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The Perceptual Learning Style Preferences of Hispanic Students in Higher Education

Catherine Johnston Lui
Brigham Young University

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Catherine Johnston Lui

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Doctor of Education

Scott E. Ferrin, Chair
Donald R. Baum
Vance E. Randall
MacLeans A. Geo-JaJa
A. LeGrand Richards

Department of Educational Leadership & Foundations

Brigham Young University

ABSTRACT

The Perceptual Learning Style Preferences of Hispanic Students
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Catherine Johnston Lui
Department of Educational Leadership & Foundations, BYU
Doctor of Education

This paper addresses the question of whether higher education Hispanic students of different nationalities have different perceptual learning style preferences. Independent samples *t*-tests findings suggest that the country of origin of a Hispanic student's parents has a statistically significant relationship (n=165, $p<0.0073$) with student's learning style preferences. ANOVA results also identified a statistically significant relationship between SES and group learning style ($p<0.004$,) and visual learning style and two factors: age ($p<0.011$) and family education ($p<0.033$).

Keywords: perceptual learning styles, learning styles, learning style preferences, cultural learning differences, country of origin, Hispanic-American students, higher education students

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TABLE OF CONTENTS

LIST OF TABLES

Tables Page

DESCRIPTION OF DISSERTATION CONTENT AND STRUCTURE

This manuscript is presented in the format of the hybrid dissertation. The hybrid format focuses on producing a journal-ready manuscript, which is considered by the dissertation committee to be ready for submission for publication. Therefore, this dissertation does not have chapters in the traditional dissertation format. The manuscript focuses on the presentation of the scholarly article. This hybrid dissertation also includes appended materials. Appendix A includes an expanded literature review, Appendix B includes a detailed methods section, Appendix C includes an extended results section, and Appendix D includes an Institutional Review Board (IRB) Approval from Brigham Young University. The hybrid dissertation format contains two reference lists. The first reference list contains references for citations included in the journal-ready article. The second reference list contains references for all citations used in the journal article and appendices.

The targeted journal for this dissertation article is the *Journal of Hispanic Higher Education (JHHE) (2015 Impact Factor: 0.71)*. This quarterly international journal is devoted to the advancement of knowledge and understanding of issues at Hispanic-serving institutions and is designed specifically for those interested in Hispanic issues in higher education. The *JHHE* is an educational administration journal with cross-over into Hispanic culture studies which include retention strategies at Hispanic-serving secondary institutions, Hispanic involvement in college, Hispanic graduation rates among disciplines, organization development in Hispanic-serving institutions, curricular issues, demographic shifts and student government, teaching strategies, and retention models. The maximum word count for the abstract is 75, and the maximum number of pages for the *JHHE* submission is 30 including tables and references. The manuscript in this

hybrid dissertation is 31 pages and meets the department's criteria of being within three pages of the targeted journal's manuscript submission length.

Background

The purpose of this paper is to investigate whether Hispanic higher education students of different countries of origin have different learning style preferences. It seeks to find out if, between different Hispanic national groups, there are different perceptual learning style preferences, which they believe enable them to learn more effectively.

Achievement Gap

The 2014 U.S. Census Bureau projected that the Hispanic population would increase from 55 million in 2014 to 119 million in 2060, an increase of 115%; and that by 2060, 29% of the total U.S. population would be Hispanic (Colby & Ortman, 2015). As of July 1, 2015, the U.S. Census Bureau (2015) reported that, as projected in 2014, the Hispanic population remained the biggest minority group, i.e., 17.6% of the entire nation's population of over 321 million. With regard to the educational attainment of four racial groups of people (White, Black, Asian, and Hispanic) 25 years and older, Ryan and Bauman (2016) report that Hispanics lag behind their counterparts in five levels: (a) high school graduate or more (66.7%), (b) some college or more (36.8%), (c) associate's degree or more (22.7%), (d) bachelor's degree or more (15.5%), and (e) advanced degrees (4.7%). They add that although all groups demonstrate a higher educational attainment, only 15.5% of Hispanics had a bachelor's degree or higher compared with 22.5% of Blacks, 32.8% of Whites, and 53.9% of Asians attaining the same degree in 2015.

This finding is echoed by Hemphill and Vanneman (2011) who report the National Assessment of Educational Progress math and reading scores, at the national and state levels, of Grades 4 and 8 students from 1990 to 2009. They observe that although Hispanic and White students' 2009 scores were higher than those in 1990, White students maintained higher scores, by over 20 points, on all assessments compared with their Hispanic counterparts. Math scores for

Grade 4 had a gap of 21 points, and Grade 8 had a gap of 26 points, while reading scores for Grade 4 had a gap of 25-26 points, and Grade 8 had a gap of 24-25 points (Hemphill & Vanneman, 2011). These reports presented above are supported by research which shows that Hispanic students in the U.S. are academically underperforming compared with their English native-speaking and other nonnative-speaking counterparts (Dunn, Gemake, Jalali, & Zenhausern, 1990; Griggs & Dunn, 1995; Kreuze & Payne, 1989; Mendoza, 2013; Sanchez, 2000; Skutnabb-Kangas, 1988). Mendoza (2013) reports that only 33% of Grade 3 Hispanic students in California are proficient in reading compared with 64% of White students. She also projects that one in four Hispanic 10th graders would fail the math exit exam compared with only one in ten White 10th graders. Even more concerning, research shows that academically underperforming Hispanic students face psychological and sociological problems, which include the lack of education success, employability, family resource limitations, self-esteem, and quality of life (Clayton-Molina, 2015; Griggs & Dunn, 1995; Ogbu, 1987, 1992; Skutnabb-Kangas, 1988, 2000).

The statements above clearly indicate that, between students of Hispanic and of other ethnicities in U.S. schools, there exists an achievement gap, which is "any significant and persistent disparity in academic performance or educational attainment between different groups of students, such as white students and minorities" ("Hidden Curriculum," 2016, para. 1). One might pose these questions here: (a) why such achievement gaps exist, and, more importantly, (b) how such gaps can be eliminated. As for the first question, some scholars attribute academic achievement or success to factors including culture, socio-economic or family education background, and the education system in different countries. Betts (1996) explains that family characteristics and education background influence educational attainment. This is supported by

Becker (1992), who affirms that parents affect not only their children's knowledge, skills, and education, but also other aspects of their lives such as marriage, health, and work. Michaelowa (2000) asserts that mother's education in particular positively impacts children's health, while father's education positively impacts children's education, both of which (health and education) lead to educational attainment. Lopez (2009) of the Pew Hispanic Center reports that the biggest reason Hispanic students leave school after high school or earlier is to support a family (74%), and that substandard academic outcome is due to poor parenting and poor English skills (both over 50%). This is supported by Clayton-Molina (2015) who points out a major finding in her qualitative study: that Hispanic early school leavers were those who reported not receiving parental support in school, whose parents were drop-outs themselves, or whose family did not seem to value education. Similarly, Dreze and Kingdon (2001) state that parents' education increases their children's school attendance and participation, and that although maternal education does not affect boys' schooling, it positively influences girls' school participation and attainment. They also suggest a similar relationship between SES and education; i.e., family wealth significantly impacts children's schooling, especially girls' attainment, and that school quality matters.

In addition, Greenwald, Hedges, and Laine (1996) affirm that school resources, particularly per pupil expenditure and teacher quality (i.e., ability, education, and experience), raise school quality, which, in turn, positively impacts student achievement. Goldhaber and Brewer (1997) also find a positive relationship between schooling and student achievement. They assert that teachers with a Bachelor or Master of Arts degree in math have a statistically positive impact on student achievement—i.e., an *absolute value t-statistics* of 3.7 (with a BA) and 2.0 (with an MA). Ferguson (1991) stresses that school quality, which is strongly associated

with teacher quality, is highly correlated with parental education and socioeconomic status. He asserts that all these factors, particularly teacher quality, have a "distinguishable" impact on students' test scores (p. 466). Finally, Geo-JaJa (2006) argues that fiscal resources for schools, such as through devolution which is the "only true form of decentralization" (pp. 141-145), are essential to ensuring quality education system, which, in turn, increases the academic success of students, especially the at-risk and impoverished. Quality education is indeed important, as stressed by Psacharopoulos (1994)—who finds that one additional year of schooling leads to private returns of between 8% and 20%—and supported by Michaelowa (2000).

Other scholars observe that the Hispanic students' achievement gap may partly be caused by the fact that they are predominantly taught by native-speaking educators who are not language teachers (Nieto, 2002; Ogbu, 1987, 1992; Ogbu & Simons, 1998; Skutnabb-Kangas, 1988, 2000) and who may lack awareness of perceptual learning style needs and/or preferences that are instrumental in Hispanic student achievement and success (Dunn et al., 1990; Loza, 2003; Oxford & Anderson, 1995). Oxford and Anderson (1995) assert that several teaching programs "do not provide the kind of experiences that would allow prospective teachers to develop their skills in identifying students' learning styles and in handling crosscultural differences" (p. 201). Similarly, Nieto (2002) points out that although most teachers nowadays have students who are diverse in many ways including race, culture, ethnicity, and language background, only a few (such as bilingual education specialists, ESL and urban education teachers) are "adequately prepared to teach students who embody these differences" (p. xiii).

Apparently, seeking more ways for Hispanic learners in the US to achieve academic success is imperative. This study hopes to answer the second question raised above—how the achievement gap can be narrowed, if not eliminated—through identifying students' preferred

learning styles. In this study, the learning style preferences of Hispanic students from various countries of origin were compared. To identify preferred learning style differences, this study used Reid's (1987) self-reporting questionnaire on perceptual learning style preferences (PLSP), with slight adjustments to allow for a collection of short responses. This paper discusses learning style preferences, cultural learning differences, and collective grouping, and presents the finding that parents' country of origin significantly impacts learning style preferences. The term *Hispanic* will be used to refer to the Spanish- and Portuguese-speaking students included in this study for greater consistency and to prevent alternating between the terms *Hispanic* and *Latino*.

Learning Styles

Scholars have suggested that individuals have their own preferred learning styles that allow them to learn more effectively than through learning styles with which they are not comfortable. Hence, Mayes, Cutri, Rogers, and Montero (2007) urge the need for teachers to "know as much as is appropriate and possible about their students, … and design their curricula and instruction accordingly" (p. 4), comprising various perspectives and acknowledging different learning styles. Keefe (1987), who has conducted extensive studies on learning styles, explains that this broad concept comprises three distinct styles: cognitive, affective, and physiological. This paper will briefly mention only the first—cognitive style—as it includes perceptual modality preferences, which is the main focus of this study. Cognitive style, according to Messick (1976), is an "information processing habit" (p. 6) that "represent[s] the learner's typical mode of perceiving, thinking, problem solving, and remembering" (p. 5). Keefe (1987) adds that everyone has different cognitive styles and that preferred perceptual modality refers to the "preferred reliance on one of three sensory modes to understand experience" (p. 9), which are kinesthetic/psychomotor, visual/spatial, and auditory/verbal.

Similarly, Dunn and Dunn (1993) define learning style as "the way in which *each* learner begins to concentrate on process, internalize, and retain new and difficult academic information" (p. 2). They also suggest that it is "a biological and developmental set of personal characteristics that make the identical instruction effective for some students and ineffective for others" (p. 5). Dunn (1990) asserts that everyone has a learning style and "learning style strengths" (p. 239). Research has also found that people generally feel most confident and successful when approaching difficult tasks by using their strengths (Dunn, 1990; Kreuze & Payne, 1989). Dunn, Griggs, Olson, Beasley, and Gorman (1995) find that "the overall academic achievement of students whose learning styles have been matched can be expected to be three-fourths of a standard deviation higher" (pp. 357-358) compared with that of their counterparts whose learning styles are not addressed. Based on eight studies conducted in 10 years, Dunn, Beaudry, and Klavas (2002) report that learners whose modality preferences were matched by instructional resources obtained "statistically higher test scores" (pp. 80-81) than those whose preferred learning styles or strengths were not matched. On the contrary, when teaching methods and learning styles do not match, Kreuze and Payne (1989) warn that "students can experience feelings of insecurity, frustration, anger, anxiety, alienation, and futility" (p. 167). Such situation, Oxford and Anderson (1995) stress, makes the classroom "a place of inequity" where some could feel "deprived or confused" (p. 201) and, as a result, drop out from school. Apparently, identifying students' learning style preferences may lead to academic achievement and success.

In the late 1960s, Dunn and Dunn began developing the *Dunn and Dunn Learning Style Model*, which consists of five stimuli: environmental, emotional, sociological, physical, and psychological (Dunn et al., 2002). The fourth stimulus—physical—consists of four elements (perceptual, intake while learning, time of day energy levels, and mobility needs). This paper

focuses on the first physical element—perceptual (also modality or sensory) learning style preferences, which is the tendency to use one or more senses (visual, auditory, kinesthetic, and tactile) to understand, organize, and retain experience (Dunn et al., 2002; Kolb & Kolb, 2005; Oxford, 2003; Oxford & Anderson, 1995; Reid, 1987). Specifically, while visual learners like to obtain information through reading or seeing something such as pictures and charts, auditory learners prefer to do so through hearing or listening to someone, such as through lectures and audiotapes. Kinesthetic learners prefer whole body experience or movement during learning such as participating in a role play, while tactile learners like working with things they can touch or manipulate by hand, such as play money and flashcards, during learning (Dunn et al., 2002). This study also includes the third stimulus—sociological—with a focus on an individual's preference for working and learning alone (individual) or with others (group learning style) (Dunn, 2000).

Thus, this paper seeks to investigate whether Hispanic higher education students of different countries of origin have different learning style preferences, and to find out if, between different Hispanic national groups, there are different perceptual learning style preferences which they believe enable them to learn more effectively. Having access to respondents' self-reported demographic data, the researchers of this study also decided to see if any relationship exists between four variables and the six learning styles (visual, auditory, kinesthetic, tactile, group, and individual, or VAKTGI). By identifying learning style preferences that Hispanic students of varying national origins may have, this study hopes to contribute to an increased awareness for educators and students who may, thus, be able to improve teaching and/or learning through learners' most preferred learning styles. Students may also minimize the use of their less or least preferred perceptual learning styles, and/or work toward gradually strengthening them. Recognizing that students have learning style preferences may also raise teachers' awareness of

their own learning and teaching styles, which would allow them to adjust their teaching style to match those of their students' preferred learning style. Such adjustments may lead to greater success in Hispanic students' learning, college enrollment, attendance, and graduation rates.

Cultural Learning Differences and Learning Styles

It is apparent that students possess learning differences that may be influenced by their own culture, experiences, and other factors. The importance of recognizing these differences has been strongly recommended and widely researched by scholars in the field. With reference to understanding cultural diversity in schools, John U. Ogbu (1992), a prominent educational anthropologist, points out that minority students' academic learning and success are "influenced by complex social, economic, historical, and cultural factors" (p. 7). He contends that "the relationship between the minority cultures/languages and the mainstream culture and language" differs for the various minority groups, and that this difference prevents minority students from "cross[ing] cultural and language boundaries," which necessitates "understanding in order to enhance the success of intervention and other efforts" (p. 7). Thus, he urges a recognition of three inter-related facts: (a) the existence of cultural/language differences brought about by various reasons or circumstances; (b) the existence of cultural/ language differences associated with different kinds of minority groups and minority types; and (c) because cultural/language differences exist, "all minority children face problems of social adjustment and academic performance in school" (p. 12). In all three suggestions, Ogbu stresses that "cultural/language differences" (p. 12) exist, which, if not addressed, could affect not only a student's ability to cope with learning but also with others at school.

In addition, Dumitrescu (2013) points out that "Non-native language teachers working in their environment (which may be culturally very distant from the one associated with the target

language), as well as their students, are obviously at a disadvantage, as their situation is radically different …" (p. 195). Dunn and Griggs (1995) note that "culture influences both the learning process and its outcomes" (p. 37). Finally, Stebbins (1995) stresses a valuable point that by "acknowledging students' cultural backgrounds and using this understanding as an instructional strength upon which to build," educators "may more effectively build the trust and motivation so necessary with students facing the risk inherent in L2 [second language] learning" (p. 115). Scholars do emphasize the importance of recognizing that cultural differences exist, and such differences affect an individual's ability to socially interact, learn, and achieve.

Thus, the relationship between cultural/learning differences and learning styles have been examined. An investigation of whether learning styles of cultural groups differed from each other was conducted by Dunn et al. (1990), who assert that "Although educators verbalize that all children, regardless of age, race, or religion, have an equal right to effective education, they have not realized the extent to which ethnic and cultural differences influence learning and achievement" (p. 69). Their most important finding is that learners in various parts of "the American subculture have different patterns of preferred learning strategies" (p. 84). In their analysis of studies on how culture influences the development of learning styles, Oxford and Anderson (1995) stress the need to understand learners' styles "on a culturally deep level," and that "crosscultural understanding of language learning styles is crucial to success in language teaching and learning" (p. 201). They also urge that "learning style studies, particularly of different cultural backgrounds, be replicated so that more consistent information becomes available within and across populations" (p. 211). Similarly, Stebbins (1995) stresses that identifying learning styles among second language learners raises "awareness of the need for culturally sensitive instructional methods that may help maximize L2 [second language]

learning" (p. 109) for immigrants and international students. Following these recommendations may lead to more effective learning and greater academic achievement.

Collective Grouping

In her book *Asian American Panethnicity*, Espiritu (1993) asserts that panethnicity results from an "imposed" categorization, which "ignores subgroup boundaries" and lumps together different kinds of people, who share nothing in common, "in a single, expanded 'ethnic' framework" (p. 6). Kim and White (2010) list "substantial problems" that panethnicity poses including (a) reinforcing the idea of "homogeneity within … the Asian, black, Latino, Native American and white … groups;" (b) less "room for distinction within categories as subgroups are not differentiated and internal ethnicity is obscured;" (c) "misrepresent[ing] subgroups and ignor[ing] and minimiz[ing] the diversity of experiences;" and (d) that said groups are "affected by internal conflict and fractures based on national origins," and (e) that within national origin groups, "further cleavages based on ethnic or regional ties" (pp. 1559-1560) exist. Meanwhile, Trimble and Dickson (2005) refer to this phenomenon as "ethnic gloss," which they define as "an overgeneralization or simplistic categorical label" for groups … "where unique cultural and ethnic differences found among group members are ignored" (pp. 412-413). They assert that ethnic gloss gives "the illusion of homogeneity where none exists, and therefore may be considered a superficial, almost vacuous, categorization, which serves only to separate one group from another" (p. 413). They also note potential problems posed by using an ethnic gloss to describe an ethnocultural group: (a) "biased and flawed scientific research outcomes" which can promote stereotypes; (b) "sweeping references to ethnocultural groups," which are "gross misrepresentations;" (c) undermining of "certain scientific tenets concerning external validity,"

(d) "affect[ing] the ability to generalize findings across subgroups within an ethnic category;" and (e) preclusion of "an accurate and efficient replication of research results" (p. 413).

With specific reference to Hispanics, Calderon (1992), a sociology and Chicano studies professor, explains that "the [various Latino] groups that are said to reflect a Hispanic or Latino ethnicity differ sharply in historical experience, socioeconomic status, and identity" (p. 37). Similarly, 15 medical professionals (González Burchard et al., 2005) who reviewed the historical events leading to the formation of today's Hispanic populations, aptly affirm that "Although usually classified as a single ethnic group by researchers, Latinos are heterogeneous from cultural, socioeconomic, and genetic perspectives," and they "represent a wide variety of national origins and ethnic and cultural groups, with a full spectrum of social class" (p. 2161). Finally, Umaña-Taylor and Fine (2001) observe that "researchers discuss the 'Latino' population in their study without acknowledging the nationality differences among the Latinos included in their samples" and argue that "ethnicity pertains to cultural traditions, prescribed norms, values, and a heritage that persists beyond generations" (p. 348). Thus, they strongly recommend that since "individuals' national origin may influence their traditions, customs, values, and beliefs, ethnic identity should not be examined without considering differences in nationality" (p. 348). In other words, inferring that all Hispanic students are one homogeneous population is inaccurate as there is great diversity within Latino populations (Umaña-Taylor, Diversi, & Fine, 2002). Hispanic students are too often seen as a single homogeneous group when, clearly, they belong to different populations with different cultures. Their heterogeneity of culture, background, SES, and family education backgrounds may also be accompanied by heterogeneity of learning styles and preferences, which this paper seeks to investigate.

Although studies have been done on the perceptual learning style preferences of various nonnative speakers, research on the perceptual learning style preferences specifically of Hispanic students at higher-education level is limited (Griggs & Dunn, 1995; Maldonado-Torres, 2011). Researchers have found differences in learning styles of students having different cultures (Dunn et al., 1990; Dunn & Griggs, 1995; Oxford & Anderson, 1995; Reid, 1987; Rossi-Le, 1995; Sanchez & Gunawardena, 1998; Stebbins, 1995), but most studies on perceptual learning style preferences that included Hispanic students lumped all of them into one big group and did not report their countries of origin or isolate demographic variables other than gender and ethnicity that impact on learning style (Griggs & Dunn, 1995; Maldonado-Torres, 2011). Although generally grouped as Hispanic students, they are of diverse origins (such as Argentina, Mexico, and Spain), which implies that they may have varied individual, family, and cultural experiences, backgrounds, and learning needs and styles.

The limited research done on the learning styles of Hispanic students by national origins also implies that educators in the U.S. lack awareness of differences in perceptual learning style preferences that Hispanic students from various countries of origin may possess. Consequently, this lack of awareness may be a factor in Hispanic students' lack of success in learning, which can lead to lower educational attainment (low college enrolment, attendance, and graduation rates) compared with their English native-speaking and other nonnative-speaking counterparts. However, there is very little existing research on the differences in learning style preferences between Hispanic students of different nationalities.

Methods

This section briefly introduces this study's participants. It also discusses the instrument used to collect their responses and how their responses were obtained and analyzed.

Sampling

The target population for this study were undergraduate, graduate, and post-graduate Hispanic students at two universities in the state of Utah: Brigham Young University (BYU) and Utah Valley University (UVU). Invitations to participate in the study were sent to potential respondents through both institutions' Multicultural Student Services and Spanish Departments, BYU's English Language Center and International Student Services, and UVU's English Language Learning Department and Institutional Research & Information Office.

Although the sample that these researchers had access to at the time of survey administration included approximately 800 Hispanic international students at BYU and over 2,000 Hispanic students at UVU, only 246 responses were collected. Owing to the provision of inadequate or seemingly arbitrary responses, only 165 (25 from BYU and 140 from UVU) of the responses were analyzed for this study. These 165 participants reported having family backgrounds connected to 20 countries: Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Peru, Portugal, Spain, Venezuela, and the U.S.A.

Data Collection

For this study, a two-part questionnaire was administered. The first part asked about demographic information: mother tongue, age, sex, country of origin of students and their parents, level of education, length of stay in the U.S., length of time studying English in the U.S., family education background, and students' annual family income (for SES). The second part of the questionnaire consisted of questions about six learning style preferences (VAKTGI).

To find out whether higher education Hispanic students of different national origins had different learning style preferences, these researchers adapted Reid's (1987) perceptual learning

style preferences self-reporting questionnaire, which consists of 30 statements (i.e., five per learning style). Six open-ended questions, i.e. one for each learning style, were added to Reid's original questionnaire to allow respondents to clarify, explain, and/or elaborate their *Agree* or *Strongly Agree* answers. The questionnaire was then translated to Spanish and administered through an online survey platform to all students in the sample.

Data Analysis

Responses in the 5-point Likert scale were statistically analyzed to identify the relationship of perceptual learning style preferences to 10 variables (which are the demographic particulars excluding students' mother tongue and, owing to the lack of data collected, test scores). Double coding was used for the country of origin of students' parents. That is, if a student reported two different countries for parents' country of origin, the parents were assigned to both countries. All participant scores were categorized by learning style. Means, medians, and standard deviations were calculated for each learning style.

Multivariate analysis of variance (MANOVA; plus six post-hoc ANOVA—one for each learning style—and *post hoc Tukey correction* for multiple testing for each ANOVA) was first used to explore the relationship between country of origin and the six learning styles. The sample sizes included in this study ranged between one (e.g. Costa Rica and Cuba) and 82 (Mexico). Probably owing to the small sample sizes in many of the countries, MANOVA did not yield any significant findings. Thus, independent samples *t*-tests were used to compare the means of two groups formed by the students' and the parents' regions—Mexico v. non-Mexico, and Central America v. South America. A *Bonferroni correction* was then used to compare the means of these two groups. That is, an adjustment was made to the p value of 0.05 by dividing it by the number of learning styles—i.e., six—leading to the significance cut-off level of $p < 0.0083$.

Analysis of variance (ANOVA) (plus a *post hoc Tukey correction*) was also used to identify differences of a given learning style preference across the countries.

Results

The results of this study are presented in three parts. The first set reports the findings regarding the respondents; the second shows the relationship between the six learning styles (VAKTGI) and country of origin of students and parents; and the third shows the relationship between the six learning styles and four variables (country of origin, age, level of education, and SES) which yielded significant differences. Simple percentages were calculated to analyze the six learning style preferences across a given country.

Respondents

A total of 246 students completed the first part of the survey or the demographic section. Table 1 shows the demographic variables. However, not all responded to the second part of the questionnaire, or the learning style preferences section, which used a 5-point Likert scale (where 1 = *Strongly Disagree* and 5 = *Strongly Agree*). Incomplete responses and those that appeared to be given arbitrarily (e.g. all *Strongly Agree* or all *Neutral*) were not analyzed, resulting in the inclusion of only 165 completed online survey responses: 25 from BYU and 140 from UVU.

Table 1

Percentage of Respondent Demographics (Two Highest Responses)

Variable	1st Highest Response		2nd Highest Response	
Age	20-24	40%	25-29	23%
Sex	Male	54%	Female	46%
Native language	Spanish	62%	Spanish + English	22%
Family education	1st generation	56%	2nd generation	32%
Level of education	Junior	28%	Senior	23%
Students' country of origin	Mexico	38%	USA	22%
Parents' country of origin	Mexico	50%	Peru	8%
Annual family income	$25,000-49,999	35%	$10,000-24,999	25%

Greater success in data collection from UVU might be because one of the researchers, who was a teacher there, was able to administer the questionnaire and send timely reminders to respondents to complete the survey; while at BYU, where she was a student, she had to rely on relevant department personnel to inform students of the survey, administer it to them, and remind them to complete it. Table 1 shows the first two highest student demographic responses.

Six Learning Styles

This study focuses on perceptual learning style preferences (VAKT) and the sociological stimulus, which considers an individual's preference for working and learning with others (group learning style or G) or alone (individual learning style or I). To identify the relationship between the six learning styles (VAKTGI) and country of origin of students and parents, simple percentages were used to calculate the preference means. A high preference mean (PM) for each learning style in relation to country of origin was determined when *Agree* and *Strongly Agree* responses in the 5-point Likert scale were equal to or greater than 60%.

First, this study found that when the Hispanic subjects were analyzed as a whole, students from 15 (83%) of the countries indicated an above average preference for kinesthetic learning style (PM=72.1) (see Table 2). Tactile learning style is next most preferred with students from 11 (61%) countries indicating above average preference for it (PM=62.8). This is followed by visual learning style with students from eight (44%) countries expressing above average preference for it (PM=54.5); and auditory learning with those from seven (39%) countries indicating above average preference for it (PM=53.1). The least preferred learning styles were individual learning (PM= 47.9) and group learning (PM=43.3), with students from only five (28%) countries expressing above average preference for either style.

Table 2

Perceptual Learning Style Preference Means (PM) by Country

Country, n	*Visual* (n=981)	*Auditory* (n=955)	*Kinesthetic* (n=1297)	*Tactile* (n=1130)	*Group* (n=780)	*Individual* (n=863)
Argentina, *4*	35	45	**70**	**65**	50	15
Bolivia, *3*	20	**60**	**93**	**67**	40	27
Brazil, *6*	50	53	**73**	**73**	27	50
Chile, *9*	**76**	56	**67**	51	42	**64**
Colombia, *9*	**63**	53	**84**	**60**	53	33
Costa Rica, *1*	40	**80**	**60**	40	0	**80**
Cuba, *1*	**100**	0	20	**60**	0	**100**
Dominican R., *7*	**60**	**60**	**81**	**90**	**77**	26
Ecuador, *4*	**80**	45	**85**	**85**	45	40
El Salvador, *5*	**68**	**60**	**96**	**76**	**72**	48
Guatemala, *2*	50	50	**70**	30	**60**	50
Honduras, *4*	50	40	**75**	**60**	50	35
Mexico, *80*	43	**60**	**70**	56	38	53
Nicaragua, *1*	**80**	40	**80**	**100**	**60**	20
Peru, *14*	**61**	**72**	**72**	56	58	46
Portugal, *1*	0	**80**	**100**	**80**	40	**80**
US, *5*	56	48	48	28	4	**72**
Venezuela, *9*	49	53	53	53	**64**	24
Overall MP:	54.5	53.1	**72.1**	**62.8**	43.3	47.9
MP St Dev:	23.2	17.7	18.9	19.4	23.0	23.6

Numbers in bold indicate a positive preference mean of 60% or above.

Four Variables

This section includes results which show the relationship between the six learning styles (VAKTGI) and four variables (country of origin, SES, age, and level of education). Among the four variables, country of origin demonstrates the strongest relationship with one of the six learning styles.

Country of origin. Since the largest proportion of the sample has parents from Mexico (n=84, 51%), the researchers decided to compare the responses of students whose parents were from Mexico with those of students whose parents were from the other countries (n=82, 49%). Using independent samples *t*-tests, the comparison of student learning style preference by parental country of origin identified a significant difference for visual learning style preference,

$t(164) = 2.72$, $p < 0.0073$ (see Table 3), suggesting that respondents with non-Mexican parents preferred visual learning style significantly more than those with Mexican parents.

Table 3

Students' Learning Style Preference Mean (PM) by Parental Country of Origin (Independent Samples t-Tests)

Parental Country of Origin		*Learning Styles Preference*					
		Auditory	*Visual*	*Kinesthetic*	*Tactile*	*Group*	*Individual*
Mexico v. Non-Mexico							
Non-Mexico	N	82	82	83	82	83	83
Mexico		84	84	84	83	84	84
Non-Mexico	Mean	3.57	3.32	3.46	3.47	3.37	3.31
Mexico		3.63	3.08	3.56	3.39	3.26	3.45
Non-Mexico	St. dev.	0.60	0.60	0.68	0.71	0.94	0.87
Mexico		0.60	0.53	0.65	0.69	0.74	0.85
	P value	0.52	**0.0073***	0.36	0.46	0.41	0.28
Central America v. South America							
South	N	65	65	65	65	65	65
Central		101	101	102	100	102	102
South	Mean	3.53	3.34	3.43	3.39	3.24	3.37
Central		3.65	3.11	3.57	3.46	3.35	3.38
South	St. dev.	0.58	0.61	0.70	0.74	0.92	0.85
Central		0.60	0.54	0.64	0.68	0.80	0.87
	P value	0.18	*0.01*	0.21	0.55	0.40	0.95

* $p < 0.0083$. The *Bonferroni correction* was used to compare the means of these two groups. Thus, an adjustment was made to the p value of 0.05 by dividing it by the number of learning styles, i.e., six, leading to the significance cut-off level of $p < 0.0083$ (=.05/6, to adjust for six simultaneous tests).

The researchers also compared the learning style preferences between students whose parents were from Central America (n=101, 61%)—Costa Rica, Cuba, Dominican Republic, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, and Panama—and those whose parents were from South America (n=65, 39%)—Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Peru, and Venezuela. Independent samples *t*-tests, which were used to identify preferred learning style differences between these two regions, demonstrated a similar pattern on students' preference for visual learning style, $t(164) = 2.48$, $p < 0.01$ (see Table 3). Compared with the

previous finding, this result demonstrated a similar pattern in that students whose parents were from South America preferred a visual learning style more than did students whose parents were from Central America—of which Mexico, in particular, yielded 84 (83%), the most responses.

Yearly family income. ANOVA results indicate that annual family income has a significant relationship with students' preference for group learning style, $F(1, 134) = 8.40$, $p < 0.004$ (see Table 4). This result suggests that the higher the yearly family income, the weaker the preference for group learning style; while the smaller the annual family income, the greater the preference for this particular learning style.

Table 4

Covariates of Learning Styles by Student (ANOVA)

Demographics	Covariates of Learning Styles					
	Visual	*Auditory*	*Kinesthetic*	*Tactile*	*Group*	*Individual*
Sex	0.464	0.175	0.126	0.088	0.065	0.620
Age	**0.011***	0.247	0.785	0.173	0.755	0.931
Education Level	0.139	0.515	0.642	0.744	*0.059*	0.234
Yearly Family Income	0.707	0.136	0.396	0.954	**0.004***	*0.051*
Family Education	**0.033***	0.672	0.297	0.920	0.655	0.253

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$ (The *Bonferroni correction* was not applied for the ANOVA analysis.)

The ANOVA result for annual family income and individual learning style, $F(1, 134) = 3.87$, $p < 0.051$ (see Table 4) shows a similar pattern. This result suggests that the higher the family income, the greater the preference is for individual learning style; while lower SES relates to a weaker preference for this particular style.

Age. Another relationship the researchers decided to investigate was that between age and learning style preferences. Interestingly, ANOVA results demonstrated a significant relationship between age and visual learning style, $F(1, 134) = 6.64$, $p < 0.011$ (see Table 4).

This result suggests that age is strongly related to students' preference for visual learning style. That is, the older the student, the greater the preference for visual learning style; while the younger the student, the less his/her preference for this particular learning style.

Level of education of students and their parents. Using ANOVA to determine whether family education (i.e., whether parent(s)/grandparent(s)/great-grandparent(s) received formal college education) is related to learning style preference, results indicated a significant relationship between students' family education background and their preference for visual learning style, $F(1, 134) = 4.67$, $p < 0.033$ (see Table 4). This result suggests that the more a student's parents and/or grandparents have undergone formal education, the stronger the student's preference is for visual learning style; while the less the family education, the weaker her/his preference is for it.

In addition, the ANOVA results showed a similar pattern for students' education level and group learning style preference, $F(1, 134) = 8.40$, $p < 0.059$ (see Table 4). This suggests that a higher education level is associated with group learning style preference, while a lower education level relates to a weaker preference for it.

Discussion

The findings of this research suggest that students' learning style preferences are related to country of origin as well as to age, family education background, and yearly family income. This section discusses these findings, the implications and potential future research. The study was primarily designed to find out whether a relationship exists between Hispanic students' country of origin and learning style preferences. Independent samples *t*-tests, used to identify a relationship between country of origin and learning, yielded the strongest difference—that students with non-Mexican heritage more significantly preferred visual learning style, while

students whose parents were from Mexico least preferred such learning style. This pattern of result is also evident in a comparison of learning style preferences between students whose parents were from two regions: Central and South America. Using independent samples t-tests, results demonstrate a difference in students' preference for visual learning style. This result shows a similar pattern in that students whose parents were from South America preferred visual learning style much more than those whose parents were from Central America—of which Mexico, in particular, yielded the greatest number of responses. Dunn, Griggs, and Price (1993) obtained a similar finding in their sample of Caucasian, African American, and Mexican American students. The latter, according to these authors, were significantly the least visually oriented. Likewise, Lincoln and Rademacher (2006) note that Hispanic college students (of whom almost 50% were Mexicans) significantly favored other learning styles over visual, $F(3, 208) = 11.51$, $p < .01$, and that Hispanic females were the least visual.

Although this research intended to investigate the relationship between country of origin and learning style preferences, and such a relationship was found which addressed the primary research question, this study also found other significant factors. First, ANOVA results, which demonstrate a significant relationship between age and visual learning style, indicate that age is strongly related to students' preference for this style. This result suggests that the older the student, the greater her/his preference for visual learning style, which supports Reid's (1987) and Rossi-Le's (1995) findings that students who were older and had higher language proficiency (and thus had greater exposure to written words) preferred visual learning style. Second, this study's ANOVA results also demonstrate that family education—i.e., if a student's parent(s) and/or grandparent(s)/great-grandparent(s) received formal college education—has a significant relationship with students' preference for visual learning style. That is, the higher a student's

family education background, the greater her/his preference is for visual learning style. Third, ANOVA results indicate a very strong inverse relationship between reported SES and group learning style preference, suggesting that the higher the SES, the less the preference for group learning style; while the smaller the SES is, the greater the preference for this style.

Although country of origin is significant, other factors which may be associated in some ways with country of origin, including economic development, family, and factors such as age, education, and SES, may work together to vary the relationship between country of origin and Hispanic students' learning style preferences. This study found that Hispanic students whose heritage is non-Mexican and who come from higher SES and education backgrounds preferred visual learning style—e.g., reading, probably owing to greater exposure to written words (Rossi-Le, 1995)—more than students who have a Mexican heritage, lower SES and family education backgrounds. However, despite the robustness of this study's findings with regard to regional differences in learning style preferences, this finding does not suggest that all students with a Mexican (or other types of) heritage prefer visual learning style less (or more) than other styles, or that students from Central or South America prefer a particular learning style to another. This finding also does not suggest that one learning style is better than another either. Instead, this finding highlights the need for further research on the relationship between preferred learning styles and demographic factors, such as age, sex, SES, family education background, and country of origin, to more clearly identify any patterns or differences that may exist between them.

One clear implication based on this study's results is that educators and students themselves who are aware of the relationship between learning styles and demographic factors can make necessary adjustments to their respective styles so that the former can address their students' learning styles. Apparently, teachers—those with students of various national origins in

particular—should take some time, preferably at the start of each semester, to identify their students' learning style preferences, strengths, and weaknesses for their own and for their students' information, so that they may adjust their teaching strategies and resources to match various student learning styles. Nieto (2002), a professor of language, culture and literacy, urges that current and prospective "teachers need to develop strategies that will speak to the preferred working and learning styles of *all* students, not just of some" (p. 194). Various approaches and instruments for identifying college students' learning styles have been documented in research studies. For instance, Dunn (2000) describes experimental research findings "with significantly higher results" (p. 12) of college students and recommends three instruments—Learning Style Inventory, Productivity Environmental Preference Survey, and Building Excellence—for identifying their learning styles. For teachers, Dunn and Griggs (2000) introduce practical ways to identify learning styles and prepare to teach students with varying learning styles.

Another implication that can be derived from the results of this study is that knowing where students and/or their parents come from can be of use to teachers, of whatever subject, in helping their own students learn more effectively through their preferred learning styles while strengthening their less preferred ones, which may lead to academic success (Dunn et al., 1995; Dunn et al., 2002). This implication is valuable particularly with regard to promoting greater opportunities for the largest minority group of students to achieve academic success in U.S. schools. As cultural diversity in many schools in this nation is increasing, and since "minority [learners] face problems of social adjustment and academic performance in school" owing to the existence of "cultural/language differences" (Ogbu, 1992, p.12), knowing more about if and how Hispanics of various countries of origin differ in their perceptual learning style preferences may indeed be necessary for existing and prospective educators as it may lead to the improvement of

higher education pedagogy, material & curriculum design, teacher training, and, ultimately, teaching and learning of Hispanic students in particular. Stebbins (1995) points out that "knowledge of cultural differences and their influence on how people learn can offer guidance to educators and students caught in the crossfire of conflicting educational ideologies" (p. 114). Similarly, Nieto (2002) asserts that adopting a "culturally appropriate" instruction type is essential for teachers currently working with students of varied cultural backgrounds, and that prospective and current teachers need to "understand that culture may influence … how their students learn" (p. 194).

Finally, although there may be no one Hispanic learning style preference as a whole, this study suggests that country of origin may have an impact on preferred learning styles of higher education students. Learning style preferences may be only one of many factors, such as differences in the education system in each country and the value of learning or reading in each household, that may have affected the students' responses in this study and that may affect student learning and achievement in general. A salient point that Dunn (2000) makes is that "college students evidenced the largest effect-size gains when instructional strategies or resources were complementary to their learning-style strengths" (p. 5) and that teaching strategies which complement learning styles "have reversed underachievement among many at-risk and achieving college students" (p. 6). Since higher education students demonstrate "the greatest gain in academic achievement" through learning-styles based instruction, Dunn urges that educators in such institutions capitalize on their students' learning styles (p. 5). Among other things, she proposes that educators help students become aware of their sociological preferences for learning (such as alone or with others) and physiological characteristics (such as VAKT).

Conclusion

This paper sought to investigate whether Hispanic higher education students of different countries of origin have different learning style preferences. Independent samples *t*-tests results suggest that the country of origin of a Hispanic student's parents has a statistically significant relationship with his/her learning style preferences—i.e., that students with non-Mexican heritage more significantly preferred visual learning style, while students whose parents were from Mexico least preferred such learning style. Through ANOVA, this study also found three other strong relationships: (a) between family education and students' preference for visual learning style, suggesting that the greater one's family education background, the more her/his preference for visual learning style; (b) between age and visual learning style, suggesting that the older the student, the greater her/his preference for visual learning style; and (c) between reported SES and group learning style preference, suggesting that the higher the SES, the less the preference for group learning style, and vice versa.

Future study on the relationship between students' preferred learning styles and demographic factors, such as age, sex, SES, and family education background, may be able to more clearly identify any patterns or differences that may exist between them. Aside from examining learning style differences between cultures, further research on learning style preferences of individuals within countries may also help in encouraging educators to become more aware of perceptual learning style preferences of their students and to become more proactive in identifying their students' and their own preferred teaching and learning styles. At the very least, educators and policy makers should not assume that Hispanics have one monolithic preferred perceptual learning style.

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APPENDIX A: EXTENDED LITERATURE REVIEW

Achievement Gap

The 2014 U.S. Census Bureau projected that the Hispanic population would increase from 55 million in 2014 to 119 million in 2060, an increase of 115%; and that by 2060, 29% of the total U.S. population would be Hispanic (Colby & Ortman, 2015). As of July 1, 2015, the U.S. Census Bureau (2015) reported that, as projected in 2014, the Hispanic population remained the biggest minority group, i.e., 17.6% of the entire nation's population of over 321 million. With regard to the educational attainment of four groups of people (White, Black, Asian, and Hispanic), 25 years and older, Ryan and Bauman (2016) report that Hispanics lag behind their counterparts in five levels: (a) high school graduate or more (66.7%), (b) some college or more (36.8%), (c) associate's degree or more (22.7%), (d) bachelor's degree or more (15.5%), and (e) advanced degrees (4.7%) (see Table A1). The authors add that although all groups demonstrate a higher educational attainment, only 15.5% of Hispanics had a bachelor's degree or higher compared with 22.5% of Blacks, 32.8% of Whites, and 53.9% of Asians attaining the same degree in 2015 (see Table A1).

This finding is echoed by Hemphill and Vanneman (2011) who report the National Assessment of Educational Progress math and reading scores, at the national and state levels, of Grades 4 and 8 students from 1990 to 2009. They observe that although Hispanic and White students' 2009 scores were higher than those in 1990, White students maintained higher scores, by over 20 points, on all assessments compared with their Hispanic counterparts (see Table A2 on p. 34). Math scores for Grade 4 had a gap of 21 points and Grade 8 26 points, while reading scores for Grade 4 had a gap of 25-26 points and Grade 8 24-25 points (Hemphill & Vanneman,

Table A1

Educational Attainment of the Population Aged 25 & Older by Sex, Race & Hispanic Origin, & Other Selected Characteristics (Numbers in thousands)

Characteristics	Total	High school graduate or more		Some college or more		Associate's degree or more		Bachelor's degree or more		Advanced degree	
		Percent	Margin of error1 (±)	Percent	Margin of error1 (±)	Percent	Margin of error1 (±)	Percent	Margin of error1 (±)	Percent	Margin of error1 (±)
Population 25 or over	212,132	88.4	0.3	58.9	0.5	42.3	0.5	32.5	0.5	12.0	0.3
Sex											
Male	101,888	88.0	0.4	57.6	0.7	41.2	0.7	32.3	0.6	12.0	0.4
Female	110,245	88.8	0.3	60.1	0.6	43.4	0.6	32.7	0.6	12.0	0.4
Race and Hispanic origin											
White alone	168,420	88.8	0.3	59.2	0.6	42.8	0.6	32.8	0.6	12.1	0.3
Non-Hispanic White alone	140,638	93.3	0.3	63.8	0.6	46.9	0.7	36.2	0.7	13.5	0.4
Black alone	25,420	87.0	0.9	52.9	1.4	32.4	1.4	22.5	1.2	8.2	0.7
Asian alone	12,331	89.1	1.2	70.0	1.9	60.4	2.0	53.9	2.0	21.4	1.5
Hispanic (of any race)	31,020	**66.7**	1.1	**36.8**	1.0	**22.7**	0.9	**15.5**	0.7	**4.7**	0.4

1 A margin of error is a measure of an estimate's variability. The larger the margin of error in relation to the size of the estimate, the less reliable the estimate. When added to and subtracted from the estimate, the margin of error forms the 90 percent confidence interval.
Source: U.S.Census Bureau, 2015 Current Population Survey (in Ryan & Bauman, 2016).

Table A2

Trends in NAEP Mathematics & Reading at Grades 4 & 8 Since Earliest Comparison Year, by Grade & Student Group: 2009

Assessment		Gap	Scores	
			Hispanic	White
Math	**4th Grade**			
	National Public	↔	↑	↑
	Gender			
	Male	↔	↑	↑
	Female	↔	↑	↑
	NSLP[1]			
	Eligible	↔	↑	↑
	Not Eligible	↔	↑	↑
	8th Grade			
	National Public	↔	↑	↑
	Gender			
	Male	↔	↑	↑
	Female	↔	↑	↑
	NSLP[1]			
	Eligible	Narrowed	↑	↑
	Not Eligible	↔	↑	↑
Reading	**4th Grade**			
	National Public	↔	↑	↑
	Gender			
	Male	↔	↑	↑
	Female	↔	↑	↑
	NSLP[1]			
	Eligible	Narrowed	↑	↑
	Not Eligible	↔	↑	↑
	8th Grade			
	National Public	↔	↑	↑
	Gender			
	Male	↔	↑	↑
	Female	↔	↑	↑
	NSLP[1]			
	Eligible	Narrowed	↑	↔
	Not Eligible	↔	↑	↑

↔ no significant change in score or score gap.
↑ increased score.
[1] National School Lunch Program
NOTE: Comparison year for National Public and Gender is 1990; NSLP comparisons are made to 2003.
SOURCE: US Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), Various years: 1990-2009 Mathematics & 1992-2009 Reading Assessments (in Hemphill & Vanneman, 2011).

2011). These reports presented above are supported by research which shows that Hispanic students in the U.S. are academically underperforming compared with their English native-speaking and other nonnative-speaking counterparts (Dunn, Gemake, Jalali, & Zenhausern, 1990; Griggs & Dunn, 1995; Kreuze & Payne, 1989; Mendoza, 2013; Sanchez, 2000; Skutnabb-Kangas, 1988). Mendoza (2013) adds that only 33% of Grade 3 Hispanic students in California are proficient in reading compared with 64% White students. She also projects that one in four Hispanic 10th graders would fail the math exit exam compared with only one in ten White 10th graders. Even more concerning, research shows that academically underperforming Hispanic students face psychological and sociological problems, which include the lack of education success, employability, family resource limitations, self-esteem, and quality of life (Clayton-Molina, 2015; Griggs & Dunn, 1995; Ogbu, 1987, 1992; Skutnabb-Kangas, 1988, 2000).

The statements above clearly indicate that, between students of Hispanic and of other ethnicities in U.S. schools, there exists an achievement gap, which is "any significant and persistent disparity in academic performance or educational attainment between different groups of students, such as white students and minorities" ("Hidden Curriculum," 2016, para. 1). One might pose these questions here: (a) why such achievement gaps exist, and, more importantly, (b) how such gaps can be eliminated. As for the first question, some scholars attribute academic achievement or success to factors including culture, socio-economic background, family education background, and the education system in different countries. Betts (1996) explains that family characteristics and education background influence educational attainment. This is supported by Becker (1992), who affirms that parents affect not only their children's knowledge, skills, and education, but also other aspects of their lives such as marriage, health, and work. Michaelowa (2000) asserts that mother's education in particular positively impacts children's

health, while father's education positively impacts children's education, both of which (health and education) lead to educational attainment. Lopez (2009) of the Pew Hispanic Center reports that the biggest reason Hispanic students leave school after high school or earlier is to support a family (74%), and that substandard academic outcome is due to poor parenting and poor English skills (both over 50%). This is supported by Clayton-Molina (2015) who points out a major finding in her qualitative study: that Hispanic early school leavers were those who reported not receiving parental support in school, whose parents were drop-outs themselves, or whose family did not seem to value education. Similarly, Dreze and Kingdon (2001) state that parents' education increases their children's school attendance and participation, and that although maternal education does not affect boys' schooling, it positively influences girls' school participation and attainment. They also suggest a similar relationship between SES and education; i.e., family wealth significantly impacts children's schooling, especially girls' attainment, and that school quality matters.

In addition, Greenwald, Hedges, and Laine (1996) affirm that school resources, particularly per pupil expenditure and teacher quality (i.e., ability, education, and experience), raise school quality, which, in turn, positively impacts student achievement. Goldhaber and Brewer (1997) also find a positive relationship between schooling and student achievement. They assert that teachers with a Bachelor of Arts (BA) or Master of Arts (MA) degree in math have a statistically positive impact on student achievement—i.e., an *absolute value t-statistics* of 3.7 (with a BA) and 2.0 (with an MA). Ferguson (1991) also stresses that school quality, which is strongly associated with teacher quality, is highly correlated with parental education and socioeconomic status. He asserts that all these factors, particularly teacher quality, have a "distinguishable" (p. 466) impact on students' test scores. Finally, Geo-JaJa (2006) argues that

fiscal resources for schools, such as through devolution which is the "only true form of decentralization" (pp. 141-145), are essential to ensuring quality education system, which, in turn, increases the academic success of students, especially the at-risk and impoverished. Quality education is indeed important, as stressed by Psacharopoulos (1994)—who finds that one additional year of schooling leads to private returns of between 8% and 20%—and supported by Michaelowa (2000).

Other scholars observe that the Hispanic students' achievement gap may partly be caused by the fact that they are predominantly taught by native-speaking educators who are not language teachers (Nieto, 2002; Ogbu, 1987, 1992; Ogbu & Simons, 1998; Skutnabb-Kangas, 1988, 2000) and who may lack awareness of perceptual learning style needs and/or preferences that are instrumental in Hispanic student achievement and success (Dunn et al., 1990; Loza, 2003; Oxford & Anderson, 1995). Oxford and Anderson (1995) assert that several teaching programs "do not provide the kind of experiences that would allow prospective teachers to develop their skills in identifying students' learning styles and in handling crosscultural differences" (p. 201). Similarly, Nieto (2002) points out that although most teachers nowadays have students who are diverse in many ways including race, culture, ethnicity, and language background, only a few (such as bilingual education specialists, ESL and urban education teachers) are "adequately prepared to teach students who embody these differences" (p. xiii).

Apparently, seeking more ways for Hispanic learners in the US to achieve academic success is imperative. This study hopes to answer the second question raised above—how the achievement gap can be narrowed, if not eliminated—through identifying students' preferred learning styles. In this study, the learning style preferences of Hispanic students from various countries of origin were compared. To identify preferred learning style differences, this study

used Reid's (1987) self-reporting questionnaire on perceptual learning style preferences (PLSP), with slight adjustments to allow for a collection of short responses. This paper discusses learning style preferences, cultural learning differences, and collective grouping, and presents the finding that parents' country of origin significantly impacts learning style preferences. The term *Hispanic* will be used to refer to the Spanish- and Portuguese-speaking students included in this study for greater consistency and to prevent alternating between the terms *Hispanic* and *Latino*.

Learning Styles

Scholars have suggested that individuals have their own preferred learning styles, which allow them to learn more effectively than through learning styles with which they are not comfortable. Hence, Mayes, Cutri, Rogers, and Montero (2007) urge the need for teachers to "know as much as is appropriate and possible about their students, … and design their curricula and instruction accordingly" (p. 4), comprising various perspectives and acknowledging different learning styles. Keefe (1987), who has conducted extensive studies on learning styles, explains that this broad concept comprises three distinct styles: cognitive, affective, and physiological. This paper will briefly mention only the first—cognitive style—as it includes perceptual modality preferences, which is the main focus of this study. Cognitive style, according to Messick (1976), is an "information processing habit" (p. 6) that "represent[s] the learner's typical mode of perceiving, thinking, problem solving, and remembering" (p. 5). Keefe (1987) adds that everyone has different cognitive styles and that preferred perceptual modality refers to the "preferred reliance on one of three sensory modes to understand experience" (p. 9), which are kinesthetic/psychomotor, visual/spatial, and auditory/verbal.

Similarly, Dunn and Dunn (1993) define learning style as "the way in which *each* learner begins to concentrate on process, internalize, and retain new and difficult academic information"

(p. 2). They also suggest that it is "a biological and developmental set of personal characteristics that make the identical instruction effective for some students and ineffective for others" (p. 5). Dunn (1990) asserts that everyone has a learning style and "learning style strengths" (p. 239). Research has also found that people generally feel most confident and successful when approaching difficult tasks by using their strengths (Dunn, 1990; Kreuze & Payne, 1989). Dunn, Griggs, Olson, Beasley, and Gorman (1995) find that "the overall academic achievement of students whose learning styles have been matched can be expected to be three-fourths of a standard deviation higher" (pp. 357-358) compared with that of their counterparts whose learning styles are not addressed. Based on eight studies conducted in 10 years, Dunn, Beaudry, and Klavas (2002) report that learners whose modality preferences were matched by instructional resources obtained "statistically higher test scores" (pp. 80-81) than those whose preferred learning styles or strengths were not matched. On the contrary, when teaching methods and learning styles do not match, Kreuze and Payne (1989) warn that "students can experience feelings of insecurity, frustration, anger, anxiety, alienation, and futility" (p. 167). Such situation, Oxford and Anderson (1995) stress, makes the classroom "a place of inequity" where some could feel "deprived or confused" (p. 201) and, as a result, drop out from school. Apparently, identifying students' learning style preferences may lead to academic achievement and success.

In the late 1960s, Dunn and Dunn began developing the *Dunn and Dunn Learning Style Model*, which consists of five stimuli: environmental, emotional, sociological, physical, and psychological (see Table A3). The fourth stimulus—physical—consists of four elements (perceptual, intake while learning, time of day energy levels, and mobility needs). This paper focuses on the first physical element —perceptual (also modality or sensory) learning style preferences, which is the tendency to use one or more senses (visual, auditory, kinesthetic, and

tactile) to understand, organize, and retain experience (Dunn et al., 2002; Kolb & Kolb, 2005; Oxford, 2003; Oxford & Anderson, 1995; Reid, 1987). Specifically, while visual learners like to obtain information through reading or seeing something such as pictures and charts, auditory learners prefer to do so through hearing or listening to someone, such as through lectures and audiotapes. Kinesthetic learners prefer whole body experience or movement during learning such as participating in a role play, while tactile learners like working with things they can touch or manipulate by hand, such as play money and flashcards, during learning (Dunn et al., 2002). This study also includes the third stimulus— sociological—with a focus on an individual's preference for working and learning alone (individual) or with others (group learning style) (Dunn, 2000).

Table A3

The Dunn & Dunn Learning-Style Model

Stimuli	Stimulus Elements			
Environmental:	Sound	Light	Temperature	Design
Emotional:	Motivation	Persistence	Responsibility	Structure
Sociological:	Self	Pair	Peers Team	Adult Varied
Physical:	Perceptual	Intake	Time	Mobility
Psychological:	Global – Analytic		Hemisphericity	Impulsive – Reflective
	Simultaneous or successive processing			

Dunn et al., 1995

Thus, this paper seeks to investigate whether Hispanic higher education students of different countries of origin have different learning style preferences, and to find out if, between different Hispanic national groups, there are different perceptual learning style preferences which they believe enable them to learn more effectively. Having access to respondents' self-reported demographic data, the researchers of this study also decided to see if any relationship exists between four variables and the six learning styles (visual, auditory, kinesthetic, tactile, group, and individual, or VAKTGI). By identifying learning style preferences that Hispanic students of

varying national origins may have, this study hopes to contribute to an increased awareness for educators and students who may, thus, be able to improve teaching and/or learning through learners' most preferred learning styles. Students may also minimize the use of their less or least preferred perceptual learning styles, and/or work toward gradually strengthening them. Recognizing that students have learning style preferences may also raise teachers' awareness of their own learning and teaching styles, which would allow them to adjust their teaching style to match those of their students' preferred learning style. Such adjustments may lead to greater success in Hispanic students' learning, college enrollment, attendance, and graduation rates.

Cultural Learning Differences and Learning Styles

It is apparent that students possess learning differences that may be influenced by their own culture, experiences, and other factors. The importance of recognizing these differences has been strongly recommended and widely researched by scholars in the field. With reference to understanding cultural diversity in schools, John U. Ogbu (1992), a prominent educational anthropologist, points out that minority students' academic learning and success are "influenced by complex social, economic, historical, and cultural factors" (p. 7). He contends that "the relationship between the minority cultures/languages and the mainstream culture and language" differs for the various minority groups, and that this difference prevents minority students from "cross[ing] cultural and language boundaries," which necessitates "understanding in order to enhance the success of intervention and other efforts" (p. 7). Thus, he urges a recognition of three inter-related facts: (a) the existence of cultural/language differences brought about by various reasons or circumstances; (b) the existence of cultural/ language differences associated with different kinds of minority groups and minority types; and (c) because cultural/language differences exist, "all minority children face problems of social adjustment and academic

performance in school" (p. 12). In all three suggestions, Ogbu stresses that "cultural/language differences" exist, which, if not addressed, could affect not only a student's ability to cope with learning but also with others at school.

In addition, Dumitrescu (2013) points out that "Non-native language teachers working in their environment (which may be culturally very distant from the one associated with the target language), as well as their students, are obviously at a disadvantage, as their situation is radically different …" (p. 195). Dunn and Griggs (1995) note that "culture influences both the learning process and its outcomes" (p. 37). Finally, Stebbins (1995) stresses a valuable point that by "acknowledging students' cultural backgrounds and using this understanding as an instructional strength upon which to build," educators "may more effectively build the trust and motivation so necessary with students facing the risk inherent in L2 [second language] learning" (p. 115). Scholars do emphasize the importance of recognizing that cultural differences exist, and such differences affect an individual's ability to socially interact, learn, and achieve.

Thus, the relationship between cultural/learning differences and learning styles have been examined. An investigation of whether learning styles of cultural groups differed from each other was conducted by Dunn et al. (1990), who assert that "Although educators verbalize that all children, regardless of age, race, or religion, have an equal right to effective education, they have not realized the extent to which ethnic and cultural differences influence learning and achievement" (p. 69). Their most important finding is that learners in various parts of "the American subculture have different patterns of preferred learning strategies" (p. 84). In their analysis of studies on how culture influences the development of learning styles, Oxford and Anderson (1995) stress the need to understand learners' styles "on a culturally deep level," and that "crosscultural understanding of language learning styles is crucial to success in language

teaching and learning" (p. 201). Oxford and Anderson also urge that "learning style studies, particularly of different cultural backgrounds, be replicated so that more consistent information becomes available within and across populations" (p. 211). Similarly, Stebbins (1995) stresses the value of identifying learning styles among second language learners—it raises "awareness of the need for culturally sensitive instructional methods that may help maximize L2 [second language] learning" (p. 109) for immigrants and international students. Following these recommendations may lead to more effective learning and greater academic achievement.

Collective Grouping

In her book *Asian American Panethnicity*, Espiritu (1993) asserts that panethnicity results from an "imposed" categorization, which "ignores subgroup boundaries" and lumps together different kinds of people, who share nothing in common, "in a single, expanded 'ethnic' framework" (p. 6). Kim and White (2010) list "substantial problems" that panethnicity poses including: (a) reinforcing the idea of "homogeneity within … the Asian, black, Latino, Native American and white … groups;" (b) less "room for distinction within categories as subgroups are not differentiated and internal ethnicity is obscured;" (c) "misrepresent[ing] subgroups and ignor[ing] and minimiz[ing] the diversity of experiences;" and (d) that said groups are "affected by internal conflict and fractures based on national origins," and that within national origin groups, "further cleavages based on ethnic or regional ties" (pp. 1559-1560) exist. Meanwhile, Trimble and Dickson (2005) refer to this phenomenon as "ethnic gloss," which they define as "an overgeneralization or simplistic categorical label" for groups … "where unique cultural and ethnic differences found among group members are ignored" (pp. 412-413). They assert that ethnic gloss gives "the illusion of homogeneity where none exists, and therefore may be considered a superficial, almost vacuous, categorization, which serves only to separate one group

from another" (p. 413). They also note potential problems posed by using an ethnic gloss to describe an ethnocultural group: (a) "biased and flawed scientific research outcomes" which can promote stereotypes; (b) "sweeping references to ethnocultural groups," which are "gross misrepresentations;" (c) undermining of "certain scientific tenets concerning external validity," (d) "affect[ing] the ability to generalize findings across subgroups within an ethnic category;" and (e) preclusion of "an accurate and efficient replication of research results" (p. 413).

With specific reference to Hispanics, Calderon (1992), a sociology and Chicano studies professor, explains that "the [various Latino] groups that are said to reflect a Hispanic or Latino ethnicity differ sharply in historical experience, socioeconomic status, and identity" (p. 37). Similarly, 15 medical professionals (González Burchard et al., 2005) who reviewed the historical events leading to the formation of today's Hispanic populations aptly affirm that "Although usually classified as a single ethnic group by researchers, Latinos are heterogeneous from cultural, socioeconomic, and genetic perspectives," and they "represent a wide variety of national origins and ethnic and cultural groups, with a full spectrum of social class" (p. 2161). Finally, Umaña-Taylor and Fine (2001) observe that "researchers discuss the 'Latino' population in their study without acknowledging the nationality differences among the Latinos included in their samples" and argue that "ethnicity pertains to cultural traditions, prescribed norms, values, and a heritage that persists beyond generations" (p. 348). Thus, they strongly recommend that since "individuals' national origin may influence their traditions, customs, values, and beliefs, ethnic identity should not be examined without considering differences in nationality" (p. 348). In other words, inferring that all Hispanic students are one homogeneous population is inaccurate as there is great diversity within Latino populations (Umaña-Taylor, Diversi, & Fine, 2002). Hispanic students are too often seen as a single homogeneous group when, clearly, they belong

to different populations with different cultures. Their heterogeneity of culture, background, SES, and family education backgrounds may also be accompanied by heterogeneity of learning styles and preferences, which this paper seeks to investigate.

Although studies have been done on the perceptual learning style preferences of various nonnative speakers, research on the perceptual learning style preferences specifically of Hispanic students at higher-education level is limited (Griggs & Dunn, 1995; Maldonado-Torres, 2011). Researchers have found differences in learning styles of students having different cultures (Dunn et al., 1990; Dunn & Griggs, 1995; Oxford & Anderson, 1995; Park, 2000; Reid, 1987; Rossi-Le, 1995; Sanchez & Gunawardena, 1998; Stebbins, 1995), but most studies on perceptual learning style preferences that included Hispanic students lumped all of them into one big group and did not report their countries of origin or isolate demographic variables other than gender and ethnicity that impact on learning style (Griggs & Dunn, 1995; Maldonado-Torres, 2011). Although generally grouped as Hispanic students, they are of diverse origins (such as Argentina, Mexico, and Spain), which implies that they may have varied individual, family, and cultural experiences, backgrounds, and learning needs and styles.

The limited research done on the learning styles of Hispanic students by national origins also implies that educators in the U.S. lack awareness of differences in perceptual learning style preferences that Hispanic students from various countries of origin may possess. Consequently, this lack of awareness may be a factor in Hispanic students' lack of success in learning, which can lead to lower educational attainment (low college enrolment, attendance, and graduation rates) compared with their English native-speaking and other nonnative-speaking counterparts. However, there is very little existing research on the differences in learning style preferences between Hispanic students of different nationalities.

APPENDIX B: DETAILED METHODS

This section briefly introduces this study's participants. It also discusses the instrument used to collect their responses and how their responses were obtained and analyzed.

Sampling

The original target population for this study consisted of Hispanic English-as-a-Second-Language (ESL) learners in two higher education institutions: Brigham Young University's (BYU) English Language Center and Utah Valley University's (UVU) English Language Learning department, in the state of Utah. Owing to the difficulty in recruiting Hispanic ESL volunteer students to respond to the online survey (probably owing to the length of time—approximately 10 minutes—to complete the questionnaire with 30 questions), the target population was adjusted to include Hispanic students of all education levels (e.g., undergraduate, graduate, and post-graduate) at both institutions.

To encourage survey participation, incentives—in the form of $25 university bookstore gift cards through random drawing of four names per university—were also provided. Participants who were interested in joining the lucky draw provided their first name and email address or phone number at the end of the questionnaire and had to complete the questionnaire at a set date—i.e., three weeks after the questionnaire was administered. Random drawing of respondents' names was done through Excel software. The day after random drawing, the four lucky draw winners from each university were informed electronically of the dates of prize—i.e., $25 gift card—collection from either BYU Store for BYU students or UVU Student Center for UVU students. At the time of collection, they were asked to sign a note certifying that they had collected the prize at a certain date.

Researchers sent invitations to participate in the study to potential respondents, approximately 800 at BYU and 2,000 at UVU who self-reported having Hispanic heritage to their respective institutions at enrolment. Online invitations for participation was sent through both institutions' Multicultural Student Services and Spanish Departments, BYU's International Student Services and English Language Center, and UVU's Institutional Research & Information office and English Language Learning department. The invitations for participation were sent in two batches: (a) the first batch was sent to BYU students in Winter Semester 2016 when the Hispanic student enrollment was deemed larger than in Summer term probably because with standard tuition throughout the academic year, summer time might be seen as an opportunity for internship or seasonal full time summer employment; and (b) the second batch was sent to UVU students in Summer Term 2016 when the Hispanic student enrolment was deemed larger than in the regular semesters. The reasons for the latter's higher enrollment trend are that UVU, which is a public institution, charges in-state tuition for all students, including out-of-state and international students, and no parking fees during summer.

Although the sample that the researchers had access to (with the help of both institutions' relevant departments) at the time of survey administration included approximately 800 Hispanic international students at BYU and over 2,000 Hispanic students at UVU, only a total of 246 responses were collected—a response rate of 3% for BYU and 7% for UVU. The sample sizes ranged between 1 (e.g., from Costa Rica and Cuba) and 82 from Mexico. Owing to the provision of inadequate or seemingly arbitrary responses, such as incomplete or no answers at all in the questionnaire's demographic or learning styles section or both, or answers were all *Strongly Agree* or all *Neutral*, only 165 (25 from BYU and 140 from UVU) of the responses were analyzed for this study. These 165 respondents reported having family backgrounds connected to

20 countries: Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Peru, Portugal, Spain, Venezuela, and the U.S.A. (see Table C1 in Appendix C).

Data Collection

For this study, a two-part questionnaire was first designed in English and then translated to Spanish. It was designed so that students, particularly those who felt they were not proficient in either language, had the option of reading and answering the survey questions in either Spanish and/or English, and it was administered through the online platform *Qualtrics* to all students in the sample. The first part of the questionnaire asked about demographic information: mother tongue, age, sex, country of origin of students and their parents, level of education, length of stay in the U.S., length of time studying English in the U.S., family education background, and students' annual family income (for SES). The second part of the questionnaire consisted of questions about six learning style preferences (VAKTGI). The second part of the questionnaire consisted of 30 questions (five per learning style) about six learning style preferences (visual, auditory, kinesthetic, tactile, group, individual, or VAKTGI) (Reid, 1987). To determine whether higher education Hispanic students of different national origins had different learning style preferences, the researchers adapted Reid's (1987) perceptual learning style preferences self-reporting questionnaire, which consisted of 30 statements (i.e., five per learning style). Six of the questions in Reid's original questionnaire were converted into open-ended questions, i.e. one for each learning style, to allow respondents to clarify, explain, and/or elaborate on their *Agree* or *Strongly Agree* answers.

Upon collection of the first set or batch of data—i.e., from BYU's respondents, an itemized breakdown of students' demographic information and learning style responses were

recorded, in Spanish and English, on Excel spreadsheets. Responses which were incomplete, irrelevant, or did not make sense were not included in this study's data analysis. A similar strategy was used upon collection of the second set or batch of data—i.e., from UVU's respondents. The two data sets were then combined using an Excel master spreadsheet.

Data Analysis

Responses in the 5-point Likert scale were statistically analyzed to identify the relationship of perceptual learning style preferences to 10 variables (which were the demographic particulars excluding students' mother tongue and, owing to the lack of data collected, test scores). Double coding was used for the country of origin of students' parents. That is, if a student reported two different countries for parents' country of origin, the parents were assigned to both countries. All participant scores were categorized by learning style. Means, medians, and standard deviations were calculated for each learning style.

Multivariate analysis of variance (MANOVA) (plus six post-hoc ANOVA—one for each learning style—and *post hoc Tukey correction* for multiple testing for each ANOVA) was first used to examine the potential relationship between country of origin and the six learning styles. Originally, this type of analysis was deemed useful for comparing the means of multiple groups, such as 20 countries. However, probably driven by the small sample sizes created by so many different groups, MANOVA did not yield any significant findings.

Thus, independent samples *t*-tests were used to identify differences in learning style preferences across students' and parents' country of origin. That is, using independent samples *t*-tests, researchers compared the means of two groups in two ways. First, two groups were formed by the students' regions: (a) Mexico v. non-Mexico, and (b) Central America v. South America. However, such analysis did not yield any significant differences. Thus, a comparison was done

of the means of two groups formed by the parents' regions: (a) Mexico v. non-Mexico, and (b) Central America v. South America. This yielded significant differences (see Table 3 on page 18).

To reduce the chances of obtaining false-positive results, the *Bonferroni correction* was also used to compare the means of these two groups. For this type of correction, an adjustment was made to the p value of 0.05 by dividing it by the number of learning styles—i.e., six—leading to the significance cut-off level of $p < 0.0083$ (=.05/6, to adjust for six simultaneous tests). Analysis of variance (ANOVA) was also used to identify differences of a given learning style preference across the countries. Instead of using the *Bonferroni correction* which is useful for a smaller number of comparisons or means (Field, 2013), a *post hoc Tukey correction* was used to test the larger number of comparisons or means—in this case, 20 countries.

APPENDIX C: EXTENDED RESULTS

The results of this study are presented in three parts. The first set reports the findings regarding the respondents; the second shows the relationship between the six learning styles (VAKTGI) and country of origin of students and parents; and the third shows the relationship between the six learning styles and four variables (country of origin, age, level of education, and SES) which yielded significant differences. This section shows the detailed findings regarding the respondents.

Respondents

A total of 246 students completed the first part of the survey, or the demographic section. However, not all responded to the second part of the questionnaire, or the learning style preferences section, which used a 5-point Likert scale (where 1 = *Strongly Disagree* and 5 = *Strongly Agree*). Incomplete responses and those that appeared to be given arbitrarily (e.g., all *Strongly Agree* or all *Neutral*) were not included in this study, resulting in the analysis of only 165 completed online survey responses: 25 from BYU and 140 from UVU.

Greater success in data collection from UVU was probably because one of the researchers, who was a teacher there, was able to administer the online questionnaire and send timely reminders herself to respondents to complete the survey; while at BYU, where she was a student, that researcher had to rely on relevant department personnel to inform students of the survey, administer it to them, and remind them to complete it. Table C1 provides an overview of the demographic variables in the self-reporting questionnaire.

Table C1

Overview of Demographic Variables in the Self-Reporting Questionnaire

AGE				
	BYU	**UVU**	**Total**	**%**
15-19	3	10	13	7.9%
20-24	8	58	66	40.0%
25-29	9	29	38	23.0%
30-34	2	23	25	15.2%
35-39	3	8	11	6.7%
40-44	0	6	6	3.6%
45-49	0	1	1	0.6%
50-55	0	5	5	3.0%
55+	0	0	0	0.0%
Total	**25**	**140**	**165**	**100%**

SEX				
	BYU	**UVU**	**Total**	**%**
Male	13	76	89	54.29%
Female	12	64	76	45.71%
Total	25	140	165	100%

FAMILY EDUCATION				
	BYU	**UVU**	**Total**	**%**
1st generation	7	86	93	56.36%
2nd generation	13	40	53	32.12%
3rd generation	5	12	17	10.30%
4th generation	0	2	2	1.21%
Total:	**25**	**140**	**165**	**100%**

LANGUAGE				
	BYU	**UVU**	**Total**	**%**
English	1	18	19	11.52%
Portuguese	0	5	5	3.03%
Spanish	23	79	102	61.82%
English-Spanish	1	35	36	21.82%
Eng-Span-French	0	1	1	0.61%
Eng-Span-Portuguese	0	1	1	0.61%
Skipped	0	1	1	0.61%
Total:	**25**	**140**	**165**	**100%**

FAMILY INCOME				
	BYU	**UVU**	**Total**	**%**
< $10,000	4	11	15	9.09%
$10,000 - 24,999	4	37	41	24.85%
$25,000 - 49,999	6	52	58	35.15%
$50,000 - 74,999	6	24	30	18.18%
$75,000 - 100,000	1	9	10	6.06%
> $100,000	3	6	9	5.45%
Skipped	1	1	2	1.21%
Total:	**25**	**140**	**165**	**100%**

Table C1 – cont.

EDUCATION	BYU	UVU	Total	%
1st year	5	24	29	17.58%
2nd year	3	31	34	20.61%
3rd year	2	44	46	27.88%
4th year	5	33	38	23.03%
5th year	2	1	3	1.82%
6th year	1	1	2	1.21%
Graduate	3	4	7	4.24%
Master/Post-grad	4	2	6	3.64%
Total:	**25**	**140**	**165**	**100%**

BYU & UVU	Total	%
University	152	92.12%
Graduate	7	4.24%
Master/Post-grad	6	3.64%
Total:	**165**	**100%**

LENGTH OF TIME STAYED IN THE US	BYU	UVU	Total	%
< 3 months	4	2	6	3.6%
3 - 6 months	4	5	9	5.5%
7 - 11 months	2	2	4	2.4%
12 - 17 months	1	2	3	1.8%
18 - 24 months	1	2	3	1.8%
> 2 years	2	7	9	5.5%
> 3 years	11	119	130	78.8%
Skipped	0	1	1	0.6%
Total:	**25**	**140**	**165**	**100%**

LENGTH OF TIME STUDIED ENGLISH IN THE US	BYU	UVU	Total	%
< 3 months	8	7	15	9.09%
3 - 6 months	3	11	14	8.48%
7 - 11 months	2	6	8	4.85%
12 - 17 months	1	1	2	1.21%
18 - 24 months	0	5	5	3.03%
> 2 years	1	8	9	5.45%
> 3 years	9	102	111	67.27%
Skipped	1	0	1	0.61%
Total:	**25**	**140**	**165**	**100%**

Table C1 – cont.

COUNTRY OF ORIGIN									
STUDENT'S COUNTRY OF ORIGIN					**PARENT'S COUNTRY OF ORIGIN**				
	BYU	**UVU**	**Total**	**%**		**BYU**	**UVU**	**Total**	**%**
Argentina	1	3	4	2.42%	Argentina	1	3	4	2.42%
Bolivia	2	1	3	1.82%	Bolivia	2	1	3	1.82%
Brazil	0	6	6	3.64%	Brazil	0	6	6	3.64%
Chile	1	6	7	4.24%	Chile	1	8	9	5.45%
Colombia	3	5	8	4.85%	Colombia	3	5	8	4.85%
Costa Rica	1	0	1	0.61%	Costa Rica	1	0	1	0.61%
Cuba	0	1	1	0.61%	Cuba	0	1	1	0.61%
Dominican Rep	0	6	6	3.64%	Dominican Rep	0	7	7	4.24%
Ecuador	0	4	4	2.42%	Ecuador	0	4	4	2.42%
El Salvador	1	2	3	1.82%	El Salvador	1	3	4	2.42%
Guatemala	0	0	0	0.00%	Guatemala	0	3	3	1.82%
Honduras	0	3	3	1.82%	Honduras	0	7	7	3.94%
Mexico	9	53	62	37.58%	Mexico	9	74	83	50.30%
Nicaragua	0	0	0	0.00%	Nicaragua	0	1	1	0.61%
Panama	0	0	0	0.00%	Panama	0	1	1	0.30%
Peru	3	9	12	7.27%	Peru	3	11	14	8.18%
Portugal	0	0	0	0.00%	Portugal	0	1	1	0.30%
Spain	0	0	0	0.00%	Spain	0	1	1	0.30%
Venezuela	2	7	9	5.45%	Venezuela	2	7	9	5.45%
USA	2	34	36	21.82%	USA	0	1	1	0.30%
Total:	**25**	**140**	**165**	**100.00%**	**Total:**	**23**	**142**	**168**	**100.00%**

Almost two-thirds (63%) of the respondents were in their 20s and more than half were male (54%) (see Table C1). A majority (62%) reported Spanish as their mother tongue, and almost one-fourth (23%) indicated that Spanish plus one or two other languages—English and/or Portuguese—were their native languages (see Table C1). More than half of the respondents (56%) were first-generation and nearly one-third (32%) were second-generation college students. Most respondents (92%) were undergraduate: freshman (18%); sophomore (21%); junior (28%); and senior (23%); while a few were post-graduate (8%). Over three-fourths (79%) indicated having stayed in the U.S. for over three years, while two-thirds (67%) reported having studied English in the U.S. for over three years (see Table C1). While 50% of the parents, which is the largest number reported for country of origin, were from Mexico, only a little over one-third (38%) of the students reported coming from Mexico. Over one-third of the respondents (35%) reported an annual family income of less than $50,000, while one-fourth of them (25%) less than $25,000 (see Table C1).

APPENDIX D: IRB APPROVAL

Institutional Review Board
for Human Subjects

Brigham Young University
A-285 ASB Provo, Utah 84602
(801) 422-3841 / Fax: (801) 422-0620

April 8, 2016

Catherine Lui

842 N 1760 W

Provo, UT 84604

Re: X 15448

The Perceptual Learning Style Preferences of Hispanic ESL Students in Two Higher Education Institutions

Dear Catherine Lui

This is to inform you that Brigham Young University's Institutional Review Board has reviewed your Amendment dated 4-1-2016 for the above captioned study. The changes to the study have been approved.

Please find the revised Informed Consent document enclosed. You will note that the date of approval at the bottom right hand corner has been updated on 2-23-2016. No other consent form should be used. It must be signed by each subject prior to initiation of any protocol procedures. In addition, each subject must be given a copy of the signed consent form.

The approved period for the study ends on 1-7-2017. Any additional modifications in the research protocol, study site, personnel, or consent form during this time period must first be reviewed and approved by the IRB.

If you have any questions, please let us know. We wish you well with your research!

Sincerely,

Robert Ridge, PhD., Chair
Sandee Aina, Administrator
Institutional Review Board for Human Subjects

DISSERTATION REFERENCES

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