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Exploratory Analysis of Normative Performance on the UCSD Performance-Based Skills Assessment-Brief

Lea Vella^{a,b}, Thomas L. Patterson^c, Philip D. Harvey^{d,e}, Margaret McNamara McClure^{f,g}, Brent T. Mausbach^c, Michael J. Taylor^{a,c}, and Elizabeth W. Twamley^{c,h,*}

^aSan Diego State University/University of California Joint Doctoral Program, San Diego, CA, USA

^bSan Francisco VA Healthcare System, San Francisco, CA, USA

^cDepartment of Psychiatry, University of California, San Diego, La Jolla, CA, USA

^dDepartment of Psychiatry and Behavioral Sciences, University of Miami Miller School of Medicine, Miami, FL, USA

^eResearch Service, Bruce W. Carter VA Medical Center, Miami, FL

^fDepartment of Psychology, Fairfield University, Fairfield, CT, USA

^gDepartment of Psychiatry, Icahn School of Medicine at Mt. Sinai, New York, NY, USA

^hCenter of Excellence for Stress and Mental Health, VA San Diego Healthcare System, San Diego, CA, USA

Abstract

The UCSD Performance-Based Skills Assessment (UPSA) is a performance-based measure of functional capacity. The brief, two-domain (finance and communication ability) version of the assessment (UPSA-B) is now widely used in both clinical research and treatment trials. To date, research has not examined possible demographic-UPSA-B relationships within a non-psychiatric population. We aimed to produce and describe preliminary normative scores for the UPSA-B over a full range of ages and educational attainment. The finance and communication subscales of the UPSA were administered to 190 healthy participants in the context of three separate studies. These data were combined to examine the effects of age, sex, and educational attainment on the UPSA-B domain and total scores. Fractional polynomial regression was used to compute demographically-corrected T-scores for the UPSA-B total score, and percentile rank conversion was used for the two subscales. Age and education both had significant non-linear effects on the UPSA-B total score. The finance subscale was significantly related to both gender and years of education,

*Corresponding author. Elizabeth W. Twamley, Ph.D. Department of Psychiatry, University of California, San Diego, 140 Arbor Drive, Mail Code 0851 San Diego, CA 92103 USA, Tel: 619-543-6684. etwamley@ucsd.edu.

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Conflict of Interest

In the past year, Dr. Harvey has served as a consultant to Allergan, Boehringer-Ingelheim, Lundbeck, Otsuka America, Sanofi, Sunovion, and Takeda Pharma. He has also has other research support from The Stanley Medical Research Foundation and Takeda. The other authors declare no conflicts of interest.

whereas the communication subscale was not significantly related to any of the demographic characteristics. Demographically corrected T-scores and percentile ranks for UPSA-B scores are now available for use in clinical research.

Keywords

Functional Capacity; Functional Skills; Communication Ability; Financial Ability

1. Introduction

Schizophrenia is a debilitating psychological disorder that not only affects psychological and cognitive functioning, but also results in disabilities affecting everyday living, such as in obtaining employment, living independence, self-care, partner relationships, and household participation (Anthony and Blanch, 1987; Harvey et al., 2007; Mausbach et al., 2008; Patterson et al., 1998; Wiersma et al., 2000). It is therefore of interest, when studying treatment outcomes in schizophrenia, to include measures of functional outcome, in addition to symptom scales and neuropsychological measures. The National Institute of Mental Health (NIMH) has suggested that functional outcomes be targeted for measurement in pharmaceutical studies of cognitive enhancers in schizophrenia through the establishment of the Measurement and Treatment Research to Improve Cognition in Schizophrenia (MATRICS) initiative (Green et al., 2004). In this initiative, they have suggested that standardized tests of functional capacity (i.e., the capacity to perform everyday tasks) be used to measure functional outcomes instead of functional improvements such as job or relationship attainment, as these improvements may take more time to change than is typical of a time-limited pharmaceutical trial (Green et al., 2004). Although there are various methods of measuring functional outcomes (e.g., direct observation, self-report, clinician- or informant-rated), a practical way of measuring functional capacity is through a performance-based measure. Many of these measures were designed to serve as a proxy for real-world functional skills, and provide direct observation of a patient's behavior in a standardized setting.

Patterson and colleagues (2001) published the UCSD Performance-Based Skills Assessment (UPSA), a performance-based assessment of functional capacity designed to measure everyday skills needed to function independently in a community setting. The UPSA uses structured role-play scenarios to measure functional skills, rather than depending on patient insight or informant reports. The original UPSA measures five domains of functioning (recreation planning, finance, communication, transportation, and household chores). The UPSA total score and most of the UPSA domain scores, with the exception of transportation and household chores, have consistently differentiated schizophrenia-spectrum patients from healthy comparison subjects, indicating reduced functional capacity in people with schizophrenia (Heinrichs et al., 2006; Patterson et al., 2001).

The association between functional capacity and cognitive status has also been well replicated (Bowie et al., 2006; Keefe et al., 2006a; Keefe et al., 2006b; Kiang et al., 2007; Kurtz, 2006; Kurtz et al., 2010; Mausbach et al., 2008; Twamley et al., 2002). Although the

two constructs are highly related, overall cognitive status has been shown to account for 26.0% to 41.1% of the variance in the UPSA (McClure et al., 2007; Twamley et al., 2002), therefore the UPSA captures variance independent from cognitive performance. The UPSA has also been shown to predict residential independence in individuals with psychosis and bipolar disorder (Mausbach et al., 2008; Twamley et al., 2002).

A brief version of the UPSA (UPSA-B) was developed in 2007 using factor analytic methods to determine the domain scores that loaded most heavily on the main UPSA factor (Mausbach et al., 2007). The finance and communication domains were found to have the two highest loadings, and this two-subscale version was highly correlated with the full UPSA ($r=0.91$; (Mausbach et al., 2007)). The UPSA-B predicted residential independence ($AUC=0.73$) at a similar level to the full UPSA ($AUC=0.74$; (Mausbach et al., 2007)). The UPSA-B is also associated with cognitive performance, as measured by the Mattis Dementia Rating Scale (DRS) and MATRICS Consensus Cognitive Battery (MCCB; (Burton et al., 2013; Keefe et al., 2006a; Mausbach et al., 2007), as well as other traditional neuropsychological tests (Harvey et al., 2009). The accuracy of UPSA-B in predicting residential independence, as with the full UPSA, was significantly greater than that of the DRS, indicating that the UPSA-B has predictive ability above and beyond a cognitive screening measure (Mausbach et al., 2007). The UPSA-B has also been shown to predict employment outcomes in persons with schizophrenia and bipolar disorder (Mausbach et al., 2011; Mausbach et al., 2010), as well a functional responsibility in community-dwelling individuals with schizophrenia (Cardenas et al., 2008). The UPSA-B has the advantage of shorter length (10 minutes), while remaining highly correlated ($r=0.91$; (Mausbach et al., 2007)) with the full UPSA (30 minutes).

Because the UPSA and UPSA-B are related to neuropsychological tests, which are themselves often related to demographic factors (Lezak et al., 2004; Strauss et al., 2006), it is possible that the UPSA-B will also be associated with various demographic factors such as age, educational attainment, and gender. So far, the relationship between demographic factors and the UPSA/UPSA-B has mainly been examined in the schizophrenia population for which they were developed. In the original UPSA publication, age, educational attainment and gender were not significantly related to the UPSA total score, but the three demographic variables accounted for 10.6% of the total score variance (Patterson et al., 2001). In a report by Twamley et al. (2002), age, educational attainment, and gender were also non-significant predictors of the UPSA total score in a schizophrenia sample. More recent studies examining the full UPSA and the UPSA-B in schizophrenia populations have found significant correlations between age and educational level, with better performance on the UPSA (measured by the total score) being correlated with younger age and higher educational attainment (Leifker et al., 2010; Mausbach et al., 2007; Mausbach et al., 2010). It is also possible that the demographic profile may differ according to the disorder that characterizes the sample, as Mausbach and colleagues (2010) found the UPSA-B to be significantly related to years of education in schizophrenia patients but not in bipolar patients. The UPSA-B is widely used internationally (Kaneda et al., 2011; McIntosh et al., 2011; Vesterager et al., 2012). A study using the Chinese version of the UPSA-B found an association between UPSA-B scores and educational attainment (but not age or sex) in a sample of participants with severe mental illnesses and healthy comparison participants

(McIntosh et al., 2011). In a Danish sample of individuals with first episode schizophrenia spectrum disorders, a Danish version of the UPSA-B was associated with age, but not gender or completion of high school (Vesterager et al., 2012). Although there is some evidence that education may influence UPSA performance, the samples have either been limited to groups with a limited age range, or to psychiatric samples with small healthy comparison groups.

As disease symptoms and deficits may influence the relationship between demographics and the UPSA-B, it is important to examine these relationships in a healthy, non-psychiatric, comparison population. Understanding demographic influences is important, as we would like the UPSA-B to measure specific deficits in individuals that are not due to characteristics we cannot intervene to change, such as age, education, and gender. The full UPSA was originally validated in older populations, and as the UPSA-B gains popularity it is important to consider what role age and other demographic characteristics may play in the relationship between the UPSA-B and its prediction of functional capacity. The use of demographically-corrected normative scores will allow future researchers to examine functional capacity levels in the absence of demographic effects. It may be reasonable to assume that ability to manage finances and to communicate effectively, as measured by the UPSA-B, are related to age, education, and even gender; however, this assumption cannot be validated until we measure these effects in a sample of healthy individuals. The goal of this study was to perform an exploratory analysis of healthy comparison participants' performance on the UPSA-B. We also aimed to produce and describe preliminary normative scores for the UPSA-B in men and women over a full range of ages and educational attainment.

2. Methods

2.1 Subjects

Participants included 190 healthy individuals recruited from San Diego and New York City. Participant age ranged from 20–92 years old ($M=57.31$, $SD=17.92$). Years of education ranged from 6–20 years ($M=14.14$, $SD=2.48$). Just over half of the sample was female (56%) and Caucasian (64%). Study participants classified themselves in the following race/ethnicity categories: African American ($n=40$, 22%), Asian ($n=9$, 5%), Caucasian ($n=118$, 64%), Hispanic ($n=14$, 8%), and Other ($n=4$, 2%). Five individuals had missing data in this category. This demographic variable was not included in the final regression model because we lacked sufficient sample size to sufficiently capture each group. We were also unable to separate this category into separate race and ethnicity descriptors, as the data for this analysis was derived from multiple studies that collected these variables in the above categories.

2.2 Procedures

The San Diego sample was collected at two different times: prior to 2001 (early San Diego sample, $n=30$) and from 2007–2011 (recent San Diego sample, $n=52$). The majority of the earlier sample was included in the original UPSA paper (Patterson, et al., 2001) and was recruited from volunteers at the VA San Diego Healthcare System, as well as through local advertisements. The recent San Diego sample was recruited through local advertisements

(i.e., flyers and Craigslist postings). New York City participants ($n=108$) were recruited at a Manhattan retirement community that required modest lifetime income (Leifker et al., 2010). The early San Diego and the New York samples were selected as control groups for their similarity of patients with schizophrenia. These original studies were aimed at understanding cognition and functional capacity in schizophrenia. The recent San Diego recruitment was specifically designed to recruit participants younger than 50 years of age, to create a sample that had a full adult age range.

Exclusion criteria from the earlier San Diego sample were: “seizure disorder, medical illness severe enough to require current hospitalization, history of head injury followed by loss of consciousness for at least 30 minutes, and diagnosis of dementia or current substance abuse or dependence that would meet *DSM-III-R* or *DSM-IV*...criteria” (Patterson et al., 2001). Exclusion criteria from the recent San Diego sample were: history of dementia or other neurological disorders, history of loss of consciousness for more than 30 minutes, and evidence of a psychiatric illness as determined by administration of the Mini International Neuropsychiatric Interview (Sheehan et al., 1998). Exclusion criteria from the New York sample (Leifker et al., 2010) were: evidence of current or lifetime criteria for substance abuse, major depression or any psychotic condition as determined by the Comprehensive Assessment of Symptoms and History (Andreasen et al., 1992), prescription of psychotropic medications for the psychiatric conditions mentioned above, a Mini-Mental Status Examination (Folstein et al., 1975) score less than 18, and a Wide Range Achievement Test (Wilkinson, 1993) reading grade-equivalent score of grade 6 or less. Collection of data at each site was approved by the local institutional review board and each subject provided written informed consent for the parent study. At each site, the study was carried out in accordance with the latest version of the Declaration of Helsinki.

The earlier San Diego sample was administered the full UPSA (i.e., planning recreational activities, communication, finance, transportation, and household chores) and the New York sample was administered the full UPSA minus the household chores subtask. The recent San Diego sample was only given the communication and finance subscales of the UPSA, as these were the subscales used to create the UPSA-B (Mausbach et al., 2007). The finance subscale includes tasks such as counting change and writing a check to pay a bill. The communication subscale includes tasks such as choosing who to call in case of an emergency, finding information using the telephone, and changing an appointment at a doctor’s office by telephone. All tasks are completed in a role-play format. The finance and communication subscale scores are each converted to a range of 0–50. The two subscales are added together to compute the UPSA-B total score, which has a range of 0–100.

2.3 Analyses

Raw UPSA-B scores (finance, communication, and total) were initially checked for normality using the Shapiro-Wilk W Test. All three scores were converted into normal quantiles and then standardized. The UPSA-B scores were converted to scaled scores with a mean of 10 and a standard deviation of 3. The scaled scores were again checked for normality. If the scaled scores were still found to be non-normally distributed, they were converted to percentile ranks. Spearman correlations were used to determine if the non-

normally distributed UPSA-B scores were related to any of the demographic variables. If they were, the percentile tables were separated by levels of the demographic variable.

If the scaled scores were normally distributed, multivariable fractional polynomial regression was used to determine the relationship between the UPSA-B score and the demographic predictor (i.e., age, education, and gender). As only eight subjects had below eleven years of education, this variable was truncated at 11 years (i.e., all values below 11 years of education were replaced with 11). The *mfracpol* package (Royston and Ambler, 1999) was used to fit the fractional polynomial regressions in STATA/IC (version 10, StataCorp LC, 2009). The fractional polynomial regression method used in the *mfracpol* package was formally described by Royston and Altman (Royston and Altman, 1994). This method allows for the relationships between predictor and dependent variables to be linear or polynomial, and it uses an iterative algorithm to fit the best polynomial transformation to each predictor. This method has been used to create demographically-corrected scores for a number of previous neuropsychological tests (Cherner et al., 2007; Taylor and Heaton, 2001). All three demographic variables were kept as predictors, even if they were not statistically significant predictors, as they accounted for some degree of the total variance.

T-scores were created using the residuals from the best fitting regression model, and were verified to have a mean of 50 and a standard deviation of 10. To ensure that the new T-scores were no longer associated with the demographic predictors, correlations between the T-scores and demographic variables were computed (Pearson correlations for age and education, and point-biserial correlations for gender). An alpha level of 0.05 was used for all statistical tests. All statistical analyses other than the fractional polynomial regressions were performed using JMP (version 10.0.2, SAS Institute Inc., 2012).

3. Results

Subsample differences are described in Table 1. The subsamples differed in mean age, with the New York subsample and the early San Diego subsample having participants with a mean age over 50 and the recent San Diego subsample having a mean age in the 30s. This was expected, as the recent San Diego subsample was designed to recruit individuals younger than 50 years old. The communication subscale and the UPSA-B total score also differed between subsamples, with the early San Diego subsample showing slightly higher levels of functional capacity than both the New York and recent San Diego subsamples.

All three UPSA-B raw scores (finance, communication, and total) were non-normally distributed ($W=0.79, 0.92, \& 0.95$, respectively, $ps<0.0001$). The descriptive statistics and relationships to the demographic variables for the three raw scores are described in Table 2. None of the UPSA-B scores showed bivariate correlations with age ($ps = 0.093$), and none of the demographic variables were related to the communication score ($ps = 0.293$). Both years of education and gender were significantly related to the finance score ($\rho=0.18$ and -0.18 , respectively, $ps = 0.014$). Those with more years of education had greater financial capacity, and men's financial capacity was slightly worse than women's financial capacity. The UPSA-B total score was related to years of education ($\rho=0.15$, $p=0.034$), with better functional capacity associated with more years of education.

After standardization, the finance and the communication subscales remained non-normally distributed ($W=0.87$ & 0.93 , respectively, $p<0.0001$), but the UPSA-B total score was normally distributed ($W=0.99$, $p=0.0502$). Because the two subscales' scaled scores had a limited range and a skewed distribution, fractional polynomial regression was not used to create demographically corrected T-scores. Instead, the subscale scores were converted to percentile ranks. The percentile ranks for the communication subscale and the finance subscale, which was divided by gender and education level, are described in Table 3.

As the scaled scores for the UPSA-B total score were normally distributed, fractional polynomial regression was used to determine the relationship between the total score and the demographic variables. Table 4 contains raw to scaled score conversions for the UPSA-B total score. The final model for the UPSA-B total score was significant ($F(4,185)=6.85$, $p<0.001$, $R^2=0.13$), with age having a significant non-linear effect ($p<0.001$) and education having significant non-linear effects (square & cubic effects $p<0.001$). Gender was not significantly related to the UPSA-B total score ($p=0.403$). T-score values for the UPSA-B total score were derived from the resulting fractional polynomial equation, and these T-scores were not correlated with any of the demographic variables ($p > 0.990$). The range of T-scores for the UPSA-B total was between 25 and 72. The following equation can be used to compute the T-scores for the UPSA-B total score:

$$\begin{aligned} &(((\text{Scaled ; UPSA-B ; Total} \\ &\quad - (11.06 \\ &\quad + (-0.35 \\ &\quad \times \text{gender} + (0.22 \\ &\quad \times (\text{education} \\ &\quad \quad - 14.28)) \\ &\quad + (0.28 \times ((\text{age}/10)^2 \\ &\quad \quad - 32.85)) \\ &\quad + (-0.033 \times ((\text{age}/10)^3 - 188.26)))) \times 10) + 50) \end{aligned}$$

In this equation gender is coded '1' for male and '0' for female; education is the number of years of formal education completed (11 or less years scored as 11, college scored as 16, masters scored as 18, PhD/MD scored as 20); and age is entered as the years of age. For example, consider a 68-year-old woman with 14 years of education who scored 80 on the UPSA-B. Using Table 4, her scaled score would be 8 and her corresponding T-score would be calculated as:

$$\begin{aligned} \text{T-score} = &(((8 - (11.06 + (-0.35 \times 1) + (0.22 \times (14 - 14.28)) \\ &\quad + (0.28 \times ((68/10)^2 - 32.85)) \\ &\quad + (-0.033 \times ((68/10)^3 - 188.26)))) \times 10) + 50) = 27.7 \end{aligned}$$

A supplementary excel document which will convert raw scores to the final T-score is available online through the publisher's website.

In evaluating the possible ceiling effect in the three UPSA-B scores, the majority of participants (74%) achieved the highest or second highest possible score on the finance subscale (skewness = -1.59). A smaller proportion (43%) achieved the highest or second highest possible score on the communication subscale (skewness = -0.43). Only 13% of the sample achieved the highest or second highest possible score on the UPSA-B total score (skewness = -0.73). Thus, the financial subscale may be more susceptible to ceiling effects in a normal population than the UPSA-B total score and communication subscale.

4. Discussion

This study found that the two of the three scores from the UPSA-B were related to demographic characteristics. The UPSA-B total score was influenced by both participant age and years of education. Gender, however, did not significantly affect the total score. Both the finance and communication subscale scores had skewed distributions, as well as a limited number of possible outcomes. Because of this finding, they were more appropriately described using percentile ranks. The finance score, in particular, was susceptible to ceiling effects in this sample. Only the finance score was significantly related to any of the demographic predictors, and therefore the percentile ranks were calculated by both gender and educational attainment.

The results of this analysis suggest that when examining the relationship between demographic variables and an outcome of interest, it is important to examine non-linear effects. In this study, the most utilized score from the UPSA-B, the total score, simple correlations did not indicate a relationship with age. When examined using fractional polynomials, however, a highly significant relationship was discovered. As mentioned earlier, there have been mixed findings in the literature about the relationship between the UPSA-B and demographic characteristics, with some finding no relationship with age and education (Patterson et al., 2001; Twamley et al., 2002) and others finding significant relationships (Leifker et al., 2010; Mautsach et al., 2007; Mautsach et al., 2010). These mixed findings may have been due to the fact that the study samples were not designed to explicitly explore the relationships between the UPSA-B and demographic characteristics. Limited age and education ranges in these studies may have led to non-significant findings or misleading indications of the shape of the relationship between the UPSA-B and the demographic characteristics.

Limitations of the current study include use of data from three separate studies from different national locations with slightly different inclusion and exclusion criteria and recruitment techniques. It is possible that participants from the sites had different levels of functioning (e.g., ability to live independently, employment status). This sample was also not expressly recruited to represent the general population, as would be preferable for the creation of representative normative scores. Collateral information about these functional profiles and assessments of cognitive/intellectual functioning were not consistently available across the samples, and therefore it is possible that those who volunteered for the study were different from the greater population of healthy individuals. While we were able to collect a sample with a wide age range, our sample was still mostly Caucasian and had relatively high education attainment. As only a handful of subjects had educational attainment below 12

years, caution should be used when applying these normative conversions to individuals with education below 12 years. This sample also did not have enough people in each of the ethnic and racial groups to accurately assess these influences on the UPSA-B scores. Another limitation was that this study did not use the newest version of the UPSA-B, although the changes are minor and include: (1) a different amount of change from which the participants are to count change, (2) a different name and location to ask about when dialing information, (3) a newly formatted doctor's letter and bill, and (4) directions to leave a message for the doctor instead of having a live conversation to change an appointment time. It is possible that the changes could affect the relationship to the demographic relationships examined in this study; however, the UPSA-B was designed to be tailored to site of administration, and the changes should not require a different level of functional abilities. The age of the data is also a limitation, as the use of smartphones and computerized banking has become more the norm for many populations. This is one reason there are current efforts to develop an updated computerized version of the UPSA. However, the paper and pencil version of the UPSA is still in relatively wide use, and, as of yet, no other norms have been developed. Lastly, the earlier San Diego sample did not exclude individuals with major depression. However, this site actually had higher UPSA-B scores than did the other two sites, arguing against the possibility that this set of participants had higher rates of depression.

The current study has various strengths, and it adds to the limited published literature on the relationship between functional capacity and demographic characteristics. This study included a wider range of individuals with varying ages and educational attainment, so results may generalize to a larger range of samples. This study provides useful information about the range of functional capacity in healthy individuals, including the finding that even healthy individuals may occasionally score in the lower end on these tasks, as indicated by the wide range of T-scores. Importantly, we did not identify a clear ceiling effect on the UPSA-B total score in healthy comparison subjects, which has been replicated in another study utilizing a "cognitively normal" comparison group (Goldberg et al.). We did, however, find a ceiling effect in the finance subscale. It should be noted that this scale was significantly associated with both gender and education, further strengthening the case for demographically corrected normative scoring for this scale. To further evaluate demographic influences on the UPSA-B, future studies should use the most current version of the UPSA-B and should include a larger sample with greater ethnic and racial diversity in order to examine the effect of this demographic characteristic.

It was previously unclear how healthy individuals across a full adult age and education range performed on the UPSA-B. The preliminary normative scores presented in the current study can be used in future research, or even clinical samples, to examine if the functional capacity of a study sample or individual is above or below that expected for a healthy individual. As the normative methods presented in this paper correct for demographics, future researchers can now use these normative scores to account for possible effect of age, education, or gender when examining the relationship between functional capacity, as measured by the UPSA-B, and their outcomes of choice.

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Highlights

- The UCSD Performance-Based Skills Assessment-Brief (UPSA-B), a measure of functional capacity is now widely used in both clinical research and treatment trials; however, possible demographic-UPSA-B relationships have not yet been thoroughly.
- Fractional polynomial regression was used to compute demographically-corrected T-scores for the UPSA-B total score, and the finance subscale was found to be significantly related to both gender and years of education, whereas the communication subscale was not significantly related to any of the demographic characteristics.
- Demographically corrected T-scores and percentile ranks for UPSA-B scores are now available for use in clinical research.

Table 1

Subsample differences in demographics and UPSA-B scores

	ANOVA	<i>n</i>	Mean	Std. Deviation	<i>F</i>	<i>df</i>	<i>p-value</i>
Age	New York	108	68.01	11.55			
	Early San Diego	30	59.15	8.99	188.90	(2, 189)	<0.001
	Recent San Diego	52	34.04	8.27			
Education	New York	108	14.31	2.50			
	Early San Diego	30	13.33	2.32	1.93	(2, 189)	0.148
	Recent San Diego	46	14.46	2.44			
Chi-Squared Test							
		Male <i>n</i>	% Male		χ^2	<i>df</i>	<i>p-value</i>
Gender	New York	49	45				
	Early San Diego	10	33		1.81	2	0.404
	Recent San Diego	25	48				
Kruskal-Wallis Test							
		<i>n</i>	Median		<i>H</i>	<i>df</i>	<i>p-value</i>
Finance	New York	108	45.45				
	Early San Diego	30	45.45		2.96	2	0.228
	Recent San Diego	52	45.45				
Communication	New York	108	38.89				
	Early San Diego	30	44.44		33.02	2	<0.001
	Recent San Diego	52	38.89				
UPSA-B Total	New York	108	84.34				
	Early San Diego	30	92.68		21.26	2	<0.001
	Recent San Diego	52	83.33				

Note. ANOVA = Analysis of Variance; UPSA-B = UCSD Performance-Based Skills Assessment-Brief

Table 2

UPSA-B score descriptive statistics and correlations with demographic variables

Raw Scores	n	Mean	SD	Min	Max	Age		Education (Truncated)		Gender	
						ρ	p-value	ρ	p-value	ρ	p-value
Finance	190	44.32	5.46	22.73	50	-0.12	0.093	0.18	0.012	-0.18	0.014
Communication	190	39.30	7.66	16.67	50	-0.047	0.522	0.077	0.293	0.004	0.960
UPSA-B Total	190	83.65	10.29	49.49	100	-0.078	0.283	0.15	0.034	-0.10	0.160

Note. ANOVA = Analysis of Variance; UPSA-B = UCSD Performance-Based Skills Assessment-Brief; ρ = Spearman's rho

Table 3

Percentile ranks for the finance and communication subscale scores.

Finance Raw Score	Percentile				Communication Raw Score				Percentile
	Female		Male						
	<14	14	<14	14	<14	14	<14	14	
<22.7	<2	<2	<2	<5	<16.7	<0.5	<0.5	<0.5	
22.7	2	<2	2	<5	16.7	0.5	0.5	0.5	
27.3	5	2	2	5	22.2	4	4	4	
31.8	9	3	2	7	27.8	14	14	14	
36.4	25	5	12	12	33.3	34	34	34	
40.9	36	8	30	30	38.9	56	56	56	
45.5	73	66	81	81	44.4	84	84	84	
50	>73	>66	>81	>81	50	>84	>84	>84	

Note. The finance score percentiles are divided by gender and years of education (0–13 years vs. 14 or more years).

Table 4

Scaled Score Conversion for the UPSA-B Total Score.

Scaled Score	UPSA-B Total Raw
16	100
15	
14	94.9–99.9
13	92.7–94.8
12	89.9–92.6
11	86.6–89.8
10	83.8–86.5
9	81.1–83.7
8	77.6–81.0
7	74.5–77.5
6	69.5–74.4
5	62.9–69.4
4	57.9–62.8
3	52.8–57.8
2	<52.8