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Title: A Country-Wide Probability Sample of Public Attitudes Toward Stuttering in Portugal

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ABSTRACT

Background: Negative public attitudes toward stuttering have been widely reported, although differences among countries and regions exist. Clear reasons for these differences remain obscure.

Purpose: Published research is unavailable on public attitudes toward stuttering in Portugal as

well as a representative sample that explores stuttering attitudes in an entire country. This study sought to (a) determine the feasibility of a country-wide probability sampling scheme to measure public stuttering attitudes in Portugal using a standard instrument (the *Public Opinion Survey of Human Attributes–Stuttering* [*POSHA–S*]) and (b) identify demographic variables that predict Portuguese attitudes,

Methods: The *POSHA–S* was translated to European Portuguese through a five-step process. Thereafter, a local administrative office-based, three-stage, cluster, probability sampling scheme was carried out to obtain 311 adult respondents who filled out the questionnaire.

Results: The Portuguese population held stuttering attitudes that were generally within the average range of those observed from numerous previous *POSHA–S* samples. Demographic variables that predicted more versus less positive stuttering attitudes were respondents' age, region of the country, years of school completed, working situation, and number of languages spoken. Non-predicting variables were respondents' sex, marital status, and parental status.

Conclusion: A local administrative office-based, probability sampling scheme generated a respondent profile similar to census data and indicated that Portuguese attitudes are generally typical.

Key Words: Stuttering; Attitudes; Portugal; *POSHA–S*; Representative Sampling

Highlights:

Portuguese adults held mostly average *POSHA–S* attitudes toward stuttering.

Like other samples worldwide, these attitudes reflected stereotypes and stigma.

Age, region, education, work, and number of languages predicted stuttering attitudes.

Sex, marital status, and parental status did not predict stuttering attitudes.

1 Introduction

1.1 Attitudes toward Stuttering

The current study was motivated by a growing number of investigations over several decades that have investigated public attitudes toward stuttering and have documented that the general public attributes negative traits to people who stutter (c.f. reviews by Hughes, 2015). Studies have sampled people from different ages (Doody, Kalinowski, Armson, & Stuart, 1993; Evans, Healey, Kawai, & Rowland, 2008; Griffin & Leahy, 2007; Hartford & Leahy, 2007; Kirsch, 2006), varying family status (Al-Khaledi, Lincoln, McCabe, Packman, & Alshatti, 2009; Crowe & Cooper, 1977; Özdemir, St. Louis, & Topbaş, 2011b), and different professional groups (Crowe & Cooper, 1983; Crowe & Walton, 1981; Dorsey & Guenther, 2000; Lass et al., 1992, 1994; Ruscello, Lass, Schmitt, & Pannbacker, 1994; Yeakle & Cooper, 1986), including speech and language therapists (SLTs) (Cooper & Cooper, 1996; Lass, Ruscello, Pannbacker, Schmitt, & Everly-Myers, 1989; Yairi & Williams, 1970). Findings from these studies indicate that anxiety, shyness, nervousness, introversion, and unassertiveness are among those negative traits commonly attributed to people who stutter and are referred to as the "stuttering stereotype" (MacKinnon, Hall, & MacIntyre, 2007; Yairi & Williams, 1970). The purpose of this study was to determine *POSHA*–S results using a probability sampling approach. As described in the Method (see Section 2.2), the country of Portugal was chosen for this research because the country's government is organized in such a way that a novel approach to probability sampling was feasible.

Stigma, which can include prejudice (e.g., stuttering stereotype) and discrimination, relate to a "spoiled identity" (Goffman, 1963). Stigma typically begins with negative attitudes of the public (i.e., public stigma), but can become internalized by individuals (i.e., self-stigma)

(Boyle, 2013). Given the pervasiveness of public and self-stigma related to stuttering, and their consequences, calls for actions, e.g., public awareness campaigns, to mitigate public stigma are common. The assumption has been that providing compelling, accurate, and up-to-date information regarding stuttering will increase the likelihood that people who stutter can grow up and live without the burden of stigma (Flynn & St. Louis, 2011).

A major initiative, the International Project on Attitudes Toward Human Attributes (IPATHA), was inaugurated to compare public attitudes toward stuttering in different populations and then to develop a science of improving such attitudes. Both purposes required a standard survey instrument that could be translated and used internationally. Accordingly, the *Public Opinion Survey of Human Attributes–Stuttering* (*POSHA–S* explained in detail below in Section 2.1.1) was developed (St. Louis, 2011; 2012; 2015) and has been used since 2001 to collect information related to attitudes toward stuttering in 42 different countries and in 26 different languages (circa March, 2016). Excluding experimental versions of the instrument and samples composed entirely of stuttering individuals, SLTs, or SLT students, 11383 respondents from 141 different samples comprise the public database. The USA is most highly represented in the database, but American respondents account for 29% of the samples. Because the database samples vary, based on such selection variables as country, age, level of education, profession, socio-economic status (SES), or languages known, the *median* of the 141 sample means is taken as the "average" for each *POSHA–S* rating. The rationale is that, compared to the *mean* of all 141 sample means, the median value minimizes influence of "outlier" samples, i.e., samples with extremely positive (high) or extremely negative (low) attitudes. Currently, the median of the "*Overall Stuttering Score*" (*OSS*, described below) is 17 for public samples. On the *POSHA–S* -100 to +100 scale, this means that values below 17 are below average and those above 17 are

above average.

Most of the studies have employed various methods of convenience sampling. Typically, these involved investigators asking friends, acquaintances, family members, students, or colleagues to both fill out the *POSHA–S* and to distribute other questionnaires to their friends, acquaintances, family members, students, or colleagues. Many of these studies have excluded SLTs or SLT students (except those seeking to sample only these populations) since clear evidence exists that their attitudes are more positive than those of people in other professions (e.g., St. Louis, Przepiorka, et al. 2014). A few studies have used a form of probability sampling. These range from random sampling from a list of the population to sampling from a randomly selected cluster of potential respondents.

1.2 Stuttering Attitudes in Various Countries

Whereas, studies of public attitudes toward stuttering have been carried out in numerous countries, no systematic research has been reported that has sought to collect a representative sample that would allow generalization of findings to an entire country. Following is a review of selected studies that measured attitudes in samples across different regions of a country or sampled comprehensively enough to generate an impression of attitudes in a specific country. Most of the studies used convenience sampling. The few that used probability sampling are highlighted.

1.2.1 Comparative Country Studies with a Short Questionnaire. Van Borsel and colleagues (Pereira, Rossi, & Van Borsel, 2008; Van Borsel, Verniers, & Bouvry, 1999; Xing Ming, Jing, Yi Wen, & Van Borsel, 2001) carried out parallel studies in Belgium, China, and Brazil with an orally-presented questionnaire composed of 12 questions (different from the *POSHA–S* questionnaire). The three studies were similar enough such that the authors have

reported inter-country comparisons. Questions related to respondents' knowledge about stuttering as well as thoughts about stuttering in other races and treatment of stuttering children. The studies were carried out with a form of convenience sampling, but with constraints designed to reduce bias that may be inherent in typical samples of convenience. Eligible respondents were people on a main shopping street who happened to be present on the days of sampling and agreed to talk to examiners who approached them. The fact that none of the respondents were presumably known to the questioners reduced selection bias, and the fact that none of them could have known in advance that they would be approached reduced response bias. Care was taken to assure that three age groupings and both sexes were proportionally included and that SLTs, physicians, and people who stuttered were excluded. Similarities and differences among respondents from Belgium, China, and Brazil were reported. For example, 68% to 85% reported that they had heard or met a person who stutters, and of those 41% to 59% knew someone who stuttered who was a friend, relative, or neighbor. Fifty-three to 71% thought more males than females stuttered. Other selected results of these studies are compared to those of the current study in Section 4.3.

1.2.2 Comparative studies using the *POSHA–S*

Although numerous studies have been carried out in the USA using the *POSHA–S* in its original English, only one study intended to sample a subset of the population of the entire country, i.e., a study of American Indians (Native Americans) (Beste-Guldborg, St. Louis, & Campanale, 2015). In this study, through email lists acquired from tribal directories provided by tribal leaders, more than 1500 self-identified American Indian adults filled out online *POSHA–Ss*. They represented four regional tribal groups: Northern Plains, Eastern, Southwestern, and Northwestern tribal groups. Overall, 95 different tribal affiliations were listed, with individuals

responding from 35 of the 50 USA states. Summary *POSHA–S* scores (described below) were very similar across the four regions and the *Overall Stuttering Scores* (*OSSs)* were identical to the *POSHA–S* database median (17) in the majority of the sample. Nevertheless, significant differences between regions for selected individual items occurred, partly because of the large sample sizes (n = 205 to 639). The authors concluded that, in spite of a few exceptions, the American Indians had accommodated closely to majority attitudes around the country.

Using Turkish translations of the *POSHA–S*, public attitudes in Turkey were investigated in four different studies. Three of them were convenience samples (i.e., Aydın, 2008; Çoşkun, 2006; St. Louis, de Andrade, Georgieva, & Troudt, 2005). One was a probability sample derived from a public school-based scheme wherein city districts, then elementary schools within them, were selected at random (i.e., Özdemir, St. Louis, & Topbaş, 2011b). This probability study compared samples of sixth-year elementary students with their parents, grandparents or adult relatives, and adult neighbors. Specific results are summarized in Section 4.3. Overall, however, the above-mentioned convenience samples yielded more negative *Beliefs* about stuttering on the *POSHA–S* but less negative *Self Reactions* to stuttering [Section 2.1.1] than the probability samples. Accordingly, Özdemir et al. (2011a) concluded that results from convenience sampling generated different attitudes than results obtained from probability sampling in one Turkish city.

Four *POSHA–S* investigations in Poland (in Polish) explored attitudes toward people who stutter (Przepiórka, Błachnio, St. Louis, & Woźniak, 2013; St. Louis et al., 2014; Węsierska, Węsierska, & St. Louis, & Beste-Guldborg, 2015; Węsierska & St. Louis, 2014). Respondents were 268 adults from the general public, 188 SLTs, 403 SLT students and 205 university students from other majors, all responding via convenience sampling. Generally, the Polish attitudes on different samples were quite consistent except that, uniformly, SLTs held more

positive attitudes on *POSHA–S* than SLT students, and both groups were more positive than the general public (St. Louis, Przepiórka, et al., 2014; Węsierska et al., 2015).

Subsequent to data collection in the current study but highly relevant to it, St. Louis, Sønsgerud, et al. (2016) reported a study of European country attitudes that involved combining data from eight different studies of public attitudes. It showed that attitudes varied across countries, with the most positive attitudes being demonstrated in a combined sample from Norway and Sweden with an *OSS* of 34 (Nillson & Wetterling, 2013; St. Louis, Sønsterud, Carlo, Heitmann, & Kvenseth, 2014), followed next by the same *OSS* (23) from a sample from Bosnia-Herzegovina and a combined sample from Ireland and England (Daly & Leahy, 2014; Tyrell, 2009; Węsierska & St. Louis, 2014), then by a sample from Germany (*OSS* = 15) (Theiling, 2013), and finally with the least positive attitudes from Italy (*OSS* = -3) (Tomaiuloi, Del Gado, Capparelli, & St. Louis, 2013). It was noteworthy that for three of the country samples, i.e., Norway, Bosnia-Herzegovina, and Italy, three different regions of the countries had been sampled in the same investigations, permitting regional comparisons within the countries. In each case, differences within countries were small, even though differences among countries were large. In the case of Italy, for example, 100 adults were sampled from several provinces in the north, in the central region, and in the south, wherein *OSSs* were 0, 12, and -6, respectively. All of these studies used convenience sampling except a portion of the Swedish sample which employed probability sampling.

In searching for predictors in this compilation of studies of European attitudes, the authors were limited by the differences in sampling procedure (e.g., different strategies for convenience sampling), sample size, and other factors. Accordingly, they used a strategy of comparing rank orders of numerous demographic variables in the five countries (or areas) with

rank orders for *OSS*. This procedure would not identify the effect of a given variable, e.g., sex of the respondent, on all the attitudes. Instead, it would provide an estimate of whether that variable had parallel or nonparallel effects in the different countries or areas. It is noteworthy that the suspected demographic variables of sex, age, and education had less effect on public stuttering attitudes than one's citizenship. Thus, national identity, or unique factors related to being a citizen of a particular country, was hypothesized to be a variable worthy of further investigation. For example, it might seem that the most negative Italian attitudes might somehow be related to less positive attitudes that have been observed in southern Europe and Turkey, but the samples in Bosnia-Herzegovina, where more positive *OSSs* were observed, were roughly in the same latitude. Furthermore, recent unpublished *POSHA–S* data from France and Spain generated *OSSs* closer to or above the overall *POSHA–S* database mean, 19 and 16, respectively (M. Eboli, personal communication, April, 2014; L. Leprovost personal communication November, 2015).

The authors called for additional studies of public attitudes in Europe, especially those that could be generalized with some confidence to entire countries. Given that no systematic studies of public attitudes toward stuttering in any country using the *POSHA–S* have been published, the current study focused on Portugal and its potential geographical and cultural influences that might affect Portuguese public attitudes. Would Portuguese attitudes be more negative than the *POSHA–S* median values, as was the case in Italy, or be close to the median, as was the case in France and Spain (with which Portugal shares a border)? Regardless of the answers to this question, the need exists for a study designed to sample public attitudes toward stuttering in such a way that would enable statistical inferences from the sample to the typical, literate, adult population of an entire country. To do so, the sample size would need to be large enough to provide the statistical power to identify potential demographic variables that influence

public attitudes within the country.

A systematic, country-wide sample of public attitudes toward stuttering in Portugal would also be useful for stakeholders in the country. Although no systematic research study has been conducted related to public attitudes toward those who stutter, information distributed through pamphlets by the Portuguese Stuttering Association indicate that the public holds the stuttering stereotype with misconceptions about stuttering as well as a lack of information about the disorder (Associação Portuguesa de Gagos [Portugese Stuttering Association], 2014). Results from a carefully designed, probability sampling study could inform future public awareness campaigns or cognitive-behavioral treatments to attempt to mitigate negative stuttering attitudes and also serve as a baseline against which potential long-term attitude changes could be compared.

1.3. Purpose

The overall purpose of this study was to measure the attitudes related to stuttering and people who stutter throughout the country of Portugal using the widely used *POSHA–S*. Two research questions guided the research.

(a) To what extent is a local administration office-based probability sampling scheme in all the regions of the country of Portugal feasible for measuring and generalizing public attitudes toward stuttering? Addressing this question involved comparing demographic profiles to Portuguese census information and comparing the attitude results with results from other samples around the world. In that this is the first countrywide probability sample of public attitudes toward stuttering, complete information on the results are provided in tables and supplementary material.

(b) To what extent do selected demographic variables predict Portuguese stuttering attitudes?

Results were stratified according to selected variables, such as educational achievement, and tested statistically to determine whether the variables predicted more positive versus less positive stuttering attitudes.

2 Material and Methods

2.1 Attitude Measure

2.1.1 Instrument. The *POSHA–S* is an epidemiological survey instrument designed to measure public attitudes toward stuttering worldwide (St. Louis, 2011, 2012b, 2015). As such, it was deemed the most appropriate measure of public attitudes for this feasibility study. It has a demographic section, a general section related to the comparison of stuttering with other stigmatizing and nonstigmatizing ("anchor") conditions, and a detailed section related to stuttering. Items ratings of the *POSHA–S* are clustered and averaged to calculate components and components are clustered and averaged into subscores. The *Beliefs* about people who stutter subscore reflects opinions external to the respondent, i.e., Traits/Personality, Help From, Cause, and Potential. The *Self Reactions* to people who stutter subscore reflects opinions that personally involve or are internal to the respondents, i.e., Accommodating/Helping, Social Distance/Sympathy, Knowledge/Experience, and Knowledge Source. The mean of these two stuttering subscores is the *OSS*. The third subscore, *Obesity/Mental Illness*, permits comparisons of attitudes toward stuttering with those other potentially stigmatizing attributes (See St. Louis [2011] for a detailed rationale.)

2.1.2 Scoring. Items in the general section and some of the demographic section require a 1-5 rating. Items in the detailed stuttering section require a "yes", "no", "not sure" response. The latter are first converted to a 1-3 scale (i.e., "no" = 1, "not sure" = 2 and "yes" = 3) and then, for the sake of convenience, to a -100 to +100 scale with 0 being neutral. The 1-5 ratings are also

converted to the -100 to +100 scale (i.e., "1" = -100, "2" = -50, "3" = 0, "4" = +50 and "5" = +100) (St. Louis, 2012b)). Ratings on some items are inverted so that, uniformly, higher *POSHA–S* scores reflect more sensitive or accurate attitudes (consistent with recent literature findings), and lower scores reflect less sensitive or accurate attitudes.

2.1.3 Psychometric Properties. Psychometric and related properties of the *POSHA–S* have been carefully addressed and shown in numerous publications to be satisfactory and adequate, i.e., item analysis (St. Louis, 2012b), reliability (St. Louis, 2012b; Junuzović-Žunić, Weidner, Reichel, Cook, St. Louis, & Ware, 2015; St. Louis, Lubker, Yaruss, & Aliveto, 2009), construct and discriminant validity (Flynn & St. Louis, 2011; St. Louis, Reichel, Yaruss, & Lukber, 2009; St. Louis, Williams, Ware, Guendouzi, & Reichel, 2014)), and internal consistency (Al-Khaledi, et al., 2009; St. Louis, 2012b). The instrument has been shown to be user-friendly as well as easy to measure and score (St. Louis, Lukber, Yaruss, Adkins, & Pill, 2008; St. Louis, Reichel, et al., 2009). It has been typically administered as a paper-and-pencil questionnaire, but an online administration versus paper-and-pencil administration were found to generate very similar results (St. Louis, 2012b).

2.1.3 Translation. In a growing number of studies, the *POSHA–S* has been administered in many different languages (26 languages circa March, 2016), documenting that the instrument can be successfully and efficiently translated to other languages for international comparisons (St. Louis, 2015). For example, in the most comprehensive translation study, St. Louis and Roberts (2010) showed that differences in stuttering attitudes in two officially bilingual countries (Canada and Cameroon), were large regardless of whether an experimental prototype of the *POSHA–S* was given in English or French (when respondents selected their stronger language for the survey). By contrast, differences between English and French *POSHA–S* were small,

regardless of the country. The authors recommended that *POSHA–S* translations be carried out by a bilingual person (in English and the other language) with knowledge of speech and language therapy. A back-translation to English should also be made by another bilingual person without familiarity with *POSHA–S* or the details of the study in question. They also pointed out that back-translations could not always exclude differences between the original and the translation.

In order to rule out inaccuracies or inconsistencies that might affect the results, translation procedures carried out for the current study were more stringent than those of any previous translations (St. Louis, 2015). The following procedures were carried out: Translation into European Portuguese, synthesis of the translations, back-translation, committee review of the resultant translation, and feedback from the committee for final adjustments (Beaton, Bombardier, Guillemin, & Ferraz, 1998; Guillemin, Bombardier, & Beaton, 1993). The detailed process and satisfactory results are described elsewhere (Valente, Jesus, Roberto, Leahy, & St. Louis, 2015).

2.2 Probability Sampling Scheme

A three-stage cluster probability sampling scheme, approved by an ethical committee and the National Data Protection Commission, was implemented for this study, with each stage including simple random sampling (Thompson, 2012). The scheme was designed to locate adults representing the population of Portugal as accurately as possible.

The first stage entailed compiling a list of all Portuguese mainland districts and Islands (a total of 20 districts) as well as a list of all administrative regions (*concelhos*) within them. All 308 administrative regions in the entire country were included, with a number assigned to each region. Using random sampling without replacement five administrative regions within each

district were selected such that a total of 100 administrative regions were included in the sampling frame.

For the second stage, a list of all administrative subregions (*freguesia*s) within each of the five administrative regions selected from each district was compiled resulting in a total of 1456 administrative subregions. Again, random sampling without replacement was used to choose one administrative subregion within each administrative region already chosen, yielding a total of 100 administrative subregions. The local administrative office (*Junta de Freguesia*) of each administrative subregion was the site where potential respondents would be selected because these local offices are accessible and used by the local population in Portugal for a wide variety of public services that are necessary and frequently used by adults, all in one place. Specifically, the local administrative office is the place where such activities as obtaining internet access, licenses (e.g., for animals or hunting), photocopy authentication, legal advice, social support services, tutoring (academic support), support for being unemployed, and – in some local offices – postal services are available. It is also the place where people attend various citizen meetings or workshops organized by the offices, register to vote, and cast ballots in elections. As such, a wide range of the population in terms of age, sex, occupation, education, income level, and health status would regularly go into the offices.

The third of the three-stage cluster probability sampling scheme comprised the actual respondent identification and questionnaire distribution. Staff at each local administrative office (representing each of the 100 administrative subregions) selected one male and one female within each of three age groups: 18-24 yr, 25-64 yr, and 65 yr or older to be included as potential respondents. In summary, the random sampling procedure would represent 100 administrative subregions (taken from five administrative regions, one from each of 20 districts) and would

yield 600 potential respondents (300 males and 300 females). One third of the males and females would be in each of the three age ranges.

The first author made a list of the local administrative offices in each of the 100 administrative regions through a web search and then contacted those that were selected randomly in the second stage. The first contact, carried out via telephone and/or email explained the purposes of the study, explained the random procedure to select suitable persons to fill out the *POSHA–S* questionnaires, and asked permission to distribute questionnaires. When a contact person of the local office declined to assist in the study, the first author contacted the next local office of the same administrative subregion and followed the same procedure. Of the 100 local administrative offices contacted, the initial compliance rate was 70/100 or 70%. Proceeding to the next local administrative office after one declined generated a compliance rate of 100%.

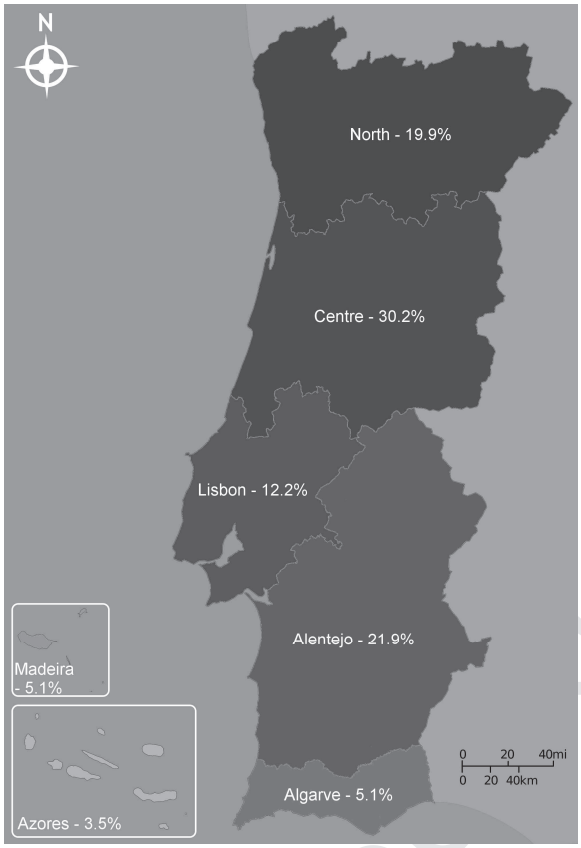
The contact person, typically a staff employee, at each local office actually made the final selection of respondents (a male and female in each of three age groups). It was requested that the staff person ask the first six persons entering the office to complete the questionnaire who would complete the inclusion criteria, i.e., that they lived in the subregion, that they were able to read and write, and that they were male or female in one of the age ranges.

For statistical analysis, the administrative regions randomly chosen were clustered using the Nomenclature of Territorial Units for Statistics (NUTS level II, hereinafter referred to as "Region"), which is a hierarchical system that divides the country based on existing administrative units and population size (EUROSTAT, 2011). The 100 administrative regions were distributed through seven NUTS level II regions, that is, five divisions on Portugal's mainland (North, Central, Lisbon, Alentejo, and Algarve) and two island regions (Madeira and Azores). as shown in Figure 1. The region percentages of the NUTS II data are represented in

Figure 1.

Figure 1.

Regions (NUTS level II) in Portugal and percentage of respondents in each region.



2.3. Data analysis

The first purpose of the study was to ascertain the feasibility of the probability sampling countrywide. This was carried out in two ways. First, we compared selected *POSHA–S* demographic results with available Portuguese census data. The extent to which the probability sampling scheme generated results that approximated the census data would be an index of the extent the survey results were representative of Portugal's population. Second, we compared the results of the Portuguese stuttering attitudes with those from around the world generated from the

POSHA–S. Specifically, we compared mean ratings for each *POSHA–S* component, subscore, and the *OSS* with the lowest, highest, and median sample mean values of the *POSHA–S* database, which contained 141 samples representing 11383 public respondents from 42 countries and 26 languages (circa March, 2016). Percentile ranks of the mean ratings for *POSHA–S* items, components, subscores and *OSS* for the Portuguese sample derived from all 141 database samples were calculated. The percentage of ratings falling in the 1st quartile (0–25th percentiles), interquartile range (25th–75th percentiles) and the 4th quartile (75th–100th percentiles) were used to determine if the attitudes of the Portuguese sample were close to the median or more/less positive than those in the *POSHA–S* total sample. It must be recalled that "average" adult attitudes toward stuttering are characterized by stereotype and stigma, and more similarities than differences have characterized *POSHA–S* samples around the world (St. Louis, 2015). Accordingly, another way of conceptualizing the percentile comparisons is that, within the *POSHA–S* ratings of the numerous populations sampled, some items typically reflect accurate or empathic attitudes while others do not. Thus, actual mean ratings must be interpreted within the context of percentiles relative to all the samples that have been analyzed rather than relative to their absolute -100 to +100 values.

For the second purpose, predicting *POSHA–S* summary ratings (stuttering subscores and the *OSS*), eight demographic variables were targeted for their predictive potential for stuttering attitudes: Age group, regions in country, completed school levels, working situation, sex, marital status, parenthood, and number of languages known. As a first step, eight multivariate analysis of variance (MANOVA) procedures were run in SPSS (version 22) to assess the overal influence of each of these predictive variables on the *Beliefs* subscore, the *Self Reactions* subscore, and the *OSS* with a Bonferroni correction such that alpha level for significance was set at $p \leq 0.00625$

(.05/8). Roy's largest root was chosen as the discriminant function variate because this statistic typically generates the most powerful results on MANOVA comparisons (Field, 2013). The second step involved identifying the predictor variables that revealed statistically significant impact using univariate ANOVAs for their influence on the stuttering subscores and the *OSS*. Again, a Bonferroni correction was implemented, resulting in a criterion for significance of $p \leq 0.0168$ (.05/3). As a third and final step, Gabriel post-hoc pairwise comparisons were run between means in all variables for which the ANOVAs were significant. Gabriel post-hoc tests were chosen since they can accommodate differences in sample sizes (Field, 2013).

3 Results

3.1 Demographic

3.1.1 Respondents. From a total of 600 persons given a *POSHA–S* through the three-stage sampling procedure described above, a total of 311 questionnaires were returned, generating a return rate of 52%. Babbie (2006) asserts that a response rate of at least 50% is considered acceptable for analysis in a social science research survey.

Table 1 presents absolute and relative frequencies of demographic information for the respondents according to demographic categories. Eight of these were evaluated as predictor variables (see below). Data related to respondents' acquaintance with or self-identification as stuttering – as well as the four other anchor attributes on the *POSHA–S* (obesity, mental illness, left handedness, and intelligence) – are also listed. Wherever available, information from the 2011 Portuguese census (INE, 2011) is shown for the sake of comparing the probability sample obtained for this study to the entire population.

Table 1.

Descriptive demographic information of Portuguese respondents with frequencies and

associated percentages. Where available, recent Portuguese census data are provided.

VARIABLE	Categories	*Number of Respondents*	Percentage	Portuguese Population (From Census)
Age group[a]	18-24 yr	88	28.3%	9.4%
	25-64 yr	124	39.9%	67.4%
	≥65 yr	90	28.9%	23.2%
	No answer	9	2.9%	—
Sex[a]	Male	150	48.2%	47.0%
	Female	157	50.5%	53.0%
	No answer	4	1.3%	—
Region (NUTS level II)[a]	North	62	19.9%	34.7%
	Center	94	30.2%	22.4%
	Lisbon	38	12.2%	26.6%
	Alentejo	68	21.9%	7.3%
	Algarve	16	5.1%	4.3%
	Azores	11	3.5%	2.2%
	Madeira	16	5.1%	2.5%
	No answer	6	1.9%	—
School level completed[a]	Primary school (1st cycle)	71	22.8%	28.1%
	Middle school (2nd cycle)	19	6.1%	11.9%
	Middle school (3rd cycle)	43	13.8%	15.9%
	High school	89	28.6%	15.3%
	Trade/military/technical school	30	9.6%	—
	4-yr university degree	35	11.3%	14.4%
	Master or similar degree	10	3.2%	1.3%
	Doctoral degree	1	0.3%	0.3%
	No answer	13	4.2%	—
Working situation[a]	Student	35	11.3%	2.4%
	Working	140	45.0%	49.9%
	Unemployed or not working	42	13.5%	7.3%
	Retired	87	28.0%	27.0%
	Student worker	2	0.6%	—
	No answer	5	1.6%	—

Marital status[a]	Married	185	59.5%	56.9%
	Not married	112	36.0%	43.1%
	No answer	14	4.5%	—
Parental status[a]	Parent	165	53.1%	—
	Non-parent	117	37.6%	—
	No answer	29	9.3%	—
Religion	Christian	229	73.6%	—
	Catholic	204	65.6%	—
	Denomination unspecified	23	7.4%	—
	Evangelical	2	0.6%	—
	Muslim	1	0.3%	—
	Agnostic	4	1.3%	—
	Atheist	3	1.0%	—
	None	6	1.9%	—
	No answer	68	21.9%	—
Native language	Portuguese	303	97.4%	—
	Other	1	0.3%	—
	No answer	7	2.3%	—
Number of languages known[a]	1	137	44.1%	—
	2	83	26.7%	—
	3	47	15.1%	—
	4	39	12.5%	—
	No answer	5	1.6%	—
Persons known who have a stuttering disorder[b]	Nobody	80	25.7%	—
	Acquaintance	172	55.3%	—
	Close friend	31	10.0%	—
	Relative	33	10.6%	—
	Me	5	1.6%	—
	Other	9	2.9%	—
No persons known	Stuttering	80	25.7%	—
	Mentally ill	113	36.3%	—
	Obese	45	14.5%	—
	Left handed	47	15.1%	—
	Intelligent	23	7.4%	—
Self-identification	Stuttering	5	1.6%	—
	Mentally ill	2	0.6%	—
	Obese	18	5.8%	—
	Left handed	13	4.2%	—

Intelligent	51	16.4%	—

[a] Predictor variables evaluated statistically in the study.
[b] Items weighted and used to construct the Personal Experience item on the *POSHA–S*.

Nine out of 10 respondents were from Portugal's mainland, and 3 out of 10 were from the center of the country. Nearly 40% of the Portuguese respondents who completed questionnaires were in the middle 25–64 age group, with approximately 30% in either the younger or older age groups. Respondents were about evenly split female to male, i.e., 51% to 48%. For educational achievement, the largest subgroup of respondents had completed high school (nearly 30%), Similarly, for current work status, the largest subgroup (45%) were currently working. Sixty percent of the sample was married, slightly over half had children, and about 45% knew only one language, i.e., European Portuguese.

It can be seen that for sex, school level completed, working status, and marital status, census data indicate that the Portuguese sample is generally aligned with the population of the country (INE, 2011). By virtue of the individuals who visited the administrative offices, the younger, 18-24 group was over-represented, the middle, 25-64 group was under-represented, and the older, 65+ group was slightly over-represented. Also, the Center and Alentejo regions were over-represented while the North and Lisbon region were under-represented.

More than half (55%) of the respondents reported having an acquaintance who stuttered. Only five people (less than 2%) identified themselves as individuals who stutter (which did not disqualify him/her as a respondent), and fewer than 1% as mentally ill. One quarter reported not knowing anyone who stuttered. More than one-third (36%) of the respondents reported knowing no one who was mentally ill, which represented the least familiarity with the five attributes. Only 1 in 6 of the Portuguese respondents regarded themselves as being intelligent.

3.1.2. Demographic and Related Ratings. *POSHA–S* results for demographic ratings

(converted to the -100 to +100 scale) relating to respondents' relative income, self-rating of health and abilities, life priorities, and completion time are presented in the Supplementary Dataset 1. The table also includes ratings for the two attributes not included in *POSHA–S* summary scores, i.e., left handedness and intelligence, and thus are treated as demographic variables. In this table, means (converted to the -100 to +100 scale) are followed by the *POSHA–S* database medians (based on 141 samples around the world), and the rank-order or percentile of the Portuguese data relative to those 141 samples.

Relative income was scored well below average of the *POSHA–S* total database samples, i.e., -22 versus 0 on the -100 to +100 scale or at the 6th percentile. Self-ratings of health and abilities were also rated much lower than the average sample in the database, with percentiles ranging from the lowest observed heretofore for physical health (0 percentile) to ability to speak (13th percentile). Hypotheses related to why these values were rated so low are discussed in Section 4. Except for spending time alone, ratings of life priorities were within the approximate average interquartile range (25th to 75th percentile) relative to the 141 samples in the database.

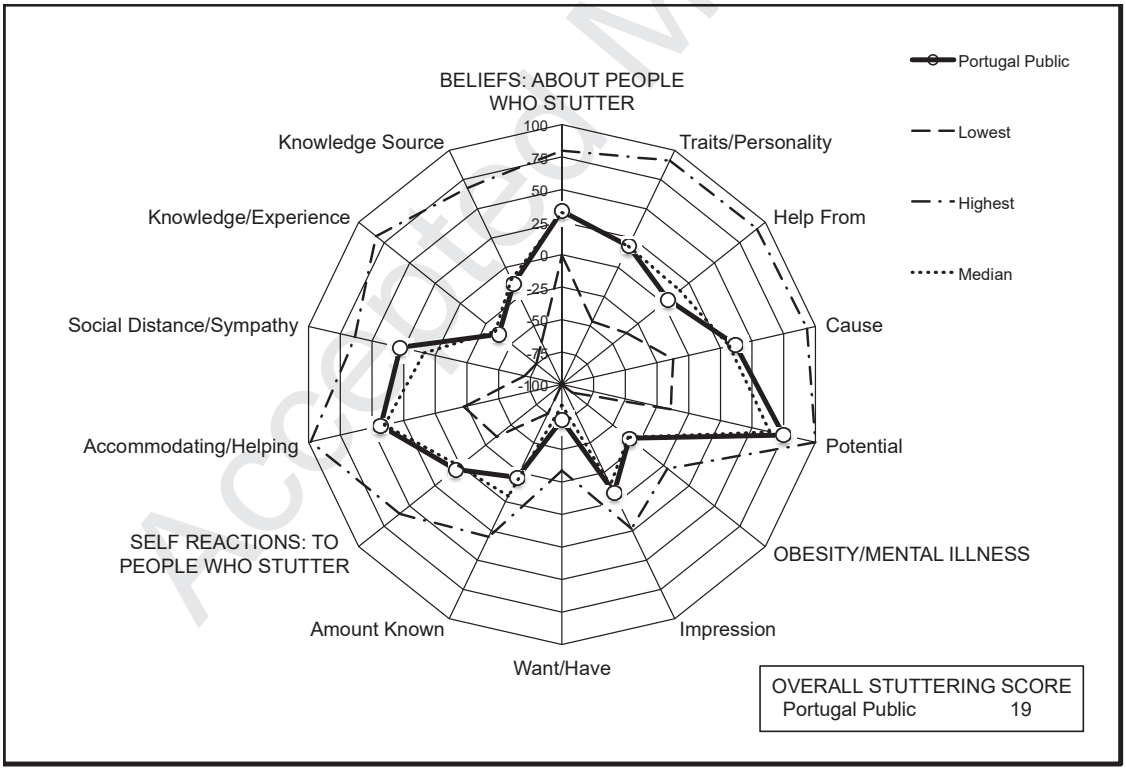
3.2. Comparison of the Portuguese Results with *POSHA–S* Database

POSHA–S studies have typically been summarized in radial graphs that include components and subscores, with more positive scores closer to the periphery and more negative ratings closer to its center (St. Louis, 2011, 2012, 2015). The *Overall Stuttering Score* (*OSS*) of the Portuguese sample was 19 or only two units higher than the database average. Compared to all the samples in the database, this was at the 65th percentile relative to 141 previously analyzed samples from 42 countries, or slightly above the median at the 50th percentile. Component and subscore ratings are compared to the lowest, highest and median sample means from the *POSHA–S* database. The Portuguese comparisons can be seen clearly in Figure 2 where mean

values parallel the median database value quite closely but reflect more positive attitudes for the Potential and Social Distance/Sympathy components (which were in the 4th quartile) and less positive than average attitudes for the Help From component (which falls into the 1st quartile). Portuguese respondents also indicated knowing considerably less than the median database value for the combined Amount Known about obesity and mental illness (1st quartile). Overall, however, Figure 2 shows graphically that the Portuguese respondents, chosen according to a careful probability sampling procedure, generated mean stuttering attitudes ratings that were similar to the medians from the *POSHA–S* database.

Figure 2.

Comparison of POSHA–S results from the Portuguese population and the database samples.



Supplementary Dataset 2 provides all of the mean ratings of the Portuguese sample

scored in the *POSHA–S* (items, components, subscores, and the *OSS*), along with the median database values and percentiles. It is important to recall that the percentiles compare the Portuguese to all other samples; they do not address the absolute positivity or negativity of particular attitudes [see Section 3.3.].

In comparison to previously analyzed samples, the 60 sample ratings are distributed as follows: 1st quartile or least positive attitudes, 7%; interquartile range or average attitudes, 73%; and 4th quartile of most positive attitudes, 20%. The mean percentile value was 54. Taken together, the Portuguese attitudes obtained through the probability sampling procedure in this study were mostly average but with a trend for slightly more positive than average ratings.

Selected items that reflected more positive than average attitudes (i.e., in the 4th quartile) were: Agreeing that people who stutter can hold any job they want, rejecting that they should hide their stuttering; not feeling impatient while a conversational partner is stuttering; not being concerned if their doctor, a sibling, or the respondents themselves stuttered; wanting to stutter themselves. More negative than average attitudes (i.e., in the 1st quartile) were reported for three items: Accepting that a medical doctor should help a person who stutters and rejecting that others who stutter should do so and not agreeing that stuttering is caused by genetic inheritance.

3.3 *POSHA–S* Predictors Variables of Portuguese Stuttering Attitudes

The predictor demographic variables were analyzed with multivariate analysis of variance (MANOVA) for the *Beliefs* and *Self Reactions* subscores and the *OSS*. Table 2 shows values for *Beliefs*, *Self Reactions*, and *OSSs* of the *POSHA–S* for subcategories in each of the eight predictor variables and Supplementary Dataset 3 provides detailed statistical results for each variable. The highest or most positive mean values were observed for the 25-64 age group (23), males, respondents living in Azores, those with 4-yr university degrees, students, unmarried

respondents, non-parents, and persons knowing three languages. Results of MANOVA and univariate ANOVA analyses for each of the eight predictor variables revealed that five variables were statistically significant for *OSSs*: age ($F(2,299) = 13.853$, $p = 0.004$), region ($F(6, 298) = 2.580$, $p = 0.019$), school level completed ($F(6, 290) = 3.258$, $p = 0.004$), working situation ($F(4, 301) = 4.783$, $p = 0.001$), and number of languages known ($F(3, 302) = 4.055$, $p = 0.008$). Three variables did generate significant effects: Sex, marital status, and parental status. Considering the *Self Reactions* subscore, age, region, school level completed, working situation, and number of languages were significantly different. Only the age group variable significantly influenced the *Beliefs* subscore.

Table 2.

Mean values for POSHA–S stuttering subscores and Overall Stuttering Scores (OSSs) for predictor demographic variables in the Portuguese population.

Predictor Variable	**Categories**	***Beliefs* about people who stutter**	***Self-Reactions* to people who stutter**	***Overall Stuttering Score***
Age group	18-24 yr	35.6	9.0	22.3
	25-64 yr	36.5	8.9	22.7
	≥65 yr	28.4	-5.9	11.2
Sex	Male	33.8	5.7	19.7
	Female	33.5	5.0	19.3
Region	North	32.2	6.9	19.5
	Center	32.3	6.1	19.2
	Lisbon	31.9	-2.8	13.6
	Alentejo	33.2	1.5	17.3
	Algarve	36.8	-5.8	15.5
	Azores	36.6	27.7	32.1
	Madeira	46.7	12.3	29.5
School level completed	Primary school (1st cycle)	30.4	-4.3	13.1
	Middle school (2nd cycle)	36.9	6.8	21.9
	Middle school (3rd cycle)	30.0	7.7	18.8
	High school	35.7	9.9	22.8
	Trade/military/technical school	27.9	5.7	16.8
	4-yr university degree	41.4	11.2	26.3
	Master or similar degree	31.0	9.4	20.2
	Doctoral degree	33.3	-21.7[a]	5.8
Working situation	Student	38.0	5.8	21.9
	Working	32.6	10.6	21.6
	Unemployed or not working	38.6	6.4	22.5
	Retired	29.4	-5.02	12.2
	Student worker	30.2	-5.5	12.4
Marital status	Married	32.8	4.2	18.5
	Not married	35.1	5.9	20.5
Parental status	Yes	33.4	3.4	18.4
	No	33.7	6.7	20.2
Number of languages known	1	30.3	0.2	15.3
	2	37.8	2.9	20.4
	3	30.8	16.2	23.5
	4	35.1	11.2	23.2

[a] Data related to Subscores and *OSS* concerning doctoral degree is based on only one respondent.

Gabriel post-hoc multiple comparisons revealed significant differences between the 18–24 and ≥65 age groups (M=14.966, p<0.001) and also between the 25–64 and ≥65 age groups (M=14.831, p<0.001) for *Self-Reactions.* For *Beliefs*, the 25–64 age group held significantly more positive attitudes than the ≥65 group (M=8.068, p=0.014). And for *OSS*, the 18–24 and 25–64 age groups differed significantly from the older age group (M=11.065, p<0.001, and M=11.450, p<0.001, respectively).

Post-hoc comparisons for the region variable revealed that respondents from the Azores island region held more positive *Self Reactions* in comparison with Central region (M= 21.58, p= 0.046), Lisbon (M= 30.46, p=0.004), Alentejo (M=26.16, p= 0.008), and Algarve (M= 33.45, p= 0.011). *Self-Reactions* of respondents who completed secondary school or a 4-yr university degree were also more positive than those with only a primary school education (M= -14.245, p= 0.006 and M= -15.493, p= 0.041, respectively). The same was true for the *OSS* comparisons (M= -9.765, p= 0.010 and M= -13. 222, p= 0.005, respectively).

Working people held significantly higher *Self Reactions* subscores and *OSS* values when compared with retired people (M= 15.640, p= 0.000 and M= 9.380, p= 0.001, respectively). Students and unemployed people also had higher *OSSs* than retired people did (M=9.671, p= 0.048 and M= 10.267, p= 0.016, respectively).

We carried out additional ANOVAs to identify factors that might explain the lower scores of elderly people. The amount known about stuttering reported by the ≥65-yr age group was lower (although not significantly so) than the amount known by the younger age groups. Nevertheless, Post-hoc comparisons within the ≥65 age group revealed that the amount known influenced negatively the *Self Reactions* subscore [F(4, 84) = 3.865, p = 0.006]. Accordingly, we

submit that misinformation or lack of information can be a reason for significantly negative ratings of older adults compared with younger adults.

Post-hoc comparisons for the number of languages known was associated with significantly more positive attitudes for respondents who spoke three languages versus one language ($M = -15.96$, $p < 0.001$) and also between two languages and three languages spoken ($M = -13.30$, $p = 0.017$) for the *Self Reactions* subscore. *OSSs* were significantly higher for people who knew three languages in comparison with people knew only one language ($M = -8.23$, $p = 0.024$).

4 Discussion

4.1 Summary

The present study analyzed the public attitudes of the Portuguese population toward people who stutter through a representative sample of the entire country based on a Portuguese translation of the *POSHA–S*. Mean attitudes on the *POSHA–S* using a three-stage cluster sampling procedure, with final recruitment of respondents accomplished by staff at widely-used local administrative offices were commensurate with median of the 141 previously analyzed samples from 42 countries around the world. To the extent that the median represents "average" adult stuttering attitudes, the results of this country-wide sampling procedure were approximately "average," with trends toward slightly "more positive than average" attitudes. With the methodological innovations employed, we submit that the detailed probability sampling not only generated a representative sample from which to generalize about Portugal's adult stuttering attitudes but also a solid baseline against which future samples can be compared.

Given the careful stratification of the sample, the variables that predicted more positive versus less positive stuttering attitudes can be regarded as important for future investigations.

Respondents' age, home region, educational achievement, employment/student status, and number of languages known all were significant predictors. By contrast, respondents' sex, marital status, or parental status were not significant predictors of stuttering attitudes.

4.2 Portuguese Attitudes toward Stuttering

Figure 2 confirms that the measured attitudes toward stuttering of the Portuguese population were visibly very similar to the median tracing of all the sample means in the *POSHA–S* database. Their *Beliefs* about stuttering were 34, their *Self Reactions*, 5, and their OSS, 19. Their Obesity/Mental Illness ratings were -34. As noted, these ratings were average to slightly more positive than average. Consistent with the database sample ratings, fully 73% of the percentiles shown in the Supplementary Dataset 2 for each Portuguese *POSHA–S* rating are in the interquartile range, with 7% and 20%, respectively, in the 1st and 4th quartiles.

4.3 Feasibility of the Probability Sampling Scheme

The over-arching purpose of this study was to carry out a study of public attitudes toward stuttering that would be representative of the entire country of Portugal. Specifically, one goal was to determine the feasibility of using a local administrative office-based method of respondent recruitment in the country-wide probability sample. Results indicated that the sampling procedure, in general, generated respondents who were representative of the Portuguese population. With a few exceptions, the samples obtained at the 100 local administrative offices were aligned to the expected percentages based on data from the official Portuguese census. Most notably, the sample was almost equally balanced for males and females and was parallel to the population percentages for school achievement, work status, and marital status. Additionally, the fact that 2% of the respondents stuttered is close to prevalence rates of stuttering around the world (Bloodstein & Ratner, 2008).

The relative income rating (combined from ratings of one's income relative to both friends and family as well as all the people in one's country) of -22 was considerably lower than the *POSHA–S* database median of 0 on the -100 to +100 scale, placing it at the 6th percentile. This was also lower than all five countries/areas in the St. Louis, Sønsterud, et al. (2016) study, where mean ratings ranged from -9 in Bosnia & Herzegovina to 15 in Germany. These means, as are most in the *POSHA–S* database, were generated from convenience sampling. Özdemir et al. (2011a) found that the relative incomes of two probability samples of adults in Turkey were also much lower than those of adults from a convenience sample in the same city, i.e., -7 and -12 versus 9. It is likely that most previous *POSHA–S* investigators, representing moderate income levels, tend to recruit respondents more similar to their own incomes than do probability sampling strategies.

Although not comparable to any available census data, it was puzzling that the Portuguese sample regarded themselves much lower than average on the demographic self-ratings for physical health, mental health, ability to learn, and ability to speak (0-13th percentiles relative to the *POSHA–S* database samples) (Supplementary Dataset 1). Moreover, only 16% regarded themselves as intelligent (18th percentile). These are commensurate with some other cultural samples analyzed wherein respondents apparently do no not wish to "brag" about themselves, e.g., Poland (Przepiórka et al., 2013) and Hong Kong or Mainland China (Ip, St. Louis, Myers, & An Xue, 2012) where rank orders were all in the 1st quartile relative to the database and most below the 10th percentile. Apparently, the Portuguese population is not predisposed to rate themselves highly on characteristics that might appear to be "bragging."

Public attitudes toward stuttering in Portugal, in comparison to other database samples around the world that used the *POSHA–S*, were also roughly "average." Importantly, however, in

comparison to the most relevant study of European attitudes (St. Louis, Sønsterud, et al., 2016), Portuguese attitudes were substantially more positive than measured attitudes in Italy (*OSS* = -3), slightly more positive than those in Germany (*OSS* = 15), slightly lower than Bosnia & Herzegovina or the combined English/Irish samples (*OSS* = 23), and substantially lower than the combined Norway/Sweden samples (*OSS* = 34). Additionally, the present probability sample also confirmed that regions within the Portugal mainland held similar attitudes, confirming what has been showed in three different regions of Bosnia & Herzegovina, Italy, and Norway (St. Louis, Sønsterud, et al., 2016).

The authors of the European study acknowledged that variation in sampling schemes may have influenced their results; however, it is extremely unlikely that the large differences (i.e., between the Scandinavian countries and Italy) were due to sampling differences. Given that demographic variables such as sex, age, SES did not predict the rank orders of ratings among the five countries or areas, national identity was suggested as a likely predictor variable. The authors did not speculate on how national identity might affect attitudes, i.e., why the Italian attitudes were substantially less positive than the other four countries and why the Scandinavian attitudes were substantially more positive. The current study does not address the question either; yet, it further brings into focus the need to include a measure of national identity (e.g., the *International Social Survey* [Rusciano, 2003]) in public attitude studies in different countries or perhaps measures of identity within countries.

Comparing to other samples within countries, Portuguese attitudes were similar to the four tribal groups of American Indians (Beste-Guldborg et al., 2015 wherein *OSSs* ranged from 17 to 24. They were also similar to attitudes of adults sampled in six different regions of Poland (*OSS* = 18) (Przepiórka et al., 2013).

As noted, most studies utilizing the *POSHA*–S have employed convenience sampling methodology. Only one study in Turkey compared probability sampling of adults using a public school-based cluster sampling scheme with a previous study using convenience sampling in Eskişehir, Turkey (Özdemir et al., 2011a; 2011b). Whereas *OSS*s were similar, the profiles of the various components and subscores were markedly different using the different sampling methods, leading the authors to conclude that probability sampling was the preferred procedure. Comparing the Portuguese results to adults in the two different probability samples (Özdemir et al., 2011b), summary stuttering attitudes for Portugal (*OSS* = 19) were more positive than those for Turkey (*OSS* = -2 and *OSS* = 4). Of course, the Turkish studies were not attempting to generalize to an entire country, but demographic difference were likely important determinants for the differences observed from the current study.

School-based samples are likely effective and efficient strategies to generate probability samples in specified areas, but country differences in public versus private schools, socio-economic influences on school populations, sizes and grade level included in school, and other factors such as access to schools in an increasingly dangerous world limit their use. By contrast, the current study confirms that in countries such as Portugal where adults are obliged to visit various local governmental offices for a wide variety of necessary life functions, a local administrative office-based sampling model provides an attractive, relatively inexpensive strategy to carry out probability sampling of adults in an entire country where these or similar government offices exist.

The results of this study can be compared to results of three items of the Van Borsel et al. (1999), Pereira et al. (2008), and Xing Ming et al. (2001) studies in Belgium, Brazil, and China related to knowing a person who stutter and the cause of stuttering. Compared to 82% of the

Flemish respondents, 85% of the Chinese respondents, and 68% of the Brazilian respondents had heard of or met a person who stutters, 79% of the Portuguese respondents identified an acquaintance, close friend, relative, or someone else who stuttered. Nearly half (45%) of the Flemish respondents believed the cause of stuttering to be psychogenic, compared to 57% of the Brazilians but only 15% of the Chinese. Forty-four percent of the Portuguese respondents marked "yes" that stuttering was caused by a very frightening event. By contrast, for genetic etiology, 70% of the Belgium respondents, 69% of the Brazilian respondents, and 77% of the Chinese respondents thought that stuttering was not hereditary. This corresponds to a "no" answer to the question for 63% of the Portuguese respondents. The results suggest that the Portugal local office-based sampling procedure yielded reasonably similar results to the face-to-face interviews on the street in three cities in other countries.

Taken together, the comparisons of the current respondents with Portuguese census data and the comparison of Portuguese attitudes with other studies of stuttering attitudes around the world indicate that the administrative office-based sampling scheme is an effective way to sample attitudes in an entire country. As such, the *POSHA–S* results for Portugal can be considered to be the most representative profile of public attitudes toward stuttering available for any country to date and arguably a "gold standard" estimate for Portuguese beliefs and self reactions regarding stuttering.

4.4 Demographic Predictors of Stuttering Attitudes

Numerous studies have attempted to explain differences in attitudes toward stuttering related to various demographic variables. In a detailed review of potential predictors (or correlates) of *POSHA–S*-measured attitudes, St. Louis (2015) considered such variables as familiarity with stuttering, sex, age, socio-economic status (mostly likely manifested as

education, occupation, and income), geography (continent or country), language of the questionnaire, and religion. Geography, education, familiarity with stuttering appeared to emerge the most frequently from published and unpublished *POSHA–S* studies.

The current study did document that respondents characterized by younger or middle age, university education, living in the island regions of Portugal, not being retired, and speaking at least three different languages were all associated with more positive attitudes. By contrast, respondents' sex, marital status, and parental status were not. It should be noted that sex of the respondent has been mentioned often as a predictor of stuttering attitudes, perhaps because one of the first studies to consider it found a significant difference (Burley & Rinaldi, 1986). In fact, the study sampled only 10 male and 10 female respondents. Like Burley and Rinaldi (1986), some studies have shown better attitudes for females than males, especially those with very large sample sizes (e.g., Arnold, Li, & Goltl, 2015; Li & Arnold, 2015). Such studies typically have very small effect sizes, raising questions of how the findings might best be interpreted. Careful studies using the *POSHA–S* have shown, as the current study did, that sex of the respondent did not make a difference in the attitudes of adults toward stuttering (St. Louis, 2012a; St. Louis, LeMasters, and Poormohammad, 2015). Supporting the lack of relationship between Portuguese parental status and attitudes, a recent study by St. Louis, Weidner, and Mancini (2016) revealed that parents of young children, parents of older children or adult children, and non-parents held very similar attitudes on the *Appraisal of the Stuttering Environment* (*ASE*), a clinical instrument that is very similar to the second experimental version of the *POSHA–S*.

More positive stuttering attitudes were associated with achieving higher levels in education, and less positive attitudes were associated with the ≥ 65yr age group. Comparisons with the two aforementioned probability samples in Turkey using the *POSHA–S* (Özdemir et al.,

2011b), might shed light on these findings. The mean Portuguese age for the 311 respondents was 46 yr compared to12 yr for the Turkish children, 37 & 38 yr for the parents, 45 & 62 yr for the grandparents/adult relatives (with far more aunts and uncles and far fewer grandparents in the first sample), and 35 & 36 yr for the neighbors. Mean years of school completed in Portugal was 10.3 yr and in Eskişehir, Turkey, 5.0 & 5.0 yr (children), 7.1 & 7.3 yr (parents), 4.8 & 7.0 yr (grandparents/adult relatives), and 7.6 & 8.2 yr (neighbors). It would be reasonable to assume that the differences in education would explain the much less positive attitudes in Eskişehir, Turkey compared to Portugal. However, the lack of large differences in attitudes as a function of age in the Turkish sample suggests that age, per se, might not be a universal predictor of stuttering attitudes. Our analyses suggested that less knowledge of stuttering was an important factor in the older Portuguese age group, but the weighted *POSHA–S* item for personal experience with stuttering of the groups was -86 for Portugal in comparison to -87 to -92 for Eskişehir, Turkey, or not much different.

Speaking more than one language positively influenced the attitudes toward people who stutter in Portugal. Comparisons across samples in the *POSHA–S* database have not been carried out, so at this point we cannot explain why multilingualism appears to be associated with more positive stuttering attitudes. Though only significant for one versus three languages known, the means in Table 2 suggest that *Self Reactions* were most different between one or two languages known versus three or four. Different results have also been reported. St. Louis and Roberts (2010) compared Canadian and Cameroonian respondents taking an experimental version of the *POSHA–S* either in English or French. Importantly, both are official languages in Canada and Cameroon. A control group of monolingual USA respondents taking the *POSHA–S* English held attitude ratings much more similar to the Canadians than the Cameroonians, irrespective of the

latter groups' knowledge and use of other languages.

As it was mentioned in section 4.1, the current study showed that stuttering attitudes in the Portuguese mainland regions were quite similar. However, statistical significance of the region variable related to the better attitudes in the small island regions of Azores suggest that different factors could have influenced a higher score of the *Self Reactions* to people who stutter in this region which accounts for less than 5% of the country's population.

These predictor findings suggest that future studies of public attitudes adults in circumscribed regions consider age, education, work status, and number of languages known as covariates. Additionally, this study adds support to previous research showing that respondents' sex, parental status, or marital status are not consistent predictors of better or worse attitudes.

4.5. Strengths, Limitations, and Future Research

We have suggested that the care and controls employed in this study which employed a three-stage cluster probability study of the entire country of Portugal arguably have generated the most valid estimate of stuttering attitudes in any single country to date. This is supported by the generally similar percentages of adults in the study versus in the population census summaries. Accordingly, the study's results have substantial potential value in efforts to improve attitudes in Portugal as well as in validation of results from a host of convenience samples in other countries. The methodology of the study can serve as a model for future studies as well.

In spite of these strengths, limitations or cautions must be mentioned. First, whereas the return rate was determined to be satisfactory (Babbie, 2006), nearly one half of the individuals handed a questionnaire by staff members at the local administrative offices did not return them. It is possible that those who did not fill them out would have held attitudes different than those who did. If so, then the generalizability would be limited the "typical" individual who not only

avails him or herself to the functions of the office but also those who would be likely to fill out a questionnaire that they did not expect to receive. This is similar to questions that could be raised about virtually any study. For example, were the persons on one main street on a heavy shopping day in Flanders, Shanghai, and Rio de Janiero representative of the average adult in their respective countries (Van Borsel et al., 1999; Pereira et al., 2008; Xing Ming et al., 2001)? A follow-up mixed-method study with interviews of a number of potential respondents who did and did not complete the questionnaire would be one way to estimate the effect of such potential selection bias.

Additionally and possibly related to the same sampling issue, the alignment of the percentages of respondents in this study with Portuguese census, although generally close, is far from perfect. The regions of Alentejo and Center regions of the country are somewhat over-represented while the North and Lisbon regions are under-represented. Similarly, the 18–24 age group is over-represented, and the 25–64 group is under-represented. This is likely not a serious issue given that the only significant differences which occurred between age groups were between these two younger groups and the ≥65 age group (with this older age group holding the more negative attitudes). It is not clear whether these differences are due to factors related to whether or not potential respondents filled out questionnaires or to who would be more or less likely to visit their local administrative office. We suspect that the latter explanation is the most tenable.

Results of the current study suggest several research projects that should be carried out. First, a similar, though not necessarily identical probability sampling procedure should be carried out consistently in several different countries to determine the extent to which probability sampling can distinguish differences between countries as convenience sampling has. If

Portugal, Italy, and a Scandinavian country could be included, along with a carefully selected measure of national (or regional) identity, the reasons behind the differences that have been observed between countries might be elucidated. In this process, schemes for probability sampling, beyond the local administrative offices scheme in Portugal and randomly selected schools scheme in Turkey, could be advanced and tested. It is possible that the population of Portugal is more homogeneous than populations of some other countries, such as the USA. If so then yet-to-be tested schemes for probability sampling of stuttering attitudes might be more appropriate in such countries.

Second, in probability or convenience sampling with substantial sample sizes, additional predictors of positive and negative stuttering attitudes should be sought. Knowledge of and acquaintance with stuttering is one such predictor that past research has shown to be ambiguous. Third, smaller, convenience samples in Portugal of the general public, or specific occupational groups, should be carried out and compared with the results of the current study to determine when and where probability sampling is required or not required. Fourth, studies should be undertaken in Portugal that attempt to improve public attitudes.

Finally, considering the large number of studies that have documented negativity in public attitudes toward stuttering (see reviews by Boyle & Blood, 2015; Hughes, 2015; St. Louis, 2015), one can wonder if additional studies add meaningful information. Agreeing with St. Louis et al. (2016), we submit that so long as unexplained, disparate findings are forthcoming, as in differences in attitudes in Italy versus other European countries, continued search for relevant predictor variables are warranted.

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