Baker, S., & Scott, J. (2016). Sociocultural and academic considerations for school-age d/Deaf and hard of hearing multilingual learners: A case study of a deaf Latina. *American Annals of the Deaf, 161*(1), 43–55.

Sociocultural and Academic Considerations for School-Age d/Deaf and Hard of Hearing Multilingual Learners: A Case Study of a Deaf Latina

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For decades, research has focused on American Sign Language/English bilingual education for d/Deaf and hard of hearing students whose families used English or ASL. However, a growing population of d/Dhh children come from households where languages other than English (e.g., Spanish, Chinese, Vietnamese) are used. In a longitudinal case study, the authors document the K–12 educational pathway of a deaf Latina student. Anecdotal records, semistructured interviews, assessment data, and document reviews of the participant's school and clinical records are used to develop the case study. The findings provide the basis for recommendations for future research and for critical factors to consider to improve the education of d/Dhh Multilingual Learners (DMLs). These include ensuring appropriate educational placements, addressing early communication and language needs, determining effective instructional techniques and assessments, strengthening the L1 to support L2 learning, and providing students with opportunities to learn their heritage language.

Keywords: American Sign Language (ASL), bilingual, culturally and linguistically diverse (CLD), deaf, d/Dhh Multilingual Learner (DML), Deafness and Diversity (DAD), demographics, disability, diverse, English for Speakers of Other Languages (ESOL), English Language Learner (ELL), hard of hearing, hearing loss, Latinos, Mexican Americans, multicultural

The population of d/Deaf and hard of hearing (d/Dhh) students educated in schools in the United States and Canada is rapidly changing; specifically, it is becoming more diverse as a result of medical and technological advances (Knoors & Marschark, 2012) and shifting demographic and immigration patterns (Gallaudet Research Institute, 2013). Schools consequently must respond to the changing needs of students. The present article focuses on a specific population of d/Dhh students from non–English-speaking homes who are multilingual learners and represent diverse cultural and linguistic backgrounds. These d/Dhh Multilingual Learners (DMLs) typically are students who were born in countries where English is not the primary language (Cannon & Guardino, 2012) and

immigrated with their families to the United States or Canada; they attended schools in which English and/or American Sign Language (ASL) were the primary languages of instruction. Extant research on students who are DMLs is extremely sparse. To better understand the educational experiences of the DML population and to form a foundation for future research, we compiled a case study of a DML who had recently graduated from high school. The case study provides a rich description of one Latina student's experience in an urban public school program for d/Dhh students, focusing on the educational and sociocultural factors that had an impact on her learning trajectory.

Literature Review

Historical Context of Immigration

Numerous state and federal agencies, think tanks, and policy centers study and report on the shifting demographics of the United States, which affect the economy, schools, health care, and the labor force (e.g., the Pew Hispanic Center, the Brookings Institution). Immigration, in particular, continues to be a controversial topic because of the growing number of immigrant students educated in U.S. public schools. According to the National Center for Education Statistics (2014a), 4.4 million students whose home language was not English were educated in U.S. schools during the 2011–2012 academic year; these children and youth accounted for 9.1% of the entire student population. Schools educating these children usually refer to them as English Language Learners (ELLs). However, the student population is dynamic, and while the United States is less multilingual than the rest of the world, almost 20% of the U.S. student population uses multiple languages (Grosjean, 2010).

Immigrant students from non–English-speaking homes have been attending schools in the United States since the beginning of public education, but it was only after passage of the Immigration and Nationality Act of 1965 and its amendments in 1976 that the country became a more diverse, multicultural society (Rong & Preissle, 2009). These laws opened borders and increased opportunities for the fourth wave of immigration, the largest in U.S. history. Between 1965 and 2015, new immigrants, their children, and their grandchildren accounted for 55% of U.S. population growth (Pew Research Center, 2015). Most fourth-wave immigrants entered the country from Latin America, particularly Mexico (Lukes, 2015; Zong & Batalova, 2014). Brown (2015) reports that 34.6 million Hispanics of Mexican origin resided in the United States in 2013; Mexican Americans are the largest population of Latinos in the country, accounting for nearly two thirds of the U.S. Latino population. Moreover, 28% of the country's 41.3 million foreign-born residents are natives of Mexico (Zong & Batalova, 2014, as cited in Brown, 2015).

Looking at bilingualism and language dominance, Brown (2015) provides further information about the Mexican immigrant population, reporting that Mexican immigrants tend to be Spanish-dominant language users, with only 3 in 10 reporting that they are bilingual. Furthermore, 73% of Hispanic people living in the United States report that they speak Spanish in the home (Brown, 2015). The heritage language seems to be an important cultural component of the Latino home in America.

Sociocultural Factors Affecting Bilingual Latino Immigrant Students' Education

While Latinos exhibit wide variation in acculturation patterns, ethnic identity, socioeconomic status (SES), and language use (Unger, Schwartz, Huh, Soto, & Baezconde-Garbanati, 2014), there are sociocultural factors, both positive and negative, that have been found to affect Latino students' educational attainment.

Positive Factors Affecting Educational Attainment

Latino immigrant families have been found to value the centrality of mothers in children's development (Durand, 2011), as well as the family and education (Cycyk & Inglesias, 2015; Gottfredson, 2001; Rumbault, 2006). They also respect educators (Gonzalez, Borders, Hines, Villalba, & Henderson, 2013) and often defer decisions to them (Walker, Ice, Hoover-Dempsey, & Sandler, 2011). Another positive factor that has been reported is the role of religion in the Latino community. Jeynes (2015) has found that faith and family are positive correlates that may help bridge the achievement gap that becomes evident when various racial/ethnic groups are compared.

Negative Factors Affecting Educational Attainment

Sociocultural factors and economic conditions, including living in poverty, have been found to influence various educational outcomes (National Center for Education Statistics, 2014a). Shonkoff and Garner (2012) state that poverty can be associated with toxic stressors (e.g., hunger or food insecurity, teen pregnancy, domestic violence, absentee parents, drug abuse). In addition, poverty has been associated with subaverage academic performance (Mulligan, Hastedt, & McCarroll, 2012). The National Center for Education Statistics (2014a) has reported that 45% of Latino children attend schools in high-poverty urban areas. Moreover, students who are Latino and come from low-SES households are nearly four times as likely as White students to

attend poorly performing schools (Almy & Theokas, 2010).

Whether parents have completed formal education also affects children's educational success. Hispanic households have the highest percentage of parents who have not completed high school (National Center for Education Statistics, 2014b), and research has shown that dropout rates tend to be higher for children who live in poverty (Sparks, 2011). However, studies have also found that children in poverty whose parents provide engaging learning environments at home do not start school with the same academic readiness gaps seen among poor children generally (National Center for Education Statistics, 2010; Sparks, 2011; Viadero, 2000), and this message may be reaching parents. Latino students' graduation rate increased 5.5 percentage points from 2008 to 2009, the largest year-to-year gain among all the groups in a recent study ("Latinos' School Success," 2012).

Incidence of Students Who Are d/Dhh in the Latino Population

Latino students constitute 28.4% of d/Dhh students (GRI, 2013). The GRI found in its 2011–2012 Annual Survey of Deaf and Hard of Hearing Children and Youth that the western region of the United States had the highest population of Latino d/Dhh students, 40.8%, compared to 20.6% in the Northeast, 13.6% in the Midwest, and 33.0% in the South (GRI, 2013). However, this is likely an incomplete picture of the Latino population because many students may be mainstreamed into schools that do not participate in the GRI survey. Consequently, these results may underestimate the actual number of Latino d/Dhh students educated in schools in the country today.

Like the general Latino population, Latino students who are d/Dhh are a highly diverse group. Some are first-generation immigrants, while others are native-born citizens. Included in this population are students learning to listen to and use spoken languages; they will most likely be learning English at school while using Spanish with family members at home. Other students may be in a more complex language environment where three or more different languages (e.g., English, Spanish, Mexican Sign Language, and ASL) may be used and expressed through a combination of spoken, written, and signed modes of communication. It remains unknown how many Latino DMLs are served in schools, as they are a subset of the Latino d/Dhh population. However, according to the GRI (2013), the population of Latinos enrolled in schools is expanding faster than that of any other ethnic group, which suggests that the number of Latino DMLs may be increasing as well.

Multilingual Learners Who Are d/Dhh

DMLs' access to visual language may be impeded by a lack of early language access and by late enrollment in school. At school, DMLs may be learning languages (e.g., ASL and English) other than their family's native language and, therefore, live in multicultural, diverse environments in which they are surrounded by several languages they may be learning simultaneously (e.g., ASL and English as their primary languages for learning and Spanish for communicating with family members). The extent to which DMLs become proficient in these non-native languages has not been reported in the literature.

DMLs may have families who emigrated from a foreign country—Mexico was the country of origin of the participant in the present case study. According to Clark and Monroy (2013), education in Mexico has experienced expansive growth, but control of education programs is mainly left to local authorities. Since the 1990s, Mexican special education policy has mirrored that of the United States (i.e., policies promoting educational integration and inclusion are practiced by most local schools; Mount-Cors, 2007). Listening and spoken language is the most common methodology used with students who are d/Dhh, although Mexican Sign Language (Lenguaje de Signos Mexicano) is acquired by a few (Joshua Project, 2016). If students who are d/Dhh attend a school in Mexico, it is most likely a community school for hearing children without a trained teacher of the deaf and hard of hearing (TODHH). In some cases, DMLs arrive in the United States from Mexico having had limited access to formal education. ASL may be the most appropriate language option for many DMLs, as it takes advantage of the student's visual pathway and provides cognitive benefits (Allen, 2015; Hauser, Lukomski, & Hillman, 2008). In a recent study, Twitchell, Morford, and Hauser (2015) investigated the effect of SES on literacy development in deaf, signing ASL-English bilinguals, and found that for the poorest readers, home SES and ASL proficiency were predictors of literacy outcomes. SES has a direct impact on ASL-English bilinguals' L2, and this effect is independent of and additional to the benefit of L1 proficiency in ASL. It is also relevant to note that evidence of bidirectionality of influence exists: Development in one language facilitates acquisition of a second language (Pucci, Harmon, & Mounty, 2012). Given that Latino students may come from lower-SES homes, ensuring the development of an L1 appears to be critical. According to Mayberry (1993, 2007), age of exposure to a first language can influence language development later on. Students exposed to ASL later who do not

have another language in place may struggle to develop native-like fluency.

Researchers who study hearing ELLs have emphasized the importance of preserving and strengthening students' heritage or home language (Ortiz & Grimaldo, 2015), as they have found that a symbiotic relationship exists between the two languages: Strengthening the heritage language simultaneously improves students' use of English. Given DMLs' diverse range of attributes, it is probable that the extent to which they learn their heritage language varies from student to student. DMLs who have more access to hearing may have opportunities to acquire their heritage language through listening, while others may acquire it through print-based avenues, the home country's sign language, or a combination of all three. Regardless of the pathway through which DMLs acquire and learn language, according to Arellano (2014), developing students' heritage language should be a school priority.

Method

Case study methodology (Creswell, 2009; Yin, 2009) was adopted for the present study, which formally began in March 2015 and lasted 6 months. To develop the case study, we used summaries of anecdotal records, semistructured interviews of the participant and her secondary school teachers (see Appendix), and document reviews of the participant's academic and clinical records, minus access to her individualized education programs (IEPs). To contribute to a longitudinal perspective on her development, we assessed the participant's current language and literacy abilities.

Participant

The participant in the present study was a 19-year-old Deaf Mexican American whose family had immigrated to the United States in November 2001. We refer to the participant throughout the study by the pseudonym Maria.

Maria was from a family in which she was the seventh of eight children. She was 5 years, 8 months old when she and her family arrived in the United States from Mexico. Maria's bilateral hearing loss, however, had occurred when she was very young. While still living in Mexico she contracted a high fever and was hospitalized. A review of audiological records revealed that Maria had a profound hearing loss bilaterally with no identified disabilities; she was the only member of her family who was deaf. Maria did not attend school in Mexico prior to emigrating. As a result, her first educational services were provided in the United States. When she entered school, she used a hearing aid in one ear that had been donated to her family by a social services agency. She and her family communicated using a basic home sign system: Each family member had a sign name, and she used pointing and gesturing to communicate her basic needs. At the time of the present study, she did not use hearing aids and communicated in ASL and English through text messages, usually translated into Spanish. In May 2015, Maria graduated from an urban high school and at the time of the study was assisting her father, who cleaned office buildings in the evening. Her goal was to attend the local community college. The case study began with the first meeting between the school's speech-language pathologist and the director of the deaf education program, in the fall of 2001, and continued until Maria's graduation from high school in May 2015.

Setting

The case study was set in a city in the south-central region of the United States that had a population of approximately 400,000. When the family emigrated from Mexico in 2001, they settled in the city's barrio. Along with four of her siblings, Maria enrolled in the neighborhood school across the street from her home. (Three older siblings remained in Mexico to complete their education.) The family maintained residence in the same location over the 13 years of Maria's schooling.

The Neighborhood School

In 1997 a new community school was constructed in Maria's neighborhood that provided integrated social services and educational programs to ethnically diverse populations, including immigrant families from Mexico. Since 1997, the school has provided bilingual immersion programs for ELL children moving into the district, especially Spanish-speaking bilingual children. Today, ethnically diverse students make up 84% of the school's enrollment; 66% of the students are Hispanic and 47% are ELLs. The school's website reports that 94% of the student population receives free or reduced-price lunches.

Other Placements in the Urban School District

Maria's education began at the neighborhood school, but she transferred to three other educational settings: a private early childhood center for deaf and hard of hearing children, a deaf education program in a public elementary school, and a middle/high school deaf education program in the same urban school district. We describe each of these settings in the section on Maria's school placements.

Data Collection and Procedures

The first author of the present study maintained anecdotal records over the 13-year period when the participant was in school. Anecdotal records included handwritten and typed narra-

tive descriptions of clinical and classroom observations, informal meetings with teachers and school administrators, meetings with the participant's mother, and meetings with the participant as she became older.

To understand how schools accommodate DMLs, we conducted semistructured interviews with classroom teachers in the summer of 2015 (see Appendix) to discuss the ways DMLs were educated and how accommodations were provided in the local deaf education program. We maintained participant anonymity by gathering information from teachers regarding DMLs as a group. Four middle and high school teachers from the local deaf education program were interviewed. The interviews lasted 30–45 minutes each and focused on the educational needs of DMLs and current and desired supports for DMLs in the deaf education program.

In addition, in the summer of 2015 a semistructured interview was conducted with the participant to obtain information about her educational experiences retrospectively and to gather suggestions for ways to improve the education of students who are DMLs (see Appendix). The interview was done in a neutral location off campus and lasted 2 hours. A second meeting took place a week later, during which the interview continued. The interview was conducted in ASL, the participant's primary language, by the first author, who took written notes during the process.

After the interviews were completed, we performed a document review of educational and clinical records to gain information about the participant's placements, transitions, and academic progress. The review included an analysis of results of standardized tests to identify trends in academic outcomes over several years of data. Next, results of Exit or End of Instruction (EOI) assessments were reviewed to determine functional levels at graduation. We report these results cautiously because the assessments were developed for monolingual hearing children, and comparing the participant to the norming group would neither be appropriate nor generate useful data (Pizzo & Chilvers, this volume).

As a supplement to school records, the second author conducted a series of language and literacy assessments with the participant on a single afternoon over an hour and a half. The second author assessed ASL proficiency using the American Sign Language Development: Receptive Skills assessment (Enns, Zimmer, Boudreault, Rabu, & Broszeit, 2013), English vocabulary using the fourth edition of the Peabody Picture Vocabulary Test (L. M. Dunne & D. M. Dunne, 2007), reading fluency using the Test of Silent Word Reading Fluency (Mather, Hammill, Allen, & Roberts, 2014), and reading comprehension and rate using the Gray Oral Reading Tests (Wiederholt & Bryant, 2012).

Data were analyzed through a linear examination of materials from the participant's arrival in the local school district until her graduation from high school to identify patterns in placements, transitions, and language access over time. When appropriate, data were compared with other information sources from the same time period to triangulate information (for example, the participant's test results corroborated by examination of school records) and to obtain a more accurate description of this DML's experiences in the public school system.

Three research questions were explored by the case study:

RQ 1: What factors affected Maria's experience as a DML in the U.S. educational system?

RQ 2: What test accommodations and instructional strategies were used with Maria that were different from those used with d/Dhh students?

RQ 3: Upon graduation, what were Maria's academic outcomes (i.e., grade point average, reading ability, language ability, and prospects for future education)?

Findings

RQ 1: What Factors Affected Maria's Experience as a DML in the U.S. Educational System?

Family Background

Maria's immediate family included two parents, eight siblings and their spouses, and a large and expanding number of nieces and nephews all living in the same neighborhood. The primary language of her home was Spanish, with English translation provided to monolingual English speakers by Maria's siblings and younger nieces and nephews who were bilingual. Family was central to her life, as was faith. Maria attended both Catholic services with her family and nondenominational deaf church services provided in ASL.

By SES measures, Maria's family would be classified as living in extremely impoverished conditions, and the effects of poverty were ever present. Her neighborhood had higher rates of crime, teen pregnancy, and single-parent homes than other areas in the urban district. Some of her siblings had dropped out of school to work as laborers. None of her siblings had applied to college. Even though Maria's parents had attended primary school in Mexico, they dropped out because they needed to contribute to the family livelihood. They did value education, however, and Maria's mother was her advocate throughout her educational experience. Maria's family were

longtime residents of the community who lived in the same Latino neighborhood throughout the present study. Her father was a laborer and her mother was a homemaker, caring for her children and grandchildren.

At school, ASL was Maria's primary language for learning, with English as her L2, because these were the languages used in the school. Spanish (her L3) remained the primary language of the home, with only two of her siblings being bilingual in Spanish and English. One positive outcome of the internationalization of English is that digital applications (apps) have been created to assist different language users in translating one language to another. At the time of the present study, Maria and her family and friends primarily communicated through text messages, using Google Translate between English to Spanish.

Initial Placement in the Neighborhood School

Upon Maria's arrival in her school district in 2001, the speech-language pathologist at her neighborhood school contacted a nearby university's deaf education program. The speech-language pathologist recommended that instead of being transferred to the urban school district's program for d/Dhh students, approximately 6 miles away, Maria should stay in the neighborhood school. The rationale was based on several factors, including the fact that the neighborhood school was the first entry point for Latino immigrants, and Spanish-speaking staff were available to work with families and explain the array of social services offered through the network of agencies and nonprofit organizations (e.g., English as a Second Language classes, GED preparation classes, food banks, employment referral). Also, Maria's mother, who wanted all her children to be together, did not want to separate Maria from the family unit. In addition, the neighborhood school staff believed that the local deaf education elementary program did not use up-to-date instructional methods appropriate for bilingual students and their families; nor did it have the social service networks the family needed. Moreover, the neighborhood school staff, many of whom were spoken-language bilingual specialists, felt that Maria should learn ASL as an L1 and reached out to the deaf education program to help accomplish this goal.

At the outset, the intention was for the child to attend a general education kindergarten class, and have the teacher and students learn ASL. Five undergraduate students majoring in deaf education were assigned to the classroom on a part-time basis to assist Maria in language development during the spring of 2002. In addition, Maria and her family received language therapy from the university's speech and hearing clinic adjacent to the neighborhood school. Graduate students majoring in speech-language pathology who had taken at least two semesters of ASL and minored in deaf education provided weekly therapy sessions. Twelve therapy sessions were provided after school, which focused on ASL vocabulary and fingerspelling acquisition. In addition, sign language instruction was provided for Maria's mother, who accompanied Maria to the sessions. Therefore, the first semester of Maria's education, in the spring of 2002, involved a collaborative effort to assist the child in staying in her neighborhood school near her family, even though Maria was the only deaf student in the school.

Initially, the graduate clinicians working with Maria's mother, who was monolingual in Spanish, began with basic ASL signs and alphabetic fingerspelling. They quickly discovered, however, that acquisition of fingerspelling would be a challenge because Maria's mother could not read or write in Spanish. The mother's progress remained slow, but this was not the case for Maria, who learned signs rapidly and enjoyed the games played during therapy sessions. A review of clinical records revealed that by the end of the spring semester of her kindergarten year, Maria was beginning to acquire a formal language system and her fingerspelling had advanced at a rapid rate. However, the records of the deaf education university students providing support in the inclusive kindergarten classroom were less optimistic. These students recommended that Maria be provided with a TODHH and an ASL interpreter because she was not able to access the language of the classroom through listening or speechreading when they were not present to provide instruction in ASL. Maria nevertheless remained without a TODHH throughout the spring semester. As summer approached, a university student volunteered to provide home-based instruction to the family. She was hearing and Hispanic, and spoke survival Spanish. Over the summer she introduced Maria's mother to the director of an early childhood program for d/Dhh students.

Placement in an Early Childhood Program for d/Dhh Children

As a result of the meeting with the program director, in the summer of 2002 Maria's parents enrolled her in a Christian-based early childhood program for d/Dhh children. Although Maria had already attended kindergarten in her neighborhood school, this new placement provided her with an accessible language and trained TODHHs

for the first time. Enrollment in this program allowed her to be immersed in a signing environment. This setting followed the philosophy of Total Communication and used Christian teachings as the basis of the curriculum. Approximately 35 children were attending the school when Maria enrolled. The director of the program spoke fluent Spanish, which made Maria's parents feel welcome. In addition, her parents appreciated the faith-based nature of the program. Maria reported during interviews that she felt safe and nurtured in this environment. She remained in this setting throughout the summer and fall semesters, but after her seventh birthday, in December 2003, she transitioned to the elementary school serving d/Dhh students.

Placement in the Deaf Education Mainstream Program

Maria remained in the district's mainstream program, with placements in self-contained and resource rooms with TODHHs, from 1st through 12th grades. The programs in this area were established in 1978 in the district's public elementary, middle, and secondary schools and have continuously provided educational services for d/Dhh students. Table 1 lists characteristics, including rating information, of each of the schools where Maria attended deaf education programs.

Communication philosophies in the deaf education programs varied widely; teachers had a great deal of autonomy regarding the communication approaches they used. In the elementary school, the overriding philosophy was the use of both ASL and English, but the actual use of the two languages depended greatly on the individual teacher and his or her ASL ability. All teachers were hearing, having learned ASL as a second language. One paraprofessional/interpreter, a child of Deaf adults, served as a fluent ASL model throughout Maria's experience in the elementary education program. During the interviews, Maria commented, "Without her, I would have been lost!" Most of the teachers used the standards-based general curriculum while making modifications for d/Dhh learners. In this context, Maria was mainstreamed for nonacademic classes, such as art, gym, and music, with an interpreter. This early inclusion experience in elementary school helped prepare her for middle school, where the number of courses in which she would be mainstreamed increased.

In the middle school program, services were provided by TODHH resource teachers who used a Total Communication approach. As a result, Maria was mainstreamed in several general education classes during her middle school years, returning to the resource classroom for tutoring, which consisted of individual instruction in language-specific courses. In contrast, the high school program functioned similarly to her elementary program, where Maria had been taught by TODHHs who were proficient in ASL. Unlike in middle school, Maria was educated primarily in self-contained deaf education classrooms for most content areas during high school. She was mainstreamed on a limited basis in arts-focused classes, which she enjoyed. However, Maria reported that high school was her least favorite academic experience, mostly due to social/peer relationship issues. In addition, anecdotal records revealed that sociocultural issues were ever present, such as the mismatches between the home culture and the school culture and between home languages and school languages, cultures of poverty, transportation issues, and her parents' low educational and literacy levels. These findings were consistent with the research findings presented in the literature review (National Center for Education Statistics, 2014a; Shonkoff & Garner, 2012). During an interview with Maria, we asked if she had ever considered attending the state school for the deaf, which was 3 hours away. She replied, "No, because it is so far away from my family." In Maria's life, family was clearly central, an outlook that has been found to be a positive influence on the educational attainment of Latino students (Jeynes, 2015). In May 2015, Maria graduated from high school having completed 13 years of public education in the United States.

Table 1
Characteristics of the Public Schools With Deaf Education Programs in the Case Study

Program type	*Grades served*	*Number of students receiving free or reduced-price lunches*	*Number of racially and ethnically diverse students*	*Schools' A–F report card, 2013–2014*
Elementary school	PK–5	89%	52%	D–
Middle school	6–8	65%	51%	C+
High school	9–12	57%	49%	B-

Note. Data are from National Center for Education Statistics (2014a), the schools' websites, and school rankings by the state department of education.

RQ 2: What Test Accommodations and Instructional Strategies Were Used With Maria That Were Different From Those Used With d/Dhh Students?

Assessments and Assessment Modifications for DMLs

After reviewing Maria's records and completing her interview, the second author met with middle and high school TODHHs and conducted semi-structured interviews regarding the accommodations and modifications of assessments and classroom instruction that DMLs received in their programs. Although the high school teachers reported that there was an ELL specialist who assessed all incoming ELLs, including DMLs, according to the interviewed teachers these assessments did not inform instruction or placement of these students—the scores were simply provided to the TODHH. Decisions about how best to instruct DMLs and recommendations for placement were made exclusively on the basis of teacher observation. Regarding state assessments, teachers reported that there were no special accommodations for DMLs beyond those typically received by all d/Dhh students (i.e., extended testing time, small-group testing, interpreted questions).

Academic Modifications for DMLs

Although initial assessment accommodations may not have focused on the needs of DMLs, the teachers reported that some accommodations were made in the middle and high school classrooms to support DMLs' language and literacy development. In the self-contained environment, DMLs received intensive one-on-one instruction, simplified texts, word banks for work sheets or tests, calculators, and tutoring from local Deaf adults. These accommodations were based on the TODHH's observations of the individual DML's language and literacy needs. Additionally, newer arrivals were enrolled in ASL classes to support their language acquisition.

Interviews revealed that the teachers recognized that the types of accommodations and modifications they provided might not be ideal for DMLs. The teachers stated that all students, and DMLs in particular, need increased access to and interaction with Deaf adults beyond what schools are capable of providing in the classroom. They felt that improving access to fluent language and cultural models would be beneficial to students' linguistic, cultural, and identity development. Some teachers stated that they would prefer that all students with limited language exposure, including DMLs, have a one-on-one bilingual instructor to provide focused support and language access in the classroom. Teachers also felt that more education for families, especially in terms of helping them understand the types of services they were entitled to and how to gain access to these services, was essential. This can be especially challenging for parents whose home language is not English. Finally, teachers reported a lack of availability of qualified interpreters as a critical issue. Interestingly, at no point did teachers mention their own knowledge or skills as a barrier to educating DMLs, the need for research-driven instructional strategies particular to the needs of DMLs, or their lack of evidence-based decisions regarding Maria's academic program.

RQ3: Upon Graduation, What Were Maria's Academic Outcomes (i.e., Grade Point Average, Reading Ability, Language Ability, Prospects for Future Education)?

In order to better understand Maria's levels of language and literacy achievement upon graduation from high school, we administered a series of assessments in the following areas: ASL proficiency, English vocabulary, silent reading fluency, reading comprehension, and reading rate. The results of these assessments are displayed in Table 2.

For Maria, a DML, ASL emerged as her primary language. However, it is important to note that the test used to measure ASL ability (ASL Development: Receptive Skills) is normed on ASL/English bilingual children, and only those up to age 13 years. Nineteen years old at the time of the present study, Maria was well beyond that point. On an assessment normed for 13-year-old d/Dhh students, she scored at the low end of average in ASL

Table 2
Maria's Standardized Assessment Outcomes

Test	*Raw score*	*Age equivalent (yrs.-mos.)*	*Grade equivalent*	*Percentile rank*	*Standard score*	*Descriptor*
ASL Development: Receptive Skills	30/42	—	—	—	95	Low average
Peabody Picture Vocabulary Test	106/132	6-5	K.8	< 0.1	43	Extremely low
Test of Silent Word Reading Fluency	88	9-3	4.0	< 1	63	Very poor
Gray Oral Reading Tests (Rate)	34/80	10-6	5.0	5	5	Poor
Gray Oral Reading Tests (Comprehension)	14/80	6-9	1.4	< 1	1	Very poor

proficiency. Because the assessment was not normed on DMLs, results should be interpreted with caution (see Pizzo & Chilvers, this volume).

Overall English literacy assessment results indicated that Maria was performing at or below the first percentile in all areas with the exception of reading rate. However, Maria's poor comprehension indicated that her actual reading rate may have been higher because she did not fully attend to what she read, a behavior noted by the second author during the assessment session. With the exception of the ASL proficiency assessment, all of the assessments were designed for hearing monolingual children; thus, results should be interpreted with caution.

There are many hypotheses that could explain why Maria scored poorly on English literacy: late exposure to an accessible language, inconsistent use of communication philosophies by her teachers, a lack of evidence-based instruction for students learning multiple languages, and a lack of assessments normed on multilingual learners. SES factors, which have been found to impede learning across many populations (Twitchell et al., 2015), may also have been influential.

In addition to the results of the administered assessments, we received a copy of Maria's state assessment results and high school transcripts. These transcripts indicated that from grades 6 to 12, Maria never received a failing grade; she received mostly A's throughout middle and high school. Her lowest grades were C's, received 10 times over 14 semesters, and she ranked 72nd out of a graduating class of 248.

A review of Maria's state assessment results since 2006 reveals the impact of the No Child Left Behind Act of 2001 on students. Forty-five separate state assessments were given to Maria between the ages of 11 and 19 years. Initially, she was given the same assessments that were administered to monolingual hearing students. However, when she turned 12, she was administered modified state assessments that used alternative portfolio assessment to document her learning. EOI state assessments revealed the following grade-level equivalents: 2.4 reading proficiency, 2.1 literacy proficiency, and 1.9 writing proficiency, which corroborated those scores we obtained through individualized testing.

Discussion

The present case study, which presents the experience of one DML educated in the United States after emigrating from Mexico, includes descriptions of her family and community, various placements and educational transitions, language and academic development, educational accommodations, and outcomes upon high school graduation. In the sections that follow, we address issues of language and communication, least restrictive environment (LRE), SES factors, and instructional and assessment needs.

Language and Communication

One of the most salient findings of the present study relates to the importance of Maria's language and communication needs. Maria needed intensive language immersion to develop a strong L1 base. During the interviews, her teachers never mentioned the need for extensive systematic exposure to address the language acquisition needs of DMLs; nor did they mention the need for students to acquire a heritage language when the language spoken in the home is not English. We believe that part of the reason for Maria's low English literacy scores is her partial exposure to multiple languages. In the home she communicated in written Spanish by texting with her family, while at school she was exposed to written English, sign-supported speech in the Total Communication environment, and ASL. In addition to experiencing the effects of inconsistent exposure and the lack of a program-wide language policy, Maria did not have access to a visual language until she enrolled in the early childhood program when she was 6 years old. Perhaps the presence of a strong language model in her early years would have allowed her to develop greater ASL proficiency. This could have been usefully accompanied by scaffolding and explicit discussion of how to use an interpreter because DMLs may not have the language proficiency to learn through an interpreter and many need an intermediary, such as a certified deaf interpreter or language mentor, to facilitate learning. In the case of Maria, as with many DMLs, the family most likely depended on the expertise of the educators who devised her IEPs to ensure appropriate educational placements and related services. Certainly, Maria's mother was always grateful for and appreciative of the services Maria received. Unfortunately, parents who are uninformed may not recognize violations of the Individuals With Disabilities Education Act (IDEA), nor understand their right to due process.

Least Restrictive Environment

Another highly salient finding of the present study relates to the issue of LRE. The decision regarding initial placement for Maria was not easy because of the complex nature of her family (i.e., monolingual Spanish-speaking parents, unknown immigration status, SES requiring coordination of social services, Maria's young age). The neighborhood school felt that the basic needs of the family needed to be addressed before Maria could be transferred to the deaf education program,

and the school devised a plan to address the child's needs by using community resources. In addition, LRE requires schools to consider placement of d/Dhh students in the general education environment with nondisabled peers to the maximum extent appropriate (Office of Special Education and Rehabilitative Services, 2003; U.S. Department of Education, n.d.), and the neighborhood school may have been compelled to comply with this provision. However, policy guidance issued by the U.S. Department of Education (1992) clarified the provision of free and appropriate public education (FAPE) to d/Dhh students, stating that schools should consider each child's unique communication needs. Furthermore, when IDEA was reauthorized as the Individuals With Disabilities Education Improvement Act Amendments of 2004, a mandate requiring discussion of special factors was added. For d/Dhh students this is addressed through development of *communication plans*, which are required as part of the IEP; see Section 300.324(a)(2)(iv). Communication plans address the language and communication needs of the child, opportunities for direct communication with peers and professional personnel, and direct instruction in the child's language and communication mode. Since 2004, most states have instituted a process requiring communication plans as part of the IEP process, and some states have expanded the provision to all children with hearing losses. For example, in 2013 the state of North Carolina enacted a law requiring that any child with any degree of hearing loss have a communication plan in place as part of the IEP (North Carolina General Assembly, 2013). Unfortunately, having started her education in the neighborhood school 2 years prior to reauthorization of IDEA, Maria probably did not benefit from the special factors provision until she was 7 years old, when she enrolled in the elementary program for d/Dhh students.

The issues surrounding LRE and FAPE in Maria's case were multifaceted. Because Maria's family was emigrating and in need of immediate social services, early decisions may have focused on the needs of the family. Between the language barriers and Maria's parents having received only a minimal education while in Mexico, it is possible that her mother and father did not understand the complex paperwork that is drawn up in an IEP meeting, nor Maria's FAPE rights. Sociocultural values of Latino parents who defer decisions to education professionals may also have been in play.

Sociocultural Factors

Maria bridged two cultures (Latino culture and Deaf culture) and used two languages (ASL and English); however, she did not understand the heritage language spoken by her family members. Since language, culture, and identity are linked, Maria felt that not knowing Spanish limited her participation in the family unit. In addition, Deaf Latino leaders have expressed the importance of heritage language development by Latino d/Dhh students (Arellano, 2014). Moreover, since family is central in Latino cultures, ways to facilitate heritage language acquisition should be investigated. Maria communicated with her family by texting, and it is possible that new technologies will facilitate heritage language access in the future (Beal-Alvarez & Cannon, 2014). Future research should be done to investigate these possibilities. In addition, consideration should be given to the potential salutary effects of collaboration between educators in the United States and educators in Mexico to improve the education of d/Dhh children in Mexico.

Instructional and Assessment Needs

The present case study points to the need for instructional strategies and assessments that are designed for DMLs. During interviews, the high school teachers acknowledged the limited resources and strategies they had in place to help DMLs succeed. The resources they had in place, such as the intake assessments by the ELL teacher, were not typically used to inform instruction, according to the teachers' own report. It is possible that because these assessments were given to all non-native English speakers when they transferred into the school district, they were inappropriate for DMLs and may not have provided the type of information that could help teachers plan these students' instruction. However, it is not appropriate that placement and instruction of a student population with such an intermediate need for language and literacy development be based solely on subjective teacher observation. Starting with promising bilingual practices, further research is needed to identify instructional strategies to improve outcomes for DMLs (Pizzo, this volume) and to identify appropriate accommodations, since standardized tests serve as gatekeepers for employment and higher education. We found no assessments available that would have reflected Maria's abilities in comparison to those of other DMLs. More efficient and better-focused use of appropriate testing may provide teachers with valuable information regarding DMLs' language and literacy abilities and needs (Pizzo & Chilvers, this volume).

Limitations of the Study

Although the present study provides rich information on the experiences of a Latina DML educated in the United States, it had several limitations. First, per the nature of case study methodol-

ogy, the findings focus on the experiences of one individual and may not be applicable to others. Second, the majority of assessments that were used to determine the participant's achievement levels at the time of the study were designed for monolingual hearing children, and may not have accurately reflected her abilities in comparison to those of other d/Dhh children or other DMLs. Third, although several teachers at the middle and high school level were interviewed, it would have been ideal to have input from the teachers who had worked with the participant in early intervention and elementary school, but due to time limitations and lack of access to teachers who had moved out of the district, this was not possible.

Recommendations

The following recommendations are based on our interpretation of the data collected in the present study.

- Ensure that newly arrived DMLs receive a FAPE in the LRE while considering their individual communication needs by developing communication plans during the IEP process.
- Ensure that DMLs have access to fluent language models immediately upon arrival at school. The school is responsible for coordinating resources (e.g., TODHHs, ASL interpreters, certified deaf interpreters, language mentors, ASL specialists) needed by the DML upon arrival.
- Value heritage languages and cultures in the classroom by giving opportunities for students to learn their heritage language; this maintains connections with the family and the students' culture, and helps students form their ethnic identity (Arellano, 2014).
- Provide accessible opportunities for parents to learn communication strategies to further develop their child's language proficiencies.
- Provide training to all teachers on appropriate accommodations and strategies to support DMLs in the classroom, including bilingual teaching strategies, cross-cultural sensitivity, advocacy techniques, and testing accommodations.

Conclusion

The availability of extant research on DMLs is extremely limited, and further research focusing on this population of students is vital. DMLs are the fastest-growing population of d/Dhh students in the United States (GRI, 2013). DMLs continue to arrive with a wide variety of language and educational experiences; they may not be fluent in any of the languages used in schools, spoken or signed. They may not be able to communicate in their heritage language, which can be isolating. It is our hope that this case study begins to shed some light on the DML experience and triggers systematic research focusing on how best to meet the needs of the DML population. For DMLs like Maria, educators must be knowledgeable of the student's unique needs as they relate to FAPE and LRE and work with families to ensure that they understand their rights, in addition to the unique language, communication, and academic considerations in the education and socialization of their children.

Note on Terminology

Hispanic and *Latino* are used interchangeably in the present article to describe individuals who have emigrated to the United States from Spanish-speaking countries.

Acknowledgment

Preparation of the present article was supported in part by a grant from the U.S. Department of Education, Office of Special Education Programs, Award No. H325K130221.

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Appendix

Interview Questions

Participant Questions[a]

1. Tell me about your family and when you moved to the U.S. from Mexico.
2. How do they communicate with you?
3. Looking back over the past 13 years, describe your educational experiences starting with when you first moved to the U.S.
4. Were there things your teachers did that helped you learn?
5. Were there things your teachers did that were not effective?
6. Remembering your favorite teacher, what were some things that made her effective?
7. When and in what subjects were you mainstreamed?
8. Describe your mainstreaming experience.
9. Tell me about learning through an interpreter.
10. What were your favorite classes in elementary school, middle school, and high school?
11. Do you recall any favorite experiences in elementary school, middle school, high school?
12. Did you ever consider attending the residential school for the deaf? Explain.
13. What would you consider your best subject? Weakest subject?
14. Think back to all of your classroom teachers to the teacher that helped you learn the most. What were the characteristics of this teacher? What did he/she do that was different? What made her/him more effective?
15. If you were the principal of a school, what would you change that would improve the education of Latino students?
16. What are your future goals/plans?

Teacher Questions

1. What educational supports and/or accommodations do you have in place for DML students above and beyond those that are typical for DHH students in general?
2. If money were not an issue, what types of supports or accommodations would you like to see included at your school for DMLs?
3. Do you think teachers need more preparation for working with DMLs, either at the preservice or in-service level?

Notes. DML= d/Dhh Multilinguistic Learner. DHH = deaf and hard of hearing.

[a] Interviewing of the participant was done in American Sign Language.