote1
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)
PCONVERGE(0, ABSOLUTE) /FIXED=sex race povstat Zage_pers zeduc wave Zneote1 |
SSTYPE(3) /METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT |
SUBJECT(hndid) COVTYPE(VC) SOLUTION.
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```
MIXED cogtot WITH sex race povstat Zage_pers zeduc wave Zneote2
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)
PCONVERGE(0, ABSOLUTE) /FIXED=sex race povstat Zage_pers zeduc wave Zneote2 |
SSTYPE(3) /METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT |
SUBJECT(hndid) COVTYPE(VC) SOLUTION.
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```
MIXED cogtot WITH sex race povstat Zage_pers zeduc wave Zneote3
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)
PCONVERGE(0, ABSOLUTE) /FIXED=sex race povstat Zage_pers zeduc wave Zneote3 |
SSTYPE(3) /METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT |
SUBJECT(hndid) COVTYPE(VC) SOLUTION.
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```
MIXED cogtot WITH sex race povstat Zage_pers zeduc wave Zneote4
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)
PCONVERGE(0, ABSOLUTE) /FIXED=sex race povstat Zage_pers zeduc wave Zneote4 |
SSTYPE(3) /METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT |
SUBJECT(hndid) COVTYPE(VC) SOLUTION.
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```
MIXED cogtot WITH sex race povstat Zage_pers zeduc wave Zneote5
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)
PCONVERGE(0, ABSOLUTE) /FIXED=sex race povstat Zage_pers zeduc wave Zneote5 |
SSTYPE(3) /METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT |
SUBJECT(hndid) COVTYPE(VC) SOLUTION.
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MIXED cogtot WITH sex race povstat Zage_pers zeduc wave Zneote6
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)
PCONVERGE(0, ABSOLUTE) /FIXED=sex race povstat Zage_pers zeduc wave Zneote6 |
SSTYPE(3) /METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT |
SUBJECT(hndid) COVTYPE(VC) SOLUTION.
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```
MIXED cogtot WITH sex race povstat Zage_pers zeduc wave Zneoto1
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)
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PCONVERGE(0, ABSOLUTE) /FIXED=sex race povstat Zage\_pers zeduc wave Zneoto1 |  
SSTYPE(3) /METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT |  
SUBJECT(hndid) COVTYPE(VC) SOLUTION.

MIXED cogtot WITH sex race povstat Zage\_pers zeduc wave Zneoto2  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race povstat Zage\_pers zeduc wave Zneoto2 |  
SSTYPE(3) /METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT |  
SUBJECT(hndid) COVTYPE(VC) SOLUTION.

MIXED cogtot WITH sex race povstat Zage\_pers zeduc wave Zneoto3  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race povstat Zage\_pers zeduc wave Zneoto3 |  
SSTYPE(3) /METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT |  
SUBJECT(hndid) COVTYPE(VC) SOLUTION.

MIXED cogtot WITH sex race povstat Zage\_pers zeduc wave Zneoto4  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race povstat Zage\_pers zeduc wave Zneoto4 |  
SSTYPE(3) /METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT |  
SUBJECT(hndid) COVTYPE(VC) SOLUTION.

MIXED cogtot WITH sex race povstat Zage\_pers zeduc wave Zneoto5  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race povstat Zage\_pers zeduc wave Zneoto5 |  
SSTYPE(3) /METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT |  
SUBJECT(hndid) COVTYPE(VC) SOLUTION.

MIXED cogtot WITH sex race povstat Zage\_pers zeduc wave Zneoto6  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race povstat Zage\_pers zeduc wave Zneoto6 |  
SSTYPE(3) /METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT |  
SUBJECT(hndid) COVTYPE(VC) SOLUTION.

MIXED cogtot WITH sex race povstat Zage\_pers zeduc wave Zneota1  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race povstat Zage\_pers zeduc wave Zneota1 |  
SSTYPE(3) /METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT |  
SUBJECT(hndid) COVTYPE(VC) SOLUTION.

MIXED cogtot WITH sex race povstat Zage\_pers zeduc wave Zneota2  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race povstat Zage\_pers zeduc wave Zneota2 |

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SSTYPE(3) /METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT |
SUBJECT(hndid) COVTYPE(VC) SOLUTION.
MIXED cogtot WITH sex race povstat Zage_pers zeduc wave Zneota3
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)
PCONVERGE(0, ABSOLUTE) /FIXED=sex race povstat Zage_pers zeduc wave Zneota3 |
SSTYPE(3) /METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT |
SUBJECT(hndid) COVTYPE(VC) SOLUTION.
MIXED cogtot WITH sex race povstat Zage_pers zeduc wave Zneota4
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)
PCONVERGE(0, ABSOLUTE) /FIXED=sex race povstat Zage_pers zeduc wave Zneota4 |
SSTYPE(3) /METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT |
SUBJECT(hndid) COVTYPE(VC) SOLUTION.
MIXED cogtot WITH sex race povstat Zage_pers zeduc wave Zneota5
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)
PCONVERGE(0, ABSOLUTE) /FIXED=sex race povstat Zage_pers zeduc wave Zneota5 |
SSTYPE(3) /METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT |
SUBJECT(hndid) COVTYPE(VC) SOLUTION.
MIXED cogtot WITH sex race povstat Zage_pers zeduc wave Zneota6
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)
PCONVERGE(0, ABSOLUTE) /FIXED=sex race povstat Zage_pers zeduc wave Zneota6 |
SSTYPE(3) /METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT |
SUBJECT(hndid) COVTYPE(VC) SOLUTION.
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MIXED cogtot WITH sex race povstat Zage_pers zeduc wave Zneotc1
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)
PCONVERGE(0, ABSOLUTE) /FIXED=sex race povstat Zage_pers zeduc wave Zneotc1 |
SSTYPE(3) /METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT |
SUBJECT(hndid) COVTYPE(VC) SOLUTION.
MIXED cogtot WITH sex race povstat Zage_pers zeduc wave Zneotc2
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)
PCONVERGE(0, ABSOLUTE) /FIXED=sex race povstat Zage_pers zeduc wave Zneotc2 |
SSTYPE(3) /METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT |
SUBJECT(hndid) COVTYPE(VC) SOLUTION.
MIXED cogtot WITH sex race povstat Zage_pers zeduc wave Zneotc3
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)
PCONVERGE(0, ABSOLUTE) /FIXED=sex race povstat Zage_pers zeduc wave Zneotc3 |
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SSTYPE(3) /METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT |
SUBJECT(hndid) COVTYPE(VC) SOLUTION.
MIXED cogtot WITH sex race povstat Zage_pers zeduc wave Zneotc4
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)
PCONVERGE(0, ABSOLUTE) /FIXED=sex race povstat Zage_pers zeduc wave Zneotc4 |
SSTYPE(3) /METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT |
SUBJECT(hndid) COVTYPE(VC) SOLUTION.
MIXED cogtot WITH sex race povstat Zage_pers zeduc wave Zneotc5
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)
PCONVERGE(0, ABSOLUTE) /FIXED=sex race povstat Zage_pers zeduc wave Zneotc5 |
SSTYPE(3) /METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT |
SUBJECT(hndid) COVTYPE(VC) SOLUTION.
MIXED cogtot WITH sex race povstat Zage_pers zeduc wave Zneotc6
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)
PCONVERGE(0, ABSOLUTE) /FIXED=sex race povstat Zage_pers zeduc wave Zneotc6 |
SSTYPE(3) /METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT |
SUBJECT(hndid) COVTYPE(VC) SOLUTION.

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**\*\*Interactions\*\***

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MIXED cogtot WITH sex race povstat Zage_pers zeduc wave Zneotn
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)
PCONVERGE(0, ABSOLUTE) /FIXED=sex race povstat Zage_pers zeduc wave Zneotn
race*Zneotn | SSTYPE(3) /METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT |
SUBJECT(hndid) COVTYPE(VC) SOLUTION.
MIXED cogtot WITH sex race povstat Zage_pers zeduc wave Zneote
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)
PCONVERGE(0, ABSOLUTE) /FIXED=sex race povstat Zage_pers zeduc wave Zneote
race*Zneote | SSTYPE(3) /METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT |
SUBJECT(hndid) COVTYPE(VC) SOLUTION.
MIXED cogtot WITH sex race povstat Zage_pers zeduc wave Zneoto
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)
PCONVERGE(0, ABSOLUTE) /FIXED=sex race povstat Zage_pers zeduc wave Zneoto
race*Zneoto | SSTYPE(3) /METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT |
SUBJECT(hndid) COVTYPE(VC) SOLUTION.
MIXED cogtot WITH sex race povstat Zage_pers zeduc wave Zneota
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)

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SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race povstat Zage\_pers zeduc wave Zneota  
race\*Zneota | SSTYPE(3) /METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT |  
SUBJECT(hndid) COVTYPE(VC) SOLUTION.

MIXED cogtot WITH sex race povstat Zage\_pers zeduc wave Zneotc  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race povstat Zage\_pers zeduc wave Zneotc  
race\*Zneotc | SSTYPE(3) /METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT |  
SUBJECT(hndid) COVTYPE(VC) SOLUTION.

MIXED cogtot WITH sex race povstat Zage\_pers zeduc wave Zneotn  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race povstat Zage\_pers wave zeduc Zneotn  
povstat\*Zneotn | SSTYPE(3) /METHOD=ML /PRINT=SOLUTION TESTCOV  
/RANDOM=INTERCEPT | SUBJECT(hndid) COVTYPE(VC) SOLUTION.

MIXED cogtot WITH sex race povstat Zage\_pers zeduc wave Zneote  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race povstat Zage\_pers wave zeduc Zneote  
povstat\*Zneote | SSTYPE(3) /METHOD=ML /PRINT=SOLUTION TESTCOV  
/RANDOM=INTERCEPT | SUBJECT(hndid) COVTYPE(VC) SOLUTION.

MIXED cogtot WITH sex race povstat Zage\_pers zeduc wave Zneoto  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race povstat Zage\_pers wave zeduc Zneoto  
povstat\*Zneoto | SSTYPE(3) /METHOD=ML /PRINT=SOLUTION TESTCOV  
/RANDOM=INTERCEPT | SUBJECT(hndid) COVTYPE(VC) SOLUTION.

MIXED cogtot WITH sex race povstat Zage\_pers zeduc wave Zneota  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race povstat Zage\_pers wave zeduc Zneota  
povstat\*Zneota | SSTYPE(3) /METHOD=ML /PRINT=SOLUTION TESTCOV  
/RANDOM=INTERCEPT | SUBJECT(hndid) COVTYPE(VC) SOLUTION.

MIXED cogtot WITH sex race povstat Zage\_pers zeduc wave Zneotc  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race povstat Zage\_pers wave zeduc Zneotc  
povstat\*Zneotc | SSTYPE(3) /METHOD=ML /PRINT=SOLUTION TESTCOV  
/RANDOM=INTERCEPT | SUBJECT(hndid) COVTYPE(VC) SOLUTION.

MIXED cogtot WITH sex race povstat Zage\_pers zeduc wave Zneotn  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)

SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race povstat Zage\_pers wave zeduc Zneotn  
sex\*Zneotn | SSTYPE(3) /METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT |  
SUBJECT(hndid) COVTYPE(VC) SOLUTION.

MIXED cogtot WITH sex race povstat Zage\_pers zeduc wave Zneote  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race povstat Zage\_pers wave zeduc Zneote  
sex\*Zneote | SSTYPE(3) /METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT |  
SUBJECT(hndid) COVTYPE(VC) SOLUTION.

MIXED cogtot WITH sex race povstat Zage\_pers zeduc wave Zneoto  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race povstat Zage\_pers wave zeduc Zneoto  
sex\*Zneoto | SSTYPE(3) /METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT |  
SUBJECT(hndid) COVTYPE(VC) SOLUTION.

MIXED cogtot WITH sex race povstat Zage\_pers zeduc wave Zneota  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race povstat Zage\_pers wave zeduc Zneota  
sex\*Zneota | SSTYPE(3) /METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT |  
SUBJECT(hndid) COVTYPE(VC) SOLUTION.

MIXED cogtot WITH sex race povstat Zage\_pers zeduc wave Zneotc  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race povstat Zage\_pers wave zeduc Zneotc  
sex\*Zneotc | SSTYPE(3) /METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT |  
SUBJECT(hndid) COVTYPE(VC) SOLUTION.

MIXED cogtot WITH sex race povstat Zage\_pers zeduc wave Zneotn  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race povstat Zage\_pers wave zeduc Zneotn  
Zage\_pers\*Zneotn | SSTYPE(3) /METHOD=ML /PRINT=SOLUTION TESTCOV  
/RANDOM=INTERCEPT | SUBJECT(hndid) COVTYPE(VC) SOLUTION.

MIXED cogtot WITH sex race povstat Zage\_pers zeduc wave Zneote  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race povstat Zage\_pers wave zeduc Zneote  
Zage\_pers\*Zneote | SSTYPE(3) /METHOD=ML /PRINT=SOLUTION TESTCOV  
/RANDOM=INTERCEPT | SUBJECT(hndid) COVTYPE(VC) SOLUTION.

MIXED cogtot WITH sex race povstat Zage\_pers zeduc wave Zneoto  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)



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PCONVERGE(0, ABSOLUTE) /FIXED=sex race povstat Zage_pers wave zeduc Zneoto
Zage_pers*Zneoto | SSTYPE(3) /METHOD=ML /PRINT=SOLUTION TESTCOV
/RANDOM=INTERCEPT | SUBJECT(hndid) COVTYPE(VC) SOLUTION.
MIXED cogtot WITH sex race povstat Zage_pers zeduc wave Zneota
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)
PCONVERGE(0, ABSOLUTE) /FIXED=sex race povstat Zage_pers wave zeduc Zneota
Zage_pers*Zneota | SSTYPE(3) /METHOD=ML /PRINT=SOLUTION TESTCOV
/RANDOM=INTERCEPT | SUBJECT(hndid) COVTYPE(VC) SOLUTION.
MIXED cogtot WITH sex race povstat Zage_pers zeduc wave Zneotc
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)
PCONVERGE(0, ABSOLUTE) /FIXED=sex race povstat Zage_pers wave zeduc Zneotc
Zage_pers*Zneotc | SSTYPE(3) /METHOD=ML /PRINT=SOLUTION TESTCOV
/RANDOM=INTERCEPT | SUBJECT(hndid) COVTYPE(VC) SOLUTION.
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MIXED cogtot WITH sex race povstat Zage_pers zeduc wave Zneotn
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)
PCONVERGE(0, ABSOLUTE) /FIXED=sex race povstat Zage_pers wave zeduc Zneotn
zeduc*Zneotn | SSTYPE(3) /METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT
| SUBJECT(hndid) COVTYPE(VC) SOLUTION.
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MIXED cogtot WITH sex race povstat Zage_pers zeduc wave Zneote
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)
PCONVERGE(0, ABSOLUTE) /FIXED=sex race povstat Zage_pers wave zeduc Zneote
zeduc*Zneote | SSTYPE(3) /METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT
| SUBJECT(hndid) COVTYPE(VC) SOLUTION.
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```
MIXED cogtot WITH sex race povstat Zage_pers zeduc wave Zneoto
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)
PCONVERGE(0, ABSOLUTE) /FIXED=sex race povstat Zage_pers wave zeduc Zneoto
zeduc*Zneoto | SSTYPE(3) /METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT
| SUBJECT(hndid) COVTYPE(VC) SOLUTION.
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MIXED cogtot WITH sex race povstat Zage_pers zeduc wave Zneota
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)
PCONVERGE(0, ABSOLUTE) /FIXED=sex race povstat Zage_pers wave zeduc Zneota
zeduc*Zneota | SSTYPE(3) /METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT
| SUBJECT(hndid) COVTYPE(VC) SOLUTION.
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```
MIXED cogtot WITH sex race povstat Zage_pers zeduc wave Zneotc
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)
PCONVERGE(0, ABSOLUTE) /FIXED=sex race povstat Zage_pers wave zeduc Zneotc
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```
zeduc*Zneotc | SSTYPE(3) /METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT  
| SUBJECT(hndid) COVTYPE(VC) SOLUTION.
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**\*\*by time\*\***

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MIXED cogtot WITH sex race povstat Zage_pers zeduc wave Zneotn  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race povstat Zage_pers wave zeduc Zneotn  
wave*Zneotn | SSTYPE(3) /METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT  
| SUBJECT(hndid) COVTYPE(VC) SOLUTION.
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MIXED cogtot WITH sex race povstat Zage_pers zeduc wave Zneote  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race povstat Zage_pers wave zeduc Zneote  
wave*Zneote | SSTYPE(3) /METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT  
| SUBJECT(hndid) COVTYPE(VC) SOLUTION.
```

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MIXED cogtot WITH sex race povstat Zage_pers zeduc wave Zneoto  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race povstat Zage_pers wave zeduc Zneoto  
wave*Zneoto | SSTYPE(3) /METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT  
| SUBJECT(hndid) COVTYPE(VC) SOLUTION.
```

```
MIXED cogtot WITH sex race povstat Zage_pers zeduc wave Zneota  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race povstat Zage_pers wave zeduc Zneota  
wave*Zneota | SSTYPE(3) /METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT  
| SUBJECT(hndid) COVTYPE(VC) SOLUTION.
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```
MIXED cogtot WITH sex race povstat Zage_pers zeduc wave Zneotc  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race povstat Zage_pers wave zeduc Zneotc  
wave*Zneotc | SSTYPE(3) /METHOD=ML /PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT |  
SUBJECT(hndid) COVTYPE(VC) SOLUTION.
```

**\*\*3-way interactions\*\***

```
MIXED cogtot WITH sex race povstat Zage_pers zeduc wave Zneotn  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race povstat Zage_pers zeduc wave Zneotn  
race*povstat race*Zneotn povstat*Zneotn race*povstat*Zneotn | SSTYPE(3) /METHOD=ML  
/PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid) COVTYPE(VC) SOLUTION.
```

MIXED cogtot WITH sex race povstat Zage\_pers zeduc wave Zneote  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race povstat Zage\_pers zeduc wave Zneote  
race\*povstat race\*Zneote povstat\*Zneote race\*povstat\*Zneote | SSTYPE(3) /METHOD=ML  
/PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid) COVTYPE(VC) SOLUTION.  
MIXED cogtot WITH sex race povstat Zage\_pers zeduc wave Zneoto  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race povstat Zage\_pers zeduc wave Zneoto  
race\*povstat race\*Zneoto povstat\*Zneoto race\*povstat\*Zneoto | SSTYPE(3) /METHOD=ML  
/PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid) COVTYPE(VC) SOLUTION.  
MIXED cogtot WITH sex race povstat Zage\_pers zeduc wave Zneota  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race povstat Zage\_pers zeduc wave Zneota  
race\*povstat race\*Zneota povstat\*Zneota race\*povstat\*Zneota | SSTYPE(3) /METHOD=ML  
/PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid) COVTYPE(VC) SOLUTION.  
MIXED cogtot WITH sex race povstat Zage\_pers zeduc wave Zneotc  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race povstat Zage\_pers zeduc wave Zneotc  
race\*povstat race\*Zneotc povstat\*Zneotc race\*povstat\*Zneotc | SSTYPE(3) /METHOD=ML  
/PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid) COVTYPE(VC) SOLUTION.

MIXED cogtot WITH sex race povstat Zage\_pers zeduc wave Zneotn1  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race povstat Zage\_pers zeduc wave Zneotn1  
race\*povstat race\*Zneotn1 povstat\*Zneotn1 race\*povstat\*Zneotn1 | SSTYPE(3) /METHOD=ML  
/PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid) COVTYPE(VC) SOLUTION.  
MIXED cogtot WITH sex race povstat Zage\_pers zeduc wave Zneotn2  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race povstat Zage\_pers zeduc wave Zneotn2  
race\*povstat race\*Zneotn2 povstat\*Zneotn2 race\*povstat\*Zneotn2 | SSTYPE(3) /METHOD=ML  
/PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid) COVTYPE(VC) SOLUTION.  
MIXED cogtot WITH sex race povstat Zage\_pers zeduc wave Zneotn3  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race povstat Zage\_pers zeduc wave Zneotn3  
race\*povstat race\*Zneotn3 povstat\*Zneotn3 race\*povstat\*Zneotn3 | SSTYPE(3) /METHOD=ML  
/PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid) COVTYPE(VC) SOLUTION.

MIXED cogtot WITH sex race povstat Zage\_pers zeduc wave Zneotn4  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race povstat Zage\_pers zeduc wave Zneotn4  
race\*povstat race\*Zneotn4 povstat\*Zneotn4 race\*povstat\*Zneotn4 | SSTYPE(3) /METHOD=ML  
/PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid) COVTYPE(VC) SOLUTION.  
MIXED cogtot WITH sex race povstat Zage\_pers zeduc wave Zneotn5  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race povstat Zage\_pers zeduc wave Zneotn5  
race\*povstat race\*Zneotn5 povstat\*Zneotn5 race\*povstat\*Zneotn5 | SSTYPE(3) /METHOD=ML  
/PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid) COVTYPE(VC) SOLUTION.  
MIXED cogtot WITH sex race povstat Zage\_pers zeduc wave Zneotn6  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race povstat Zage\_pers zeduc wave Zneotn6  
race\*povstat race\*Zneotn6 povstat\*Zneotn6 race\*povstat\*Zneotn6 | SSTYPE(3) /METHOD=ML  
/PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid) COVTYPE(VC) SOLUTION.

MIXED cogtot WITH sex race povstat Zage\_pers zeduc wave Zneotc1  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race povstat Zage\_pers zeduc wave Zneotc1  
race\*povstat race\*Zneotc1 povstat\*Zneotc1 race\*povstat\*Zneotc1 | SSTYPE(3) /METHOD=ML  
/PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid) COVTYPE(VC) SOLUTION.  
MIXED cogtot WITH sex race povstat Zage\_pers zeduc wave Zneotc2  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race povstat Zage\_pers zeduc wave Zneotc2  
race\*povstat race\*Zneotc2 povstat\*Zneotc2 race\*povstat\*Zneotc2 | SSTYPE(3) /METHOD=ML  
/PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid) COVTYPE(VC) SOLUTION.  
MIXED cogtot WITH sex race povstat Zage\_pers zeduc wave Zneotc3  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race povstat Zage\_pers zeduc wave Zneotc3  
race\*povstat race\*Zneotc3 povstat\*Zneotc3 race\*povstat\*Zneotc3 | SSTYPE(3) /METHOD=ML  
/PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid) COVTYPE(VC) SOLUTION.  
MIXED cogtot WITH sex race povstat Zage\_pers zeduc wave Zneotc4  
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)  
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)  
PCONVERGE(0, ABSOLUTE) /FIXED=sex race povstat Zage\_pers zeduc wave Zneotc4  
race\*povstat race\*Zneotc4 povstat\*Zneotc4 race\*povstat\*Zneotc4 | SSTYPE(3) /METHOD=ML  
/PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid) COVTYPE(VC) SOLUTION.

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MIXED cogtot WITH sex race povstat Zage_pers zeduc wave Zneotc5
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)
PCONVERGE(0, ABSOLUTE) /FIXED=sex race povstat Zage_pers zeduc wave Zneotc5
race*povstat race*Zneotc5 povstat*Zneotc5 race*povstat*Zneotc5 | SSTYPE(3) /METHOD=ML
/PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid) COVTYPE(VC) SOLUTION.
MIXED cogtot WITH sex race povstat Zage_pers zeduc wave Zneotc6
/CRITERIA=DFMETHOD(SATTERTHWAITE) CIN(95) MXITER(100) MXSTEP(10) SCORING(1)
SINGULAR(0.000000000001) HCONVERGE(0.00000001, RELATIVE) LCONVERGE(0, ABSOLUTE)
PCONVERGE(0, ABSOLUTE) /FIXED=sex race povstat Zage_pers zeduc wave Zneotc6
race*povstat race*Zneotc6 povstat*Zneotc6 race*povstat*Zneotc6 | SSTYPE(3) /METHOD=ML
/PRINT=SOLUTION TESTCOV /RANDOM=INTERCEPT | SUBJECT(hndid) COVTYPE(VC) SOLUTION.
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