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An Item Response Theory Analysis of *DSM–IV* Personality Disorder Criteria Across Younger and Older Age Groups

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Abstract

Many of the *Diagnostic and Statistical Manual of Mental Disorders*, 4th edition (*DSM–IV*; American Psychiatric Association, 1994) personality disorder (PD) diagnostic criteria focus on a younger social and occupational context. The absence of age-appropriate criteria for older adults forces researchers and clinicians to draw conclusions based on existing criteria, which are likely inadequate. To explore which *DSM–IV* PD criteria contain age group measurement bias, the authors report 2 analyses of data on nearly 37,000 participants, ages 18–98 years, taken from a public data set that includes 7 of the 10 PDs (antisocial, avoidant, dependent, histrionic, obsessive–compulsive, paranoid, and schizoid). The 1st analysis revealed that older age groups tend to endorse fewer PD criteria than younger age groups. The 2nd analysis revealed that 29% of the criteria contain measurement bias. Although the latent variable structure for each PD was quite similar across younger and older age groups, some individual criteria were differentially endorsed by younger and older adults with equivalent PD pathology. The presence of measurement bias for these criteria raises questions concerning the assessment of PDs in older adults and the interpretation of existing data.

Keywords

age bias; aging; item response theory; personality disorders; prevalence

At least six studies have compared the prevalence of personality disorders (PDs) in younger and older adults (Ames & Molinari, 1994; Casey & Schrodt, 1989; Fogel & Westlake, 1990; Kenan et al., 2000; Mezzich, Fabrega, Coffman, & Glavin, 1987; Molinari, Ames, & Essa, 1994; see also Abrams & Horowitz, 1999). One study found that the prevalence of PDs in community-dwelling younger adults was just under 18%, whereas for a similar sample of older adults the prevalence was approximately 13% (Ames & Molinari, 1994). Four of the studies revealed a similar negative trend in clinical samples (Casey & Schrodt, 1989; Fogel & Westlake, 1990; Kenan et al., 2000; Mezzich et al., 1987). In a cross-sectional study of psychiatric inpatients, for example, 76% of younger adults were diagnosed with PDs, whereas only 55% of older adults were similarly diagnosed (Kenan et al., 2000). Although the remaining study found that the prevalence of PDs for younger and older adults in clinical

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settings was similar at approximately 50% (Molinari et al., 1994), the overall trend suggests that younger adults are diagnosed with PDs more frequently than older adults.[1]

The reasons for this trend are unclear. Some researchers have suggested that the higher prevalence rates of PDs reported for younger adults as compared with older adults indicate that PDs mellow or soften with age (Kenan et al., 2000; Paris, 2003). This hypothesis finds support in longitudinal data, which indicate that PD features decline with age (e.g., Lenzenweger, Johnson, & Willett, 2004). Other studies have found that although specific symptoms disappear with increasing age, significant problems remain (Moffitt, Caspi, Harrington, & Milne, 2002). For example, a study that examined men with PDs over a 33-year period found that although specific behaviors required to meet a particular PD diagnosis declined with age, general social and interpersonal problems remained (Drake & Vaillant, 1988).

Although it is possible that PD pathology truly decreases with age, an alternative explanation for the apparent decrease is that the pathology presents itself differently and hence remains undetected by diagnostic criteria that are not designed for older people (Agronin & Maletta, 2000; Mroczek, Hurt, & Berman, 1999; Segal, Hersen, Van Hasselt, Smith Silberman, & Roth, 1996). Take, for example, the *Diagnostic and Statistical Manual of Mental Disorders*, 4th edition (*DSM–IV*; American Psychiatric Association, 1994) criterion for avoidant PD, “Avoids occupational activities that involve significant interpersonal contact, because of fears of criticism, disapproval, or rejection” (p. 664). This criterion has little face validity for assessing current personality functioning for people who are retired. In an epidemiological study, this criterion would capture younger adults with significant avoidant PD pathology but fail to capture older adults with the same amount of avoidant PD pathology. Subsequent comparisons between the two age groups based on how frequently younger and older adults endorsed this criterion would underestimate PD pathology and make the older adults appear less avoidant than they actually were.

The possibility that the current diagnostic scheme does not measure PD features adequately in older adults has implications for an understanding of the course of personality presentation across the life span. The idea that underlying latent personality characteristics remain stable with age while the presentation of these characteristics may change has been referred to as *heterotypic continuity* (e.g., Caspi & Bem, 1990; Kagan, 1969; Mroczek et al., 1999). Heterotypic continuity is different from actual change. An example of actual change would be someone who is diagnosed with antisocial PD in early adulthood but who ages and then no longer has the disorder. Instead, heterotypic continuity implies that the person still possesses the underlying disorder or qualities of the disorder but that the presentation of the disorder changes with time (Mroczek et al., 1999). There are at least three ways that PD features may show heterotypic continuity with age: The presentation of PD features may

[1]All of the studies used slightly different but very comparable definitions for younger and older age groups. For Ames and Molinari (1994), younger adults’ mean age was 42 years and older adults’ mean age was 72 years. For Casey and Schrodt (1989), younger adults ranged from ages 18 to 65 years and older adults were older than age 65 years. For Fogel and Westlake (1990), younger adults were younger than age 44 years and older adults were older than age 65. For Kenan et al. (2000), younger adults ranged from ages 20 to 39 years and older adults were older than age 60 years. For Mezzich et al. (1987), younger adults ranged from ages 19 to 59 years and older adults were older than age 60 years. For Molinari et al. (1994), younger adults’ mean age was 35 years and older adults’ mean age was 68 years.

show natural developmental change, the context within which the PD features exist may change, or the opportunity for the presentation of the features may change over time. These types of change do not necessarily occur in isolation. Some combination may shape the presentation of a latent personality characteristic.

PD features can present differently across the life span because of some natural development or maturation process. For example, a young girl might behave aggressively as a child by hitting other children, but she may behave aggressively during the teenage years by insulting or bullying classmates. In this example, natural learning processes likely shape the presentation of her personality.

PD features also may present differently across the life span because contexts change and constrain the ways in which the features can present. Contexts can change at the societal level, including social context, or they can change at the personal level, including cognitive ability or physical strength (Mroczek et al., 1999). Either type of context change may affect how personality presents in older adults because older adults are likely to experience either. Take, for example, a younger man with paranoid PD disorder who is afraid of being mugged. His suspiciousness may not keep him from jogging in the park because he may be able to comfort himself with the thought that he can fight off a mugger if necessary. In late life, though, his physical context may have changed so that now this same person may lack the strength and agility that at one time allowed him to overcome his fear and venture outside the safety of his home.

Finally, PD features can present differently across the life span because the opportunities for the presentation of the features may change with age (Mroczek et al., 1999). For example, a younger woman with borderline PD features may have many opportunities for encountering conflict in daily life through work, driving, and caring for children and may have many opportunities to exhibit irritability as a result. When this woman is older and retired, however, she may encounter less conflict and hence have less of a propensity to exhibit irritability. In essence, this woman's irritability has become functionally latent in late life. One could imagine what would happen if this older woman suddenly found herself in a hospital having to depend on others for care. A plausible hypothesis is that she would exhibit irritability, thereby disrupting the staff and other patients. Only diagnostic criteria sensitive to this type of heterotypic continuity would capture accurately the presentation of this older woman's personality.

The apparent lack of appropriate diagnostic criteria for older adults with PDs leaves the older adult population vulnerable to misdiagnosis and poor treatment possibilities (Agronin & Maletta, 2000; Mroczek et al., 1999; Segal et al., 1996). In addition, researchers who examine prevalence rates may draw incorrect conclusions about the nature of PDs across the life span (Mroczek et al., 1999). The present research is designed to assess whether this measurement problem exists and to identify which *DSM–IV* PD criteria may be inadequate to assess personality in older adults.

To this end, we examine both the prevalence of PD features across several age groups and the item-level functioning of *DSM–IV* criteria in the National Epidemiologic Survey on

Alcohol and Related Conditions (NESARC) data set. Within an item response theory framework, we determine empirically which PD criteria in the *DSM–IV* (American Psychiatric Association, 1994) show differential item functioning (DIF; Millsap & Everson, 1993) for older as compared with younger adults. DIF analyses are well suited to detect how systematically biased an item is for one group versus another group, controlling for true group-mean differences. The DIF analyses reported here test whether the measurement properties of each item (i.e., each criterion) differ between older and younger adults. If the measurement properties differ, the items contain DIF, which may indicate that they have limited validity for use with older adults.

Our analyses cannot tease apart which influence (age or cohort) drives the DIF between groups for a particular item. It may be the case that both forces contribute to the net DIF. Take, for example, the criterion for schizoid PD, “Has little, if any, interest in having sexual experiences with another person” (American Psychiatric Association, 1994, p. 641). Even older adults without schizoid tendencies may endorse this criterion quite readily because of physiological or hormonal changes that accompany the aging process (e.g., Kingsberg, 2002). Or they may endorse it because of cohort differences in the willingness to report sexual desire. Consider for another example the criterion for obsessive–compulsive PD, “Is unable to discard worn-out or worthless objects even when they have no sentimental value” (American Psychiatric Association, 1994, p. 673). Many older adults may save because they are influenced by the economics of retirement, or they may save because they were influenced by the Great Depression, a time when resources were scarce. In both of these examples it is possible that age and/or cohort factors cause the DIF. The analyses presented here are intended to illuminate where DIF occurs. Future studies can explore possible underlying causes of any DIF.

Study 1

To understand PD features across the life span, one must first investigate trends in prevalence rates across age groups. Prevalence trends will determine whether older age groups express more or less pathology than younger age groups, whether changes in prevalence are gradual or dramatic across age groups, and whether these trends differ not only by diagnostic category but also by specific criteria.

Method

Participants and procedure—The data used in this analysis come from the 2000–2001 wave of the NESARC study conducted by the National Institute of Alcohol Abuse and Alcoholism. This public data set consists of a sample of noninstitutionalized adults 18–98 years old in the United States. Participants included individuals in households, boarding houses, college dormitories, apartments, shelters, group homes, motels, and hotels. Those 18–24 years old were oversampled at a rate of 2.25 to 1. Hispanic and non-Hispanic Black households were also oversampled, increasing the number of Hispanic households from 12.5% to 19.3% and the number of Black households from 12.3% to 19.1% across all age groups. Female and male respondents were sampled at a rate equal to their proportion in the United States, and this resulted in more women being interviewed, particularly as participant age increased (Grant, Kaplan, Shephard, & Moore, 2003). The overall NESARC response

rate was 81%. Approximately 10% of all participants were recontacted to ensure that the protocol was administered correctly.

Data were collected by over 1,800 trained assistants who interviewed 43,093 participants in person. The interviewers worked for the U.S. Census Bureau and had on average 5 years of experience administering questionnaires. In addition, interviewers received 5 days of classroom training along with 5 days of in-home training in the use of this particular interview (Grant et al., 2003; Grant, Stinson, Dawson, Chou, & Ruan, 2005).

Study 1 included only participants who responded to all of the relevant PD questions, resulting in 36,659 participants. A complete description of the study was given to the participants prior to the interview, and written consent was obtained. Participants were paid $80 for their participation, which was completed in English or Spanish at their discretion. Accommodations were made so that 8 participants who were hearing impaired could complete the study. Although dementia was not officially screened, interviewer discretion was used to exclude participants who appeared mentally or physically incapable to complete the survey (Grant et al., 2003; N. Laken, personal communication, March 8, 2006).

Materials—Seven types of PD (antisocial, avoidant, dependent, histrionic, obsessive–compulsive, paranoid, and schizoid) were assessed with a structured diagnostic interview based on *DSM–IV* criteria, the Alcohol Use Disorder and Associated Disabilities Interview *Schedule-DSM–IV* version (AUDADIS–IV). The interview consisted of a series of yes/no questions answered by the participant regarding *DSM–IV* PD features across the lifetime. Participants responded on the basis of how they usually acted or felt. Interviewers instructed participants not to endorse PD features that were present only when other mental (e.g., depression) or physical (e.g., serious injury) conditions were present. Endorsed items were followed by another yes/no question that assessed whether the specific PD feature troubled them and/or caused functional impairment. The interviewers did not exercise any clinical judgment in the recording of the data. Participants were allowed to skip questions if they so chose or could not give a yes/no answer, but only the data from participants who answered all relevant questions were included in this sample.

To determine whether a participant met a specific *DSM–IV* PD criterion, we sometimes combined questions from the interview (the Appendix shows more specifically how questions from the interview mapped onto *DSM–IV* diagnostic criteria). To qualify for a specific PD diagnosis, individuals had to meet the requisite number of criteria outlined in *DSM–IV* (antisocial = 3+ criteria; avoidant = 4+; dependent = 5+ ; histrionic = 5+; obsessive-compulsive = 4+; paranoid = 4+; schizoid = 4+). They also had to indicate that at least one of the criteria caused functional impairment.[2] The internal consistency of all seven scales was extremely high, each $\alpha > .97$.

[2]Antisocial PD items differed slightly. If an antisocial item was endorsed, then it was followed by questions to determine whether the item had been present before and/or after age 15. Antisocial criteria did not include follow-up questions regarding whether they were problematic. To meet a diagnosis for antisocial PD, individuals had to endorse at least three of the antisocial PD diagnostic criteria and also meet a diagnosis for conduct disorder.

Results

The prevalence of specific PDs tended to be lower with increasing age. Antisocial, avoidant, histrionic, obsessive-compulsive, paranoid, and schizoid PDs showed negative associations with age (see Table 1). Antisocial PD, for example, was present in 4.5% of participants ages 18–24 years, 1.4% of participants ages 55–64 years, and close to 0% of participants over age 65 years. For this disorder, the difference between the youngest and oldest age groups was about 4%. For dependent PD, the rates across all age groups were quite low, and the trend across increasing age groups was relatively flat; the prevalence rate for dependent PD was under 1% for all age groups. Despite these more dominant trends, of note were the slightly higher prevalence rates for dependent, histrionic, and paranoid PDs in the oldest age group (85–98 years) when compared with the previous age group (75–84 years).

The prevalence rate for meeting *only one* PD tended to decrease across increasing age groups. Of those ages 18–24 years, 9.4% met diagnosis for one PD. This rate was lower for the next decade of life, with only 7.7% of those ages 25–34 years meeting diagnosis for one PD. The rate continued to decrease slightly across the next three decades, and it dropped quickly after age 64. For those 65 years and older, the rates remained relatively flat, averaging 3.5%. Younger adults also were more likely to meet criteria for *at least two* PDs. Of those ages 18–24 years, 6.2% met diagnosis for two or more PDs. This prevalence rate dropped over the next four decades of life. For those 65 years and older, the rates remained relatively flat at just over 1%.

When analyzing particular PD features, several trends emerged. Across increasing age groups, most of the criteria were endorsed less frequently (see Table 1). Overall, 37 of the 52 criteria followed a somewhat negative linear trend such that younger adults endorsed each of these criteria with the greatest frequency, followed by middle-aged adults and then older adults. For example, the criterion for antisocial PD, “Failure to conform to social norms with respect to lawful behaviors as indicated by repeatedly performing act that are grounds for arrest” (American Psychiatric Association, 1994, p. 649). was endorsed by 11.5% of those ages 18 to 24 years, 6.4% by those ages 45 to 55 years, and close to 0% by those over age 75 years.

Another 8 of the 52 criteria seemed to remain somewhat stable throughout much of adulthood until older age when the criteria were either endorsed very frequently or very infrequently. For example, the criterion for dependent PD, “Feels uncomfortable or helpless when alone because of exaggerated fears of being unable to care for himself or herself” (American Psychiatric Association, 1994, p. 668), was endorsed by just under 1.5% of participants ages 18–64 years. This rate was a bit larger for those ages 65–74 years, more than double for those ages 75–84 years, and approximately five times greater for those ages 85–98 years.

Still another 4 of the 52 criteria showed a curvilinear trend indicating that they were endorsed about equally by the younger and older adult groups but less frequently by the middle-aged groups. An example is the dependent PD criterion, “Has difficulty making everyday decisions without an excessive amount of advice and reassurance from others” (American Psychiatric Association, 1994, p. 668). This criterion was endorsed by 3.9% of

those ages 18–24 years, just over 1% by those ages 35–84 years, and by 3.3% of those ages 85–98 years.

An even less common trend was seen in only 3 of the 52 criteria, which were endorsed at approximately the same rate across all age groups. For example, one of the criteria for schizoid PD, “Neither desires nor enjoys close relationships, including being part of a family” (American Psychiatric Association, 1994, p. 641), was endorsed by approximately 4% of participants between the ages of 18 and 84 years.

The primary purpose of this study was to investigate prevalence trends across age groups. Because the proportion of females to males varies by age group, it was important to rule out gender as a possible confound for the decreasing prevalence rates. To do this, we conducted a 2 (gender) × 8 (age group) analysis of variance for each disorder, with number of endorsed PD features as the dependent variable. For paranoid, schizoid, histrionic, avoidant, and dependent PDs, there was a main effect of gender in that women endorsed more symptoms compared with men. For antisocial PD, however, men endorsed more symptoms compared with women. For obsessive-compulsive PD, there was no gender difference. The main effect of age group was also significant across all PDs, with those in younger age groups endorsing more symptoms compared with those in older age groups. Gender and age group did not interact significantly in any disorder other than paranoid PD (both women and men in increasing age groups endorsed fewer paranoid features, but women in increasing age groups endorsed relatively fewer paranoid features than did men) and antisocial PD (women in increasing age groups were less likely to endorse antisocial PD features than did men in increasing age groups). This general lack of interaction suggests that gender is not a viable explanation for the differences in prevalence across age groups, except for perhaps paranoid and antisocial PDs.[3]

Study 2

An examination of the trends in prevalence rates leads one to believe that at least some of the criteria are, indeed, measuring parts of older adults’ lives that are unrelated to PD pathology. Take, for example, the increase in prevalence rate that occurred for the criteria “Has little, if any, interest in having sexual experiences with another person” (American Psychiatric Association, 1994, p. 641) and “Is unable to discard worn-out or worthless objects even when they have no sentimental value” (p. 673). As we suspected (see previous comments), these criteria were endorsed much more often by the older participants in this sample. Here again, the greater endorsement of these items by older adults may reflect age-associated or generational differences between younger and older adults, and these are exceptions to the hypothesis that PD features abate over time. The increases in prevalence rates for these items do, however, fit with the notion that some of the criteria are not well suited to assess PD features for an older age group. To understand which criteria possess age group bias, we implemented an item-level, item response theory (IRT) analysis of *DSM–IV* PD criteria from the NESARC data set.

[3]Contact Steve Balsis for the Gender × Age Group analyses.

Within an IRT framework, the next set of analyses examined which PD criteria in the *DSM–IV* show DIF for older as compared with younger adults. For these analyses, the relation between an item and the relevant latent variable (e.g., "avoidant PD") is modeled using Birnbaum's (1968) two-parameter logistic (2PL) model. Parameters of the 2PL model include discrimination (*a*) and threshold (*b*) estimates for each item. The *a* parameter indicates how related the item is to the PD, and the *b* parameter shows where on the latent PD continuum that degree of discrimination occurs. Each item was examined separately for the presence of DIF with respect to the *a* parameter and with respect to the *b* parameter.

Items with high DIF levels have different measurement properties for older versus younger adults, controlling for true group-mean differences on the latent variable being measured. In other words, DIF means that even when younger and older adults are matched with respect to their degree of PD pathology, their probability of endorsing the criterion is not the same. More specifically, the presence of DIF in the *a* parameter suggests that the item measures a different latent variable in the two groups, whereas the presence of DIF in the *b* parameter indicates that the degree of pathology required for endorsement of the item is greater for one group versus the other.

Method

Participants and procedure—The data again are those from the first wave of the NESARC data (see the *Method* section for Study 1). We divided our sample into two groups to test the hypothesis that the criteria contain age group bias for older adults. We chose to use 18- to 34-year-olds as the baseline age group because this younger group was considered most carefully when the *DSM–IV* PD criteria were created (e.g., Agronin & Maletta, 2000). We chose to use 65- to 98-year-olds for the comparison group because this group is one commonly referred to as "older adults" and has been the general focus of other age-specific measurement tools (e.g., Geriatric Depression Scale; Yesavage, Brink, & Rose, 1983). If item functioning differences emerge between these two age groups, we can conclude that items do indeed function differently for older adults when compared with younger adults.

Materials—To test for DIF, we carried out IRT-based likelihood-ratio DIF testing (Thissen, Steinberg, & Gerrard, 1986) separately for each PD. This type of DIF testing involves statistically comparing IRT models with chi-square difference tests. The models differ with respect to their constraints. For each item, a model with item parameters constrained equal for younger and older adults is compared with a model that permits item parameters to vary between groups. (The models are described more fully below.) A Bonferroni correction was applied separately across all 52 criteria ($p = .05/52 = .001$) for both sets of parameters (*a* and *b*) to reduce the chances of making a Type I error.

Analyses were conducted using a program developed by Thissen (2001). For one item at a time, the 2PL model was fitted with *a* and *b* parameters constrained equal for both groups, and with *a* and *b* parameters permitted to vary by group. If the constraints significantly decreased model fit, there was evidence of omnibus DIF (DIF with respect to *a*, *b*, or both) for that item. Follow-up tests were then undertaken to more fully understand the nature of the DIF. Specifically, a model with *a* parameters constrained equal between groups but *b*

parameters free to vary was compared with the model permitting both item parameters to vary between groups. A significant difference between these models suggested significant DIF with respect to the *a* parameter. Finally, because interpretation of threshold DIF is most straightforward if there is not significant DIF in *a*, a test of DIF in *b* was carried out conditional on equal *a*s: The model with *a* and *b* constrained equal between groups was compared with the model with *a* constrained equal and *b* allowed to vary between groups. A significant difference indicated that the item was more easily endorsed by one group than the other.

The tests described above require treating some of the items as "anchors," to set a common scale for the latent variable between groups. Anchor items are assumed to be DIF-free; thus, they are not tested for DIF. To identify a set of anchor items for each disorder, we used a purification procedure suggested by Kim and Cohen (1995) prior to the DIF analyses reported here. The procedure begins with an omnibus test of DIF (testing DIF in *a* and *b* simultaneously) for each item. One item is tested at a time, with all other items treated as anchors. If no items show significant DIF, there is no need to proceed. Otherwise, the item with the largest statistically significant chi-square test statistic is eliminated, and the analysis is repeated with the remaining items. DIF testing is repeated as before, and again, the item with the largest statistically significant test statistic is eliminated. Items are eliminated one by one through repetition of this process until no further DIF is found. The final set of items showing no DIF are the anchors for the main analysis.

Results

DIF was present to some degree for all PDs (see Table 2). Across all PDs, DIF in *b* was much more prominent than DIF in *a*. Low levels of *a* DIF indicate that the PD criteria seem to measure the same latent variable for younger and older age groups. At the same time, high levels of *b* DIF indicate that some criteria are endorsed at different rates by older adults as compared with younger adults when controlling for degree of PD pathology (e.g., avoidant PD pathology). DIF in *b* indicates that younger and older adults with the same amount of pathology endorse these criteria at different rates, rendering the criteria biased. We first present the *a* DIF and then the *b* DIF results below.

Across all PDs, no criterion showed statistically significant *a* DIF when a Bonferroni correction was applied across all 52 criteria ($p = .05/52 = .001$), suggesting that the latent variable for each PD was quite similar for older and younger adults. For the purposes of this exploratory analysis, we also analyzed these data with a Bonferroni correction within each disorder. In this analysis, the critical *p* value depended on the number of criteria in each disorder. For example, if a disorder had seven criteria, the critical *p* value for each analysis within the disorder was $p = .05/7$ (or .007).

When the data were analyzed according to this more lenient standard, two instances of statistically significant *a* DIF emerged. For antisocial PD, the criterion "Deceitfulness, as indicated by repeated lying, use of aliases, or conning others for personal profit or pleasure" (American Psychiatric Association, 1994, p. 650) showed positive *a* DIF across age groups when the more lenient standard for statistical significance was applied, indicating that this criterion may be more related to antisocial PD pathology for older adults than it is to

antisocial PD pathology for younger adults. For dependent PD, the criterion “Goes to excessive lengths to obtain nurturance and support from others, to the point of volunteering to do things that are unpleasant” (American Psychiatric Association, 1994, p. 668) showed negative *a* DIF when the more lenient standard for statistical significance was applied, indicating that older adults’ support-seeking behavior may be less related to their level of dependency than younger adults’ support-seeking behavior is related to their level of dependency. Across all disorders, it is perhaps most important to note that *a* DIF was rarely detected. Therefore, there is no indication that the criteria are differentially related to the (respective) latent variables (e.g., avoidant PD pathology) for the two groups. Even for the two disorders that had an item that showed *a* DIF when a lenient standard for statistical significance was applied, the structures of the latent variables are considered similar.

Many more differences between the two groups emerged when examining *b* DIF. In fact, 24 of the 52 criteria showed statistically significant *b* DIF. For the purposes of these analyses, however, we are more interested in criteria that not only show statistically significant *b* DIF but also show clinically significant *b* DIF (see Jacobson & Truax, 1991, for a discussion of statistical and clinical significance). We established a clinical significance cutoff of .30 for *b* DIF. The presence of .30 *b* DIF means that for a particular criterion, the older adults need to have .30 standard deviations more PD pathology than younger adults before they endorse the item at the same rate as the younger adults. (The presence of −.30 DIF means that for a particular criterion, the older adults need to have .30 standard deviations less PD pathology than young adults before they endorse the item at the same rate as the younger adults.) Conventions for cutoffs in this area of study are not well established. We present both information about the statistical significance and the clinical significance of our findings. The reader may choose to view the results through any number of self-applied clinical significance cutoffs. Across all criteria, 15 met both statistical and clinical significance for *b* DIF. Eight of these items contained negative *b* DIF, indicating that older adults endorsed them more readily than younger adults who have the same level of PD pathology. Seven of the items contained positive *b* DIF, indicating that older adults endorsed them less readily than younger adults who have the same level of PD pathology. Implications for trends within each PD are explored in the General Discussion section.

General Discussion

Study 1

The NESARC data analyses reported here are largely consistent with the limited prevalence information that is available regarding PDs and aging. Like other studies that have compared the prevalence of PDs across age groups (Casey & Schrodt, 1989; Fogel & Westlake, 1990; Kenan et al., 2000), the NESARC data reveal a negative trend, indicating that people in increasing age groups are diagnosed less frequently with PDs. Also, the findings reported here are consistent with findings from the Epidemiologic Catchment Area study, which reported a 2.0% rate for antisocial PD (the only PD assessed in the Epidemiologic Catchment Area study) in adults ages 18–55 years and a 0% prevalence for antisocial PD in adults over age 55 years (Narrow, Rae, Robins, & Regier, 2002). The NESARC data show a

prevalence of about 2.6% for people ages 18–55 years and 0.7% for people over age 55 years.

Our report adds to the current literature about PDs and aging. Previous prevalence reports generally have not broken older groups into subgroups based on age. As our results show, this segmentation reveals some interesting trends in the latest years of life. Three of the PDs examined here are diagnosed more often in 85- to 98-year-olds when compared with 75- to 84-year-olds. Possibly because of the relatively small sample size for the 85- to 98-year-olds, these trends are not statistically significant. They may indicate, however, that some older adults start to become a bit more dependent, histrionic, and paranoid in very late life. Such trends in the endorsement of individual items fit with the notions that very late life can be accompanied by physical changes that may make older adults dependent on others for support (e.g., Fried et al., 1996), neurological changes that may make older adults more immature and aloof (e.g., Balsis, Carpenter, & Storandt, 2005; Siegler, Dawson, & Welsh, 1994; Strauss, Pasupathi, & Chatterjee, 1993), and sensory changes that are associated with paranoia (Zimbardo, Andersen, & Kabat, 1981).

There are several possible explanations for the general decreasing prevalence rates across age groups. For example, PD features may mellow or soften with increased age. This explanation has been advanced previously to explain similar trends in other studies (e.g., Grilo et al., 2004; Kenan et al., 2000; Lenzenweger et al., 2004; Paris, 2003; Warner et al., 2004) and seems to have been accepted as fact by many PD researchers. A second explanation is that people in older age groups have always had fewer PD features than people in younger age groups. This explanation is a bit less plausible perhaps, because it requires a society becoming more pathological in successive cohorts over the past 50 or so years. Although the world has undergone much social change in the past half century, it is not clear why that social change would lead to increased PD pathology. A third plausible explanation is that older generations are less willing or able to articulate mental health concepts because of differing social and linguistic norms. Little to no evidence supports this possibility, and it remains an open empirical question. A fourth possibility is that the lower rates in increasing age groups are due to attrition. Attrition can occur for a variety of reasons, including differential mortality, hospitalization, imprisonment, nursing home placement, or death, making older adults with PD features much less accessible than younger adults with PD features (see Costa et al., 1986, for a brief discussion of attrition in personality research).

Several of these hypotheses are compelling and fit with the decreasing prevalence rates but lack explanatory power for some of the increasing prevalence rates we found at the item level. A hypothesis that may help explain the heterogeneous trends is that some of the criteria contain age group (measurement) bias. According to this view, a criterion may be endorsed more or less frequently by older adults depending on how it relates to aspects of older adults' lives (such as their unique occupational, economic, social, and/or historical context). In other words, the notion that differences in prevalence rates may be indicative of measurement bias can accommodate other patterns of prevalence found across age groups.

Study 2

Our IRT analyses explored the possibility of measurement bias. Findings indicate that many of the criteria in the *DSM–IV* do contain bias. The absence of *a* DIF indicates that PD pathology has a similar latent structure across age groups. Meanwhile, the presence of *b* DIF indicates that some criteria are differentially endorsed by older adults and younger adults with equivalent PD pathology.

Antisocial PD—The criterion "Deceitfulness, as indicated by repeated lying, use of aliases, or conning others for personal profit or pleasure" (American Psychiatric Association, 1994, p. 650) had a lower *b* parameter for older adults. The lower *b* may indicate that antisocial older adults will use the strategy of deception more readily than will equivalently antisocial younger adults. Perhaps antisocial older adults use deception to accomplish their goals even at lower overall levels of antisocial PD pathology because strategies such as physical confrontation or intimidation are not as useful for them.

Avoidant PD—Four of the seven criteria for avoidant PD showed significant *b* DIF in the positive direction, indicating that avoidant older adults are less likely to endorse these criteria than younger adults with equivalent avoidant PD pathology. The consistent elevation in the *b* parameter across these four criteria suggests that avoidant older adults may be generally less likely to fear disapproval and rejection, show inhibition because of fear of ridicule in social situations, show restraint in intimate relationships, or worry about being criticized in social situations when compared with younger adults with equivalent avoidant PD pathology. These trends fit with research conducted within the so-cioemotional selectivity theory paradigm (e.g., Carstensen, Fung, & Charles, 2003; Lockenhoff & Carstensen, 2004), which suggests that people who perceive a shortened life expectancy compensate by optimizing their emotional experiences.

Dependent PD—Three of the eight criteria for dependent PD showed meaningful differences in their *b* parameters, all in the positive direction. This trend may indicate that dependent older adults have little difficulty disagreeing with others, do not seek other relationships when close ones end, and do not go to excessive lengths to obtain nurturance and support from others to the same extent as younger adults with an equivalent amount of dependent PD pathology. In other words, older adults may have to be exceptionally dependent before they will endorse criteria that reflect these behaviors at the same rate as (lesser) dependent younger adults.

Histrionic PD—A histrionic PD criterion, "Has a style of speech that is excessively impressionistic and lacking in detail" (American Psychiatric Association, 1994, p. 658), showed negative *b* DIF, indicating that histrionic older adults may be more likely to describe themselves as showing this style of speech than similarly histrionic younger adults. Perhaps this particular *b* DIF reflects the tendency of older adults, in general, to use grammatically simple speech (Kemper, Thompson, & Marquis, 2001). Other than this finding, the absence of other meaningful differences within the histrionic PD is consistent with the notion that the criteria for histrionic PD should function similarly for older and younger adults (Agronin & Maletta, 2000).

Obsessive– compulsive PD—Three of the criteria in obsessive– compulsive PD showed negative *b* DIF. This trend indicates that older adults may be generally more inflexible about matters of morality, ethics, or values, more apt to hold onto worthless objects, and more likely to adopt miserly spending styles when compared with younger adults with equivalent obsessive–compulsive PD. Perhaps these trends are related to cohort or economic differences between these two groups.

Paranoid PD—For paranoid PD, no criteria showed *b* DIF over our threshold for clinical significance. This finding is consistent with the supposition that no paranoid PD criteria should show age group bias (Agronin & Maletta, 2000). This finding does not indicate that extreme distrust or suspiciousness presents itself in exactly the same way across different age groups. It merely suggests that the particular items used in the *DSM–IV* diagnostic criteria capture this disorder equally well for both groups.

Schizoid PD—All of the estimated schizoid PD *b* parameters were statistically lower in older adults than younger adults. Three of these also met our clinical threshold for significance. The negative trend for these three criteria suggests that older adults with schizoid PD are less likely to enjoy close relationships, have less interest in having sexual experiences with another person, and are less likely to take pleasure in activities than younger adults with equivalent schizoid PD pathology. This robust trend is consistent with findings that suggest that although older adults have fewer social contacts, engage in fewer leisure activities, and have less sex, they are content (Brim et al., 1995). Even older adults with low levels of schizoid PD pathology will endorse these criteria readily.

These reported *b* DIF trends support our hypothesis that some of the criteria contain age group bias. When coupled with the null findings for the *a* DIF, we conclude that although the latent structure of PD pathology is similar for younger and older age groups, the rate at which the criteria are endorsed given the same amount of PD pathology differs.

Additional Comments

The results of these analyses may help bridge a gap in two lines of research that have traditionally appeared incompatible. One line suggests that personality is stable over time. Personality trait research conducted within the tradition of the Five-Factor Model (FFM; e.g., McCrae & Costa, 1996) has found repeatedly that Neuroticism, Extraversion, Openness, Agreeableness, and Conscientiousness remain relatively stable across adult age groups. Cross-sectional studies (Costa et al., 1986; Weiss et al., 2005), retrospective/prospective accounts (e.g., Fleeson & Heckhausen, 1997), and longitudinal analyses (e.g., Costa, Herbst, McCrae, & Siegler, 2000; Terracciano, McCrae, Brant, & Costa, 2005) provide converging evidence for this claim. Although all of these studies find slight differences in trait personality across age, the overall trend in this tradition suggests that trait personality is stable over time. Findings regarding the stability of personality traits within this tradition would lead one to predict that PD pathology should also be similar across younger and older age groups.

Although the trait model generally predicts that personality remains stable over time, a context-dependent view of personality suggests that personality may change as one’s

situation changes (e.g., Mischel, 1968, 2004; Mischel & Shoda, 1994, 1998, 2000). Research conducted within this context-dependent tradition takes a more dynamic view of personality and highlights the variable presentation of personality across situations and time (e.g., Mischel & Shoda, 1995). This line of research rejects the notion that traits are sufficient descriptors of personality. Findings within this tradition would lead one to suggest that personality should manifest itself differently across younger and older adults in as much as those age groups represent different meaningful contexts.

The present analyses of the NESARC data are consistent with both of these seemingly irreconcilable traditions, trait stability and context dependency. The null *a* DIF in the present analyses and research within the FFM seems to converge on the conclusion that the underlying trait structure of personality is consistent across older and younger age groups. Meanwhile, the large presence of *b* DIF in the NESARC data may indicate that the presentation of that similar latent personality is quite different across age groups (contexts). In other words, the two lines of competing personality research may address different, albeit related, phenomena that operate simultaneously. The trait personality tradition addresses the latent structure of personality, whereas the context-dependent tradition addresses the presentation of that latent structure across situations. The DIF findings presented here may have revealed simultaneously the latent structure of personality and its differential presentation across younger and older age groups.

The possible reconciliation of these traditions is consistent with recent observations of personality and aging. Consider Whitbourne's (2001) eloquent description of personality in later life as "an unobservable influence on outward behavior" (p. 212). She noted that an older adult's latent personality may remain stable over time and serve as just one of the influences on the personality's associated presentation. According to this perspective, the context of aging (occupational, social, economic, and physiological) contains forces that also influence the presentation of underlying personality. Whitbourne's view can accommodate the findings presented here, as it highlights both stability of latent trait structure and change in the presentation of that structure.

To concretize how the NESARC data simultaneously show latent personality stability and presentation change, consider obsessive–compulsive PD in both older and younger people. The absence of *a* DIF for this disorder suggests that the structure of obsessive– compulsive PD pathology is quite similar for older and younger adults. At the same time, positive *b* DIF for a particular item, say, "Adopts a miserly spending style," suggests that older adults exhibit this behavior more often as compared with younger adults with the same degree of obsessive–compulsive PD pathology. Viewed through this lens, the DIF analyses presented here provide a way to describe simultaneously both the latent structure of personality and the behavioral changes associated with that latent structure.

The *b* DIF findings raise important questions about how to assess PDs in older adults. If the PD features present differently in later life, how should we go about measuring them in a diagnostic classification system? One option would be to create a diagnostic classification system that is specific to the context of later life (age and cohort specific). Clinicians could use this system to judge whether a particular client meets a diagnosis. Investigators could

use it to study a variety of research questions relevant to older adults, such as how PD features are related to physical disease, compliance with medical rehabilitation, comorbidity, and social support in late life. One negative implication of a context-specific diagnostic system is that it may constrain clinicians and investigators who measure PD features cross-sectionally or longitudinally across broad age ranges and different cohorts. An investigator, for example, who conducts a longitudinal study across many years would need to switch assessment tools for a participant when that participant reaches some critical age. Switching assessment tools mid-study would introduce a confound when analyzing and interpreting data. Perhaps a context-neutral (age and cohort nonspecific) diagnostic system could solve this problem. With a context-neutral system, investigators could conduct research across broad ages and different cohorts without having to address certain confounds. A potential limitation of such a diagnostic system is that it may not provide clinicians with rich descriptions of their clients' personalities within the context in which their clients live (see Segal, Coolidge, & Rosowsky, 2006, for discussions and illustrations of context in the assessment of PD pathology in late life).

Although we provide strong exploratory evidence that suggests some of the *DSM–IV* criteria contain age group bias, there are several limitations to this study. First, the data analyzed here rely on self-report, a method of reporting that does not provide an exhaustive record of all PD features. Self-report instruments have significant limitations, and they do not always agree with other sources of information (Oltmanns & Turkheimer, 2006). Some participants can be especially imprecise when describing their own PD features. Reasons for their lack of precision may include limited insight into their own PD features or hesitancy to disclose negative personal qualities.

Another problem with using structured diagnostic interviews is that the diagnoses established are not clinical diagnoses. They are epidemiological research diagnoses and should not be confused with the former. A third limitation concerns our limited ability to determine what causes the observed DIF. The current analyses cannot determine the underlying reasons, be they age or cohort differences, that explain the presence of DIF between groups. DIF analyses are not intended to reveal what causes the differences between groups but merely to illuminate those differences. More sophisticated research designs would be required to determine the mechanism(s) behind the differences. Sequential or cross-sequential designs might be able to distinguish the DIF that is related to age differences from the DIF that is related to cohort differences. A fourth limitation is our inability to determine when DIF begins to occur between age groups. It might be that some of the criteria that show DIF for those 65 years old or older begin to show DIF even earlier at age 50. Future analyses may explain when DIF starts to emerge for each PD criterion. In fact, there are many extensions of these analyses that can be conducted across age groups, minority groups, gender, and different levels of pathology.

It is important to add that although we began our exploration expecting to find mostly negative *b* DIF across age groups, we found roughly equivalent amounts of positive and negative *b* DIF. This result does not support the view that the declining prevalence rates can be explained away entirely by DIF. The directions of our findings suggest that schizoid PD and obsessive–compulsive PD features may be overestimated in older adults and that

avoidant PD and dependent PD may be underestimated. Future work will need to investigate the clinical and research implications of these findings at different levels of PD pathology. On a related note, it is also perhaps important to add that our analyses do not include three of the PDs (borderline, narcissistic, and schizotypal PDs), which were not included in the NESARC protocol. The DIF for items that make up these disorders may tend toward one direction or another (positive or negative) and make it more or less plausible that the overall decline in PD prevalence can be accounted for by DIF.

In summary, clinicians who want to assess PDs in their older clients and researchers who want to study PDs in their participants are stymied by the lack of adequate diagnostic criteria for this age group. As a result, the presentation and course of PD features in late life may be understood poorly. Like other researchers (Widiger & Seidlitz, 2002), we recognize that PDs in late life are only beginning to be understood. We hope that this exploratory analysis can stimulate discussion among those interested to reach a more thorough understanding of PDs in later life and create more precise measurement tools for older adults.

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Appendix

Algorithms for Determining the Presence of Particular *DSM–IV* Criteria

Disorder	Criteria (paraphrased)	Questions asked (paraphrased)
Antisocial	Failure to conform to norms regarding legal behavior††	Ever vandalize another's property
		Ever start a fire intentionally
		Ever steal something when no one was around
		Ever shoplift
		Ever rob or mug someone
		Ever make money illegally
		Ever do something you could have been arrested for
		Ever force someone to have sex with you
		Ever harass or threaten someone
	Deceitfulness (lying, conning others)††	Ever lied a lot, other than to avoid being hurt
		Ever use a false name
		Ever scam or con someone for money
		Ever forge someone else's signature
	Impulsiveness (fails to plan ahead)†	More than once quit a job without plans for finding another one
		Travel from place to place without plans
		Ever have a time when had no regular place to live
	Irritability and aggressiveness††	Ever start a lot of fights
		Ever get into a physical fight that included punching
		Ever use a weapon like a stick or gun in a fight
		Ever hit someone so hard that you injured them
		Ever physically hurt another person on purpose
		Ever hurt an animal on purpose
	Reckless disregard for safety†	Ever do risky things like speeding or driving after having too much to drink
		Ever get more than 3 driving/speeding tickets
		Ever have driver's license suspended or revoked for reckless driving
	Consistent irresponsibility	Ever fail to pay off debts
	Lack of remorse†	Since time when destroyed property, stole, or mistreated another person/animal, have you regretted doing these things
		Did you feel you had a right to do these things
Avoidant	Avoids occupational activities requiring lots of social contact	Avoid tasks that deal with people
	Unwilling to become involved with others unless sure to be liked	Avoid getting involved with people unless certain they will like you

Disorder	Criteria (paraphrased)	Questions asked (paraphrased)
	Restrained in intimate relationships due to fear of ridicule	Find it hard to be open with people
	Preoccupied with being criticized in social settings	Often worry about being criticized/rejected in social situations
	Inhibited in new situations with others due to low self-esteem	Usually quiet when meet new people because you feel they are better than you are
	Views self as inept, unappealing, or inferior	Believe that you are not as good, as intelligent, or as attractive as most people
	Unusually reluctant to try new social activities that might be embarrassing	Afraid of trying new things or doing things outside usual routine because you may become embarrassed
Dependent	Difficulty making everyday decisions without being reassured by others	Need a lot of reassurance from others before making everyday decisions
	Needs others to take responsibility for most areas of his/her life	Depend on others to handle major areas in life
	Difficulty voicing disagreement with others	Find it hard to disagree with people because fear losing their support
	Difficulty starting projects on own	Find it hard to start a task when there is no one to help
	Goes to great lengths to find nurturance from others	Ever volunteered to do unpleasant things so that others will like you
	Uncomfortable or helpless when alone because fears cannot care for self	Usually feel uncomfortable when alone because afraid can't take care of yourself
	Urgently seeks new partner when close relationship ends	When close relationship ends, feel you have to find someone to take care of you
	Preoccupied with fears of being left alone to take care of self	Worry a lot about being left alone to take care of self
Histrionic	Uncomfortable if not center of attention	Feel uncomfortable in situations when not the center of attention
	Inappropriately seductive or provocative†	Flirt a lot and it causes trouble or problems at work/school or with family/other people
		Often find yourself behaving as if you're "coming on" to others
	Rapidly changing and shallow display of emotion	Feelings often change very suddenly/unexpectedly for little reason
	Uses physical appearance to attract attention	Try to draw attention by the way you dress or look
	Speech is impressionistic and lacks detail	Often express self using very little detail
	Dramatic, theatrical, and overly emotional†	Often dramatic and colorful
		Display emotions in dramatic ways
	Easily influenced by others' opinions and behavior	Change mind often about things depending on who you're with or a recent experience
	Considers relationships to be closer than they really are	Ever discovered that people aren't close like you thought
Obsessive–compulsive	Preoccupied with details, rules, lists, order††	The kind of person who focuses on details/ organization or likes to make lists and schedules and it has caused trouble for you
		Sometimes get so caught up with details/ schedules/organization that you lose sight of the main point
	Perfectionism gets in the way of finishing things	Have trouble completing jobs because spend so much time trying to make things perfect

Disorder	Criteria (paraphrased)	Questions asked (paraphrased)
	Excessive devotion to work interferes with leisure and friendships	You or others feel you are so devoted to work/ school you have no time for fun or others
	Overly conscientious and inflexible regarding matters of morals and ethics	Others think you have unreasonably high standards/morals/ideas
	Cannot discard worn-out things, even those without value	Have trouble throwing out worn-out/worthless things even when they have no sentimental value
	Reluctant to delegate tasks to others unless they do it his/her way	Hard to let others help if they don't agree to do things just the way you want
	Miserly pattern of spending for both self and others	Hard to extra spend money on self/others
	Rigid and stubborn††	The kind of person who focuses on details/ organization or likes to make lists and schedules and it has caused trouble for you
		Sometimes get so caught up with details/ schedules/organization that you lose sight of the main point
Paranoid	Suspects others are causing problems for him/her	Often have to keep an eye out to keep people from exploiting you
	Preoccupied with doubts about others' trustworthiness	Spend a lot of time wondering about trust of friends/colleagues
	Reluctant to confide in others	Find it is best to stay guarded because they will use it against you
	Reads hidden meaning into innocent remarks	Often detect hidden threats or insults in what people do or say
	Bears grudges (unforgiving of insults) ††	The kind of person who takes a long time to forgive people
		Many people you can't forgive because they did something to you a long time ago
	Perceives attacks on his/her integrity that are not noticed by others	Often get angry or lash out when someone criticizes you
	Has recurrent suspicious about partner's fidelity	Often suspected that your spouse/partner is unfaithful
Schizoid	Does not want or enjoy close relationships††	Be fine without having a close relationship
		Take little pleasure in being social or with others
	Always chooses solitary activities	Have almost always preferred to do things alone
	Little interest in sexual experiences	Could be content without ever being sexually involved
	Takes pleasure in few behaviors	Very few things give you pleasure
	Lacks close friends	Very few people you are really close to outside of family
	Indifferent to positive or negative feedback from others†	Slow to react to praise or criticism Do not care about what people think of you
	Emotionally cold or flat†	Rarely show emotion
		Find that nothing makes you very sad or very happy

Note. DSM–IV = Diagnostic and Statistical Manual of Mental Disorders, 4th edition (American Psychiatric Association, 1994).

† At least one question required to qualify for criterion.

†† At least two questions required to qualify for criterion.

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Table 1

Prevalence Rates for DSM-IV Personality Disorder (PD) Criteria by Age Group (N = 36,659)

PD criteria (paraphrased)	Age group (in years)							
	18–24 (*n* = 4,615)	**25–34 (*n* = 6,881)**	**35–44 (*n* = 7,878)**	**45–54 (*n* = 6,455)**	**55–64 (*n* = 4,261)**	**65–74 (*n* = 3,494)**	**75–84 (*n* = 2,376)**	**85–98 (*n* = 699)**
Antisocial (diagnosis)	4.5	3.3	2.3	1.9	1.4	0.3	0.2	0.3
Failure to conform to norms regarding legal behavior	11.5	8.3	7.1	6.4	3.3	1.1	0.6	0.0
Deceitfulness (lying, conning others)	3.9	2.2	1.6	1.4	0.8	0.2	0.3	0.0
Impulsiveness (fails to plan ahead)	19.3	15.6	13.9	14.1	10.4	6.4	5.5	3.6
Irritability and aggressiveness	7.7	6.2	5.6	4.9	3.8	1.4	0.8	0.6
Reckless disregard for safety	20.1	24.5	24.2	21.9	19.0	10.9	6.2	2.4
Consistent irresponsibility	3.4	5.5	5.5	4.8	3.4	1.5	0.8	0.1
Lack of remorse[†]	22.7	19.3	16.7	14.9	10.2	4.5	2.9	1.6
Avoidant (diagnosis)	3.7	2.7	2.4	2.4	1.6	0.7	0.8	0.7
Avoids occupational activities requiring lots of social contact	7.7	5.3	5.2	5.3	4.0	2.2	2.6	3.9
Unwilling to become involved with others unless sure to be liked	8.3	5.3	4.8	4.4	3.8	2.5	3.0	4.6
Restrained in intimate relationships due to fear of ridicule	14.6	11.1	10.0	10.0	9.3	7.0	7.4	7.2
Preoccupied with being criticized in social settings	13.6	10.7	9.0	8.4	7.2	4.6	4.6	4.2
Inhibited in new situations with others due to low self-esteem	7.4	5.1	5.3	5.2	5.1	4.8	5.2	6.3
Views self as inept, unappealing, or inferior	10.7	7.9	7.7	8.0	7.4	6.0	7.4	7.7
Unusually reluctant to try new social activities that might be embarrassing	7.5	6.6	6.0	6.8	5.8	4.5	5.4	5.0
Dependent (diagnosis)	0.9	0.5	0.4	0.4	0.4	0.2	0.2	0.7
Difficulty making everyday decisions without being reassured by others	3.9	1.6	1.5	1.2	1.2	1.3	1.5	3.3
Needs others to take responsibility for most areas of his/her life	7.8	4.0	3.2	3.6	4.7	4.8	8.0	17.9
Difficulty voicing disagreement with others	5.9	5.3	4.0	4.7	4.0	3.6	5.0	5.0
Difficulty starting projects on own	4.7	2.9	2.7	2.6	2.8	2.8	4.3	7.3
Goes to great lengths to find nurturance from others	6.2	5.7	4.3	4.5	3.9	3.1	3.1	3.4
Uncomfortable or helpless when alone because fears cannot care for self	2.0	1.0	1.0	1.2	1.5	1.7	3.3	7.4
Urgently seeks new partner when close relationship ends	2.9	1.6	1.2	1.1	0.9	0.8	0.8	1.7
Preoccupied with fears of being left alone to take care for self	3.8	2.6	2.8	3.0	3.1	3.4	4.6	7.3
Histrionic (diagnosis)	2.4	1.3	0.8	0.9	0.6	0.1	0.2	1.0
Uncomfortable if not center of attention	2.5	1.5	1.2	1.1	1.2	1.1	1.2	2.4

PD criteria (paraphrased)	Age group (in years) 18–24 (*n* = 4,615)	25–34 (*n* = 6,881)	35–44 (*n* = 7,878)	45–54 (*n* = 6,455)	55–64 (*n* = 4,261)	65–74 (*n* = 3,494)	75–84 (*n* = 2,376)	85–98 (*n* = 699)
Inappropriately seductive or provocative	9.5	5.1	3.8	3.6	3.2	2.7	1.6	2.2
Rapidly changing and shallow display of emotion	19.0	12.4	9.3	8.8	7.3	4.8	4.8	5.0
Uses physical appearance to attract attention	9.1	5.1	3.8	3.1	3.2	2.9	3.0	3.3
Speech is impressionistic and lacks detail	15.5	14.3	14.5	15.1	16.0	15.3	14.3	13.0
Dramatic, theatrical, and overly emotional	18.7	17.1	16.3	16.3	15.3	14.2	10.8	9.9
Easily influenced by others' opinions and behavior	18.2	14.7	12.6	12.7	12.3	13.2	12.4	11.7
Considers relationships to be closer than they really are	32.1	27.5	25.5	27.3	25.8	20.8	18.1	15.0
Obsessive–compulsive (diagnosis)	7.3	4.8	4.5	4.3	3.8	2.3	2.5	1.6
Preoccupied with details, rules, lists, order	6.1	6.7	6.1	5.3	4.8	4.0	3.0	1.9
Perfectionism gets in the way of finishing things	9.3	8.8	8.1	7.2	8.2	6.1	6.2	4.4
Excessive devotion to work interferes with leisure and friendships	9.0	9.8	10.3	10.0	6.6	3.8	2.1	1.7
Overly conscientious and inflexible regarding matters of morals and ethics	18.0	17.5	18.1	20.7	21.4	18.3	18.5	14.7
Cannot discard worn-out things, even those without value	17.6	14.4	15.0	20.1	24.4	26.1	27.4	23.9
Reluctant to delegate tasks to others unless they do it his/her way	16.3	17.0	16.6	16.4	16.6	15.3	13.3	10.7
Miserly pattern of spending for both self and others	9.8	10.5	9.9	9.9	9.3	8.7	9.9	10.7
Rigid and stubborn	14.8	11.3	10.8	10.0	11.1	9.4	9.1	6.9
Paranoid (diagnosis)	6.6	4.9	3.9	3.5	2.4	1.5	1.2	1.6
Suspects others are causing problems for him/her	21.4	18.5	16.6	17.5	15.0	10.9	10.2	7.3
Preoccupied with doubts about others' trustworthiness	13.3	9.7	7.2	7.1	5.1	3.9	3.2	3.4
Reluctant to confide in others	16.8	13.5	12.7	12.2	10.3	8.0	7.4	6.7
Reads hidden meaning into innocent remarks	10.8	8.8	6.6	6.2	5.3	4.0	2.9	3.0
Bears grudges (unforgiving of insults)	8.7	6.9	5.7	5.6	5.0	5.0	4.6	3.4
Perceives attacks on his/her integrity that are not noticed by others	15.8	11.0	8.8	7.9	7.4	6.6	6.6	4.7
Has recurrent suspicions about partner's fidelity	9.8	9.1	8.7	8.0	7.9	6.7	4.1	4.4
Schizoid (diagnosis)	4.1	3.2	3.1	2.8	2.2	1.5	1.9	0.9
Does not want or enjoy close relationships	4.0	4.3	4.2	4.5	4.2	3.9	4.0	2.2
Always chooses solitary activities	18.7	15.1	15.5	15.8	15.4	14.1	14.8	13.7
Little interest in sexual experiences	35.0	25.4	27.0	31.3	38.1	42.6	49.2	52.4
Takes pleasure in few behaviors	9.1	7.6	8.1	7.8	8.0	7.8	9.2	9.0
Lacks close friends	36.7	33.4	33.9	34.4	32.3	27.2	22.9	22.6

PD criteria (paraphrased)	Age group (in years)							
	18–24 (*n* = 4,615)	25–34 (*n* = 6,881)	35–44 (*n* = 7,878)	45–54 (*n* = 6,455)	55–64 (*n* = 4,261)	65–74 (*n* = 3,494)	75–84 (*n* = 2,376)	85–98 (*n* = 699)
Indifferent to positive or negative feedback from others	48.1	40.7	38.9	37.3	36.0	35.5	33.3	28.2
Emotionally cold or flat	24.2	19.4	19.4	20.7	21.1	22.5	20.0	19.9
At least one PD	15.6	12.6	11.1	10.6	8.5	5.0	4.9	4.7

Note. DSM–IV = Diagnostic and Statistical Manual of Mental Disorders, 4th edition (American Psychiatric Association, 1994).

†Asked of those who endorsed at least one previous antisocial criterion.

Table 2

Discrimination and Threshold Parameters for DSM–IV Personality Disorder (PD) Criteria for Younger and Older Adults

	18–34 years		65–98 years		Older–younger	
PD criteria (paraphrased)	***a***	***b***	***a***	***b***	***a***	***b***
Antisocial (*N*= 21,425)						
Failure to conform to norms regarding legal behavior	1.87	1.79	2.50	2.00	0.63	**0.21**
Deceitfulness (lying, conning others)	2.05	2.53	4.00	2.00	1.95	**−0.53***
Impulsiveness (fails to plan ahead)	—	—	—	—	—	—
Irritability and aggressiveness	1.76	2.10	1.94	2.19	0.18	0.09
Reckless disregard for safety	1.18	1.29	1.44	1.18	0.26	−0.11
Consistent irresponsibility	—	—	—	—	—	—
Avoidant (*N*= 21,364)						
Avoids occupational activities requiring lots of social contact	1.44	2.43	1.29	3.16	−0.15	**0.73***
Unwilling to become involved with others unless sure to be liked	1.86	2.07	1.86	2.41	0.00	**0.34***
Restrained in intimate relationships due to fear of ridicule	1.71	1.62	1.54	1.92	−0.17	**0.30***
Preoccupied with being criticized in social settings	3.56	1.31	3.76	1.62	0.20	**0.31***
Inhibited in new situations with others due to low self-esteem	2.42	1.92	2.26	1.87	−0.16	−0.05
Views self as inept, unappealing, or inferior	—	—	—	—	—	—
Unusually reluctant to try new social activities that might be embarrassing	—	—	—	—	—	—
Dependent (*N*= 21,346)						
Difficulty making everyday decisions without being reassured by others	2.50	2.42	3.27	2.52	0.77	**0.10**
Needs others to take responsibility for most areas of his/her life	—	—	—	—	—	—
Difficulty voicing disagreement with others	1.79	2.25	1.42	2.93	−0.37	**0.68***
Difficulty starting projects on own	2.29	2.27	2.52	2.32	0.23	0.05
Goes to great lengths to find nurturance from others	1.35	2.59	0.78	4.90	−0.57	**2.31***
Uncomfortable or helpless when alone because fears cannot care for self	4.00	2.35	4.00	2.24	0.00	**−0.11**
Urgently seeks new partner when close relationship ends	2.49	2.54	2.90	2.86	0.41	**0.32***
Preoccupied with fears of being left alone to take care for self	—	—	—	—	—	—
Histrionic (*N*= 21,242)						
Uncomfortable if not center of attention	1.66	3.12	1.28	3.46	−0.34	0.22

PD criteria (paraphrased)	18–34 years		65–98 years		Older–younger	
	a	*b*	*a*	*b*	*a*	*b*
Inappropriately seductive or provocative	2.07	1.97	2.31	2.03	0.24	0.06
Rapidly changing and shallow display of emotion	2.03	1.37	2.22	1.56	0.19	**0.19**
Uses physical appearance to attract attention	—	—	—	—	—	—
Speech is impressionistic and lacks detail	0.83	2.36	0.84	1.90	0.01	**−0.46***
Dramatic, theatrical, and overly emotional	1.89	1.25	1.97	0.97	0.08	−0.28
Easily influenced by others' opinions and behavior	1.49	1.51	1.36	1.33	−0.13	**−0.18**
Considers relationships to be closer than they really are	—	—	—	—	—	—
Obsessive-compulsive (*N*= 21,298)						
Preoccupied with details, rules, lists, order	—	—	—	—	—	—
Perfectionism gets in the way of finishing things	2.25	1.70	1.73	1.80	−0.52	0.10
Excessive devotion to work interferes with leisure and friendships	2.70	1.56	3.76	1.57	1.06	0.01
Overly conscientious and inflexible regarding matters of morals and ethics	1.50	1.39	1.99	0.91	0.49	**−0.48***
Cannot discard worn-out things, even those without value	4.00	1.12	4.00	0.72	0.00	**−0.40***
Reluctant to delegate tasks to others unless they do it his/her way	2.71	1.15	3.05	0.91	0.34	**−0.24**
Miserly pattern of spending for both self and others	1.06	2.43	1.15	2.03	0.09	**−0.40***
Rigid and stubborn	—	—	—	—	—	—
Paranoid (*N*= 21,297)						
Suspects others are causing problems for him/her	—	—	—	—	—	—
Preoccupied with doubts about others' trustworthiness	3.59	1.35	3.43	1.43	−0.16	0.08
Reluctant to confide in others	2.84	1.21	2.71	1.14	−0.13	−0.07
Reads hidden meaning into innocent remarks	2.57	1.57	2.57	1.60	0.00	0.03
Bears grudges (unforgiving of insults)	2.16	1.85	1.89	1.72	−0.27	**−0.13**
Perceives attacks on his/her integrity that are not noticed by others	—	—	—	—	—	—
Has recurrent suspicions about partner's fidelity	1.78	1.84	1.48	1.92	−0.30	0.08
Schizoid (*N*= 21,218)						
Does not want or enjoy close relationships	1.31	2.95	1.63	2.32	0.32	**−0.63***
Always chooses solitary activities	1.52	1.45	1.61	1.18	0.09	**−0.27**
Little interest in sexual experiences	0.96	1.12	0.86	−0.08	−0.10	**− 1.20***
Takes pleasure in few behaviors	1.76	1.94	1.67	1.62	−0.09	**−0.32***

PD criteria (paraphrased)	18–34 years		65–98 years		Older–younger	
	a	*b*	*a*	*b*	*a*	*b*
Lacks close friends	—	—	—	—	—	—
Indifferent to positive or negative feedback from others	—	—	—	—	—	—
Emotionally cold or flat	1.57	1.16	1.38	0.91	−0.19	**−0.25**

Note. *a*= discrimination parameter; *b* = threshold parameter. For *a* and *b* differential item functioning, bold values are statistically significant after Bonferroni correction across all disorders ($p = .05/52 = .001$). Dashes indicate the presence of an anchor item. *DSM–IV* = *Diagnostic and Statistical Manual of Mental Disorders*, 4th edition (American Psychiatric Association, 1994).

* *b* parameters differ by at least 30% of a standard deviation.