

Revisiting the Need for Age-Based Norms in Personality Assessment Using the Cleveland Adaptive Personality Questionnaire

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Abstract

The need for age-based norms in personality assessment is of great interest given the trend of adjusting for demographic variables in neurocognitive evaluations. We examined the need for age-based norms using the Cleveland Adaptive Personality Questionnaire (CAPQ; Poreh & Levin, 2019) in 1,646 individuals ages 25 to 95 years (M = 44.5, SD = 16.1). Results showed that scores on the CAPQ clinical scales linearly declined across the lifespan in conjunction with a linear increase in measures of social desirability. Power analysis indicated that the CAPQ Avoidant scale produced the most significant effect, followed by a moderate effect for the Anxiety, Borderline, Depression, and Paranoia scales, in that order. However, when the social desirability scale served as a covariate, only the Avoidant and Depression scales significantly declined across age/cohort, showing medium and small power, respectively. These findings are consistent with the literature on other multiscale personality assessment measures. In sum, while age-based norms do not seem to be necessary, a linear regression-based algorithm that controls for social desirability would improve the meaningfulness of personality assessment results across the lifespan.

Introduction

The Cleveland Adaptive Personality Questionnaire (Poreh, 2018) is a brief multiscale self-report measure. It consists of eleven clinical and three validity scales and has online as well as paper versions. Unlike existing personality measures, it was not developed for forensic purposes and provides validity scales of social desirability, consistency, and exaggeration. The initial validation study showed that this new measure has adequate internal and test-retest reliability across 3, 6, 9, and 12 months. In addition, each scale has high diagnostic sensitivity and specificity (Poreh & Levin, 2019).

Grezmak (2021) showed that the CAPQ clinical and validity scales are significantly correlated with the Personality Assessment Inventory (PAI, Morey & Ambwani, 2008) corresponding scales, aside from PAI's Hypomania and CAPQ's Bipolar scales, which were only moderately correlated. Additionally, the study showed that the profiles generated by the two measures were comparable. Holmes (2021) reported that the CAPQ scales significantly correlated with corresponding MMPI-2 (Hathaway et al., 1989) clinical scales, aside from the MMPI's Hypochondriasis and Hypomania scales, reflecting changes in the conceptualization and diagnostic criteria of these constructs. Holmes also showed that the profiles generated by the two

measures were comparable. Finally, Lancaster et al. (2022) employed two large clinical samples ($N = 2,937$) to conduct exploratory and subsequent confirmatory factor analyses to develop subscales for the CAPQ clinical scales. The study showed that eight of the CAPQ scales consisted of two dimensions, with the CAPQ Bipolar scale consisting of three dimensions. The Paranoid and Obsessive–Compulsive Personality scales did not hold any dimensionality. The authors concluded that these newly developed subscales might aid clinicians in formulating more accurate conceptualizations of complex underlying psychological problems in their patients.

The brevity of the CAPQ makes it an ideal measure for the assessment of older adults. However, it is unclear whether the assessment of older adults might require the development of age-based norms. As such, there were two primary goals of this study: first, to replicate previously reported patterns of personality characteristic endorsement across the lifespan; second, to determine whether the CAPQ requires the inclusion of age-based norms.

Method

Participants. In this study, 3,954 community-dwelling adults with or without a mental health history completed the CAPQ, and 1,646 community-dwelling adults without a mental health history served as the standardization sample. The volunteers were recruited from across the United States. Age ranged from 18 to 86 years ($M = 43.3$, $SD = 15.2$); 76.1% were female, 30.6% had a high school education, 36.0% had a bachelor's degree, and 33.4% had a graduate degree. Level of education differed across the cohorts, with a higher proportion of the younger participants attaining a post bachelor's degree (ages 26 to 40: 37.5%) than the middle-aged and older cohorts (ages 41 to 55: 22.0%; ages 66 to 90: 20.9%). Gender differences were previously examined using multiple t tests with a Bonferroni correction to control for Type 1 error (Poreh & Levin, 2019). None of the clinical or validity scales approached significance within the normative sample. The correlation between education and CAPQ scales, with Social Desirability and Consistency of response serving as covariates, also did not produce significant findings aside from the Sociopathy ($r = -.12$), Psychoticism ($r = -.13$), and Somatization ($r = -.84$) scales (Poreh & Levin, 2019).

Procedure. Participants were recruited through ResearchMatch.org, a research registry funded by the NIH Clinical and Translational Science Award program and endorsed by the NIH Clinical Center as a source for participant recruitment. Each participant was sent an email with an IRB-approved study script. Interested individuals signed an electronic consent form that included a detailed description of the study, specified that there would not be compensation for participation, and indicated that they could terminate participation at any time. Volunteers who agreed to participate were sent a follow-up email with a link to the questionnaire. Statistical analyses were conducted using NCSS statistical software (Hintze, 2022). Given the relatively few cases within the 18-to-25-year range (27), subsequent statistical analyses did not include this cohort.

Materials. The CAPQ includes 123 items with three validity scales (Naïveté [NAV], Infrequency [INF], and Inconsistency [CON]). Of the ten clinical scales, six (Paranoia [PAR], Psychoticism [PSY], Borderline [BOR], Sociopathy [SOC], Avoidant [AVD], and Anakastia [OCPD]) match the primary DSM–V personality disorder diagnostic entities. The other four scales assess familiar psychopathological entities (Anxiety [ANX], Depression [DEP], Bipolar [BIP], and Somatic). Finally, Substance Use [SUB] is a scale for assessing lifetime substance use. Internal consistency coefficients for the full clinical scales ranged from $\alpha = .70$ –.87. The internal consistency of the validity scales ranged from $\alpha = .77$ –.84. The range of internal

consistency coefficients for the validity scales was $\alpha = .73-.88$ for the first sample, and $\alpha = .55-.89$ for the second sample. The test-retest range across 2 to 5 months ($n = 831$) was $r_{tt} = .74-.90$; across 6 to 12 months ($n = 420$) was between $r_{tt} = .67-.90$; and over a year ($n = 250$) between $r_{tt} = .58-.82$. The international version of the CAPQ (the International Adaptive Personality Inventory, IAPI) is available in German, Czech, Hebrew, French, Canadian, Spanish, Norwegian, and Arabic.

Results

Figure 1 shows the normative group profile means for the CAPQ validity and clinical scales. One sees that older adults presented with significantly lower profiles aside from the Bipolar, Somatic, and Substance Use scales.

Figure 1

Expanded Normative Group Mean Scores for the CAPQ (Cleveland Adaptive Personality Inventory) Validity and Clinical Scales

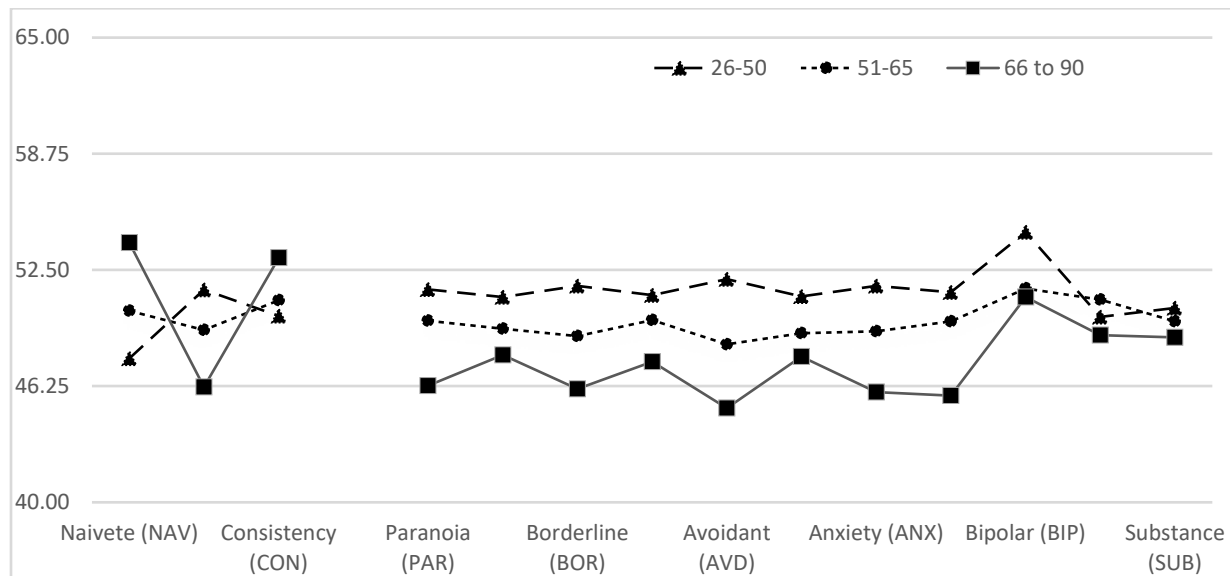


Table 1 presents the mean and standard deviations and *T*-transformed CAPQ validity and clinical scales.

Table 1
Normative Data for the CAPQ Validity and Clinical Scales

| Age | 26-30 | 31-35 | 36-40 | 41-45 | 46-50 | 51-55 | 56-60 | 61-65 | 66-70 | 71-75 | 76-90 |
|--------------------|---------------|-------------|-------------|-------------|-------------|-------------|------------|-------------|-------------|-------------|-------------|
| <i>n</i> | 151 | 200 | 176 | 118 | 88 | 104 | 119 | 149 | 142 | 67 | 71 |
| Scale | <i>M (SD)</i> | | | | | | | | | | |
| Naivete (NAV) | 45.8 (9.1) | 48.7 (8.9) | 48.3 (8.5) | 46.9 (8.8) | 49.0 (7.9) | 48.7 (9.1) | 49.7 (8.3) | 52.5 (9.2) | 52.2 (8.1) | 54.3 (8.1) | 55.0 (10.5) |
| Infrequency (INF) | 53.9 (11.0) | 50.9 (10.0) | 51.6 (10.0) | 50.5 (9.7) | 50.3 (10.0) | 49.7 (11.0) | 49.4 (8.5) | 48.7 (8.8) | 47.0 (8.3) | 47.5 (7.8) | 44.1 (5.9) |
| Consistency (CON) | 49.1 (9.4) | 50.8 (9.6) | 49.3 (9.3) | 49.6 (10.0) | 51.3 (11.0) | 50.3 (10.0) | 50.3 (9.2) | 52.0 (10.0) | 52.9 (10.0) | 50.6 (10.0) | 56.0 (10.1) |
| Paranoia (PAR) | 52.7 (11) | 50.6 (9.2) | 51.7 (11) | 51.2 (11) | 51.1 (11) | 50.3 (11) | 50.6 (10) | 48.4 (9.1) | 46.2 (7.4) | 47.1 (8.5) | 45.5 (7.4) |
| Psychoticism (PSY) | 52.2 (12) | 50.6 (9.8) | 51 (11) | 50.2 (9.5) | 51.2 (11) | 50 (12.5) | 49.7 (9.2) | 48.3 (6.5) | 47.3 (6.5) | 47.9 (7.8) | 48.6 (8.6) |
| Borderline (BOR) | 54.6 (12) | 51.8 (10) | 51.8 (11) | 50.2 (9.5) | 49.8 (9.1) | 49.6 (9.9) | 49.0 (9.6) | 48.2 (9.2) | 46.3 (6.1) | 46.9 (7.8) | 45.1 (5.0) |
| Sociopathy (SOC) | 50.8 (11) | 53.6 (11) | 51.8 (9.9) | 49.9 (9.5) | 49.6 (10) | 50 (9.1) | 48.9 (10) | 50.5 (10) | 48.5 (8.4) | 46.9 (8.6) | 47.3 (8.7) |
| Avoidant (AVD) | 55 (10) | 52.6 (10) | 53.1 (10) | 50.5 (10) | 48.8 (8.5) | 48.1 (9.5) | 49.7 (9.4) | 47.7 (8.9) | 46.1 (7.8) | 46.8 (7.7) | 42.3 (6.6) |
| Anakastia (OCPD) | 53.4 (10) | 51.3 (10) | 50.6 (9.1) | 49.5 (9.1) | 50.6 (10) | 48.1 (11) | 50.3 (9.8) | 48.9 (10) | 47.6 (9.4) | 47.6 (8.6) | 48.3 (8.5) |
| Anxiety (ANX) | 53.8 (11) | 51.9 (10) | 52.2 (10) | 50.1 (8.7) | 50.2 (10) | 49.5 (11) | 49.7 (10) | 48.4 (8.8) | 46.6 (8.9) | 46.6 (7.6) | 44.6 (7.1) |
| Depression (DEP) | 53.2 (11) | 50.5 (9.5) | 52.3 (10) | 50.2 (9.2) | 50.3 (10) | 50.5 (11) | 50 (10) | 48.7 (9.6) | 47.4 (8.4) | 47.1 (8.6) | 42.7 (6.9) |
| Bipolar (BIP) | 55.4 (11) | 54.2 (11) | 54 (10.9) | 54.8 (10) | 54.3 (10) | 51.1 (9.3) | 52.4 (8.7) | 51 (8.5) | 50.9 (9.7) | 51.4 (8.5) | 50.8 (8.6) |
| Somatic (SOM) | 50.5 (9.1) | 48.0 (7.9) | 50.6 (10) | 50.2 (11) | 50.6 (10) | 51.4 (11) | 51.3 (11) | 50.0 (11) | 49.1 (10) | 50.3 (9.0) | 47.6 (7.0) |
| Substance (SUB) | 52.8 (8.6) | 50.6 (7.0) | 50.3 (5.9) | 49.6 (6.8) | 49.0 (6.3) | 50.6 (11) | 49.0 (5.4) | 49.6 (7.7) | 48.7 (6.0) | 48.4 (5.3) | 49.5 (7.8) |

Table 2 presents planned comparisons of the CAPQ validity and clinical scales. The results show a statistically significant linear trend at $p < .001$ for all scales, aside from Somatic and Substance Abuse. Follow-up power analyses showed that the NAV scale produced the most significant effect, followed by the INF and CON scales.

Table 2
Multiple Analysis of Variance and Analysis of Variance Including Linear and Quadratic Trend and Power Analyses

| | <i>F</i> | Linear <i>T</i> Value | η^2 |
|--------------------|----------|--------------------------|----------|
| Validity Scales | | | |
| Naivete (NAV) | 8.71*** | 8.96** | .11* |
| Infrequency (INF) | 7.89*** | 8.29** | .06 * |
| Consistency (CON) | 4.00*** | 4.97 ** | .04 |
| Clinical Scales | | | |
| Paranoia (PAR) | 6.73*** | 7.27** | .04 |
| Psychoticism (PSY) | 3.31*** | 4.73 ** | .02 |
| Borderline (BOR) | 10.10*** | 9.01 ** | .07* |
| Sociopathy (SOC) | 5.26*** | 5.18** | .04 |
| Avoidant (AVD) | 17.70*** | 12.06** | .12* |
| Anakastia (OCPD) | 4.64*** | 5.26 ** | .03 |
| Anxiety (ANX) | 9.50*** | 9.02 ** | .07* |
| Depression (DEP) | 6.96*** | 7.70 ** | .05* |
| Bipolar (BIP) | 4.27*** | 5.36 ** | .04 |
| Somatic (SOM) | 2.03* | 0.33 | .02 |
| Substance (SUB) | 1.82* | 3.00 ** | .03 |

Note. Wilks's $\lambda = .75$; $F(45, 1489.12) = 3.37$, $p < .001$. No Scheffé tests were conducted as the linear trend analyses were significant.

* $p < .05$. ** $p < .01$. *** $p < .001$.

To control for the impact of social desirability, we conducted follow-up MANCOVA with NAV serving as a covariate and the dependent variables being the ten clinical scales (see Table 3). The overall test was statistically significant (Wilks's $\lambda = 1.79$, $F(10, 750) = 2.53$, $p = .005$). Table 3 also shows the Avoidant and Depression scales were the only scales that remained statistically significant, showing medium and small power, respectively.

Table 3
Multiple Analysis of Covariance with age groups serving as the independent variable and Naivete (NAV) serving as the covariate

| Scale | <i>F</i> (<i>df</i> = 10) | <i>p</i> | Partial η^2 |
|--------------------|----------------------------|----------|------------------|
| Paranoia (PAR) | 1.99* | .03 | .03 |
| Psychoticism (PSY) | 1.26 | .25 | .02 |
| Borderline (BOR) | 2.19* | .02 | .03 |
| Sociopathy (SOC) | 1.75* | .03 | .03 |
| Avoidant (AVD) | 6.57*** | < .001 | .08 |
| Anakastia (OCPD) | 1.17 | .31 | .02 |
| Anxiety (ANX) | 2.28* | .01 | .03 |
| Depression (DEP) | 3.32*** | < .001 | .04 |
| Bipolar (BIP) | 0.94 | .49 | .01 |
| Somatic (SOM) | 1.53 | .13 | .02 |
| Substance (SUB) | 0.97 | .47 | .02 |

* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 4 presents the MANCOVA with education as the independent variable and NAV as a covariate. The overall analysis was marginally statistically significant ($\lambda = 0.74$; $F(84, 777) = 2.21$, $p = .04$), and follow-up ANCOVA indicated that scores on two measures of psychotic-like symptoms (PSY and PAR scales) were statistically significant; the higher the level of education, the lower the probability of endorsing items on the scale. Scheffé's post hoc analysis showed that those with some college education but without a degree scored higher than those with undergraduate or graduate degrees. SUB was the third clinical scale to be impacted by education.

Table 4

Multiple Analysis of Covariance with level of education as the independent variable and Naivete (NAV) serving as the covariate

| | <i>F</i> | <i>p</i> | Linear <i>T</i> Value | Scheffe's Test |
|-----------------------|----------|----------|--------------------------|-------------------------------|
| Validity Scales | | | | |
| Naivete (NAV) | 1.13 | 0.34 | | |
| Infrequency (INF) | 1.10 | 0.36 | | |
| Consistency (CON) | 0.41 | 0.89 | | |
| Clinical Scales | | | | |
| Paranoia (PAR) | 5.68** | < 0.01 | 0.23 | Some College > BA, MA, PHD |
| Psychoticism (PSY) | 3.62*** | < .001 | 0.29 | Some College > BA, MA, PHD |
| Borderline (BOR) | 0.79 | 0.59 | | |
| Sociopathy (SOC) | 2.39* | 0.02 | | |
| Avoidant (AVD) | 0.64 | 0.72 | | |
| Anakastia (OCPD) | 0.33 | 0.94 | | |
| Anxiety (ANX) | 0.33 | 0.94 | | |
| Depression (DEP) | 0.63 | 0.72 | | |
| Bipolar (BIP) | 0.64 | 0.73 | | |
| Somatic (SOM) | 1.15 | 0.33 | | |
| Substance Abuse (SUB) | 3.56** | < 0.01 | 2.74** | |

* $p < .05$. ** $p < .01$. *** $p < .001$.

Conclusion

This study illustrates that older adults tend to present themselves positively, resulting in lower scores on various clinical scales. Consequently, the normative data for this population is significantly lower than for younger adults. Lewinsohn and others (1980) termed this phenomenon an "illusory glow" and argued that well-adjusted older adults without significant

mental health problems rate themselves as functioning better than younger adults. Latkin et al. (2017), on the other hand, interpreted elevated social desirability scores in the older population as reflecting the tendency of older cohorts to stigmatize mental health issues.

The above explanations do not clarify why older adults scored significantly lower on the CAPQ Depression and Avoidance scales, even after controlling for social desirability. One hypothesis regarding the lower scores on the Depression scale relates to recent data summarized by the National Institute on Aging (NIA), which challenges past notions regarding the higher prevalence of depression in older adults. Specifically, the NIA reported that major depression in older people living in the community ranges from less than 1% to about 5%. Another possibility is that older adults report less depressed mood and more vegetative (somatic) symptoms, such as insomnia and gastrointestinal distress, impacting traditional self-report measures (Gottfries, 1998; Shahpesandy, 2005). Since the CAPQ was designed for the general population and includes a relatively brief Depression scale, it contains only a limited number of vegetative symptoms, resulting in lower scores among older individuals.

The lower scores on the Avoidant scale are consistent with the literature, which demonstrates with both cross sectional and longitudinal studies that older adults report less social anxiety over their lifespan (Charles et al., 2001; Weisman et al., 2015). Some interpret these lower scores as a reflection of decreased occupational involvement (Oltmanns & Balsis, 2011). However, the CAPQ Avoidance scale does not include questions regarding occupational behavior. Other researchers attribute these results to the rise of "social-emotional selectivity behavior" in this population (Carstensen & Mikels, 2005). According to this theory, older adults engage in activities that maximize their positive experiences over time. Therefore, one might conclude that the lower scores on the CAPQ Avoidance scale are related to the notion that as people age, they become increasingly selective, investing more significant resources in emotionally rewarding goals and activities.

According to the literature, several other CAPQ scales should intuitively produce varying scores by age, including the Somatic, Substance, and Bipolar scales. For example, one might expect higher scores on the Somatic scale in the older population. However, the Somatic scale was constructed using indirect questioning and intended to identify tendencies to focus on physical symptoms due to emotional distress. Therefore, scores on this scale did not correlate with age-related physical decline. The Substance scale was also impervious to age or cohort effect due to having questions that address lifelong, rather than just current, substance use (Dowling et al., 2008; Mende, 2019). Finally, the Bipolar scale also did not yield age/cohort effects reflecting its item composition. Namely, unlike traditional measures, it was not designed to assess the current level of energy and excitability. Instead, the Bipolar scale emphasizes lifelong hypomanic/manic episodes consistent with the goal of screening psychopathology according to established criteria for bipolar disorder (American Psychiatric Association [APA], 2013). That said, the approach taken by the CAPQ developers limits its effectiveness in assessing fluctuations (state-dependent changes) in affect regulation across time.

A question is raised as to why prior studies did not identify the negative linear trajectory of symptom endorsement across the life span. Butcher et al. (1991) acknowledged that limited range impacted their study. Namely, they only included individuals aged 40 and older. They did hypothesize that a linear trend might emerge if younger cohorts were included in their research. On the other hand, Colligan and Offord (1992) were overly inclusive. They had a large group of adolescents in their sample, resulting in an exponential function distribution with a peak in symptom endorsement during the early twenties. Since exponential functions are difficult to

study, they did not investigate the impact of social desirability or examine linear or nonlinear effects.

The current study supports Butcher et al.'s (1991) findings that creating separate age-based norms for multiscale measures is unnecessary. Instead, however, a regression-based algorithm to correct for social desirability would be a more appropriate solution. However, this approach may run the risk of over diagnosing mental health problems in the older population. Therefore, additional studies with clinical samples are needed to address the sensitivity and specificity of this method.

There are two significant limitations to this study. First and foremost is the relatively small sample size of the 71-to-90 and the 18-to-25-year-old cohorts. Second, much like previous studies, the data presented here are cross sectional and not longitudinal. Therefore, comparison between the groups might not be sensitive to within-subject changes over the lifespan. Nevertheless, as was noted in the literature review, the tendency to report fewer symptoms and present oneself in a more favorable light emerged in all past studies, including those conducted almost 40 years ago. This trend suggests that the social desirability response style might be maturity related rather than a cohort effect. Again, however, longitudinal studies will be needed to confirm this hypothesis.

The present study results lead to several broad recommendations when assessing the emotional functioning of older adults. First, researchers should consider using social desirability scales to administer self-report measures. Second, whenever clinicians and researchers interpret self-report stand-alone measures, they should be aware that older adults often present themselves in a favorable light. Namely, it is not uncommon to see patients who were emergently hospitalized after making self-injurious statements denying that they have ever made such statements. Therefore, it is vital that clinicians carefully review a patient's medical chart and gather collaborative information, such as by interviewing family members, rather than relying solely on patient self-report.

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