

# Hispanic neuropsychologists in the United States: What do we know about them and how can the field address their needs?

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## Abstract.

**BACKGROUND:** Despite numerous calls throughout the years for an increase in ethnic, cultural, and racial diversity within the field of psychology, it remains an elusive reality for Hispanic neuropsychology practitioners in the United States (U.S.).

**OBJECTIVE:** 1. Determine the background and current work situation of Hispanic clinical neuropsychologists in the U.S. (e.g., professional training, assessment and diagnostic procedures used, rehabilitation techniques employed, populations targeted, teaching responsibilities, and research activities), and 2. Examine issues related to perceived discrimination in the field of neuropsychology and what this means for our profession.

**METHODS:** The sample consisted of 107 Hispanic neuropsychologists residing among the 50 United States, District of Columbia, and Puerto Rico who took a survey of professional practices and experiences in clinical neuropsychology.

**RESULTS:** Our findings confirm that Hispanic neuropsychologists in the U.S. are culturally diverse, present with varied levels of bilingualism, have been faced with discrimination during training and in their workplace, and compare favorably with non-Hispanic neuropsychologists in terms of education and clinical training.

**CONCLUSIONS:** Transforming neuropsychology into a diverse and inclusive field requires intentional, strategic, and systematic interventions in education, academia, training, professional organizations and in research.

Keywords: Hispanic, neuropsychology, United States, diversity

## 1. Introduction

Despite numerous calls throughout the years for an increase in ethnic, cultural, and racial diversity within the field of psychology, it remains an elu-

sive reality for clinical neuropsychology practitioners in the United States (U.S.), especially for Hispanic professionals. Most recent data document a slow diversity growth rate, where Caucasian neuropsychologists continue to be the predominant group (84.5%), followed by Asian or Pacific Islanders (4.7) and Hispanics (4.5) (Sweet et al., 2021). This data is particularly concerning in view of the shifting demographic trends in the U.S. pointing to an increasingly

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diverse country, and thus, patient base. For example, 40% of the population self-identify as ethnic minorities, with Hispanics as one of the largest groups, accounting for 18% (U.S. Census Bureau, 2019). Numbers are projected to increase by the year 2060, where nearly one in three U.S. residents or 111 million people in the U.S. will be Hispanic (Hernández & Moreno-Fernández, 2018; U.S. Census Bureau, 2011).

Neuropsychology researchers and scholars have recently and urgently responded to the issues and implications spurred by these concerns, namely, an increasingly diverse population in the U.S., a country where the political environment and the neuropsychology profession are yet to be considered inclusive and culturally consonant with the shifting demographics. They have eloquently proposed transformative ways for neuropsychology to respond to the changing times by becoming more multicultural/multiracial/multilingual, antiracist, as well as culturally, socially and healthcare relevant (Byrd, 2021; Cory, 2021, Postal, 2021).

If clinical neuropsychology is to responsibly increase its cultural relevance and best meet the needs of a changing U.S. population with its shifting professional and patient base, it is important to understand current Hispanic neuropsychologists' professional characteristics, practice trends, and experiences. For that reason, this study sought to: 1) determine the background and current work situation of Hispanic clinical neuropsychologists in the U.S. (e.g., professional training, assessment and diagnostic procedures used, rehabilitation techniques employed, populations targeted, teaching responsibilities, and research activities), and 2) examine issues related to perceived discrimination in the field of neuropsychology and what this means for our profession.

## 2. Methods

### 2.1. Participants

The sample consisted of 107 Hispanic neuropsychologists residing among the 50 United States, District of Columbia, and Puerto Rico who met the following inclusion/exclusion criteria: 1) be a licensed doctoral level psychologist, post-doctoral clinical fellow or resident in clinical neuropsychology; 2) reside and deliver neuropsychological services in the U.S.; 3) be over 21 years of age; 4) self-identify as Hispanic or as an individual from a

Spanish-speaking country, either by birth or family ethnic heritage to that country, regardless of proficiency level in Spanish; 5) have carried out at least one activity related to clinical neuropsychology in the last 3 years (e.g., assessment, rehabilitation); 6) provide electronic consent to participate in the study, and 7) complete all of the sociodemographic questions.

### 2.2. Instruments

A survey of professional practices and experiences in clinical neuropsychology was developed in English by a group of seven bilingual Hispanic neuropsychology professionals after performing an exhaustive review of the literature in seven specific areas of interest: 1) sociodemographic information; 2) professional training; 3) current work situation; 4) perceived discrimination; 5) neuropsychological assessment; 6) neuropsychological rehabilitation, and 7) teaching and research in neuropsychology. Although most of the survey questions were developed by this group of researchers, a few questions were adapted from existing surveys and further incorporated into this instrument (Arango-Lasprilla et al., 2017; Sweet et al., 2015).

### 2.3. Procedure

The survey was reviewed and evaluated by a group of seven bilingual Hispanic neuropsychologists professionals to ensure that the questions were appropriate, understandable, and relevant. Then, the final version of the survey was moved to the online platform [www.SurveyMonkey.com](http://www.SurveyMonkey.com) and distributed through the list serves of U.S. Neuropsychology associations (Hispanic Neuropsychological Society, Division 40, n.d.), as well as shared in the social networks of professional groups (Facebook, Twitter, WhatsApp, LinkedIn).

Before starting the survey, participants were informed, through a consent cover letter located on the first page of the survey form, about the objectives of the study, eligibility criteria, and procedures used to guarantee anonymity. The voluntary nature of their participation was emphasized by clearly indicating that they were free to withdraw their consent to participate at any time. Finally, as a means of documenting consent, the first survey question "Do you want to participate in this study?" had to be answered affirmatively in order to continue with the rest of the

questionnaire. Data collection began on June 15, 2020 and ended on July 15, 2020.

#### 2.4. Data analysis

This was an exploratory study, so descriptive analyzes were carried out to determine the frequencies and percentages of each response. The denominator used to calculate the percentages was adapted to the number of individuals who answered each question for two reasons: a) the questions were not mandatory, so not all participants answered all the survey questions, and b) some questions were multiple-choice. The analyzes were run in the statistical program SPSS version 23 (IBM Corp., 2015).

### 3. Results

#### 3.1. Sociodemographic information

The survey was initiated by 124 people; however, 17 were excluded as one did not provide consent and 16 did not complete all the sociodemographic information. Thus, the final sample was composed of 107 neuropsychology professionals, mainly women ( $n = 75$ ; 71.4%) between 23 and 75 years old ( $M = 42.5$ ;  $SD = 12.4$ ), a majority of whom resided in the states of Florida ( $n = 24$ ; 23.3%), Texas ( $n = 18$ ; 17.5%), and California ( $n = 14$ ; 13.6%).

More than half of the participants reported being born in the U.S. ( $n = 62$ ; 59%), with Caribbean ( $n = 39$ ; 38.2%) and Mexican American ( $n = 28$ ; 27.5%) as the most common Hispanic background. Additionally, 72.9% ( $n = 78$ ) of respondents considered themselves bilingual (English/Spanish) and, consistent with these findings, 82.2% ( $n = 88$ ) of participants reported Spanish as their family of origin's native language. Table 1 includes more detailed sociodemographic information and Table 1B shows the language proficiency levels reported by the professionals.

#### 3.2. Professional training

More than half of the professionals ( $n = 70$ ; 65.4%) informed holding a PhD while 34.6% ( $n = 37$ ) had a PsyD degree. Additionally, most of the participants ( $n = 97$ ; 90.7%) indicated having completed their doctorate degree in the U.S. Regarding post-doctoral training, 63.6% ( $n = 68$ ) of the respondents reported having completed a two-year fellowship training program, 15.9% ( $n = 17$ ) were currently completing it,

and 14% ( $n = 15$ ) completed one year of the program (See Table 2).

Although more than half of the participants ( $n = 70$ ; 65.4%) indicated having a license in the state where they worked, most professionals ( $n = 85$ ; 79.4%) were not board-certified, mainly because they were currently in the process ( $n = 32$ ; 29.9%), due to the prohibitive time commitment ( $n = 31$ ; 29%), or because it was not required by their current employer ( $n = 19$ ; 17.8%). See Table 2 for more information.

#### 3.3. Current work situation

Most of the professionals ( $n = 70$ ; 70%) reported having a salaried position, primarily in hospitals/medical centers ( $n = 49$ ; 49%), followed by private practice ( $n = 28$ ; 28%). The main areas of work included clinical ( $n = 98$ ; 91.6%), academic ( $n = 55$ ; 51.4%), and research ( $n = 54$ ; 50.5%). Eighty-one professionals (84.4%) affirmed being competent to provide neuropsychological services to Spanish-speaking patients including conducting intake interviews ( $n = 84$ ; 78.5%), neuropsychological evaluations ( $n = 82$ ; 76.6%), and offering treatment and rehabilitation ( $n = 51$ ; 47.7%). In fact, the majority of participants ( $n = 83$ ; 91.2%) suggested that speaking both Spanish and English, had opened professional opportunities for them in the field of neuropsychology in the U.S.

Notably, almost all respondents ( $n = 90$ ; 90%) reported working with Hispanic Spanish-speaking patients. A large percentage of them ( $n = 76$ ; 76%) attributed the increment in Hispanic patient referrals to their own Hispanic origin or descent. Finally, 62% ( $n = 62$ ) of the participating professionals indicated engaging in Hispanic activities in the community.

In terms of salary, nearly half of the professionals ( $n = 44$ ; 45.3%) reported having an annual pre-tax income between \$76,000 and \$125,000. Salary satisfaction ranged between 29.9% ( $n = 29$ ) who were somewhat satisfied to 34% ( $n = 33$ ) who reported being mostly satisfied with their wages. Additionally, 84.2% ( $n = 80$ ) of the professionals acknowledged being satisfied with the activities that they performed as practicing neuropsychologists in the U.S. See Table 3 for more information.

#### 3.4. Neuropsychological assessment

Almost all the professionals affirmed conducting neuropsychological evaluations ( $n = 92$ ; 97.9%), of which between 1–25% ( $n = 47$ ; 53.4%) of them

Table 1A  
A. Sociodemographic

	Mean	SD
What is your age? ( <i>n</i> = 105)	42.5	12.4
How many years have you been living in the U.S.? ( <i>n</i> = 104)	33.1	17.3
	Frequency (n)	Percentage (%)
What is your gender? ( <i>n</i> = 105)		
Woman	75	71.4
Man	29	27.6
Non-binary	1	1
Specify the U.S. state or territory in which you currently live ( <i>n</i> = 103)		
Florida	24	23.3
Texas	18	17.5
California	14	13.6
New York	8	7.8
Arizona	5	4.9
Colorado	5	4.9
Massachusetts	5	4.9
Puerto Rico	4	3.9
Oregon	3	2.9
Illinois	2	1.9
Virginia	2	1.9
Connecticut	1	1.0
District of Columbia (DC)	1	1.0
Indiana	1	1.0
Maryland	1	1.0
Mississippi	1	1.0
New Jersey	1	1.0
New Mexico	1	1.0
North Carolina	1	1.0
Ohio	1	1.0
Pennsylvania	1	1.0
Rhode Island	1	1.0
Utah	1	1.0
Wisconsin	1	1.0
Were you born in the United State? ( <i>n</i> = 105)		
Yes	62	59.0
No	43	41.0
What is your Hispanic/Latino background? ( <i>n</i> = 102)		
Caribbean (Puerto Rico, Dominican Republic, or Cuba)	39	38.2
Mexican-American	28	27.5
South American	18	17.6
Central American	11	10.8
Spain	6	5.9
What is your family of origin's native language? ( <i>n</i> = 107)		
Spanish	88	82.2
English Other	17	15.9
Other	2	1.9
Which of the following best describes your language skills? ( <i>n</i> = 107)		
Bilingual (English/Spanish)	78	72.9
Monolingual (English)	13	12.1
Other language	9	8.4
Multilingual	7	6.5

were in Spanish. The main sources of referrals were neurologists (*n* = 73; 79.3%), primary care physicians (*n* = 57; 62%), psychiatrists (*n* = 47; 51.1%), and psychologists (*n* = 41; 44.6%), mainly for diag-

nostic purposes (*n* = 85; 92.4%), baseline evaluations (*n* = 44; 47.8%), pre- and post-surgical evaluations (*n* = 39; 42.4%), educational/academic purposes (*n* = 38; 41.3%), and establishing level of indepen-

Table 1B  
B. Sociodemographic. Please select your level of language proficiency

		Beginner		Intermediate		Advanced		Superior	
		Frequency (n)	Percentage (%)						
Spanish	Understanding	10	9.4	5	4.7	35	33	56	52.8
	Speaking	11	10.4	15	14.2	39	36.8	41	38.7
	Reading	8	9.4	19	22.4	25	29.4	33	38.8
	Writing	15	17.6	26	30.6	18	21.2	26	30.6
English	Understanding	0	0	2	1.9	24	22.4	81	75.7
	Speaking	1	0.9	4	3.8	26	24.5	75	70.8
	Reading	0	0	1	1.2	18	20.9	67	77.9
	Writing	0	0	3	3.6	20	23.8	61	72.6

Table 2  
Professional training

	Frequency (n)	Percentage (%)
Did you complete your doctorate degree in the U.S.? (n = 107)		
Yes	97	90.7
No	10	9.3
What type of doctorate degree did you earn? (n = 107)		
Psy.D.	37	34.6
Ph.D.	70	65.4
Did you complete a Post-doctoral Fellowship (Residency) training program? (n = 107)		
Yes, two years (full-time or equivalent)	68	63.6
I am currently completing a postdoctoral training program (full-time or equivalent)	17	15.9
Yes, one year (full-time or equivalent)	15	14.0
Other	4	3.7
Yes, more than two years (full-time or equivalent)	3	2.8
Please indicate your current licensure status (n = 107)		
Licensed in the state where I work	70	65.4
Not licensed	19	17.8
Licensed in more than one state	18	16.8
Please select the professional certifications you currently hold (n = 103)*		
Not board certified	85	79.4
Board certified by the American Board of Clinical Neuropsychology (ABCN)	13	12.1
Board certified by the American Board of Professional Neuropsychology (ABPN)	4	3.7
American Board of Pediatric Neuropsychology (AAPdN)	2	1.9
Board certified by any other board in Neuropsychology	2	1.9
What has prevented you from becoming board certified? (n = 107)*		
Other	36	33.6
In the process of becoming board certified	32	29.9
Prohibitive time commitment (e.g., insufficient time to prepare for the exam process)	31	29.0
Not required by my current employer	19	17.8
Limited incentive (e.g., lack of employer support)	14	13.1
Family reasons	9	8.4
Financial reasons	8	7.5
Lack of mentorship opportunities	4	3.7
Lack of mobility (e.g., unable to move to sites that provide post-doctoral training)	3	2.8
Limitation with the English language proficiency required for examination	2	1.9
Lack of access (e.g., unable to match with a training site)	1	0.9

\*Multiple response options available, responses do not add up to 100%. Percentages are calculated out the total response for each question.

dent functioning (n = 34; 37%). Further, the domains most frequently assessed by the professionals were executive function (n = 87; 94.6%), attention (n = 87; 94.6%), language (n = 87; 94.6%), memory and learn-

ing (n = 86; 93.5%), visual skills (n = 85; 92.4%), emotional functioning (n = 84; 91.3%), and intelligence (n = 83; 90.2%). See Table 5A for more information.

Table 3  
Current work situation

	Frequency (n)	Percentage (%)
Indicate your current employment status ( <i>n</i> = 100)		
Salaried employment	70	70.0
Self-employment	25	25.0
Hourly employment	4	4.0
Retired	1	1.0
What is your primary place of work? ( <i>n</i> = 100)		
Hospital/Medical Center	49	49.0
Private practice	28	28.0
Academic setting	11	11.0
Private/Public Rehab Center/Institution	3	3.0
Other	2	2.0
Psychiatric Hospital	2	2.0
Non-group practice	2	2.0
Private/Public Hospital	1	1.0
Research Institute	1	1.0
Community Mental Health Center	1	1.0
Please choose the number of professional areas in which you work ( <i>n</i> = 107)*		
Clinical	98	91.6
Academic (training, teaching)	55	51.4
Research	54	50.5
Consultation	38	35.5
Administrative	36	33.6
Forensic	28	26.2
Are you competent to provide neuropsychological services to Spanish-speaking patients? ( <i>n</i> = 96)		
Yes	81	84.4
No	10	10.4
Don't know	5	5.2
Which of the following specific neuropsychological activities, if any, are you competent to perform in Spanish? ( <i>n</i> = 107)*		
Intake interviews	84	78.5
Neuropsychological evaluations	82	76.6
Treatment and rehabilitation	51	47.7
Do you think that speaking both, Spanish and English, has opened professional opportunities for you in the field of neuropsychology in the U.S.? ( <i>n</i> = 91)		
Yes	83	91.2
No	8	8.8
Do you see Hispanic/Latino Spanish-speaking patients in your work? ( <i>n</i> = 100)		
Yes	90	90.0
No	10	10.0
Does being of Hispanic/Latino origin or descent in the field of neuropsychology increase the referrals for Hispanic/Latino patients in your work? ( <i>n</i> = 100)		
Yes	76	76.0
No	16	16.0
Not applicable (there are no referrals in the field I work)	8	8.0
Regarding your work as a neuropsychologist, do you engage in Hispanic/Latino activities in the community? ( <i>n</i> = 100)		
Yes	62	62.0
No	34	34.0
Not applicable (there are no known Hispanic/Latino activities in my community)	4	4.0
Please indicate your annual pre-tax income (specifically the amount that is paid to you within a year period for neuropsychological/psychological related activities, rounded to the nearest thousand ( <i>n</i> = 97)		
Less of 50,000	16	16.5
51,000 to 75,000\$	15	15.5
76,000 to 100,000\$	21	21.6
101,000 to 125,000\$	23	23.7
126,000 to 150,000\$	9	9.3
151,000 to 175,000\$	2	2.1
176,000 to 200,000\$	4	4.1
200,000 or more	7	7.2

(Continued)

Table 3  
(Continued)

	Frequency (n)	Percentage (%)
How satisfied are you with income? ( <i>n</i> = 97)		
Completely dissatisfied	6	6.2
Mostly dissatisfied	12	12.4
Somewhat dissatisfied	10	10.3
Somewhat satisfied	29	29.9
Mostly satisfied	33	34.0
Completely satisfied	7	7.2
Are you satisfied with the activities that you perform as a practicing neuropsychologist in the U.S.? ( <i>n</i> = 95)		
Yes	80	84.2
No	9	9.5
Don't know	6	6.3
	<b>Mean</b>	<b>SD</b>
How many hours do you work per week in your primary position(s)? ( <i>n</i> = 100)	40.6	12

\*Multiple response options available, responses do not add up to 100%. Percentages are calculated out the total response for each question.

Table 4A  
A. Perceived discrimination

	Frequency (n)	Percentage (%)
As a Hispanic/Latino neuropsychologist in the U.S., have you experienced discrimination during your training or at your workplace? ( <i>n</i> = 95)		
Yes	54	56.8
No	41	43.2
Please mark the source(s) of discrimination in your work or at work ( <i>n</i> = 54)*		
Supervisor or superior	31	57.4
Patient	27	50
Colleague outside the field of neuropsychology	26	48.1
Patient's family	24	44.4
Colleague in neuropsychology	23	42.6
Professional association	7	13
Other	6	9.3
Governmental organization	3	5.6
Please select the best response: Hispanic/Latino neuropsychologists have ... ( <i>n</i> = 95)		
Less opportunities than White/Caucasian neuropsychologists	44	46.3
More opportunities than White/Caucasian neuropsychologists	26	27.4
The same opportunities than White/Caucasian neuropsychologists	25	26.3
As a Hispanic/Latino neuropsychologist, what do you think are the main barriers to the development of Hispanic Neuropsychology in the U.S.? (107)*		
Lack of adequate neuropsychological tests for Hispanics/Latinos with U.S. norms	86	80.4
Lack of adequate neuropsychological instruments in Spanish	79	73.8
Lack of adequate mentorship opportunities for Hispanics/Latinos	61	57.0
Lack of adequate Hispanic/Latino leadership in the field	55	51.4
Lack of adequate grant funding programs to train Hispanic/Latino neuropsychologists	49	45.8
Lack of adequate grant funding programs to do research with Hispanic/Latino populations	46	43.0
Lack of adequate collaboration between Hispanic/Latino neuropsychologists	43	40.2
Lack of adequate opportunities to do research with Hispanic/Latino populations	33	30.8
Lack of adequate professional opportunities	28	26.2
Lack of adequate social professional networking opportunities	26	24.3
Lack of adequate clinical opportunities to work with Spanish-speaking patients	25	23.4

\*Multiple response options available, responses do not add up to 100%. Percentages are calculated out the total responses for each question.

Regarding patient characteristics, the most common patient groups which participants conducted neuropsychological evaluations were those with traumatic brain injury (*n* = 72; 78.3%), cerebrovas-

cular accidents (*n* = 66; 71.7%), dementia (*n* = 62; 67.4%), attention deficit/hyperactivity disorders (*n* = 56; 60.9%), epilepsy (*n* = 55; 59.8%), depression (*n* = 54; 58.7%), anxiety disorders (*n* = 50; 54.3%),

Table 4B  
 B. Perceived discrimination. Please indicate the ways (if any) in which you have been discriminated against because of your Hispanic/Latino background at any time during your training or professional career

	Frequency (n)	Percentage (%)
My clinical skills were underestimated ( <i>n</i> = 50)		
Yes	38	76.0
No	12	24.0
Unfair treatment by a professor or supervisor ( <i>n</i> = 50)		
Yes	37	74.0
No	13	26.0
Received an unfair evaluation ( <i>n</i> = 45)		
Yes	22	48.9
No	23	51.1
My opinion is not respected by others ( <i>n</i> = 48)		
Yes	22	45.8
No	26	54.2
My supervisor or coworkers make jokes at the expense of my Hispanic origin ( <i>n</i> = 49)		
Yes	16	33.3
No	32	66.7
Received less pay than my colleagues ( <i>n</i> = 47)		
Yes	11	23.4
No	36	76.6
A patient refused my services ( <i>n</i> = 47)		
Yes	10	21.3
No	37	78.7
Denied being selected for a leadership position ( <i>n</i> = 47)		
Yes	9	19.1
No	38	80.9
Was denied a promotion ( <i>n</i> = 46)		
Yes	8	17.4
No	38	82.6
Been denied a job ( <i>n</i> = 46)		
Yes	6	13.0
No	40	87.0
My colleagues do not refer patients to me ( <i>n</i> = 45)		
Yes	5	11.1
No	40	88.9
Denied a scholarship ( <i>n</i> = 47)		
Yes	5	10.6
No	42	89.4
Been fired from a job ( <i>n</i> = 47)		
Yes	4	8.5
No	43	91.5

and intellectual disability (*n* = 47; 51.1%), among others. Additionally, the most frequent patient age ranges were between 19–39 (*n* = 70; 76.1%), 40–65 (*n* = 67; 72.8%), and >65 year (*n* = 67; 72.8%). See Table 5B for more information.

While 86.4% (*n* = 76) of the participants indicated having access to neuropsychological instruments in Spanish at their workplace/training site, they reported some problems when using neuropsychological tests with Spanish speaking patients including not having normative data for Hispanics in the U.S. (*n* = 65;

70.7%), tests not being adapted to the demographics of the patients (*n* = 64; 69.6%), tests not being culturally appropriate (*n* = 55; 59.8%), limited access to appropriate instruments in the U.S. (*n* = 41; 44.6%), and measures having poor psychometric properties (*n* = 40; 43.5%). Moreover, when providing assessment to monolingual Spanish-speaking patients, participants stated using normative data from Hispanics in the U.S. (*n* = 69; 75%), normative data from Spain or Latin American countries (*n* = 68; 73.9%), and normative data from U.S. (as published with the

Table 4C

C. Perceived discrimination. In your opinion, which of the following processes (if any) have been challenging during your training and/or to practice neuropsychology in the U.S.?

	Frequency (n)	Percentage (%)
Paying for my education/training ( <i>n</i> = 87)		
Yes	55	63.2
No	32	36.8
Obtaining board certification ( <i>n</i> = 81)		
Yes	39	48.1
No	42	51.9
Obtaining adequate English writing proficiency ( <i>n</i> = 76)		
Yes	14	18.4
No	62	81.6
Obtaining a state license ( <i>n</i> = 84)		
Yes	14	16.7
No	70	83.3
Obtaining recognition for my professional credentials obtained abroad ( <i>n</i> = 71)		
Yes	9	12.7
No	62	87.3
Obtaining recognition for a degree obtained abroad ( <i>n</i> = 70)		
Yes	8	11.4
No	62	88.6
Getting re-certified in another state ( <i>n</i> = 74)		
Yes	8	10.8
No	66	89.2
Obtaining adequate English speaking proficiency ( <i>n</i> = 74)		
Yes	6	8.1
No	68	91.9
Obtaining adequate English reading proficiency ( <i>n</i> = 74)		
Yes	4	5.4
No	70	94.6

test) (*n* = 55; 59.8%). See Table 5C for more information.

In terms of language, 63.6% (*n* = 56) of the sample reported evaluating language acculturation in bilingual patients. In addition, the most common methods used by professionals to establish their patients' language proficiency were the information obtained during the initial interview (*n* = 73; 79.3%), patient's self-report (*n* = 66; 71.7%), administering the tests in both languages (PPVT vs. TVIP; Vocabulary from WISC/WAIS; CELF; WJ Oral Language) (*n* = 47; 51.1%), or using language proficiency tests (*n* = 33; 35.9%). On the other hand, very few professionals (*n* = 8; 9.3%) informed using an interpreter for Spanish language evaluations and none for English language evaluations (*n* = 0; 0%). In fact, participants identified many challenges when working with interpreters including that important information got lost in translation (*n* = 21; 22.8%), the interpreter often provided additional instruction/explanation beyond what the examiner gave during an evaluation (*n* = 18; 19.6%), it was not possible to know what informa-

tion/instruction was being provided by the interpreter (*n* = 17; 18.5%), and cultural differences made it difficult to use interpreters (*n* = 13; 14.1%). Additionally, a live interpreter (*n* = 23; 25%) was the preferred option when professionals used interpreters, in contrast to a phone interpreter (*n* = 6; 6.5%) or interpreter "on wheels" (through an electronic device) (*n* = 3; 3.3%). See Table 5D for more information.

Finally, only 17% (*n* = 15) of the professionals affirmed using teleneuropsychology before the COVID-19 pandemic. However, more than half reported having used it during the pandemic (*n* = 59; 67%), and the majority (*n* = 74; 83.1%) stated that they would consider its use in the future. See Table 5E for more information.

### 3.5. Neuropsychological rehabilitation

Only 26.4% (*n* = 24) of the respondents reported providing neuropsychological rehabilitation. Of those, 87% (*n* = 20) provided rehabilitation to Hispanic patients and 87% (*n* = 20) did not use

Table 5A  
A. Neuropsychological assessment

	Frequency (n)	Percentage (%)
Do you currently conduct neuropsychological evaluations? (n = 94)		
Yes	92	97.9
No	2	2.1
What is the percentage of neuropsychological evaluations you conduct in Spanish only? (n = 88)		
0%	12	13.6
1–10%	23	26.1
11–25%	24	27.3
26–50%	17	19.3
51–75%	8	9.1
76–100%	4	4.5
What are the main sources of your referrals? (n = 92)*		
Neurology	73	79.3
Primary Care Physician	57	62.0
Psychiatry	47	51.1
Psychology	41	44.6
Self-referrals	32	34.8
Lawyers	29	31.5
Pediatrician	25	27.2
Schools	20	21.7
Speech and language therapists	18	19.6
Insurance company	18	19.6
Trauma Rehabilitation Centers	17	18.5
Cardiology	13	14.1
Occupational therapists	10	10.9
Family/Friends	10	10.9
Physical therapists	7	7.6
Government agencies	7	7.6
Drug/Alcohol Rehabilitation centers	1	1.1
What are the three main reasons for referral? (n = 92)*		
Diagnostic purposes	85	92.4
Baseline evaluations	44	47.8
Pre and post-surgery evaluations	39	42.4
Educational/academic purposes	38	41.3
Level of independent functioning	34	37.0
Rehabilitation/treatment	26	28.3
Return to work evaluation	21	22.8
Forensic consultations	20	21.7
Others	1	1.1
Which of the following domains do you usually assess in your neuropsychological evaluations? (n = 92)*		
Executive function	87	94.6
Attention	87	94.6
Language	87	94.6
Memory and learning	86	93.5
Visual skills	85	92.4
Emotional functioning	84	91.3
Intelligence	83	90.2
Motor	77	83.7
Effort testing	77	83.7
Daily living skills	74	80.4
Behavioral functioning	72	78.3
Sensory/Perceptual functions	63	68.5
Symptom validity	60	65.2
Personality	53	57.6
School performance/Academic achievement	50	54.3
Social cognition	37	40.2
Quality of life	34	37.0

\*Multiple response options available, responses do not add up to 100%. Percentages are calculated out the total responses for each question.

Table 5B  
B. Neuropsychological assessment

	Frequency (n)	Percentage (%)
In which of the following patient groups do you usually conduct neuropsychological evaluations? (n = 92)*		
Traumatic brain injury	72	78.3
Cerebrovascular accidents	66	71.7
Dementia	62	67.4
Attention deficit/hyperactivity disorders	56	60.9
Epilepsy	55	59.8
Depression	54	58.7
Anxiety disorders	50	54.3
Intellectual disability	47	51.1
Learning disorders	44	47.8
Post-traumatic stress disorders	42	45.7
Multiple sclerosis	41	44.6
Hematology/Oncology/Brain tumors	41	44.6
Developmental delay	40	43.5
Movement disorders	40	43.5
Metabolic disorders	32	34.8
Bipolar disorders	31	33.7
Autism spectrum disorder	30	32.6
Behavioral disorders	30	32.6
HIV/AIDS and other infectious diseases	25	27.2
Chronic pain	24	26.1
Neurotoxicity	24	26.1
Personality disorders	19	20.7
Substance abuse	17	18.5
Schizophrenia	10	10.9
Others	5	5.4
What is the age range of the patients you see for neuropsychological evaluations? (92)*		
<6 years	32	34.8
6–12	44	47.8
13–18	50	54.3
19–39	70	76.1
40–65	67	72.8
>65 years	67	72.8

\*Multiple response options available, responses do not add up to 100%. Percentages are calculated out the total responses for each question.

interpreters in this practice. Although 82.6% ( $n = 19$ ) provided these services in Spanish, the majority ( $n = 15$ ; 65.2%) pointed out that their workplace did not have treatment interventions adapted in Spanish. Finally, the principal age ranges of the patients who received rehabilitation were between 19–39 ( $n = 20$ ; 83.3%) and 40–65 ( $n = 19$ ; 79.2%). See Table 6 for more information.

### 3.6. Teaching and research in neuropsychology

About half of the professionals had conducted research with Hispanic populations or patients in the U.S. ( $n = 51$ ; 56%), but did not presently have teaching duties at an educational institution ( $n = 59$ ; 64.8%). See Table 7 for more information.

### 3.7. Perceived discrimination

Fifty-seven percent ( $n = 54$ ) of the participants reported having experienced discrimination during their training or at their workplace by their supervisor or superior ( $n = 31$ ; 57.4%), patients ( $n = 27$ ; 50%), colleagues outside the field of neuropsychology ( $n = 26$ ; 48.1%), patient's family ( $n = 24$ ; 44.4%), and colleagues in neuropsychology ( $n = 23$ ; 42.6%). In fact, 46.3% ( $n = 44$ ) believed that Hispanic neuropsychologists had less opportunities than White/Caucasian neuropsychologists. See Table 4A for more information.

When asked about their specific experiences with discrimination, professionals reported that their clinical skills were underestimated ( $n = 38$ ; 76%), received unfair treatment by a professor or supervisor ( $n = 37$ ; 74%), got an unfair evaluation ( $n = 22$ ;

Table 5C  
C. Neuropsychological assessment

	Frequency (n)	Percentage (%)
Do you have access to neuropsychological instruments in Spanish in your workplace/training site? ( <i>n</i> = 88)		
Yes	76	86.4
No	12	13.6
What problems, if any, do you face when using neuropsychological tests with Spanish speaking patients in the U.S.? ( <i>n</i> = 92)*		
They do not have normative data for Hispanics/Latinos in the U.S.	65	70.7
They are not adapted to the demographics of the patients I see	64	69.6
The test materials are not culturally appropriate	55	59.8
They are not easily available in the U.S.	41	44.6
They have poor psychometric properties	40	43.5
They require a higher level of education	21	22.8
They are very expensive	18	19.6
Other	6	6.5
I do not face any problems with neuropsychological tests	1	1.1
What norms do you typically use with your Monolingual Spanish-Speaking patients? ( <i>n</i> = 92)*		
Normative data from Hispanics/Latinos in the U.S.	69	75.0
Normative data from Spain or Latin American countries	68	73.9
Normative data from U.S. (as published with the test)	55	59.8
Other	9	9.8
Personalized procedures that have been developed by clinical practice	8	8.7
I use only raw scores	3	3.3

\*Multiple response options available, responses do not add up to 100%. Percentages are calculated out the total responses for each question.

48.9%), their opinion was not respected by others (*n* = 22; 45.8%), their supervisor or coworkers made jokes at the expense of their Hispanic origin (*n* = 16; 33.3%), received less pay than their colleagues (*n* = 11; 23.4%), a patient refused their services (*n* = 10; 21.3%), were denied a leadership position (*n* = 9; 19.1%) and to a lesser extent, were denied a promotion (*n* = 8; 17.4%), were denied a job (*n* = 6; 13%), their colleagues did not refer patients to them (*n* = 5; 11.1%), were denied a scholarship (*n* = 5; 10.6%), and were fired from a job (*n* = 4; 8.5%). See Table 4B for more information.

Moreover, more than half of the professionals indicated that the main barriers to the development of Hispanic Neuropsychology in the U.S. involved lack of adequate neuropsychological tests for Hispanics with U.S. norms (*n* = 86; 80.4%), limited number of neuropsychological instruments in Spanish (*n* = 79; 73.8%), few mentorship opportunities for Hispanics (*n* = 61; 57%), and insufficient Hispanic leadership in the field (*n* = 55; 51.4%).

Finally, the professionals identified several challenging circumstances throughout their training and/or during the practice of neuropsychology in the U.S., such as paying for their education/training (*n* = 55; 63.2%), obtaining board certification (*n* = 39; 48.1%), attaining adequate English writing proficiency (*n* = 14; 18.4%), procuring a state license

(*n* = 14; 16.7%), achieving recognition for professional credentials or degree obtained abroad (*n* = 9; 12.7%; *n* = 8; 11.4%), getting re-certified in another state (*n* = 8; 10.8%), and gaining adequate English speaking and reading proficiency (*n* = 6; 8.1%; *n* = 4; 5.4%) (See Table 4C for more information).

#### 4. Discussion

Considerable decades-long efforts have been made to document the characteristics and professional practice of ethnically diverse neuropsychologists in the United States. In that direction, the present study can contribute by describing the current profile of Hispanic neuropsychologists in this country. Some of the changes that have occurred during the COVID-19 pandemic in neuropsychologists' practice are depicted as well. In addition, timely information is presented regarding the participants' experiences with discrimination in the workplace and the barriers confronted. Following is a discussion and interpretation of salient survey results, which included data from 107 clinical neuropsychologists residing in the United States.

Study results revealed that neuropsychologists in the United States are mostly women with an average age of 43 years who reside primarily in Florida, Texas, and California, the three states with the largest

Table 5D  
D. Neuropsychological assessment

	Frequency (n)	Percentage (%)
Do you evaluate language acculturation in bilingual patients? (n = 88)		
Yes	56	63.6
No	32	36.4
What is the most common method you use to establish language proficiency in your patients? (n = 92)*		
Information obtained during the initial interview	73	79.3
Self-report of the patient	66	71.7
Administration of tests in both languages (PPVT vs. TVIP; Vocabulary from WISC/WAIS; CELF; WJ Oral Language)	47	51.1
Using language proficiency tests	33	35.9
Other	4	4.3
I do not evaluate language proficiency	3	3.3
Do you use an interpreter for English language evaluations? (n = 87)		
Yes	0	0
No	87	100.0
Do you use an interpreter for Spanish language evaluations? (n = 86)		
Yes	8	9.3
No	78	90.7
What challenges have you faced when working with interpreters? (n = 92)*		
I don't use interpreters	53	57.6
Important information gets lost in translation	21	22.8
The interpreter often provides additional instruction/explanation beyond what I give during an evaluation	18	19.6
Not knowing what information/instruction is being provided by the interpreter	17	18.5
Cultural differences make it difficult to use interpreters	13	14.1
My site/practice does not have enough live interpreters	7	7.6
I don't have any challenges when working with interpreters	3	3.3
My site/practice does not provide interpreting services	1	1.1
My site/practice does not have enough resources to offer distant interpreters	1	1.1
My site/practice does not have enough resources to purchase electronic devices for distant interpreting	0	0.0
When using an interpreter, which of the following(s) options do you usually use? (n = 92)*		
I don't use interpreters	62	67.4
Live interpreter	23	25.0
Phone interpreter	6	6.5
Interpreter "on wheels" (through an electronic device)	3	3.3

\*Multiple response options available, responses do not add up to 100%. Percentages are calculated out the total responses for each question.

Table 5E  
E. Neuropsychological assessment

	Frequency (n)	Percentage (%)
Did you use tele-neuropsychology with your patients before COVID-19? (n = 88)		
Yes	15	17.0
No	73	83.0
Have you used tele-neuropsychology with your patients during COVID-19? (n = 88)		
Yes	59	67.0
No	29	33.0
Will you consider using tele-neuropsychology in the future with your patients? (n = 89)		
Yes	74	83.1
No	15	16.9

Hispanic population (Pew Research Center, 2019). They are predominantly U.S. born, belong to the main origin groups, namely Caribbean (Puerto Ricans, Cuban, Dominican) and Mexican (U. S. Department of Health and Human Services Office of Minority Health, 2019), and report that Spanish is the native

language employed by their family of origin. Most consider themselves bilingual (English/Spanish) with an advanced to superior Spanish language level of proficiency. This is congruent with data provided in a report from Harvard's University Cervantes Institute stating that 76% of Hispanics in the U.S. are Spanish-

Table 6  
Neuropsychological rehabilitation

	Frequency (n)	Percentage (%)
Do you currently provide neuropsychological rehabilitation? ( <i>n</i> = 91)		
Yes	24	26.4
No	67	73.6
Do you provide neuropsychological rehabilitation to Hispanic/Latino patients? ( <i>n</i> = 23)		
Yes	20	87.0
No	3	13.0
Have you used interpreters when providing neuropsychological rehabilitation? ( <i>n</i> = 23)		
Yes	3	13.0
No	20	87.0
Do you provide neuropsychological rehabilitation in Spanish? ( <i>n</i> = 23)		
Yes	19	82.6
No	4	17.4
Does your site/practice have treatment interventions adapted to Spanish? ( <i>n</i> = 23)		
Yes	8	34.8
No	15	65.2
What is the age range of the patients you see for neuropsychological rehabilitation? ( <i>n</i> = 24)*		
<6 years	2	8.3
6–12	6	25.0
13–18	10	41.7
19–39	20	83.3
40–65	19	79.2
>65 years	14	58.3

\*Multiple response options available, responses do not add up to 100%. Percentages are calculated out the total responses for each question.

Table 7  
Teaching and research in neuropsychology

	Frequency (n)	Percentage (%)
Have you conducted research with Hispanic/Latino populations or patients in the U.S.? ( <i>n</i> = 91)		
Yes	51	56.0
No	40	44.0
Presently, do you have any teaching duties at an educational institution in the U.S.? ( <i>n</i> = 91)		
Yes	32	35.2
No	59	64.8

dominant or bilingual, and come from families where Spanish is spoken at home (Hernández-Nieto & Gutiérrez, 2017).

Like their non-Hispanic colleagues in the United States (Elbulok-Charcape et al., 2014; Sweet et al., 2021), Hispanic professionals are licensed, doctoral-level psychologists who have completed one to two years of post-doctoral residency/fellowship training in neuropsychology. Based on their mean age, they are early and mid-career neuropsychologists, who mostly work on a full-time basis in hospital and medical centers, followed by private practice.

It is important to note that similarities in professional training, experience level, work time and setting between Hispanic and non-Hispanic neuropsychologists in the U.S. end there. An income

disparity with their non-Hispanic counterparts was evident.

When examining reported salary ranges and excluding the ones who earned less than US\$50,000 (who can presumably be postdoctoral trainees) almost one fourth of the Hispanic respondents earned between US\$101,000 to US\$125,000 followed by roughly one fifth who earned US\$76,000 to US\$100,000. These reported earnings represent between US\$6,300 to US\$25,000 less than the calculated median income for similar experience level neuropsychologists (Sweet et al., 2021) in the geographic areas where most Hispanic neuropsychologists' practice.

The income inequality found is extremely concerning and requires further in-depth exploration. Pay

should be commensurate with experience level and ultimately income should be determined by several variables, ethnicity not being one of them. It can be argued that culturally and linguistically diverse neuropsychologists provide services to a wider range of patients and thus, ought to receive pay that does justice to their unique set of professional skills. Bonuses and pay equity would be an incentive to promote a much-needed increase in participation and representation of Hispanic neuropsychologists in the field, issue that will be addressed in more detail in the last section of this discussion.

A vast majority of neuropsychologists in the U.S. see Spanish speaking patients in their practice and many expressed that their cultural origin or descent increased their referrals for Hispanic patients. A similar proportion felt competent providing services to Spanish speaking individuals, including intake interviews and neuropsychological evaluations.

Most of them conducted neuropsychological evaluations, identifying prevalent conditions, such as dementias, traumatic brain injuries and cerebrovascular accidents, as well as ADHD, epilepsy, and mood disorders. However, of the neuropsychological evaluations performed, just a fourth of the participants indicated conducting them exclusively in Spanish. This was surprising as it represents a small amount considering not only their access to Spanish language instruments but their reported proficiency in providing neuropsychological evaluations to Spanish speaking patients. A possible explanation for this inconsistency is that although most Hispanics in the United States are reportedly bilingual (Hernández-Nieto & Gutiérrez, 2017), the determination of the language of evaluation is dependent on many factors, including the patient's language abilities, preference, and proficiency. According to Judd and colleagues (2009), language of evaluation procedures should depend upon the situation and context for which these results are going to be used for. Ultimately, it is the neuropsychologist's best and informed clinical judgment what matters most in determining which should be the language of evaluation.

In the case of bilingual patients, what are the steps to ensure the level of bilingualism to conclude which would be the best language to be used for evaluation? At this point, there is no universal procedure on how to best evaluate the level of proficiency in bilingual Hispanic patients. In fact, most Hispanic neuropsychologists reported relying on information obtained during intakes and self-reports of the patient, and not using language proficiency tests or instruments

to determine language competence. It has been suggested that Hispanic individuals may have stronger skills in English for informal conversational purposes, but not for formal evaluations (Salinas et al., 2016). The opposite may also be true. It is known that bilingualism has different proficiency levels which may have a broader impact on test performance. For example, Harris and colleagues (1995) found that unbalanced bilinguals presented less efficiency in learning and retention of words when compared to balanced bilinguals. Therefore, the development of uniform guidelines to confirm the language for the neuropsychological evaluation with bilingual examinees is crucial, as arbitrary standards elevate the risk of a mismatch between the patient, the instruments, and the clinician. Salinas and colleagues (2016) recommendation of using both interview questions and standardized instruments to determine proficiency is strongly endorsed.

As well as language proficiency, another essential area to be considered when working with a Hispanic patient is acculturation. According to the guidelines published in *Professional Considerations for Improving the Neuropsychological Evaluation of Hispanics*, neuropsychologists are required to evaluate the level of acculturation, particularly in first- and second-generation immigrants (Judd et al., 2009). However, those guidelines are being followed by 6 out of 10 Hispanic neuropsychologists surveyed in this study. It is possible that one of the reasons why almost 40% of Hispanic neuropsychologists in the study did not evaluate acculturation in bilingual patients can be related to the specifics of the demographics they see (perhaps, third generation immigrants). However, we agree that, in addition to the evaluation of language proficiency, acculturation measure guidelines should be emphasized as a fundamental step in the evaluation of Spanish-speaking patients. Additional as well as updated research on the relation between acculturation levels and test performance may be needed to assist in creating more awareness of this essential aspect. Clearly, this recommendation is tied with the need to develop multicultural competency as part of the training in neuropsychology.

The use of normative data in Hispanic neuropsychology has been an important topic for decades. Despite increased availability of updated normative data for some neuropsychological tests across Hispanic groups and improvements in recent years of including demographic adjustments (such as ethnic backgrounds and/or language) for norm comparisons, most neuropsychologists in this study reported that

lack of normative data for specific Hispanic subgroups is still the main barrier to neuropsychological testing of Spanish-speaking individuals from different backgrounds. In fact, many of the tests used in clinical practice do not have norms for such a culturally diverse population (Morlett-Paredes et al., 2021). All of the normative data studies that are available for Hispanics in the U.S., unfortunately, have many methodological issues. Therefore, clinicians should use caution when interpreting test scores based on these studies.

Regarding the use of interpreters, none of the responders employed them for their work in English, but a few required those services for Spanish language evaluations. Again, this might be the representation of those who indicated to be from a Hispanic heritage but spoke Spanish at a beginner's level. Historically, there have been many controversies with the use of interpreters (Ardila et al., 2002; Echemendia et al., 1997, Ponton & Ardila, 1999; Puente et al., 1997), practice that should be avoided whenever practically possible (Judd et al., 2009). The documented effects of the use of interpreters include a negative impact on test scores, mostly on verbal subtests from the Wechsler Scales in a small sample of Spanish speakers (Casas et al., 2012). Nonetheless, it is a reality that there is a huge disproportion between Spanish speakers in the community and available neuropsychologists who can competently perform evaluations in that language. Interpreter skills and training with neuropsychological tests, test demands, culture-specific language, and specific language-related instructions will be required to reduce the concerns with interpreter use.

The challenges confronted in the times of the COVID-19 pandemic motivated many Hispanic neuropsychologists to adapt their practice to use telehealth, and more of them considered the continued use of teleneuropsychology in the future. Although teleneuropsychology had been in practice for some years before COVID-19 (Cullum et al., 2014), the pandemic moved Hispanic practitioners in the field to embrace its widespread implementation. Arias and colleagues (2020) described the employment of systematic teleneuropsychology models of neuropsychological assessment and care developed by cross-cultural neuropsychologists in five U.S. academic institutions that serve monolingual and bilingual Spanish-speaking adults. It is hoped that the implementation of teleneuropsychology evidence-based models may facilitate treatment availability and reduce access-to-service barriers that have

historically afflicted underserved Spanish-speaking patients, such as the need to travel long distances to obtain neuropsychological evaluation services from a "language-congruent" specialist. Despite the potential assistance afforded by teleneuropsychology practice, it remains important to consider ways to overcome the possible obstacles to its use with Hispanic patients, some of whom may lack required equipment, physical space, and specialized computer knowledge (Arias et al., 2020).

Concerning rehabilitation services, it was observed that one in four Hispanic neuropsychologists in the U.S. provided them. That proportion is below the 41 percent reported in a study with U.S. neuropsychologists of all ethnicities (Block et al., 2017), and suggest an underrepresentation of Hispanic neuropsychologists in that service provision area. It is possible that the limited access that Hispanic patients have to rehabilitation services (Flores et al., 2020), as well as underutilization of services associated with restrictive costs, poor access to health insurance, diminished referrals by physicians (Rivera Mindt et al., 2010) may explain these results. It is also possible that the restricted number of treatment interventions available in Spanish which in turn may be associated with limited perceived competency in performing rehabilitation activities in that language (as reported by almost half of the participants in the study) contribute to the reduced participation in the provision of rehabilitation activities by neuropsychologists in the study.

Hispanic neuropsychologists were also found to be underrepresented in academic activities such as teaching and training. Thirty-five percent of respondents had teaching duties at an educational institution, which contrasts with the 75 percent documented for all neuropsychologists in the U.S. (Sweet et al., 2021). This gap reflects the general situation in the U.S. where only 5 percent of all university and psychology professors are Hispanic (Davis & Fry, 2019; Bichsel et al., 2019). The low number of Hispanic educators can be decisive for future representation of Hispanics in the field. Several investigations suggest that the presence of ethnically diverse professors contributes to culturally diverse students continuing doctoral studies (Rabin et al., 2017; Cole & Barber, 2003).

With regards to other non-clinical activities, half of the participating Hispanic neuropsychologists reported that research was one of the professional areas in which they worked. A similar proportion had conducted research with Hispanic populations in the

U.S. This data is consistent with Sweet and colleagues (2021) assertion that research participation is a less frequent professional activity among their clinical neuropsychology respondents, with 53 to 32 percent of them involved in non-funded and funded research, respectively. This is an important issue because scientific and professional progress in the field depends on research (Arango-Lasprilla et al., 2017). Thus, it is essential to increase multicultural neuropsychological research. Based on the American Psychological Association Multicultural Guideline #4 (APA; American Psychological Association, 2003), the research emphasis should be on instruments, norms, psychometric properties of instruments, validity of diagnoses and evidence-based practices for Hispanic populations (Elbulok-Charcape et al., 2014).

In the area of training of young researchers, recommendations have been issued over a decade ago [e.g., Rivera Mindt and colleagues (2010)]. However, there is a need for actionable recommendations that specify specific stakeholder actors and a timeline for implementation. For instance, neuropsychology programs should be held accountable for the institutional support they provide to ethnically diverse students at all levels of education. Metrics should be developed alongside recommendations to be able to assess the extent to which the recommendation has been taken into account. For instance, how much reach do outreach services have and how many diverse candidates are mentored. Although financial support is of course an important facilitator, the metrics should measure the impact of that spending. Over a decade ago, recommendations were made for neuropsychology programs to develop culturally competent neuropsychology models of training and purposefully recruit and retain diverse faculty. Unfortunately, it is not clear what progress has been made in this area and best practices leading to expected outcomes should be widely disseminated in order to move from recommended improvements to concrete, actionable, steps with meaningful success indicators.

## 5. Perceived discrimination

Hispanics represent 18 percent of the population (Lin et al., 2018, p.19) and 4.5 percent of the neuropsychologists in the United States (Sweet et al., 2021). As a heterogeneous group of people living in a primarily white dominant society, they have historically been subjected to discriminatory prac-

tices at cultural, institutional, and interpersonal levels (Buraschi & Aguilar-Idáñez, 2017; Byrd, 2021; Cagigas, 2021; Cory, 2021; Postal, 2021). This study's participants were not the exception. The experiences shared by them regarding discrimination in the workplace are hereby documented. They provide us with the opportunity to reflect on ways to address a pervasive situation that detracts from the equality and justice that should be prevalent socially and in the field of neuropsychology.

The results of this survey revealed three findings regarding perceived discrimination that warrant a closer discussion. Hispanic neuropsychologists expressed that: (1) they experienced discrimination; (2) they had fewer professional opportunities than their Caucasian colleagues; and (3) there were barriers to the development of Hispanic neuropsychology, both intrinsic to the field and to the general socioeconomic situation predominant in the U.S. Each of these three concerns will be discussed next and in more detail.

In this study participants were asked directly if they had experienced discrimination during their training or in their workplace. Almost six out of 10 of the participating Hispanic neuropsychologists reported experiencing discrimination. The sources of discrimination were predominantly identified as coming from superiors or supervisors, followed by patients and colleagues. This finding is consistent with Roman (2017) who points out that in neuropsychology there are clear disparities in how Hispanic professionals are treated. This situation is explained by the low ethnoracial and cultural diversity in neuropsychology, including the limited presence of Hispanics in the field (Matthews, 1992; Sweet et al., 2021). For example, Sweet and colleagues (2021) found that close to 13 percent of neuropsychologists identified themselves as non-white, including 4.5 percent who identify as Hispanic. Moreover, within neuropsychology, the low representation and opportunities for Hispanics is evident, observed in the limited availability of instruments in Spanish, the lack of normative data and the scarcity of research with Hispanic participants (Morlett-Paredes et al., 2021; Morlett-Paredes & Arango-Lasprilla, 2017). The racial imbalance in neuropsychology represents a great obstacle for Hispanics (Byrd et al., 2010; Cory, 2021). For this reason, the field of neuropsychology has the challenge and the opportunity of overcoming the interpersonal, structural, and cultural manifestations of discrimination in the U.S.

Our survey also showed that almost all Hispanic neuropsychologists acknowledged that being bilingual had expanded their prospects in the field. Nonetheless, almost half of them perceived they had fewer professional opportunities than their Caucasian colleagues. This finding is not surprising as neuropsychology in the U.S. has been historically based on a Caucasian, educational, scientific, and social framework that does not facilitate the entry of culturally and linguistically diverse professionals to the field. Furthermore, the fact that neuropsychology is such a competitive field could put those with better competence in English at an advantage (Elbulok-Charcape et al., 2014).

Most neuropsychologists in the study identified the lack of adequate neuropsychological tests with norms for Hispanics and instruments in Spanish as one of the main barriers to the development of Hispanic neuropsychology in the U.S. It is notable that for the most part test producers are in the U.S. and their priority is research and publication of tests in English, resulting in limited availability of instruments in Spanish (Elbulok-Charcape et al., 2014). This barrier reflects the “chronic disconnect”, as Cory (2021) aptly labels it, between neuropsychology and the increased cultural, linguistic, and ethnoracial diversity within the population of the United States.

The paucity of instruments in Spanish and test norms for Hispanics in the U.S. affects both neuropsychologists and patients. It also underlines the need for both Caucasian and Hispanic neuropsychologists in the U.S. to be more dynamic in the development of adequately normed instruments in Spanish. Ultimately, the development of tests in Spanish is an academic, clinical, and economically viable agenda because Spanish-speakers in the world are close to 600 million people, of which 57 million live in the U.S. (Instituto Cervantes, 2019). As Echemendia & Harris (2004) pointed out, neuropsychologists in the U.S. must prepare to provide services to the Spanish-speaking population, which may reach nearly 98,000,000 people in 2050, according to estimates from the U.S. Census Bureau (2019).

The lack of mentors and leaders who can bridge the gaps within the neuropsychology field so that more Hispanics can enter the specialty in the U.S. was an additional barrier posed by many of the neuropsychologists in the study. The underrepresentation of Hispanics in the field highlights the need for organizations such as the Hispanic Neuropsychological Society to continue their efforts in promoting collaboration with other professional and educational

organizations to draw more Hispanics into the field (Cory, 2018).

Neuropsychology organizations in the U.S. have the challenge to initiate immediate lines of action to promote cultural diversity among professionals in the field. As was mentioned previously, it is important to reduce the ethnoracial issues faced by Hispanic neuropsychologists and patients in the U.S. Along the same lines, Sweet and colleagues (2015) proposed establishing initiatives to educate neuropsychologists in the U.S. about ethnoracial diversity. Rabin and colleagues (2017) recommended increasing the recruitment and presence of culturally diverse professionals in faculty positions and providing doctoral students with financial support, mentoring programs, and clinical experiences with diverse groups.

## 6. Limitations of the study

Several limitations should be contemplated when interpreting the study’s results. Ones are inherent to the survey research, and others to the prevailing social circumstances at the time of data collection. First, while all participants self-identified as Hispanic they also indicated their specific cultural origin. Relevant data could have been obtained if item response analyses by cultural group were performed. We recommend that future studies incorporate analyses that permit Hispanic intergroup comparisons.

Second, although important information regarding perceived discrimination was gained, due to constraints imposed by survey length, questions in that direction were few. Future studies could benefit from a more profound inquiry of discriminatory experiences, perhaps using a mixed methods design, to clarify and qualify them.

Regarding social context, the study was carried out during the early stages (summer of 2020) of the COVID-19 global pandemic. Therefore, the possibility that the pandemic had an impact on the Hispanic neuropsychologists’ responses cannot be excluded. Apart from content related to teleneuropsychology, which was directly related to the impact of the pandemic in clinical practice, it is unknown to what extent other responses may have been influenced. However, reported annual income, which included a year period, appeared unaffected by the pandemic as it most likely represented income from the previous pre-COVID year. We agree with Sweet and colleagues (2021, p. 76) assertion that responses to questions about income and professional practices

could be impacted if participants were surveyed in 2021, “as the pandemic continues to ravage health and economies around the world.”

## 7. Conclusions

Our findings confirm that Hispanic neuropsychologists in the United States are culturally diverse, present with varied levels of bilingualism, have been faced with discrimination during training and in their workplace, and compare favorably with non-Hispanic neuropsychologists in terms of education and clinical training (Sweet et al., 2021). It is important to highlight that our findings also document that systemic racism persists within the field of neuropsychology. This situation is clearly manifested by the study’s participants, many of whom had been subjected to discriminatory practices, had fewer professional opportunities, and received salaries beneath those of their non-Hispanic counterparts. The racial disparities extended to inadequate availability of neuropsychological instruments in Spanish for the increasing Hispanic population in the U.S. Lack of ethnic diversity continues to represent one of the major challenges within the specialty, evidenced by data published in the most recent survey from Sweet and colleagues (2021), where they report that less than 16 percent of neuropsychologists in the U.S. are non-Caucasian.

During the past 30 years, concerns about ethnic/racial disparities have consistently been voiced in multiple neuropsychology publications. The field of neuropsychology has been slow in responding to this situation and we believe changes are overdue regarding transformations that reflect the changing demographics in U.S. society. Attention to these matters is not only a social justice priority but is urgent to avoid the risk of neuropsychology becoming an irrelevant discipline (Andoh, 2021; Cagigas, 2021; Postal, 2021).

Importantly, the APA Council of Representatives adopted a resolution on October 29, 2021 regarding the Role of Psychology and APA in Dismantling Systemic Racism Against People of Color in U.S. (<https://www.apa.org/about/policy/dismantling-systemic-racism>). It espouses psychology’s role in helping to expose, understand, and ultimately dismantle racism that operates across all levels and sectors of society. Breaking with systemic racism in neuropsychology is a priority that requires a profound examination of institu-

tional structures that may contribute to dismantling white privilege (Cagigas, 2021). The APA Resolution is a laudable example of action which should be implemented by neuropsychological institutions, societies, and organizations as an important first step. In order to eradicate discrimination and differential treatment, neuropsychology as a field must admit this problem. Transforming neuropsychology into a diverse and inclusive field requires intentional, strategic, and systematic interventions in education, academia, training, professional organizations and in research. Leaders in the field must take a stand on this issue and carry out actions to foster the inclusion of ethnically and racially diverse people in neuropsychology.

## Conflict of interest

The authors declare that there is no conflict of interest.

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## References

- American Psychological Association. (2003). Guidelines on multicultural education, training, research, practice, and organizational change for psychologists. *American Psychologist*, 58, 377-402. <https://doi.org/10.1037/0003-066x.58.5.377>
- American Psychological Association Council of Representatives. (2021). *Role of psychology and APA in dismantling systemic racism against people of color in U.S.* <https://www.apa.org/about/policy/dismantling-systemic-racism>
- Andoh, E. (2021). Special report: Psychology’s urgent need to dismantle racism. *Monitor on Psychology*, 52(3), 38.
- Arango-Lasprilla, J. C., Stevens, L., Morlett Paredes, A., Ardila, A., & Rivera, D. (2017). Profession of neuropsychology in Latin America. *Applied Neuropsychology: Adult*, 24(4), 318-330. <https://doi.org/10.1080/23279095.2016.1185423>
- Ardila, A., Rodriguez-Menendez, G., & Rosselli, M. (2002). Current issues in neuropsychological assessment with Hispanics/Latinos. In R. Ferraro, *Minority and Cross-Cultural Aspects of Neuropsychological Assessment* (pp. 161-179). Swets & Zeitlinger.
- Arias, F., Safi, D. E., Miranda, M., Carrión, C. I., Diaz Santos, A. L., Armendariz, V., Jose, I. E., Vuong, K. D., Suarez, P., Strutt, A. M., & STAR Consortium (2020). Teleneuropsychology for monolingual and bilingual Spanish-speaking adults in

- the time of COVID-19: Rationale, professional considerations, and resources. *Archives of Clinical Neuropsychology*, 35(8), 1249-1265. <https://doi.org/10.1093/arclin/acaal00>
- Bichsel, J., Christidis, P., Conroy, J., & Lin, L. (2019). Datapoint: Diversity among psychology faculty. *American Psychological Association*. <https://www.apa.org/monitor/2019/10/datapoint-diversity#:~:text=In%20crossing%20gender%20and%20race,2%25%20other%20races%20Fethnicities>
- Bieliauskas. (1998). The Houston conference on specialty education and training in clinical neuropsychology. *Archives of Clinical Neuropsychology*, 13(2), 160-166.
- Block, C., Santos, O. A., Flores-Medina, Y., Rivera-Camacho, D. F., Arango-Lasprilla, J. C. (2017). Neuropsychology and rehabilitation services in the United States: Brief report from a survey of clinical neuropsychologists. *Archives of Clinical Neuropsychology*, 32(2), 369-374. <https://doi.org/10.1093/arclin/acx002>
- Buraschi, D. & Aguilar-Idáñez, M. J. (2017). Herramientas conceptuales para un antirracismo crítico-transformador. *Tabla Rasa*, 26, 171-191.
- Byrd, D. A. (2021) Comment on Cory, 2021: White privilege in clinical neuropsychology: unpacking is not enough. *The Clinical Neuropsychologist*, 35(2), 219-220. <https://doi.org/10.1080/13854046.2020.1844298>
- Byrd, D., Razani, J., Suarez, P., Lafosse, J. M., Manly, J., & Attix, D. K. (2010). Diversity Summit 2008: Challenges in the recruitment and retention of ethnic minorities in neuropsychology. *The Clinical Neuropsychologist*, 24(8), 1279-1291. <https://doi.org/10.1080/13854046.2010.521769>
- Cagigas, X. E. (2021) Comment on Cory, 2021: Unpacking the invisible knapsack, a necessary step toward an antiracist cultural neuropsychology. *The Clinical Neuropsychologist*, 35(2), 221-223. <https://doi.org/10.1080/13854046.2020.1844299>
- Casas, R., Guzman-Velez, E., Cardona-Rodriguez, J., Rodriguez, N., Quiñones, G., Izaguirre, B., et al. (2012). Interpreter-mediated neuropsychological testing of monolingual Spanish speakers. *The Clinical Neuropsychologist*, 26(1), 88-101. <https://doi.org/10.1080/13854046.2011.640641>
- Cole, S., & Barber, E. (2003) *The problem. Increasing faculty diversity: The occupational choices of high-achieving minority students*. Harvard University Press.
- Corp, I. B. M. (2015). IBM SPSS statistics, version 23.0.
- Cory, J. M. (2021) White privilege in neuropsychology: An 'invisible knapsack' in need of unpacking? *The Clinical Neuropsychologist*, 35(2), 206-218. <https://doi.org/10.1080/13854046.2020.1801845>
- Cory, J. M. (2018). Cross-cultural neuropsychology in historical perspective: Origins echoes, challenges, and future directions. In W.B. Barr & L.A. Bieliauskas (Eds.), *The Oxford Handbook of History of Clinical Neuropsychology* (pp. 1-67). Oxford University Press.
- Cullum, C. M., Hyman, L. S., Grosch, M., Parikh, M., & Weiner, M. F. (2014). Teleneuropsychology: Evidence for video teleconference-based neuropsychological assessment. *Journal of the International Neuropsychological Society*, 20(10), 1028-1033. <https://doi.org/10.1017/S1355617714000873>
- Davis, L., & Fry, R. (2019). College faculty have become more racially and ethnically diverse but remain far less so than students. *PEW Research Center*. <https://www.pewresearch.org/fact-tank/2019/07/31/us-college-faculty-student-diversity/>
- Echemendia, R. J., & Harris, J. G. (2004). Neuropsychological test use with Hispanic/Latino populations in the United States: Part II of a national survey. *Applied Neuropsychology*, 11(1), 4-12. [https://doi.org/10.1207/s15324826an1101\\_2](https://doi.org/10.1207/s15324826an1101_2)
- Echemendia, R. J., Harris, J. G., Congett, S. M., Díaz, M. L., & Puente, A. E. (1997). Neuropsychological training and practices with Hispanics: A national survey. *The Clinical Neuropsychologist*, 11(3), 229-243.
- Elbulok-Charcape, M. M., Rabin, L. A., Spadaccini, A. T., & Barr, W. B. (2014). Trends in the neuropsychological assessment of ethnic/racial minorities: A survey of clinical neuropsychologists in the United States and Canada. *Cultural Diversity and Ethnic Minority Psychology*, 20(3), 353-361. <https://doi.org/10.1037/a0035023>
- Flores, L., Verduzco-Gutierrez, M., Molinares, D., & Silver, J. (2020). Disparities in health care for Hispanic patients in Physical medicine and rehabilitation the United States: a narrative review. *American Journal of Physical Medicine & Rehabilitation*, 99(4), 338-347. <https://doi.org/10.1002/pmrj.12509>
- Harris, J. G., Cullum, C. M., & Puente, A. E. (1995). Effects of bilingualism on verbal learning and memory in Hispanic adults. *Journal of the International Neuropsychological Society*, 1(1), 10-16. <https://doi.org/10.1017/S135561771800070X>
- Hernández, R. & Moreno-Fernández, F. (2018). *Hispanic Map of the United States 2018. Observatorio Reports from the Cervantes Institute at Harvard University*. <https://doi.org/10.15427/OR044-10/2018EN>
- Hernández-Nieto, R. & Gutiérrez, M. C. (2017). *Hispanic Map of the United States 2017. Observatorio Reports from the Cervantes Institute at Harvard University*. <https://doi.org/10.15427/OR035-11/2017EN>
- Hispanic Neuropsychological Society. (n.d.). *Mission Statement*. <https://dev80.echodigitalclients.com/about/mission-statement>
- Instituto Cervantes. (2019). *El español en el mundo*. Cervantes. [https://www.cervantes.es/sobre\\_instituto\\_cervantes/prensa/2019/noticias/presentacion\\_anuario\\_madrid.htm](https://www.cervantes.es/sobre_instituto_cervantes/prensa/2019/noticias/presentacion_anuario_madrid.htm)
- Judd, T., Capetillo, D., Carrión-Baralt, J., Mármol, L. M., Miguel-Montes, L. S., Navarrete, M. G., Puente, A. E., Romero, H. R., Valdés, J., & NAN Policy and Planning Committee (2009). Professional considerations for improving the neuropsychological evaluation of Hispanics: A National Academy of Neuropsychology education paper. *Archives of Clinical Neuropsychology*, 24(2), 127-135. <https://doi.org/10.1093/arclin/acp016>
- Lin, L., Stamm, K., & Christidis, P. (2018). Datapoint: How diverse is the Psychology work force. *Monitor on Psychology*, 49(2), 19.
- Llorente, A. (2008). *Principles of neuropsychological assessment with Hispanics*. Springer.
- Matthews, C. G. (1992). Truth in labeling: Are we really an international society? *Journal of Clinical and Experimental Neuropsychology*, 14(3), 418-426. <https://doi.org/10.1080/01688639208407617>
- Morlett-Paredes, A., & Arango-Lasprilla, J. C. (2017). Factors to take account when assessing a Hispanic client. *Bulletin National Academy of Neuropsychology*, 31(1), 11-15.
- Morlett-Paredes, A., Gooding, A., Artiola I Fortuny, L., Rivera-Mindt, M., Suárez, P., Scott, T. M., Heaton, A., Heaton, R. K., Cherner, M., & Marquine, M. J. (2021). The state of neuropsychological test norms for Spanish speaking adults in the United States. *The Clinical Neuropsychologist*, 35(2), 236-252. <https://doi.org/10.1080/13854046.2020.1729866>

- Pew Research Center (2019). *Facts on Latinos in the U.S., Washington, D.C.* <https://www.pewresearch.org/hispanic/fact-sheet/latinos-in-the-u-s-fact-sheet/>
- Ponton, M. O., & Ardila, A. (1999). The future of neuropsychology with Hispanic populations in the United States. *Archives of Clinical Neuropsychology, 14*(7), 565-580.
- Postal, K. (2021). Comment on Cory, 2021: "White privilege in clinical neuropsychology: an invisible 'knapsack' in need of unpacking,". *The Clinical Neuropsychologist, 35*(2), 224-226. <https://doi.org/10.1080/13854046.2020.1844297>
- Puente, A. E., Sol Mora, M., & Muñoz-Céspedes, J. M. (1997). Neuropsychological assessment of Spanish-speaking children and youth. In C. R. Reynolds, & E. Fletcher-Janzen (Eds.), *Handbook of Clinical Child Neuropsychology* (pp. 371-383). Plenum.
- Rabin, L. A., Brodale, D.L., Elbulok-Charcape, M.M. & Barr W.B. (2017). Diversity issues in neuropsychology: A survey of practicing neuropsychologists. *Bulletin National Academy of Neuropsychology, 31*(1), 18-23.
- Rivera Mindt, M., Byrd, D., Saez, P., & Manly, J. (2010). Increasing culturally competent neuropsychological services for ethnic minority populations: a call to action. *The Clinical Neuropsychologist, 24*(3), 429-453. <https://doi.org/10.1080/13854040903058960>
- Roman, C. A. F. (2017). My experience as Latina graduate student in clinical neuropsychology. *Bulletin National Academy of Neuropsychology, 31*(1), 7-8.
- Salinas, C. M., Edgar, V. B., & Puente, A. E. (2016). Barriers and practical approaches to neuropsychological assessment of Spanish speakers. In F. R. Ferraro (Ed.), *Minority and Cross-Cultural Aspects of Neuropsychological Assessment: Enduring and Emerging Trends* (pp. 229-258). Taylor & Francis.
- Sweet, J. J., Benson, L. M., Nelson, N. W., & Moberg, P. J. (2015). The American Academy of Clinical Neuropsychology, National Academy of Neuropsychology, and Society for Clinical Neuropsychology (APA Division 40) 2015 TCN Professional practice and 'salary survey': Professional practices, beliefs, and incomes of U.S. neuropsychologists. *The Clinical Neuropsychologist, 29*(8), 1069-1162. <https://doi.org/10.1080/13854046.2016.1140228>
- Sweet, J. J., Klipfel, K. M., Nelson, N. W., & Moberg, P. J. (2021). Professional practices, beliefs, and incomes of U.S. neuropsychologists: The AACN, NAN, SCN 2020 practice and "salary survey". *The Clinical Neuropsychologist, 35*(1), 7-80. <https://doi.org/10.1080/13854046.2020.1849803>
- U.S. Census Bureau. (2011). The Hispanic population: 2010. <https://www.census.gov/library/publications/2011/dec/c2010-br-04.html>.
- U.S. Census Bureau. (2019). *Profile America facts for features: Hispanic Heritage Month 2019*. <https://www.census.gov/content/dam/Census/newsroom/facts-for-features/2019/hispanic-heritage-month.pdf>
- U. S. Department of Health and Human Services Office of Minority Health (2019). *Profile: Hispanic/Latino Americans*. [https://minorityhealth.hhs.gov/omh/browse.aspx?lvl=3&lvlid=64#:~:text=In%202019%2C%20among%20Hispanic%20subgroups,and%20Cubans%20\(3.9%20percent\)](https://minorityhealth.hhs.gov/omh/browse.aspx?lvl=3&lvlid=64#:~:text=In%202019%2C%20among%20Hispanic%20subgroups,and%20Cubans%20(3.9%20percent)).