Preschool Predictors of Kindergarten Language Outcomes

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Abstract

The aim of the present study is to explore a variety of cognitive and social variables which are most relevant to children's linguistic success in an educational setting. The study examines kindergarten English language outcomes in classrooms containing monolingual English speaking children and bilingual children who speak English and one other language. Data from the National Center for Early Development and Learning Multistate Study of Pre-Kindergarten (2001-2003) regarding classroom and student characteristics were used for bilingual (N = 120) and monolingual (N = 534) children. Hierarchical regression analysis (Study 1) and path analysis (Study 2) were conducted to determine the cognitive and social variables present in preschool that are most predictive of English skills in kindergarten. The results of the studies demonstrate that social variables were important for both monolingual and bilingual children. Personality variables were more predictive for monolingual children, whereas teacher relationship variables were more important for bilingual children. Simple and routine adult interaction was predictive of English skills in both groups, which may indicate the importance of implicit learning over explicit instruction in early language acquisition. The present studies found different predictors of English language skills for monolingual and bilingual kindergarteners.

Keywords: bilingualism; language; quantitative; kindergarten; English; education.

Introduction

A long-standing question in the field of second language acquisition is the effect of early exposure to multiple languages. This question is gaining significance in educational practice as the world becomes increasingly globalized and children are increasingly exposed to multi-language situations (Buac, et al., 2014; Kaushanskaya, M., et al., 2014). The effect of early exposure is especially relevant when considering the best linguistic environment for children's academic success. The field has undergone dramatic changes in recent decades regarding assumptions about what makes a linguistic environment ideal for academic and educational success (Cirino, et al., 2007; Pena, 2012; Uccelli and Paez, 2007). Historically, it was assumed that exposure to multiple languages in early childhood hindered academic success by creating confusion (Byers-Heinlein, 2013; Bialystok, 2006; Hambly, et al., 2013; Pena, 2012). In the last several decades, research has indicated that multi-lingual children show higher levels of performance in many areas. For example, Kovaks and Mehler (2009) demonstrated that infants who have been exposed to multiple languages show increased cognitive control prior to speech development (Brito and Barr, 2012; Cattani, et al, 2014; Dixon, et al., 2012). Executive functioning ability has been shown to increase in bilingual children and adults (Bialystok, 2011; Bialystok, Craig, & Luk, 2008; Bialystok, et al. 2014), especially in the domains of executive function that require individuals to successfully divide attention between conflicting stimuli (Carlson & Metlzoff, 2008). Evidence has recently suggested that bilingualism may even serve as a protective factor against declines in older age (Bialystok, 2011; Luk et al., 2011; Bialystok, et al., 2014; Fernandes, et al., 2007; Siyambalapitiya, et al., 2009).

While there is clear evidence supporting benefits to multi-lingual exposure across the lifespan (Brito and Barr, 2012; Bialystok, et al. 2014; Fernandes, et al., 2007), there are also challenges that bilingual language learners face (Bialystok, 2006; Byers-Heinlein, 2013; Carlson and Meltzoff, 2008). Perhaps the most daunting of these involves the best practices for educating children who are exposed to multiple language environments, especially when a child is being educated in his or her non-dominant language (Bialystok, 2006; Byers-Heinlein, 2013). Carlson and Meltzoff (2008) show that while bilingual kindergarteners show superior performance in executive functioning compared to their monolingual peers, children who had been recently immersed in a second-language kindergarten program did not show this superiority effect (Cirino, et al., 2007). This suggests that the benefits to bilingualism only arise once a child shows some degree of mastery over both languages. For children experiencing their second language only after entering a formal educational setting, this phenomenon may substantially decrease the child's ability to succeed in school-based achievement.

Other authors have pointed out the importance of continuing linguistic development in both languages, to the extent that meta-linguistic understanding of the first language serves to bootstrap further learning of the second (Collier, 1989; Hambly, et al., 2013; Lunden and Silven, 2011; Pena, 2012). It is thought that the process of limiting linguistic mastery in the first language also dampens the individual's ability to demonstrate proficiency in the second, a process known as limited or subtractive bilingualism (Bialystok, 2006; Byers-Heinlein, 2013; Cummins, 1979, 1981; Hall, Cheng, & Carlson, 2006; Lambert, 1984). This is related to extra-linguistic factors such as the value placed by the individual on the culture associated with each language and self-esteem (Chen, 2013; Landry & Allard, 1993; Landry, Allard, & Deveau, 2009). Phenomena such as limited bilingualism may be especially relevant for children entering a formal education setting in terms of the social relationships that are concurrently being formed with peers and teachers.

Little research has attempted to ascertain exactly which elements of language experience are most relevant to school success. To narrow down potential variables, one can borrow from the

literature on first language acquisition. The current psycholinguistic literature endorses several variables as viable contributors to language development in typical early childhood (Brito and Barr, 2012; Byers-Heinlein, 2013; Kirkham, Slemmer, & Johnson, 2002; Slemmer, & Johnson, 2002). Several of these variables are related to low-level perceptual-motor skills and are typically associated with language development in early infancy (Brito and Barr, 2012; Byers-Heinlein, 2013; Garcia, et. al, 2007). For example, it is known that very young infants can learn novel word boundaries based on co-occurrence statistics after only minutes of auditory input (e.g. Gomez & Gerken, 2000; Kirkham, Slemmer, & Johnson, 2002; Sabbagh & Gelman, 2000; Saffran, Aslin, & Newport, 1996; Saffran et al., 1997).

Motor Skills

Conway et al. (2011) assessed children's fine motor skills using the sequential finger-tapping task of the Developmental Neuropsychological Assessment (NEPSY) (Korkman, Kirk, & Fellman, 1998). This task requires children to tap each finger against his/her thumb in sequential order. Children are timed until they correctly repeat the task a given number of times. Conway et al. assessed deaf children with cochlear implants, who often show language delays even after partial hearing is restored through cochlear implantation. The authors found that children's language skills were significantly correlated with their scores on the finger-tapping task.

Other studies have examined this relationship in children with other language deficiencies (Bird, et al., 2008; Highman, 2013; Peeters, et al., 2009), such as dyslexia. Viholainen and colleagues (2002) performed a cluster analysis on children at risk for developing familial dyslexia and children not at risk. They used a battery of tasks designed to measure early motor skills. They found that with children who were not at risk for dyslexia, three clusters emerged associated with fine motor development, and both fast and slow gross motor development. However, for the children at risk for dyslexia, only two clusters emerged, associated with fine motor development and gross motor development. Other work has demonstrated that children with L1 impairment showed delays on significant motor milestones, such as walking, along with significant abnormalities on MRI scans compared to typical language developing children (Aro, et al, 2009, Choudhury et al., 2007; Trauner et al., 2000).

Social Environment

Another broad area of research pertaining to children's success with language development concerns their social environment (Bridges and Hoff, 2014; Chen, 2013; Cattani et al., 2014). Language is clearly an interactive process. In fact, there are aspects of language acquisition that have been shown to be "unlearnable" through linguistic input alone. Kuhl, Tsao, and Liu (2003), have shown that for the acquisition of phonology, exposure to linguistic information may not be enough. In this study, live interaction of an infant with an adult was necessary for children to acquire phonology of an unfamiliar natural language. Perhaps the most telling result was that infants still showed the effects of the live exposure up to 1 month after the sessions had been extinguished. Furthermore, the experiment was replicated with televised or audio exposure to the second language (Kuhl, 2007; O'Doherty, 2009). The infants were able to learn more successfully through the video condition, which contained many similarities to the live interaction in the initial study such as the infants' ability to see the speakers' faces.

Another line of research examines "motherese," or the prosodic cues that are salient in infant directed speech that are believed to be partially responsible for the importance of social interaction for infant language learning (Kuhl, 2014; Mampe, 2009; Rivero, 2010). It is postulated that this specific type of adult-infant interaction plays an important role in infants'

ability to bootstrap auditory speech input to language rules. Motherese is characterized by the use of higher pitches, exaggerated intonation and stress, repetition of content words, and the use of simple sentences (Fernald & Mazzie, 1991). Merzenich and colleagues (1996) and Tallal and colleagues (1996) have both shown that altering auditory features of speech input can significantly help language delayed children improve their speech skills. Though these studies did not use motherese, the features that were altered in the speech streams were chosen to coincide with common exaggerations seen in motherese (e.g., lengthening phonemes). Likewise, when adults who were trying to learn a second language were exposed to inputs that mimicked motherese, their learning was facilitated (McClelland et al., 1999). Even computer models, though unable to master phonology completely, improved when inputs were altered to reflect motherese (Kitamura, et al. 2014; Rabiner & Juang, 1993). Evidence suggests that children naturally show social imitation in broad contexts, which may be implicated in language acquisition (Roseberry, 2014; Tare, 2011). For example, Kuhl and Meltzoff (1996) showed that infants at 12, 16, and 20 weeks old were more likely to babble using vowel sounds they had recently heard, indicating linguistic imitation at only a few months of age.

These social variables are demonstrated in early infancy, though there is reason to think that important social variables also extend to language development in school-aged children and adults. In these areas of the literature, the language learning situation is often described in terms of individual or social factors (Bridges and Hoff, 2014; Chen, 2013; Palermo and Mikulski, 2014; Pierce, 1995). For example, Pierce (1995) describes how a second language learning adult may be described individually in terms of his or her motivation, anxiety state, self- confidence, or introversion/extroversion. On the other hand, his or her social context may be described in terms of the relationship between the second language learning group and the dominant language group (Cattani et al., 2014; Dixon et al., 2012; Buac, et al., 2014). In a classroom setting, this may be the relationship between the second language learner and his/her monolingual peers or teachers.

Present Study

Taken together, the literature on first language acquisition suggests that there may be at least two important contributors to language development. Cognitively, it is necessary that children possess the low-level cognitive capacity to parse auditory input to make sense of the sounds in their environment. These low-level cognitive variables may be measured in terms of motor skills at both the fine and gross level. Socially, it is necessary that children be exposed to the type of social environment appropriate for social imitation and language learning, and must be examined at both the individual and social level. However, these predictors of language development have never been studied together and have never been looked at in children experiencing different language learning conditions. The aim of the present study is to systematically examine the effects of motor skills and social environment on language learning.

Method

Participants

The data analyzed in this study were taken from the National Center for Early Development and Learning Multistate Study of Pre-Kindergarten, 2001-2003, a part of the Child Care and Early Education Research Connections project (Clifford et al., 2009). This early development initiative collected data from schools in Illinois, Kentucky, Ohio, Georgia, the L.A. and Central Valley regions of California, and the New York City and Albany regions of New York. Preschools receiving state funding were randomly selected to recruit volunteer participants. For the present study, data were used for child participants whose parents reported that they spoke both English

and another language in kindergarten (bilingual group, N = 120) or only English (monolingual group, N = 534). Ages of the participants were not reported in the original data.

Measures and Procedure

The children were administered a battery of tests throughout their enrollment in preschool and in kindergarten. In the present study, data were used from the Classroom Assessment Scoring System (Pianta, La Paro, & Hamre, 2004), which is a classroom observation measure used to assess a child's experience within a classroom. In this analysis, data were used only from the observations that occurred in the child's preschool classroom during the fall semester. The variables from this measure include characteristics of the child's engagement in different types of simple cognitive activities as well as their engagement with their teacher and other adults in the classroom. The occurrences of behaviors are scored for the number of times they occur over a 20-second period. Each child in this sample was observed for an average of 51.1 20-second intervals. Teacher ratings of children's social skills were also used via a questionnaire designed by Hightower (1986). Only factors relating to the children's social skills were used for the present analyses. The data for this assessment was collected during the fall of the child's preschool year. The last measure used was the Oral and Written Language Scale (OWLS) (Carrow-Woolfolk, 1995) which was administered during the spring of the child's kindergarten year. This measure is used to assess a child's ability to use and understand spoken English.

Analyses

Two hierarchical regression analyses and two path analyses were conducted, one each on the bilingual children and one each on the monolingual children. The dependent and independent variables tested were identical for the two regression analyses and the two path analyses. All analyses were conducted using the software SPSS 18th Edition (SPSS Inc, Chicago, IL).

In the hierarchical regression analyses, four models were tested predicting the children's OWLS scores in Kindergarten. All of the independent variables included in the models were assessed during the fall of the child's preschool year. The first model included demographic variables: the child's gender, the child's family income, and the child's mother's level of education. The second model additionally included basic cognitive factors observed during the Snapshot classroom assessment: the time the child spent engaged in fine motor skills, gross motor skills, and letter/sound activities. The third model included variables related to the child/teacher relationship: the amount of simple or routine engagement the child had with an adult in the classroom, the time the teacher spent engaged with the child didactically, the time the teacher spent engaged with the child in a second language, and the amount of encouraging and scaffolding the teacher provided the child. The fourth model included specific personality characteristics of the child that may affect how much he/she engages socially with other people. These variables included the preschool teachers' ratings of the child's competence, assertiveness, and peer social skills using the Hightower questionnaire.

As mentioned, the two path analyses were conducted the hierarchical regression analyses. The aim of the path analyses was to further explore the relationship between the social variables present in Models 3 and 4 of the hierarchical regression analyses. It was hypothesized that both mother's education and family income would influence how children would be rated by their teachers in competence, assertiveness, and peer social skills. These factors, along with adult routine/simple interaction, teacher encouragement/scaffolding, teacher didactic engagement, and teacher engagement in a second language would predict OWLS scores in kindergarten. Additionally, it was predicted that mother's education would have a direct effect on OWLS

scores. As in the hierarchical analyses, two separate path analyses were conducted for monolingual and bilingual children.

Results

The results of the hierarchical regression analyses can be seen in (Table 1). For the monolingual children, each of the four models tested was a good fit, as shown by an analysis of variance (all p's < .001). Models two and three, containing perceptual motor and teacher relationship variables, did not significantly contribute to the variance explained (ΔF = 0.16, p > .10 and ΔF = 2.20, p> .05, respectively). Model 4, however, which added in personality characteristics important for the child's engagement in social interaction, explained significantly more variance than the demographic characteristics, cognitive factors, and teacher relationship factors alone (ΔF = 13.45, $p \leq .001$; R^2change = .06) and accounted for 21.5% of the overall variance. The variables in model 4 that significantly contributed to the explained variance were family income, mother's education, simple and routine adult interaction, the preschool teacher's ratings of the child's competence, and the child's level of assertiveness.

Table 1. Hierarchical Regression Analysis Predicting Language Scores of Monolingual Children

	Monolingual Children			
	Model 1	Model 2	Model 3	Model 4
Child's Gender	-1.44	-1.43	-1.52	-0.62
Mother Educ	2.43***	2.42***	2.34***	1.92***
Family Income	0.54***	0.54***	0.53***	0.50***
Fine Motor		-2.21	-2.82	-2.65
Gross Motor		-4.93	-3.48	-8.07
Letter/Sound		1.17	1.72	-1.95
Adult Routine Interaction			12.18*	12.58*
Teacher Scaffolding			5.00	2.76
Teacher Didactic			-9.01	-9.19
Teacher 2nd Lang			-25.12	-25.63
Child Competence				3.55*
Child Assertiveness				1.91*
Child Social Skills				-1.59
F Change	28.43***	0.16	2.20	13.45***
R^2 Change	.139	.001	.014	.061

Table 2 shows the results for the bilingual children. Each of the models tested had moderately good fit (all *p's* < .05). Like the previous analysis, Model 2 did not significantly contribute to the explained variance in OWLS scores (ΔF = 1.09, $p > .10$). However, Models 3 and 4 were significant (ΔF = 2.59, $p \leq .05$; R^2change = .09; ΔF = 3.37, $p \leq .05$; R^2change = .08). The final model accounted for 30.8% of the overall variance in OWLS scores. In the final model, the amount of simple and routine adult interaction positively predicted OWLS scores, while the level of teacher engagement and scaffolding negatively predicted OWLS scores.

Table 2. Hierarchical Regression Analysis Predicting Language Score of Bilingual Children

	Bilingual Children			
	Model 1	Model 2	Model 3	Model 4
Child's Gender	-2.50	-2.33	-3.13	-2.47
Mother Educ	1.85	1.94	1.84	1.27
Family Income	0.75*	0.83*	0.79*	0.62
Fine Motor		-20.49	-15.73	-4.86
Gross Motor		-30.03	-37.32	-44.56
Letter/Sound		6.27	-0.46	5.85
Adult Routine Interaction			35.17*	40.08*
Teacher Scaffolding			-27.47*	-30.54**
Teacher Didactic			6.80	14.52
Teacher 2nd Lang			-19.96	-24.64
Child Competence				4.55
Child Assertiveness				0.07
Child Social Skills				0.91
F Change	3.83**	1.09	2.59*	3.37*
R^2 Change	.107	.030	.090	.081

* Indicates significance at the .05 level.
** Indicates significance at the .01 level.
***Indicates significance at the .001 level.

Interestingly, both sets of results implicate the importance of social interaction during language development in the preschool and kindergarten years. Whereas for monolingual children language appears to be more closely tied to individual personality traits indicating sociality, the success of the bilingual children was tied more closely to the relationship they experienced with adults in the classroom. Interestingly, the language skills of neither group of children were predicted by lower-level perceptual motor engagement.

The results of the two path model analyses can be seen in Figure 1 and Figure 2. As indicated by the hierarchical regression analyses, different patterns of results were seen for monolingual and bilingual children. For the monolingual children, family income and mother's education predicted competence, which in turn predicted OWLS scores; mother's education was directly related to

OWLS scores; and their simple and routine interactions with adults in the classroom predicted OWLS scores (p's ≥ .05). Overall, 17.5% of the variance in OWLS scores was explained. For the bilingual children, the demographic variables were not predictive of social personality characteristics (all p's > .05). Likewise, the personality characteristics were not significantly predictive of OWLS scores (all p's > .05). However, mother's education, simple and routine interactions with adults in the classroom, teacher encouragement and scaffolding, and teacher engagement in a second language were all predictive factors in OWLS scores in kindergarten (all p's ≤ .05).

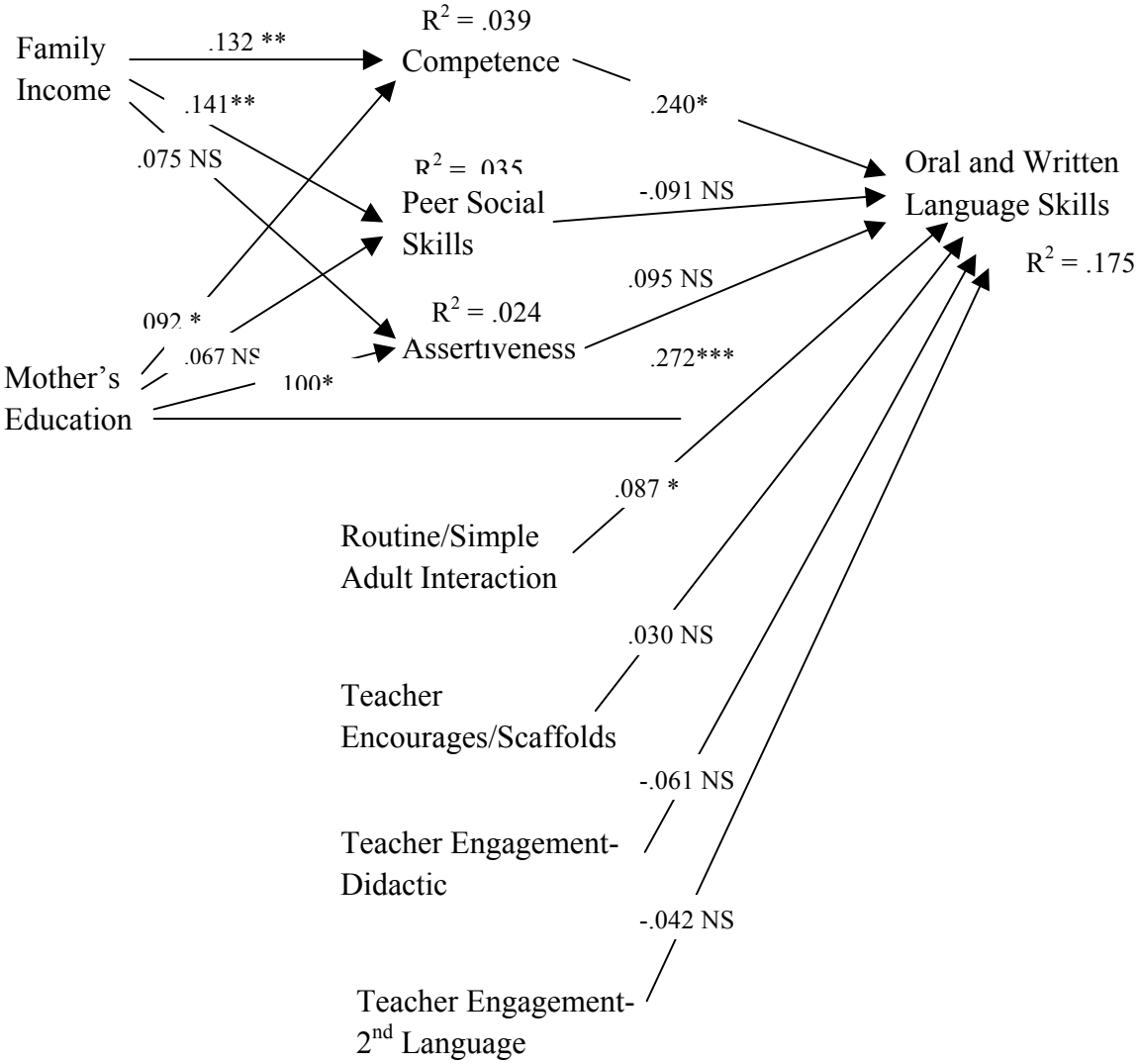

Figure 1. Path Analysis Predicting Language Scores of Monolingual Children

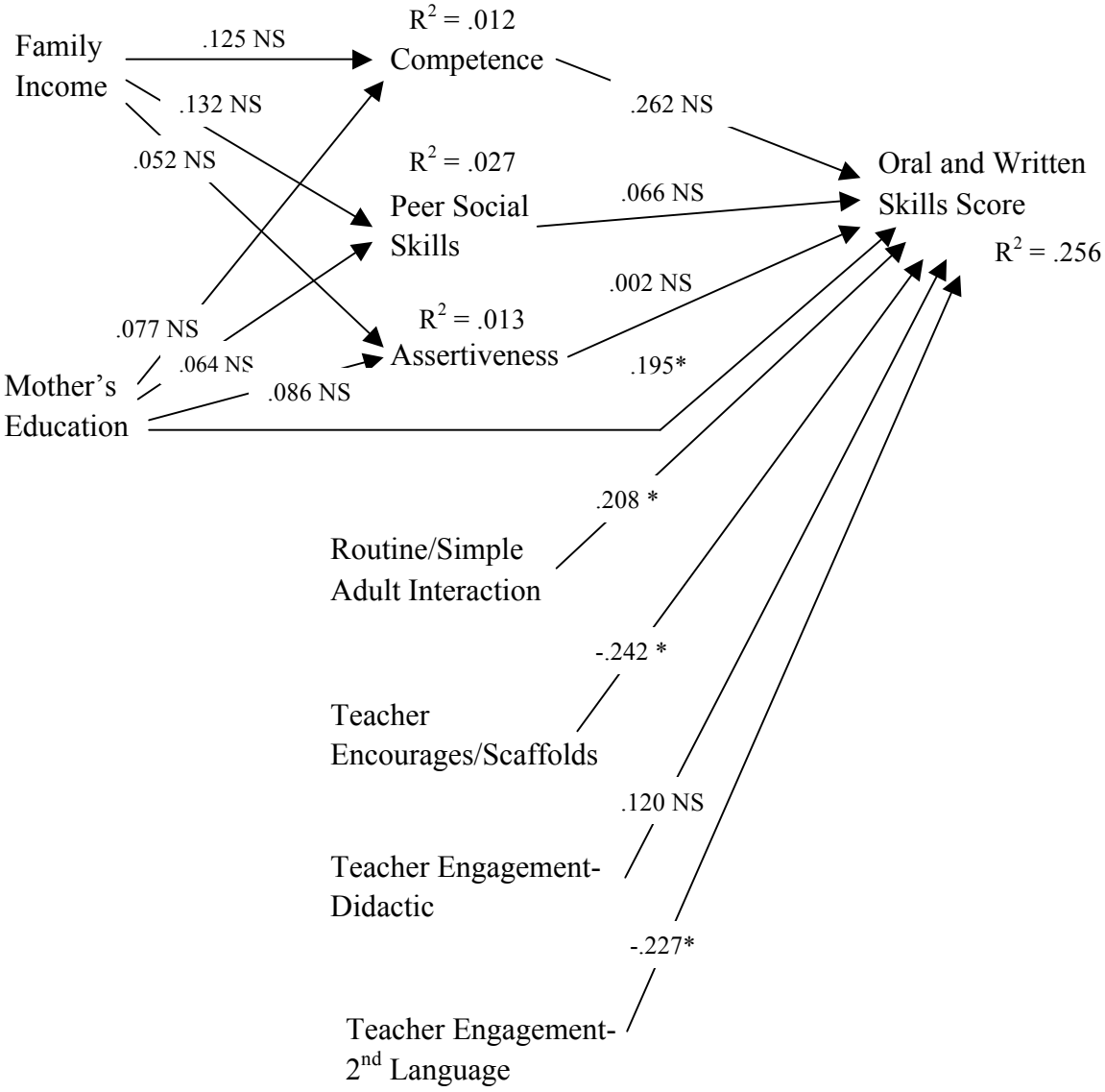

Figure 2. Path Analysis Predicting Language Scores of Bilingual Children

Discussion

These findings have several implications for language learning in monolingual and bilingual children. First of all, in both groups of children, the child's engagement in fine and gross motor activities, as well as sound/letter activities were not predictive of kindergarten language outcomes in the hierarchical regression analyses. This finding indicates that, according to this set of analyses, the time spent engaged in important, but cognitively "low-level" activities did not affect language outcomes for the children. This is surprising, considering that previous research has suggested that children with language impairments may also have impairments in motor tasks (Conway, Pisoni, & Kronenberger, 2009; Marton, 2009; Viholainen et al., 2002). However, the lack of a statistically significant outcome is likely due to a lack of sensitivity in the measure of motor skills used in the current study. The predictions made in Conway, Pisoni, and Kornenberger (2009) specifically involved *sequential* motor skills. The key to the previous

findings likely lies in the sequential nature of the tasks examined. The sequencing aspect of the tasks was not present in the analysis being reported.

On the other hand, Viholainen and colleagues (2002) demonstrated that in typically developing children, further distinctions may be more useful than a simple classification of motor skills into "fine" and "gross" motor skills. This distinction was not present in the data set.

Given the base of literature showing that language acquisition begins with very basic, automatic parsing of sounds into semantic and syntactic units, (e.g. Saffran, Aslin, & Newport, 1996; Izura, 2011; Mampe et al., 2009; Saffran, 2003) one would likely assume that activities involving fundamental units of language, such as letter/sound activities, would be important for language development. However, the finding in the current study implies that this is not the case. Perhaps in early infancy, low-level perceptual/motor skills allow language acquisition to be possible for young humans, but this need disappears as more complex cognitive skills emerge. Another possibility is that as language bootstraps onto domain general knowledge of rule structure and semantics, the relationship between perceptual/motor skills and language disappears.

However, the most important conclusion of the present study is the role that social interaction plays in language development. Recently, Kuhl (2003) demonstrated that in early infancy children may need social interaction to acquire even basic language components such as phonology. The present findings support this claim at an even older age. Social interaction was important for the language skills of both bilingual and monolingual children (Palermo and Mikulski, 2014; Roseberry, 2014; Tare and Gelman, 2011).

However, for the monolingual children, personality characteristics that may allow them to engage more freely in language interactions with others were predictive, whereas the most important factor for bilingual children was the relationships with adults in the classroom, though in some cases these relationships were inverse. Both experiments showed that simple adult interaction positively predicted OWLS scores regardless of the child's language status. This finding indicates an important relationship between adult engagement and language outcomes for all children, regardless of their language experience. However, there was an inverse relationship between teacher scaffolding/encouragement and OWLS scores and between second language engagement and OWLS scores for the bilingual children. While this finding may seem surprising, two possible explanations exist for this pattern of results.

The first involves methodological issues in developmental research. One explanation of the results of the path model is that children who have poorer language skills need more scaffolding and second language interaction in the classroom than children who can use language more efficiently. Thus, the negative predictive power seen for teacher scaffolding and engagement in a second language may be an artifact of the observation. Instead of interpreting the result as teacher scaffolding or second language engagement leading to poor language outcomes, it is as likely that the OWLS scores of poor language learners were already depressed, and therefore correlated strongly with teacher scaffolding and second language engagement, as the educator attempted to engage these students in classroom activities.

The other explanation involves the use of lower level perceptual motor processes already alluded to in this section. Informal interactions with adults lend themselves to implicit processing and implicit learning of the abstract structure of language. Teacher scaffolding and engagement in a second language, on the other hand, are more likely to take the form of explicit instruction about language or another academic area. Thus, in keeping with cognitive theory on language learning, it is possible that this pattern of results reflects the gains apparent in implicit language learning

(Buac, et al., 2014; Highman, 2013; Peeters, 2009). It has been shown that structures that are typically learned implicitly, as in the case of an artificial grammar mimicking a simplistic natural language grammar, are more difficult for people to learn when they try explicitly to look for patterns in the stimuli (Reber et al., 1980). For monolingual children, in whom the abstract rule structure of English is already rigidly engrained, this effect is not likely to be seen as strongly. For bilingual children, who are still learning the structures of the English language, informal interaction that allows them to pick up the rule structure outside of formal language training may be more effective to overall language outcomes than explicit instruction (Barac et al., 2014; Bridges and Hoff, 2014; Chen, 2013).

The finding that social personality characteristics were predictive of language scores for monolingual but not bilingual children is likely due to a relationship between sociability and language skills. On the one hand, children who are competent in English may be more likely to engage with peers, feel competent, or be assertive. On the other, children who possess these traits are likely to engage more with others, thereby enhancing their language skills. It is possible that this effect is bidirectional, with sociability scaffolding language and language scaffolding sociability. This pattern of results is consistent with the idea of limited or subtractive bilingualism laid out in an earlier section (Collier, 1989; Hambly, et al., 2013; Lunden and Silven, 2011; Pena, 2012). In the case of subtractive bilingualism, children from a second language speaking background may use social cues such as how valued their native language is by mainstream culture, to determine the level of investment placed in their native language(Brito and Barr, 2012; Cattani, et al, 2014; Dixon, et al., 2012). This is important because the continued growth of linguistic awareness in the first language appears to lead to higher meta-linguistic awareness across both languages (Collier, 1989).

In light of the present results, instruction in the classroom that warrants implicit interpretation is likely to be most effective in bilingual classrooms. This is similar to “submersion” or “immersion” language learning (Hammerly, 1987; Hickey, 2014). These methods use instruction in the student’s second language to help the student attain proficiency in that language. By being exposed to the second language in a naturalistic context, second language learners receive richer language input from which they can draw implicit language structure. Given the extensive work on a sensitive period for language, (e.g. Arshavsky, 2009; Bialystok, 2014; Brito and Barr, 2012; Hamby, 2013; Hernandez, Li, & MacWhinney, 2005), it follows that exposure to implicit rule structure may be even more important for young children learning a second language than for adult second language learners.

It also appears important for educators to embrace the concept of limited bilingualism, to ensure that students maintain their first language proficiency in order to bootstrap the second language, and attain school-based language proficiency (Cirino, et al., 2007; Pena, 2012; Uccelli and Paez, 2007; Brito and Barr, 2012; Byers-Heinlein, 2013; Kirkham, Slemmer, & Johnson, 2002 Collier, 1989; Cummins, 1979; Hall, Chang, & Carlson, 2006; Landry, Allard, & Deveau, 2009).

Limitations and Future Directions

One caveat to the present study is that the participants were only tested in English. While using English language outcomes is an ecologically valid dependent measure, assuming that the children’s academic institutions predominantly use English for instruction and assessment, it may not reflect overall language skills. For example, a child who learned Chinese as a first language and learned English upon entering school may naturally lag behind monolingual English speaking children, but have superior meta-linguistic skills. It has been demonstrated that bilingual children score higher on tasks involving executive functioning (Bialystok et al., 2010; Morton, 2010), that

their overall vocabulary is at least equal to that of monolingual children (Hoff et al., 2011), and that growth in one language may transfer to growth in the other, indicating scaffolding between multiple languages (Davidson, Hammer, & Lawrence, 2011). Thus, the numerous advantages of being bilingual should not be overlooked. Instead, the results in the present paper should represent differences that bilingual and monolingual children face in English speaking classrooms.

Likewise, the present paper explores language growth over a roughly 1.5 year period of time. Though a 1.5 year period represents a large percentage of a child's life in preschool and kindergarten, much remains to be studied about language growth in later childhood. Whether monolingual and bilingual children develop to have similar language needs is an empirical question that remains to be seen. Thus, longer longitudinal studies as well as cross-sectional studies are necessary future work.

In summary, the present study demonstrates the importance of social interaction in early childhood language outcomes. Taken together, the analyses show that interactions with peers, teachers, and parents are important for language development, and may be especially important for the development of English language skills in bilingual children.

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