Journal of Child Language (2025), 1–10
doi:10.1017/S0305000925100196

CAMBRIDGE UNIVERSITY PRESS

BRIEF RESEARCH REPORT

It's Hey Jude, not Hey Jade: Input Variation and the Emergence of the Infant Lexicon

Helen Buckler[1] and Elizabeth K. Johnson[2,3]

[1]School of English, University of Nottingham, Nottingham, UK; [2]Department of Psychology, University of Toronto Mississauga, Mississauga, Ontario, Canada and [3]Department of Psychology, University of Toronto, Toronto, Ontario, Canada
Corresponding author: Helen Buckler; Email: helen.buckler@nottingham.ac.uk

(Received 20 February 2025; revised 09 June 2025; accepted 18 July 2025)

Abstract
A growing literature explores the representational detail of infants' early lexical representations, but no study has investigated how exposure to real-life acoustic-phonetic variation impacts these representations. Indeed, previous experimental work with young infants has largely ignored the impact of accent exposure on lexical development. We ask how routine exposure to accent variation affects 6-month-olds' ability to detect mispronunciations. Forty-eight monolingual English-learning 6-month-olds participated. Mono-accented infants, exposed to minimal accent variation, detected vowel mispronunciations in their own name. Multi-accented infants, exposed to high levels of accent variation, did not. Accent exposure impacts speech processing at the earliest stages of lexical acquisition.

Keywords: language acquisition; infant speech perception; lexical development; accents; linguistic diversity

1. Introduction

How infants acquire lexical representations has been the focus of a great deal of research. Many have argued that infants learn phonetic categories through tracking distributional statistics of the speech they hear (Maye et al., 2002; Werker & Curtin, 2005), and more recently that the acquisition of lexical representations goes hand-in-hand with phonetic representations (Feldman et al., 2013; Martin et al., 2013; Thiessen, 2007). But how do infants accomplish either of these tasks in the face of natural speech variation (Johnson & White, 2020)? Different talkers, emotional affect, gender, and accents all alter the acoustic properties of speech, and infants must learn to generalize over this surface variation when building lexical representations. Does the amount, or type, of variation infants receive in their speech input affect early speech development? Despite many studies demonstrating that young infants initially struggle to extract generalities from speech in the face of indexical variation (Houston & Jusczyk, 2000; Schmale et al., 2010; Singh et al., 2004), no previous study has investigated how exposure to real-life day-to-day acoustic-phonetic variation impacts the formation of lexical representations in infants under a year old. In the present study, we consider how naturally occurring accent variation affects 6-month-olds' lexical representations.

Once infants reach 1 year of age, exposure to multiple accents has been shown to have a measurable effect on speech development. Canadian 1-year-olds exposed to more than one variety of English show delayed recognition of familiar word forms relative to their mono-accent peers (van Heugten & Johnson, 2017), as do Norwegian-learning 1-year-olds exposed to multiple varieties of their native language (Kartushina & Mayor, 2023). The impact of exposure to multiple accents perseveres, and English-learning 20-month-olds exposed to two regional varieties of their native language only recognize words in the locally dominant variety and are less sensitive to mispronunciations of familiar words (Durrant et al., 2015; Floccia et al., 2012; see, however, van der Feest & Johnson, 2016). Likewise, English-learning 24-month-olds exposed to L2 varieties of English are slower to reognize words in the locally dominant variety of English than children exposed to only L1 English (Buckler et al., 2017). Even in adulthood, evidence of multi-accent exposure in childhood is still apparent (Chen et al., 2017). Clearly, exposure to greater accent variation has a notable impact on speech development, but can these effects be observed even earlier in development?

Most current models of infant speech development assume that in the first year of life, infants' word form knowledge is exemplar based, or at least tightly tied to the speech signal (Houston & Jusczyk, 2000; Maye et al., 2002; Singh et al., 2004; van Heugten & Johnson, 2014; see, however, Johnson & White, in press). The ability to cope with accent variation is often overlooked in developmental models (White & Johnson, 2025), though this ability is thought to develop slowly and to depend at least partially on the development of abstract speech sound categories (Best et al., 2009). Accordingly, one could predict that younger infants' word form knowledge would be more significantly affected by exposure to multiple accents than older infants' or young children's. But testing this possibility is hard; prior to their first birthday, infants know only a small number of words – all of which have only recently been acquired. The sound-structure of newly acquired words is argued to be only vaguely specified, both for infants (Hallé & de Boysson-Bardies, 1996) and adults (White et al., 2013). If all lexical representations, for all infants, are loosely specified at 6 months of age, how can we test whether infants exposed to more accent variation in their daily input store and/or process words differently than infants exposed to less accent variation?

One solution to this problem is to test infants on their ability to recognize their own name, which they have been shown to recognize as early as 4 months of age (Mandel et al., 1995). If there is any word in the infant's emerging lexicon that may be well-specified, their own name is a likely candidate as it is acquired early and is highly frequent in the input. Testing infants on their own name also gets around some potential difficulties caused by regional differences in families' vocabularies, which have not typically been controlled for in previous studies. For example, words like *cookie* or *diaper*, which have been used as stimuli items for young infants previously, would be unfamiliar to infants whose families use the words *biscuit* and *nappy* (cf. Bergelson & Swingley, 2012; van Heugten & Johnson, 2017). This issue is particularly pertinent when testing infants from different linguistic and cultural backgrounds and can be bypassed by testing infants on their own name, which should be familiar to all infants.

In the present study, we investigate the impact of exposure to accent variation on 6-month-olds' ability to detect mispronunciations of vowels in their own name. Based on previous studies, we expect that an ability to detect a mispronunciation will be demonstrated in a familiarity preference; infants who detect the mispronunciation will

https://doi.org/10.1017/S0305000925100196 Published online by Cambridge University Press

look longer to the correct pronunciation of their name than the mispronunciation (cf. Bouchon et al., 2015; Delle Luche et al., 2017; Mandel et al., 1995). We predict that infants with less exposure to accent variation in their input (that is, mono-accented infants) will detect mispronunciations of vowels in their own name, consistent with previous research demonstrating that infants of a similar age are able to detect vowel mispronunciations in their name (Bouchon et al., 2015). However, the crucial test in our study is how multi-accented infants respond to mispronunciations of their name. Given the growing evidence that exposure to multiple varieties of a language impacts lexical processing at older ages, including sensitivity to mispronunciations (Buckler et al., 2017; Durrant et al., 2015; Floccia et al., 2012; Kartushina & Mayor, 2023; van Heugten & Johnson, 2017), we predict that at this very young age infants will not prefer correct pronunciations over mispronunciations. That is, whereas infants exposed to a single accent of English are expected to look longer to correct pronunciations of their name compared to mispronunciations, we predict that infants exposed to multiple varieties will look equally long to the two pronunciation variants.

2. Method

2.1. Participants

Monolingual 6-month-olds were recruited from the Greater Toronto Area (>90% English exposure). The analysis includes data from 48 infants (19 females; M_{age} = 183 days, range = 166–203 days), with data from an additional 7 infants excluded due to fussiness. Infants in the Mono-accent Group (N = 24) had primary caregivers who learned English in North America before the age of five and spoke with a standard Southern Ontario accent (10 females; M_{age} = 181 days, range = 166–196 days). Infants in the Multi-accent Group (N = 24) had at least one primary caregiver with a perceptible accent (9 females; M_{age} = 184 days, range = 169–203 days). Infants who did not clearly meet the strict criteria of the mono-accent or multi-accent group were not included in the study.

The presence of a perceptible accent for infants in the multi-accent group was verified either by the experimenter if the accented caregiver accompanied the infant to the lab, or reported by the accompanying caregiver if relating to another caregiver. Since Canada has a 12-month parental leave policy, most infants in the study did not yet attend day-care. Parents and family members were their infants' primary full-time caregivers and able to accurately report their language input. The vast majority of accent exposure infants received came from within the home, either from their parents (n = 20) or grandparents who lived with them (n = 3). Of the 20 infants with accented parents, 8 additionally had regular and extended contact with accented grandparents and extended family. One child received their accent exposure solely from a non-family member. In this case, the infant had been in the full-time care (40 hours/week) of an accented nanny since 2 months of age. Infants were exposed to non-native accents (e.g. English learned in adolescence or later; n = 8; e.g., Filipino, Hungarian, Polish), regional accents (e.g. English learned outside of North America; n = 14; e.g., British, Jamaican), or a mix of both non-native and regional varieties (n = 2). Despite differences in accent input, all participants were monolingual (Mono-accent, $M_{EnglishExposure}$ = 98.5%, $SD_{EnglishExposure}$ = 2.99; Multi-accent, $M_{EnglishExposure}$ = 98.3%, $SD_{EnglishExposure}$ = 3.07). Participants were also well matched for socio-economic status as reflected in parental education levels. Parents' highest level of education was assessed on a 7-point scale, ranging from 1 (some high school) to 7 (post-graduate study) and there was no difference between the mono-accent

https://doi.org/10.1017/S0305000925100196 Published online by Cambridge University Press

and multi-accent groups (mono-accent $M_{\text{Education}} = 5.45$, $SD_{\text{Education}} = 1.18$; multi-accent $M_{\text{Education}} = 5.24$, $SD_{\text{Education}} = 1.37$). Detailed information about infants' language environment was collected orally via questionnaire during the lab visit by highly trained lab assistants.

2.2. Stimuli

All infants heard lists of repetitions of correct pronunciations (CPs) and mispronunciations (MPs) of their own name. MPs were created by changing the place, manner, or roundedness of the vowel in the stressed syllable of the name to result in a non-word, e.g. *Sam* became **Sim, Emily* became **Omily, Jemma* became **Jimma* (see Supplementary Materials for full details). Parents were asked if they used different versions of their child's name, and the most frequently used version was used as stimuli in the study (e.g. if the child's name was *Alexandra* but the family used *Lexie* more often, we used *Lexie* in the study). Crucially, caregivers listened to our stimuli and verified that the CP was accurate and that the MP did not correspond to any pronunciation that the infant may have previously heard. This ensured that CPs were familiar and MPs were truly mispronunciations for all participants.

CPs and MPs of each name were recorded by one of two female native speakers of Southern Ontario English. Multiple tokens of a name were recorded and the three most closely matched pairs of CP and MP tokens were used as stimuli. Lists of CPs and MPs were created that contained 18 repetitions of the name (6 repetitions of each token) and were exactly 30 s long. The order of the tokens within the list was pseudo-randomised ensuring that no token was repeated twice in succession. Acoustic differences between CPs and MPs in stimuli presented to the mono- and multi-accent groups were closely matched (see Supplementary Materials for acoustic information).

2.3. Procedure

Infants were tested using a variant of the Headturn Preference Procedure similar to Mandel et al. (1995) and Bouchon et al. (2015). Infants sat on their caregiver's lap in a dimly-lit sound-attenuating IAC booth. A blue light was mounted at eye level on the panel in front of the child, and red lights and loudspeakers were mounted on the side panels. A video camera was located below the centre light enabling the experimenter to monitor the infant's behaviour and control the experiment from outside the booth.

At the start of a trial the centre light would flash to get the infant's attention. Once the infant looked at the light the experimenter pressed a button and one of the side lights would start to flash. When the infant turned their head to look to the flashing light the experimenter would again press a button to start the presentation of the audio stimuli. The stimuli continued playing until the infant turned their head away for more than 2 s, or the end of the stimuli list was reached (30 s).

Each infant heard lists of correct pronunciations and mispronunciations of their own name. Each list was presented 6 times, for a total of 12 trials. Pronunciation and side of presentation were randomised. In no more than two consecutive trials was the same pronunciation heard or side of presentation repeated.

Caregivers wore noise-cancelling headphones and listened to masking music mixed with common names throughout the experiment. The experimenter was outside the booth and viewed the infant through a muted video-link.

https://doi.org/10.1017/S0305000925100196 Published online by Cambridge University Press

3. Results

Mean listening times to CPs and MPs were calculated for participants (Figure 1). A two-way ANOVA was conducted with Pronunciation (CP or MP) as a within-subject factor and Accent Group (mono-accent or multi-accent) as a between-subject factor. There was no main effect of either Pronunciation (F(1,46) = 0.5, p = .48) or Accent Group (F(1,46) = 0.16, p = .69), however, there was a significant interaction of Pronunciation x Accent Group (F(1,46) = 4.5, p = .04). Planned comparisons revealed that infants in the Mono-accent Group listened significantly longer to CPs than MPs of their own name (M_{CP} = 12.15 s, SD_{CP} = 4.08; M_{MP} = 10.55 s, SD_{MP} = 3.36; $t(23) = 2.3$, $p = .03$; 95% CI = [0.04, 0.81]; Cohen's $d = .42$), whereas infants in the Multi-accent Group listened equally long to both pronunciation variants (M_{CP} = 11.35 s, SD_{CP} = 3.89; M_{MP} = 12.15, SD_{MP} = 4.4; $t(23) = -0.9$, $p = .38$; 95% CI = [−0.63, 0.24]; Cohen's $d = -.19$). Within the multi-accent group, we found no differences in listening behaviour between infants exposed to regional or non-native accents.

To rule out the possibility that there were any confounds in the stimuli contributing to the effect we conducted two control experiments (see Supplementary Materials for details). Adults participated in an AB discrimination task, hearing correct and mispronounced tokens of all names used in the study. This addressed the concern that difference in pronunciation between correct and mispronunciations presented to the mono-accent group may have been larger, and therefore more noticeable, than mispronunciations of names presented to the multi-accent group. There was no difference between mono- and multi-accented infants' names, indicating that mispronunciations presented to both groups of infants were equally distinct. In addition, we ran an infant control condition to rule out the possibility that the correct pronunciations presented to mono-accented infants were more engaging or exciting to listen to than the mispronunciations. An additional group of mono-accented infants ($N = 24$) were tested on their preference for CPs or MPs of the stimuli used in the mono-accented condition. Crucially, the name they were tested on was not their own, that is, it was an unfamiliar name. They demonstrated no preference for the CP, indicating that the effect found in the test group of mono-accented infants (presented with their own name) was not due to the correct pronunciation being simply more engaging.

4. Discussion

As predicted, we found that by 6 months of age, infants with regular exposure to more than one accent in their daily lives show no preference for correct pronunciations over mispronunciations of their name, whereas infants exposed to a single accent do show a preference for correct pronunciations. Thus, exposure to accent-related variation in the home affects how infants respond to mispronunciations of highly familiar words in the lab. This finding is in line with past studies demonstrating that exposure to multiple accents has an impact on lexical processing in older infants and toddlers (Buckler et al., 2017; Durrant et al., 2015; Kartushina & Mayor, 2023; van der Feest & Johnson, 2016; van Heugten & Johnson, 2017). Importantly, our findings are unique in that they demonstrate the effect using a paradigm that only requires recognition and not comprehension. Furthermore, they demonstrate an effect of acoustic-phonetic variation on word-form representations at the very onset of lexical development.

So why do multi-accent infants not show a preference for correct pronunciations of their name? One possibility is that multi-accent infants had exposure to more variants of

https://doi.org/10.1017/S0305000925100196 Published online by Cambridge University Press

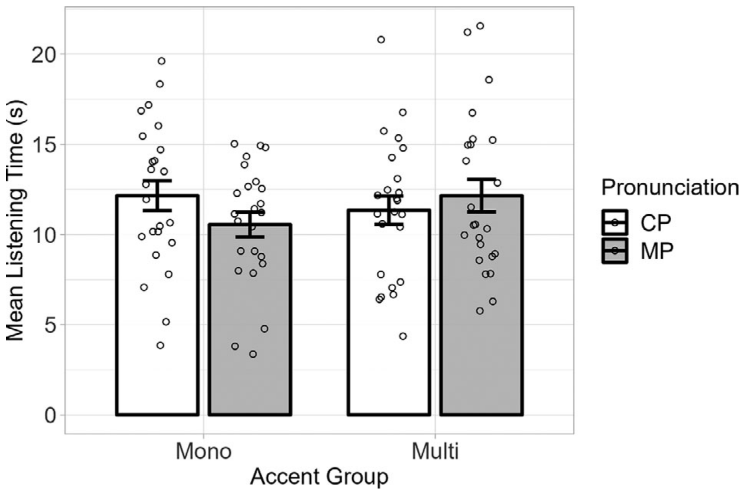

Figure 1. Mean listening time to repetitions of correct pronunciations (CP) and mispronunciations (MP) of names by infants exposed to Canadian English only (mono-accent group), or Canadian English and another variant of English (multi-accent group).

their name than mono-accent infants (e.g., Emmy, Emma, Emms; cf. Moore & Bergelson, 2024), but our discussions with parents regarding the names they used to refer to their children did not provide any support for this possibility. Thus, we consider what we view as three more likely explanations. One possibility is that multi-accent infants do not perceive the difference between the two pronunciations. Alternatively, they do perceive the difference, but it is not disruptive to them. The third possibility is that mono- and multi-accent infants respond differently to novelty in the task.

The first possibility, that multi-accent infants do not perceive the differences between the two pronunciations, is consistent with the explanation that significant exposure to multiple accents affects the specificity of lexical representations (cf. Durrant et al., 2015). This explanation assumes that infants with regular exposure to multiple accents will have less well-specified, or looser, lexical representations. The mispronunciations presented within this task fall within the bounds of their lexical representation of their name, that is, they match, and are therefore not perceived as a mispronunciation. Mono-accented infants, on the other hand, have more robustly specified lexical representations with tighter bounds of acceptability. For these infants, the mispronunciations do not match their representation and are perceived as distinct from the correct pronunciations. Multi-accent infants (like bilingual children, cf. Bosch & Sebastián-Gallés, 2003) hear more variable pronunciations in their input, which may lead to expanded lexical representations relative to infants exposed to less variable input. Studies of accent accommodation in toddlers (Schmale et al., 2015) and computational models (Feldman et al., 2013) provide support for this explanation.

The second possible explanation for our findings does not assume a difference in the specificity of the lexical representations themselves. Instead, it considers the possibility that what differs is how much attention infants pay to the fine phonetic detail of speech, and how this attentional difference impacts their lexical access. Multi-accent infants may have lexical representations that are similar in nature to those of mono-accented infants, however, due to their extensive exposure to variation in their input they are more accepting of forms that fall outside of these. This may be an early strategic adaptation to their environment; because they hear much variation, they recognize that the fine detail of speech may not always reliable and have learned not to depend on it for lexical access. Alternatively, the variation they hear in their input may make speech processing more cognitively demanding, such that they do not have the cognitive resources to focus on the fine phonetic detail (cf. the limited resource hypothesis and bilingual infants; Fennell et al., 2007; Stager & Werker, 1997).

The third explanation for our data stems from behavioural differences in how mono-accented and multi-accented infants respond to novelty within the task. The difference in listening times exhibited by the mono-accented infants has been interpreted as a familiarity preference; infants listen longer to correct pronunciations because they are familiar, and less long to mispronunciations because they are unfamiliar. However, multi-accented infants hear a greater variety of pronunciations in their daily lives, and they may simply enjoy the novelty of the mispronunciation presented in this study more than mono-accented infants do, though their enjoyment of the novel stimuli is not significant enough to reverse the direction of the effect to a novelty preference. Similar to mono-accented infants, they prefer the familiarity of the correct pronunciation, but do not reject the novelty of the mispronunciation to the same extent that mono-accented infants do. This is consistent with findings that the direction of preference is dynamic and can be influenced by various factors (Houston-Price & Nakai, 2004), and speaks to the recent view that bilingual infants prefer to attend to novel information due to the increased variability in their linguistic environment (Singh et al., 2024).

Data from the current study do not allow us to adjudicate between these explanations. However, they do establish a number of questions for future research. To tease apart questions relating to the nature of multi-accented infants' early lexical representations and how they are accessed, this study could be replicated using different research methods that do not rely on a preference response. Possible candidates may be the Conditioned Head Turn Procedure (Werker et al., 1997) or an ERP study (Parise et al., 2010) which measures a physiological response. More broadly, the present study raises questions about how multi-accented infants process language and the world around them. In discussing the present study we have drawn parallels between multi-accented infants and infants being raised in multilingual environments (cf. Fennell et al., 2007; Singh et al., 2024; Stager & Werker, 1997) due to the limited research available on multi-accented infants. But these parallels remain untested. Do multi-accented infants have limited resources to attend to fine phonetic detail (cf. Fennell et al., 2007)? How is the cognitive and linguistic processing of multi-accented infants adaptive to the nature of their environment (cf. Singh et al., 2024)? More work is needed to answer these questions.

The impact that exposure to accent variability has on early speech processing has important implications for understanding language acquisition in the real world and how researchers study it. Many children are being raised in multi-accented households and communities. This is particularly pertinent in large urban areas (e.g. Toronto, Paris), but is also true of smaller communities with pockets of linguistic diversity packed in a small geographic area (e.g. regional accent variation in the UK). Often, data about participants' accent exposure is either not collected or not reported (though the impact of exposure to accent variation on language acquisition has recently received more attention, cf. Buckler et al., 2017; Durrant et al., 2015; Johnson et al., 2022; van der Feest & Johnson, 2016). Inclusion of more heterogeneous groups of infants may mask significant group differences. Failure to account for this diversity in experimental work can give a false sense of the learning situation and feed inaccurate or incomplete data into theoretical models.

https://doi.org/10.1017/S0305000925100196 Published online by Cambridge University Press

There are also practical implications when we consider how this knowledge is applied in clinical or educational settings.

One final note concerns the difference in results for our mono-accented infants and a group of infants tested in the UK (Delle Luche et al., 2017). Here, we find that mono-accented Canadian English learning infants are sensitive to mispronunciations of vowels in their own name, whereas infants in the UK are reported to not be. Our study was not set up as a direct replication, and methodological differences prevent us making a direct comparison of results. However, we can speculate as to why these differences may arise. Notably, these infants are being exposed to different varieties of English with different socio-cultural-linguistic learning environments. For example, comparing the vowel systems of British English and North American English as documented by the International Phonetic Association (Ladefoged, 1999; Roach, 2004), British English is reported to have a more complex vowel system, with 22 vowels and diphthongs (Roach, 2004), compared to just 15 in North American English (Ladefoged, 1999). If, as we are arguing, the individual learning situations of infants impacts the early speech perception, then it is not surprising that North American and British infants differ. Nor is it a novel observation; differences between the two groups have previously been reported in relation to speech segmentation (Floccia et al., 2016) and vocabulary development (Hamilton et al., 2000). We should not assume that all speakers of the same language, for example, monolingual English-speaking children, will behave the same and have the same language environment because they are exposed to the same language (Johnson & White, 2020). We need to take variation in their environment seriously, whether this is at a community level (e.g. UK versus North American varieties) or individual level (e.g. mono- versus multi-accented infants as participated in this study) and report it clearly in our work.

In conclusion, the present study highlights the importance of taking real-life experience with accent variability seriously in laboratory experiments (Johnson & White, 2019). Our data clearly indicate that experience-based differences give rise to important differences in speech processing, even at the earliest stages of lexical acquisition. Understanding the impact that exposure to accent variation has on speech and language development is key to testing some crucial assumptions of current models of developmental speech perception.

Supplementary material. The supplementary material for this article can be found at http://doi.org/10.1017/S0305000925100196.

Funding statement. This research was funded by an NWO Rubicon grant awarded to Helen Buckler and SSHRC and NSERC grants awarded to Elizabeth K. Johnson.

Competing interests. The authors declare none.

Disclosure of use of AI tools. The authors declare no use of AI in conducting this research or preparing this manuscript.

References

Bergelson, E., & **Swingley, D.** (2012). At 6–9 months, human infants know the meanings of many common nouns. *Proceedings of the National Academy of Sciences*, **109**(9), 3253–3258. https://doi.org/10.1073/pnas.1113380109

Best, C. T., **Tyler, M. D.**, **Gooding, T. N.**, **Orlando, C. B.**, & **Quann, C. A.** (2009). Development of phonological constancy: Toddlers' perception of native- and Jamaican-accented words. *Psychological Science*, **20**(5), 539–542. https://doi.org/10.1111/j.1467-9280.2009.02327.x

Bosch, L., & **Sebastián-Gallés, N.** (2003). Simultaneous bilingualism and the perception of a language-specific vowel contrast in the first year of life. *Language and Speech*, **46**(2–3), 217–243. https://doi.org/10.1177/00238309030460020801

Bouchon, C., **Floccia, C.**, **Fux, T.**, **Adda-Decker, M.**, & **Nazzi, T.** (2015). Call me Alix, not Elix: Vowels are more important than consonants in own name recognition at 5 months. *Developmental Science*, **18**(4), 587–598. https://doi.org/10.1111/desc.12242

Buckler, H., **Oczak-Arsic, S.**, **Siddiqui, N.**, & **Johnson, E. K.** (2017). Input matters: Speed of word recognition in 2-year-olds exposed to multiple accents. *Journal of Experimental Child Psychology*, **164**, 87–100. https://doi.org/10.1016/j.jecp.2017.06.017

Chen, H., **Rattanasone, X.**, **Cox, F.**, & **Demuth, K.** (2017). Effect of early dialectal exposure on adult perception of phonemic vowel length. *The Journal of the Acoustical Society of America*, **142**, 1707–1716. https://doi.org/10.1121/1.4995994

Delle Luche, C., **Floccia, C.**, **Granjon, L.**, & **Nazzi, T.** (2017). Infants' first words are not phonetically specified: Own name recognition in British English-learning 5-month-olds. *Infancy*, **22**(3), 362–388. https://doi.org/10.1111/infa.12151

Durrant, S., **Luche, C. D.**, **Cattani, A.**, & **Floccia, C.** (2015). Monodialectal and multidialectal infants' representation of familiar words. *Journal of Child Language*, **42**(2), 447–465. https://doi.org/10.1017/S0305000914000063

Feldman, N. H., **Griffiths, T. L.**, **Goldwater, S.**, & **Morgan, J. L.** (2013). A role for the developing lexicon in phonetic category acquisition. *Psychological Review*, **120**(4), 751–778. https://doi.org/10.1037/a0034245

Fennell, C. T., **Byers-Heinlein, K.**, & **Werker, J. F.** (2007). Using speech sounds to guide word learning: The case of bilingual infants. *Child Development*, **78**(5), 1510–1525. https://doi.org/10.1111/j.1467-8624.2007.01080.x

Floccia, C., **Delle Luche, C.**, **Durrant, S.**, **Butler, J.**, & **Goslin, J.** (2012). Parent or community: Where do 20-month-olds exposed to two accents acquire their representation of words? *Cognition*, **124**(1), 95–100. https://doi.org/10.1016/j.cognition.2012.03.011

Floccia, C., **Keren-Portnoy, T.**, **DePaolis, R.**, **Duffy, H.**, **Delle Luche, C.**, **Durrant, S.**, **White, L.**, **Goslin, J.**, & **Vihman, M.** (2016). British English infants segment words only with exaggerated infant-directed speech stimuli. *Cognition*, **148**, 1–9. https://doi.org/10.1016/j.cognition.2015.12.004

Hallé, P. A., & **de Boysson-Bardies, B.** (1996). The format of representation of recognized words in infants' early receptive lexicon. *Infant Behavior and Development*, **19**(4), 463–481. https://doi.org/10.1016/S0163-6383(96)90007-7

Hamilton, A., **Plunkett, K.**, & **Schafer, G.** (2000). Infant vocabulary development assessed with a British communicative development inventory. *Journal of Child Language*, **27**(3), 689–705. https://doi.org/10.1017/S0305000900004414

Houston, D. M., & **Jusczyk, P. W.** (2000). The role of talker-specific information in word segmentation by infants. *Journal of Experimental Psychology: Human Perception and Performance*, **26**(5), 1570–1582. https://doi.org/10.1037/0096-1523.26.5.1570

Houston-Price, C., & **Nakai, S.** (2004). Distinguishing novelty and familiarity effects in infant preference procedures. *Infant and Child Development*, **13**(4), 341–348. https://doi.org/10.1002/icd.364

Johnson, E. K., **van Heugten, M.**, & **Buckler, H.** (2022). Navigating Accent Variation: A Developmental Perspective. *Annual Review of Linguistics*, **8**(1), 365–387. https://doi.org/10.1146/annurev-linguistics-032521-053717

Johnson, E. K., & **White, K.** (in press). Advancements in phonetics in the 21st century: Infant speech development. *Journal of Phonetics.*

Johnson, E. K., & **White, K. S.** (2019). Six questions in infant speech and language development. In P. Hagoort (Ed.), *Human Language: From Genes and Brains to Behaviour* (pp. 99–112). MIT Press.

Johnson, E. K., & **White, K. S.** (2020). Developmental sociolinguistics: Children's acquisition of language variation. *WIREs Cognitive Science*, **11**(1), e1515. https://doi.org/10.1002/wcs.1515

Kartushina, N., & **Mayor, J.** (2023). Coping with dialects from birth: Role of variability on infants' early language development. Insights from Norwegian dialects. *Developmental Science*, **26**(1), e13264. https://doi.org/10.1111/desc.13264

Ladefoged, P. (1999). American English. In *Handbook of the International Phonetic Association* (pp. 41–44). Cambridge University Press.

Mandel, D. R., **Jusczyk, P. W.**, & **Pisoni, D. B.** (1995). Infants' recognition of the sound patterns of their own names. *Psychological Science*, **6**(5), 314–317. https://doi.org/10.1111/j.1467-9280.1995.tb00517.x

Martin, A., **Peperkamp, S.**, & **Dupoux, E.** (2013). Learning phonemes with a proto-lexicon. *Cognitive Science*, **37**(1), 103–124. https://doi.org/10.1111/j.1551-6709.2012.01267.x

Maye, J., **Werker, J. F.**, & **Gerken, L.** (2002). Infant sensitivity to distributional information can affect phonetic discrimination. *Cognition*, **82**(3), B101–B111. https://doi.org/10.1016/S0010-0277(01)00157-3

Moore, C., & **Bergelson, E.** (2024). Wordform variability in infants' language environment and its effects on early word learning. *Cognition*, **245**, 105694. https://doi.org/10.1016/j.cognition.2023.105694

Parise, E., **Friederici, A. D.**, & **Striano, T.** (2010). "Did You Call Me?" 5-Month-Old Infants Own Name Guides Their Attention. *PLoS ONE*, **5**(12), e14208. https://doi.org/10.1371/journal.pone.0014208

Roach, P. (2004). British English: Received Pronunciation. *Journal of the International Phonetic Association*, **34**(2), 239–245. https://doi.org/10.1017/S0025100304001768

Schmale, R., **Cristia, A.**, **Seidl, A. H.**, & **Johnson, E. K.** (2010). Developmental changes in infants' ability to cope with dialect variation in word recognition. *Infancy*, **15**(6), 650–662. https://doi.org/10.1111/j.1532-7078.2010.00032.x

Schmale, R., **Sekerina, I.**, & **Cristia, A.** (2015). Mechanisms underlying accent accommodation in early word learning: Evidence for general expansion. *Developmental Science*, **18**(4), 664–670. https://doi.org/10.1111/desc.12244

Singh, L., **Barr, R.**, **Quinn, P. C.**, **Kalashnikova, M.**, **Rocha-Hidalgo, J.**, **Freda, K.**, & **D'Souza, D.** (2024). Effects of environmental diversity on exploration and learning: The case of bilingualism. *Journal of Experimental Psychology: General*, **153**(11), 2879–2898. https://doi.org/10.1037/xge0001562

Singh, L., **Morgan, J. L.**, & **White, K. S.** (2004). Preference and processing: The role of speech affect in early spoken word recognition. *Journal of Memory and Language*, **51**(2), 173–189. https://doi.org/10.1016/j.jml.2004.04.004

Stager, C. L., & **Werker, J. F.** (1997). Infants listen for more phonetic detail in speech perception than in word-learning tasks. *Nature*, **388**, 381–382. https://doi.org/10.1038/41102

Thiessen, E. D. (2007). The effect of distributional information on children's use of phonemic contrasts. *Journal of Memory and Language*, **56**, 16–34. https://doi.org/10.1016/j.jml.2006.07.002

van der Feest, S., & **Johnson, E. K.** (2016). Input-driven differences in toddlers' perception of a disappearing phonological contrast. *Language Acquisition*, **23**(2), 89–111. https://doi.org/10.1080/10489223.2015.1047096

van Heugten, M., & **Johnson, E. K.** (2014). Learning to contend with accents in infancy: Benefits of brief speaker exposure. *Journal of Experimental Psychology: General*, **143**(1), 340–350. https://doi.org/10.1037/a0032192

van Heugten, M., & **Johnson, E. K.** (2017). Input matters: Multi-accent language exposure affects word form recognition in infancy. *The Journal of the Acoustical Society of America*, **142**(2), EL196–EL200. https://doi.org/10.1121/1.4997604

Werker, J. F., & **Curtin, S.** (2005). PRIMIR: A developmental framework of infant speech processing. *Language Learning and Development*, **1**(2), 197–234. https://doi.org/10.1080/15475441.2005.9684216

Werker, J. F., **Polka, L.**, & **Pegg, J. E.** (1997). The conditioned head turn procedure as a method for testing infant speech perception. *Early Development and Parenting*, **6**(3–4), 171–178. https://doi.org/10.1002/(SICI)1099-0917(199709/12)6:3/4<171::AID-EDP156>3.0.CO;2-H

White, K. S., & **Johnson, E. K.** (2025). Accent variation and the development of speech and language abilities. *Infant Behavior and Development*, **79**, 102065. https://doi.org/10.1016/j.infbeh.2025.102065

White, K. S., **Yee, E.**, **Blumstein, S. E.**, & **Morgan, J. L.** (2013). Adults show less sensitivity to phonetic detail in unfamiliar words, too. *Journal of Memory and Language*, **68**(4), 362–378. https://doi.org/10.1016/j.jml.2013.01.003

Cite this article: Buckler, H., & Johnson, E.K. (2025). It's Hey Jude, not Hey Jade: Input Variation and the Emergence of the Infant Lexicon. *Journal of Child Language* 1–10, https://doi.org/10.1017/S0305000925100196