Role of prosody in language acquisition

Discuss the role of prosody (i. e. rhythm and intonation) in language acquisition, from early sound perception to sematic and syntactic development.

From muffled sounds heard within the womb to singing our favorite songs by memory, we humans have the astounding ability to acquire language. The remarkable thing is that we are born without full-blown language comprehension and production. How is it then that we steadily progress into competent speakers of our mother tongue? A big part lies in the prosody of our native language.

Although babies may not be able to speak, they begin to learn about language prenatally. Given that our auditory system is well developed in the womb, a fetus can process sounds as early as 28 weeks of gestation, according to Fernald in 2001 and Saffran and colleagues in 2006 (as cited in Brooks & Kempe, 2012, pg. 25). While speech sounds are muffled because the fetus is enclosed within the womb, preventing proper individual phoneme identification, there is still perception of rhythm and intonation (Brooks & Kempe, 2012, pg. 25). Rhythm and intonation are components of prosody, along with other sound features such as stress, pitch, loudness, and duration (Erekson, 2010, pg. 80). Newborns are then able to gain prenatal language experience with sounds made by their mothers and other people close by (Brooks & Kempe, 2012, pg. 25). Babies even have a preference for sounds that became familiar when they were in the womb. In a study by Mehler and colleagues in 1988 it was found that prenatal experience allowed babies to distinguish their native language from a foreign language (Brooks & Kempe, 2012, g. 28). In their study, which utilized sucking rate, French newborns could tell French sentences apart from Russian sentences, even when the

sentences were passed through a low-pass filter to make them sound like they would be heard from within the womb (Brooks & Kempe, 2012, pg. 28). This study showed that newborn infants are sensitive to prosodic characteristics of language (Brooks & Kempe, 2012, pg. 28). Prosody has important implications in language acquisition even before an infant is born but also continues to be an essential tool throughout their early years when they begin to engage with more experience speakers.

Although infants pay attention to their surroundings and are taking in all the different sounds they hear, they are not the only active participants. When people interact with babies, they do not treat them in the same manner they would treat older children or adults. Instead, they expose them to a very distinct aspect of language known as infant-directed speech (IDS) or “ motherese” (Goswami, 2008, pg. 148). This special register helps facilitate language learning because of its exaggerated prosodic nature; this emphasizes the boundaries between words and phrases, thus making segmentation of the speech stream easier for babies (Goswami, 2008, pg. 148). According to Karmiloff and Karmiloff-Smith in 2001 baby humans learn the rhythm of their native languages from birth to 2 months of age (as cited in Falk, 2004, pg. 495). During this time infants pay special attention to their language input and are particularly interested in IDS, which is characterized by simplified vocabulary, repetition, exaggerated vowels, higher tone, wider range of tone, and a slower tempo (Falk, 2004, pg. 495). These are important differences infants seem particularly sensitive to at young ages when prosody plays such a key in language acquisition. Aside from having characteristics based on the prosody of speech to help infants learn their

native languages, IDS seems to be universal; it is seen in all languages in cultures, implying that this prosodic way of speaking serves a developmental purpose (Goswami, 2008, pg. 154). Adults break down the language for babies to understand better, and doing so almost instinctively, showing the intuitiveness prosody has in language comprehension and production.

Prosody also helps babies learn a thing or two about syntax early on. According to Levitt in 1993, at 10 months infants start to babble in rhythms that are similar to the prosody of their language structure (as cited in Falk, 2004, pg. 496). Karmiloff and Karmiloff-Smith say this may be due to the vocal turn-taking that mothers and their babies engage in, helping the babies learn the “ rule” that conversationalists take turns speaking, as seen in their research in 2001 (as cited in Falk, 2004, pg. 496). Snowdon (1990) states that this “ social syntax” may help babies learn other rules that are preliminary to learning syntax, the proper arrangement of elements within sentences (as cited in Falk, 2004, pg. 496). IDS therefore helps teach babies syntax through phonological bootstrapping, which is fulfilled by paying attention to the correlations between the prosodic cues of IDS and linguistic categories, according to the works of Burnham et al. in 2002, Gleitman & Warner in 1982, Morgan in 1986 and Morgan & Demuth in 1996 (as cited in Falk, 2004, pg. 496). An infant’s perception of prosodic cues in relation with linguistic categories is essential to learn about phonology, the boundaries between words or phrases in their native tongue, and syntax (Falk, 2004, pg. 496). Prosody not only matters when it comes to learning the music of the first language learned but also seems to help teach other components of the language as well.

As infants grow older and gain more experience with language, they continue a path towards language mastery and more complicated language use. While young babies use prosody to help tell words apart, it isn't until they get older that prosody is fully used to tell syntactic relationships (Speer & Ito, 2009, pg. 94). However, there is mixed research as to when exactly children begin to use prosody to understand ambiguous sentences (Speer & Ito, 2009, pg. 94). A study in 2008 by Snedeker and Yuan found that children used prosodic phrasings of sentences to the syntax ' correctly' and perform an instrumental action (as cited in Speer & Ito, 2009, pg. 97-98). In their study they did a toy-moving scenario using sentences, such as ' You can tap the frog with the flower', with two disambiguating phrasings (Speer & Ito, 2009, pg. 97). Regardless of the prosodic phrasing, such as [You can tap the frog] [with the flower] versus [You can tap] [the frog with the flower], results showed that the children used the location of prosodic boundaries to interpret the correct syntax of the sentences (Speer & Ito, 2009, pg. 97). Additionally, prosody seems to help syntactic acquisition early on. In a study in 2014 by Hawthorne and Gerken, it was found that 19 month old infants treated prosodically-grouped words as more cohesive and constituent-like than words that straddled a prosodic boundary (pg. 420). Because syntactic constituency, groups of words that serve as cohesive units in sentences, is an important part in the early levels of syntax acquisition, prosody is seen as essential concept in language acquisition as a result (Hawthorne & Gerken, 2014, pg. 420). Although it may be debatable when syntax development exactly begins, a big puzzle piece to figure it out lies in prosody.

Prosody continues to help humans from infancy to childhood not only in the syntax of their language but also the semantics. In a study by Nygaard et al in 2008 it was investigated whether speakers were able to successfully make prosodic correlates to meaning across semantic domains and if they used these cues to interpret meaning of novel words (pg. 127). The study showed that listeners were able to match new words with their proper meaning significantly more if the prosody used matched the word correctly (Nygaard et al., 2009, pg. 127). With their findings, Nygaard and colleagues were able to support that speech has reliable prosodic markers to word meaning and that listeners use the prosodic cues of words to differentiate their meanings (Nygaard et al., 2009, pg. 127). New research is also finding prosody to be an essential component for semantic comprehension and development in children. It was previously suggested that children did not utilize prosody to figure out the meanings of new words. This was due to studies like Sasso's 2003 investigation using children age 4 years old and adults, where she found that the children did not readily use prosodic cues to determine the meaning of a new word like the adults did, even when instructed to do so (Sasso, 2003). However, recently in 2011, Herold and colleagues investigated whether children utilized prosodic correlates to word meaning when interpreting new words (Herold et al., 2011, pg. 229). They sought to examine if children would interpret a word spoken in a deep, loud, slow voice as referring to something larger than a word said in a high, quiet, and fast voice (Herold et al., 2011, pg. 229). It was found that by 5 years old children were successfully utilizing prosody to interpret meaning (Herold et al., 2011, pg. 236). In addition, there were differences in performances between 4 year old and 5 year old participants, suggesting a developmental change in

children’s ability to use prosodic cues to infer meaning (Herold et al., 2011, pg. 236). Herold and colleagues believed this may do to 4 year olds not yet able to understand that prosody can be used as a tool for novel word interpretation due to insufficient experience with prosodic information and meaning relations (Herold et al., 2011, pg. 236-237). While semantic development in children does not seem to be fully and effectively utilized before age 5, it seems to be on meet a critical transition at this point after children have a certain amount of exposure to their native language.

Many studies in linguistics and psychology demonstrate the multiple roles that prosody plays in the acquisition of language from prenatal infants to adults with fluency of their native language. What begins as sound that catches the interest of prenatal humans steadily becomes sound that serve a purpose in language comprehension. While research continues to explore the implications of prosody, there is no denying that it plays a vital and fundamental part in human language.

References

Brooks, P., & Kempe, V. (2012). Language Development (pp. xv-383). Chichester: BPS Blackwell.

Erekson, J. (2010). Prosody and Interpretation. *Reading Horizons* , 50(2), 80-98. Retrieved April 23, 2015, fromhttp://scholarworks. wmich. edu/reading_horizons/vol50/iss2/3

Falk, D. (2004). Prelinguistic Evolution in Early Hominins: Whence Motherese? *Behavioral and Brain Sciences* , 27(4), 491-541. Retrieved April 23, 2015, fromhttp://journals. cambridge. org. ezp. lib. rochester.

edu/action/displayAbstract? fromPage= online&aid= 276842&fileId= S0140525X04000111

Goswami, U. (2008). Cognitive Development: The Learning Brain (p. 457). Hove: Psychology Press.

Hawthorne, K., & Gerken, L. (2014). From pauses to clauses: Prosody facilitates learning of syntactic constituency. *Cognition* , 133(2), 420-428. doi: 10. 1016/j. cognition. 2014. 07. 013

Herold, D., Nygaard, L., Chicos, K., & Namy, L. (2011). The developing role of prosody in novel word interpretation. *Journal of Experimental Child Psychology* , 108(2), 229-241. doi: 10. 1016/j. jecp. 2010. 09. 005

Nygaard, L., Herold, D., & Namy, L. (2009). The Semantics of Prosody: Acoustic and Perceptual Evidence of Prosodic Correlates to Word Meaning. *Cognitive Science* , 33(1), 127-146. doi: 10. 1111/j. 1551-6709. 2008. 01007. x

Sasso, D. S. (2003). The developing role of prosody in novel word comprehension. (Order No. 1413020, Emory University). *ProQuest Dissertations and Theses* , 46-46 p. Retrieved April 24, 2015, fromhttp://search. proquest. com/docview/250019098? accountid= 13567

Speer, S., & Ito, K. (2009). Prosody in First Language Acquisition – Acquiring Intonation as a Tool to Organize Information in Conversation . *Language and Linguistics Compass* , 3(1), 90-110. Retrieved April 24, 2015, fromhttp://linguistics. osu. edu/files/Publication-Prosodyin First Language Acquisition. pdf