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# Changes in Preference for Infant-Directed Speech in Low and Moderate Noise by 4.5- to 13-Month-Olds

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Although a large literature discusses infants' preference for infant-directed speech (IDS), few studies have examined how this preference might change over time or across listening situations. The work reported here compares infants' preference for IDS while listening in a quiet versus a noisy environment, and across 3 points in development: 4.5 months of age, 9 months of age, and 13 months of age. Several studies have suggested that IDS might help infants to pick out speech in the context of noise (Colombo, Frick, Ryther, Coldren, & Mitchell, 1995; Fernald, 1984; Newman, 2003); this might suggest that infants' preference for IDS would increase in these settings. However, this was not found to be the case; at all 3 ages, infants showed similar advantage (or lack thereof) for IDS as compared to adult-directed speech when presented in noise versus silence. There was, however, a significant interaction across ages: Infants aged 4.5 months showed an overall preference for IDS, whereas older infants did not, despite listening to the same stimuli. The lack of an effect with older infants replicates and extends recent findings by Hayashi, Tamekawa, and Kiritani (2001), suggesting that the variations in fundamental frequency and affect are not sufficient cues to IDS for older infants.

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Supplementary materials to this article are available on the World Wide Web at http://www.infancyarchives.com

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Adults speak differently to young children than to adults, using shorter sentences, longer pauses, and a more restricted vocabulary (Phillips, 1973; Snow, 1972). Vowels are hyperarticulated, making speech clearer (Andruski & Kuhl, 1996; Bernstein Ratner, 1984). Speakers also vary prosodic speech characteristics, altering pitch and pitch variability when speaking to infants (Fernald et al., 1989; Shute & Wheldall, 1999).

These modifications appear to be ubiquitous across a range of languages (Fernald et al., 1989; Masataka, 1992), causing speculation as to why they occur. One suggestion is that infant-directed speech (IDS) encourages infant attention (Cooper, Abraham, Berman, & Staska, 1997; Fernald, 1985; Pegg, Werker, & McLeod, 1992; Werker & McLeod, 1989; Werker, Pegg, & McLeod, 1994), thus increasing opportunities for learning (see Kaplan, Jung, Ryther, & Zarlengo-Strouse, 1996). However, IDS is not limited to use with infants, for whom attentional biases have been demonstrated. Speech modifications continue until children are school-aged (Warren-Leubecker & Bohannon, 1984) and similar speech styles are used with elderly and foreign speakers (Ashburn & Gordon, 1981; Caporael & Culbertson, 1986; but see DePaulo & Coleman, 1986), leading some researchers to suggest that IDS might have specifically linguistic benefits (Golinkoff & Alioto, 1995; Kaplan et al., 1996; Kemler Nelson, Hirsh-Pasek, Jusczyk, & Cassidy, 1989), or even affective benefits (Werker & McLeod, 1989).

One recent proposal is that IDS might be easier to separate from background noise than adult-directed speech (ADS; Barker & Newman, 2000; Colombo, Frick, Ryther, Coldren, & Mitchell, 1995). Colombo and colleagues tested infants' detection of sweep tones in noise and found better performance for tones resembling IDS intonational patterns, suggesting that IDS is easier to hear in noise. Fernald (1984) suggested that the higher fundamental frequency (F0) of IDS would result in greater subjective loudness, increasing the signal-to-noise ratio. Supporting these arguments, Newman (2003) found that parents made greater use of the acoustic changes typical of IDS (increased pitch and word duration) when speaking to toddlers in noise than in quiet.

One problem in examining whether IDS is easier for infants to detect in background noise is the difficulty in distinguishing infant preference from ease of performance. Even if infants could follow IDS (but not ADS) in noise, this could be the result of increased motivation to attend in the former situation, rather than an improved ability to do so. This conundrum makes it difficult to determine whether infants actually hear IDS better in noise. Despite this difficulty in interpretation, one hint toward such a conclusion could come from comparing preferences for IDS. Infants prefer listening to IDS in quiet situations (Fernald, 1985); if IDS is particularly useful in noise, this preference might be even greater in a noisy context.

The term *infant-directed speech* is somewhat ambiguous, as there are changes in its characteristics (e.g., average pitch and pitch range) across the first year of life (Kitamura & Burnham, 2003; Kitamura, Thanavishuth, Burnham, & Lusaneeyanawin, 2002; Stern, Spieker, Barnett, & MacKain, 1983). Although some studies have looked at variations in parental output based on the child's age, few have examined variations in children's responsiveness to identical stimuli across ages. Indeed, most studies on IDS preferences have involved infants aged 4 months or younger (cf. Cooper et al., 1997; Cooper & Aslin, 1990, 1994; Fernald, 1985; Pegg et al., 1992).[1] One recent exception is a longitudinal study (Hayashi, Tamekawa, & Kiritani, 2001) in which Japanese infants showed a U-shaped pattern: They preferred IDS both when they were quite young (< 7 months) and when older (> 10 months), but showed no preference at intermediate ages.

The acoustic properties that drive preferences for IDS may also change with age. For example, 4- to 6-month-old infants' preferences appear to be based primarily on pitch contours (Fernald & Kuhl, 1987) and positive affect (Kitamura & Burnham, 1998; Singh, Morgan, & Best, 2002), whereas preferences in younger infants depend on a wider range of acoustic properties (Cooper & Aslin, 1994). Cooper and Aslin (1994) suggested that pitch properties of IDS may only become salient to infants as a result of positive experience with caretakers using exaggerated prosody. Similarly, Hayashi et al. (2001) suggested that different mechanisms drive the preference for IDS in 4-month-olds than in 12-month-olds. They argued that the initial stage is the result of an emotional attachment to prosodic exaggerations, whereas structural aspects drive older infants' preferences.

Finally, there have been arguments that infants may process IDS differently as their cognitive abilities change. For example, Spence and Moore (2003) reported that by 6 months, infants can categorize samples of IDS as either approving or comforting, but infants only 2 months younger cannot do so. Thus, there appear to be age-related changes in how IDS is processed and used, whether it is preferred, and which properties drive such preferences. These changes make it difficult to determine the benefits IDS may have for infants; any benefits may be present for some stages of development, but not others. Even if IDS is particularly helpful in noise, this may be the case for infants at some ages, but not others.

This study examines infant preferences for IDS, both in noise and quiet, at three different ages. Infants aged 4.5, 9, and 13 months heard the same passages spoken in both IDS and ADS, both in isolation and blended with multitalker babble. The youngest age is comparable to the infants in Fernald's (1985) original study of IDS preferences. We expect these infants to prefer IDS over ADS, and to prefer listening to speech in quiet rather than in noise. The critical test is whether there is an interaction between these two factors, such that infants' preference for IDS is greater in noise than in silence.

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[1]Werker and McLeod (1989) demonstrated a preference for IDS in infants aged 7.5 to 9 months. However, they used audiovisual speech, rather than audio only; these older infants may have had a preference for the greater facial expressiveness associated with IDS, but not for the auditory signal itself.

We also present the same stimuli to older infants, examining whether preferences in noise might change with development. By 9 months, infants have begun to focus more strongly on phonological aspects of their native language (cf. Jusczyk, Cutler, & Redanz, 1993; Jusczyk & Hohne, 1997; Jusczyk, Luce, & Charles-Luce, 1994; Pegg & Werker, 1997; Werker & Lalonde, 1988; Werker & Tees, 1984, 1999), and by 13 months, infants have begun producing their first words. The presence of background noise (which could mask phonological components of the signal) may be a more important factor in older infants' listening preferences. If so, older infants should be more negatively affected by noise, and they should show a greater interaction of noise and speech style.

## METHOD

### Participants

Ninety native-English-learning infants (54 boys, 36 girls) participated. Thirty infants participated at each age (4.3 months, range = 3.1–5.4; 8.9 months, range = 8.0–9.7; 13.3 months, range = 12.3–13.9). Data from 52 additional infants were excluded as a result of incorrect age ($n = 12$), ear infection ($n = 3$), nonnative ($n = 4$), sleeping ($n = 2$), refusal to attend to the lights ($n = 3$), crying or fussiness ($n = 23$), epilepsy ($n = 1$), or equipment failure or experimenter error ($n = 4$).

### Stimuli

Stimuli consisted of four short passages. Each occurred in four contexts: IDS with a quiet background (IDS-Q), IDS with a background of ADS noise (IDS-N), and ADS in both backgrounds (ADS-Q, ADS-N). Stimuli were identical for all infants; this may make them more representative of typical IDS for some ages than for others, but allows for an examination of age-related changes in responding to the same stimuli.

Passages (see Appendix) were read in both infant-directed and adult-directed registers in a sound-attenuated room using a Shure SM51 microphone. They were digitized via a 16-bit, analog-to-digital converter at a 44.1 kHz sampling rate, then amplified to the same root-mean-square (RMS) amplitude and stored on computer. No infant was physically present during recording. To compare infant listening measures, IDS and ADS versions needed to be the same duration. This required recording relatively fast IDS versions and slow ADS versions, with longer pauses in ADS (see Figures 1 and 2). Results of acoustic analyses using Kay Elemetrics' CSL 4400 are shown in Table 1; IDS versions had higher average F0, $t(3) = 4.60$; greater F0 standard deviation, $t(3) = 4.03$; and longer word durations, $t(3) = 3.01$, all $ps < .05$, than ADS. As shown in Table 2, these IDS changes were not as extreme as those in some earlier studies (e.g., Hayashi et al., 2001;

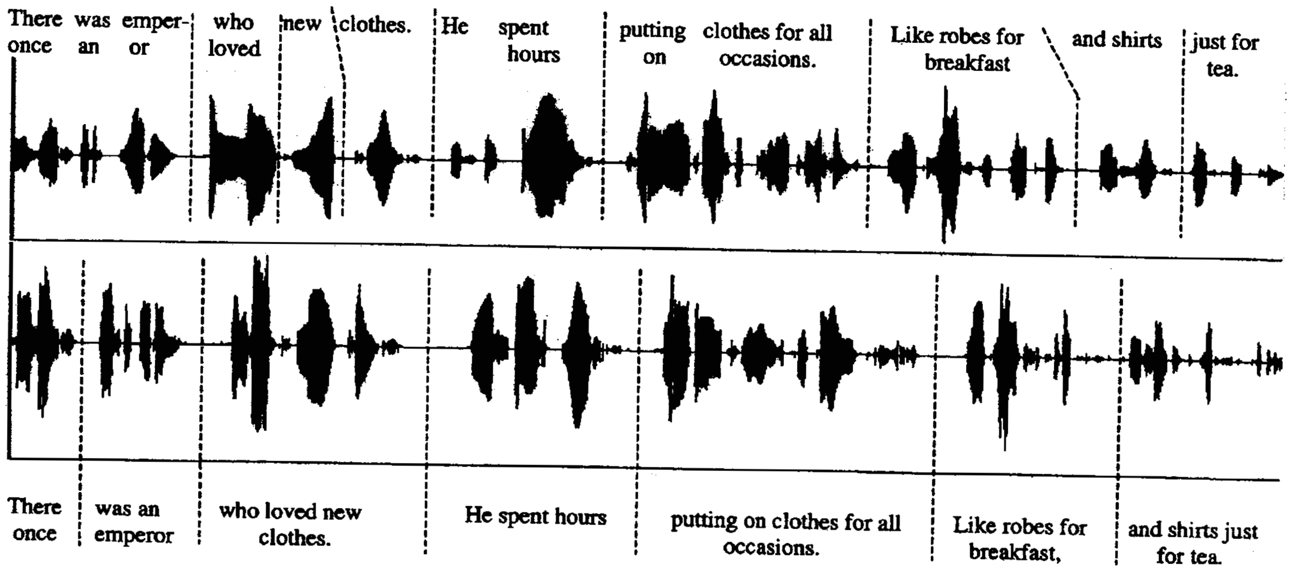


**FIGURE 1** Example waveforms of the same passage spoken in IDS (top) and ADS (bottom).

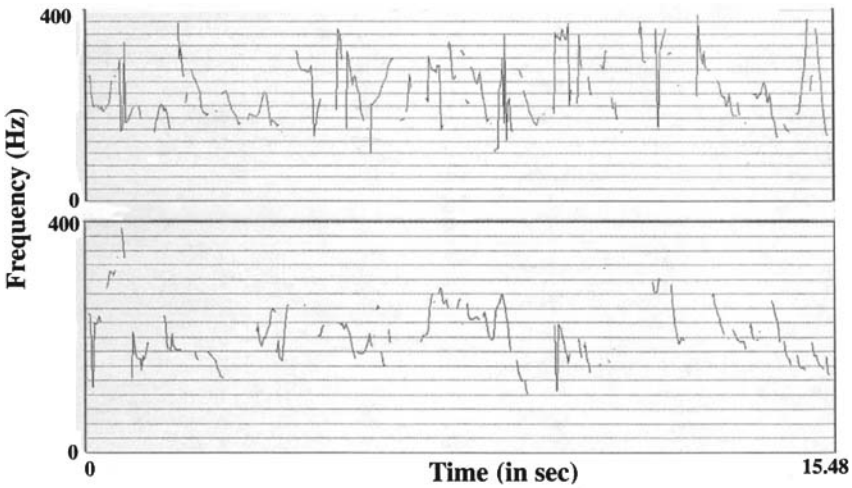


**FIGURE 2** Example pitch contours of the same passage spoken in IDS (top) and ADS (bottom).

R. Mazuka & Y. Igarashi, personal communication, September 14, 2005), but they were comparable to those from other studies (e.g., Cooper et al., 1997).

For the quiet condition, recordings were presented in isolation. For the noise condition, target passages were blended with a distractor speech stream (see Newman, 2005) at a 5-dB signal-to-noise ratio. The distractor stream consisted of nine women reading passages aloud; these recordings were adjusted to be of the same overall RMS amplitude, and then were blended together at equal ratios, resulting in multitalker babble.

## Procedure

Infants sat in their caregiver's lap in a three-sided booth (see Newman, 2005, for details). A practice phase familiarized infants with the task; infants heard musical passages on alternating trials until they consistently turned toward the flashing lights (according to experimenter judgment); there were a minimum of four familiarization trials per infant.

The test phase immediately followed. Infants heard each of the four passages in each of the four speech contexts; these 16 trials were blocked in groups of four so that all four versions of the same passage occurred in the same block. Order of items within each block, assignment of passage to block, and assignment of trial to side were randomized. Thus, in each block, infants heard the same story four times (IDS-Q, IDS-N, ADS-Q, ADS-N) before moving on to the next block (and a different story). Each stimulus played until its completion, or until the infant looked away for 2 consecutive sec. Both experimenter and caregiver listened

TABLE 1
Characteristics of the Test Stimuli Used in This Study

| | *M F0 (Hz)* | *Mdn F0 (Hz)* | *Range F0 (Hz)* | *SD F0 (Hz)* | *Average Content Word Duration (msec)* | *IDS Rating* | *Emotion Rating* |
|---|---|---|---|---|---|---|---|
| Passage 1 | | | | | | | |
| IDS | 216.22 | 222.73 | 75.00–380.17 | 57.56 | 487.21 | 2.27 | 2.82 |
| ADS | 186.31 | 188.31 | 84.00–288.24 | 32.61 | 408.11 | 5.91 | 4.09 |
| Passage 2 | | | | | | | |
| IDS | 235.56 | 253.45 | 87.15–397.30 | 63.38 | 430.36 | 2.82 | 4.09 |
| ADS | 179.28 | 181.48 | 74.12–364.46 | 38.58 | 426.91 | 4.55 | 3.82 |
| Passage 3 | | | | | | | |
| IDS | 213.94 | 221.61 | 80.04–390.27 | 61.08 | 594.50 | 1.64 | 2.82 |
| ADS | 194.71 | 199.55 | 103.04–390.27 | 47.88 | 494.06 | 4.36 | 4.09 |
| Passage 4 | | | | | | | |
| IDS | 237.06 | 246.37 | 90.00–390.27 | 59.95 | 627.25 | 3.00 | 3.36 |
| ADS | 198.29 | 204.17 | 82.12–350.00 | 52.52 | 558.38 | 4.09 | 5.00 |

*Note.* IDS = infant-directed speech; ADS = adult-directed speech.

TABLE 2
Comparison of IDS and ADS F0 Properties for This Study Compared to That of Cooper et al. (1997), Hayashi et al. (2001), and Fernald et al. (1989)

| | *M* | *Range* |
|---|---|---|
| IDS present study | 226 | 306 |
| IDS Cooper et al. | 219 | 291 |
| IDS Fernald et al. | 308 | 218 |
| IDS Hayashi et al. | 333 | 475 |
| ADS present study | 190 | 262 |
| ADS Cooper et al | 184 | 251 |
| ADS Fernald et al. | 206 | 111 |
| ADS Hayashi et al. | 221 | 240 |

*Note.* Comparable values were not available for duration measures, as the present study was based on entire utterances, not on individual words. Kitamura and Burnham (2003) did not report absolute pitch values, but only IDS/ADS pitch ratios. Hayashi et al.'s stimuli were based on Japanese, which involves higher IDS pitch ranges (Reiko Mazuka, personal communication); we thank Yosuke Igarashi, Laboratory for Language Development, RIKEN Brain Science Institute for these measurements. IDS = infant-directed speech; ADS = adult-directed speech.

to masking music over headphones throughout the test session. Mean listening times (time spent looking at the light) to the four different passage types were calculated for each infant across the different stories.

## RESULTS

### 4.5-Month-Olds

A 2 × 2 analysis of variance (ANOVA) with two factors, noise (present vs. absent) and speaking style (IDS vs. ADS) showed an overall effect of background noise, $F(1, 29) = 17.22, p < .0005; \eta^2 = .028$, with longer listening to items presented in quiet (10.3 sec) than in noise (9.4 sec) as shown in Figure 3. There was also a significant effect of speaking style, $F(1, 29) = 5.67, p < .05; \eta^2 = .027$, with longer listening to IDS (10.3 sec vs. 9.4 sec). There was no interaction between these factors, $F(1, 29) = 1.02, p > .05$; the preference for IDS in quiet (.5 sec) did not differ from that in noise (1.3 sec), $t(29) = 1.01, p > .05$.

These results replicate the expected IDS preference. They also show that infants prefer listening to speech in quiet rather than in noisy environments. However, the predicted interaction did not occur. Preference for IDS was no greater in noise than in silence.

Could infants have been paying attention to the noise itself rather than to the target voice? If so, they should not have shown any preference for IDS in noise,

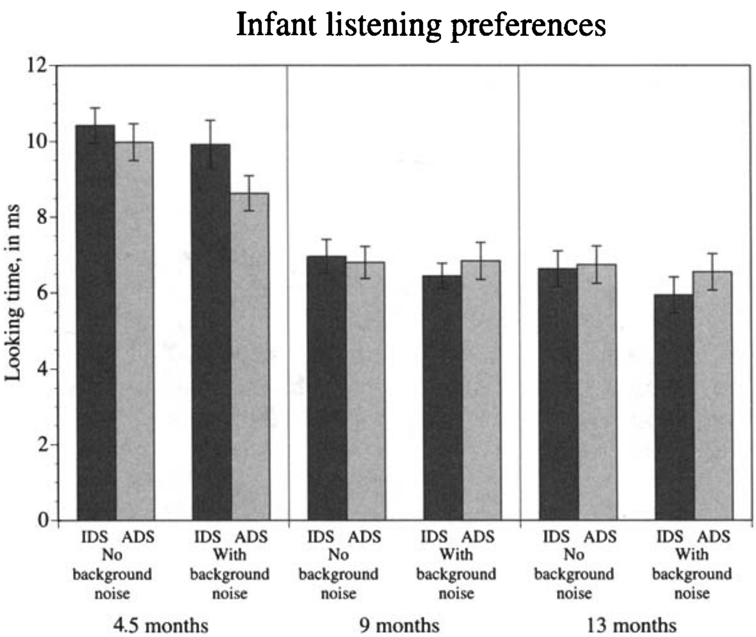


**FIGURE 3** Mean listening times and standard errors to the four different passage types (IDS and ADS both in quiet and in noise) by the 4.5-month-old (left), 9-month-old (middle), and 13-month-old (right) infants.

which they did, $t(29) = 2.13, p < .05; \eta^2 = .135$. Apparently infants were attending to the target voice, but found that IDS was no more important to them in one context than the other.

Perhaps the advantage of IDS for hearing-in-noise is specific to situations in which infants are attempting to detect a word's sound pattern. Young infants may not be engaged in learning words to the same extent as older infants, and thus may not have the same need for isolating the speech stream. Perhaps older infants would show an interaction, even though younger infants did not.

## 9-Month-Olds

Few studies have investigated whether infants actually prefer auditory-only IDS at older ages, even in quiet settings. The one study to investigate age-related changes suggests that infants aged 7 to 9 months do not prefer IDS (Hayashi et al., 2001). We found a similar result: A 2 × 2 ANOVA showed no effects of background noise ($F < 1$) or speech style ($F < 1$), and no interaction ($F < 1$). Infants showed comparable listening time to all four passages.

To further examine this lack of IDS preference, we conducted paired-comparison $t$ tests examining the effect of IDS in the two backgrounds separately. We found no effect of IDS either in quiet, $t(29) = 0.35$, $p > .70$, or noise, $t(29) = -0.89$, $p > .35$. There was no evidence that 9-month-old infants preferred listening to IDS.

### 13-Month-Olds

Results for 13-month-olds mirrored those for 9-month-olds; there were no effects of background noise, $F(1, 29) = 1.51$, $p > .05$, or speech type ($F < 1$), and no interaction ($F < 1$). We again performed follow-up $t$ tests, but found no preference for IDS either in quiet, $t(29) = -0.18$, $p > .80$, or noise, $t(29) = 1.17$, $p > .20$. Thus, there is no evidence from this study to suggest that older infants regain their preference for IDS, contrasting with Hayashi et al.'s (2001) finding of a U-shaped pattern in infants' preferences across the first postnatal year.

### Comparison Across Ages

To further explore age-related changes in preference, we performed a 3 × 2 × 2 ANOVA, with the between-subject factor of age, and within-subjects factors of noise and IDS. We found significant effects of age, $F(2, 87) = 25.29$, $p < .0001$; $\eta^2 = .29$; and background noise, $F(1, 87) = 8.60$, $p < .005$; $\eta^2 = .01$, with an overall preference for listening in quiet (7.9 sec vs. 7.4 sec) and longer listening for younger infants (4.5-month-olds, 9.9 sec; 9-month-olds, 6.7 sec; 13-month-olds, 6.5 sec).[2] There was no effect of speech style ($F < 1$), but there was a significant Age × Speech Style interaction, $F(2, 87) = 3.76$, $p < .05$; $\eta^2 = .01$. No other interaction was significant: Age × Background Noise, $F(2, 87) = 1.33$, $p > .20$; Background Noise × Speech Style, $F < 1$; three-way, $F < 1$. Thus, unlike younger infants, we confirmed that older infants did not show a preference for IDS.

## DISCUSSION

There are two main conclusions from this study. First, at none of the three ages was the preference for IDS any greater when listening in noise than in quiet. Second, only at the youngest of the three ages did infants show a preference for

[2]One concern is that older infants' shorter listening times masked preferences for IDS. Yet older infants' listening times were still presumably long enough for them to determine the speaking style being used (all infants averaged a minimum of 2.5 sec per trial). Moreover, there was no correlation between average listening time and preference for IDS among the older listeners ($r = -.18$): Those infants who did have listening times as long as those of the younger infants still did not appear to show any preference for IDS.

IDS over ADS. The youngest infants did show a general preference for listening in quiet, suggesting they were aware of (and perhaps bothered by) the presence of noise. Whereas older groups did not show significant effects of noise, the analysis across ages showed a main effect of noise and no interaction with age, suggesting that infants generally preferred listening in quiet settings. However, the presence of noise had no influence on the magnitude of infants' preference for IDS.

This is somewhat surprising; Colombo et al. (1995) reported that tone-sweeps mimicking IDS are easier to detect in noise than are those mimicking ADS, and Newman (2003) found that parents increased both average F0 and F0 variability when talking to toddlers in noisy environments. Why, then, do infants not show any greater advantage for IDS while listening in noise?

Perhaps IDS, although preferred by young infants, does not generate any functional advantage (at least in the noise level presented here). These results suggest infants were not relying on IDS to hear through the noise; they seemed equally able to attend to IDS and ADS passages, and simply listened longer to one type than another.

It is also possible that the lack of an interaction is the result of either the type or level of noise. In very low noise levels, infants would not detect the noise at all, and performance would mirror that in quiet. With extremely high noise levels, infants would be unable to hear anything else, and thus could not show any IDS advantage. To provide an accurate test of the hypothesis in this study, the noise level needed to be between these two extremes. Because infants preferred listening in quiet, we can be assured that the noise level was not so soft as to be unnoticeable. Moreover, because we found an overall preference for IDS among 4.5-month-olds (even in noise) it seems unlikely that our noise level was too high. Still, it could be that effects of IDS in noise are only to be found at certain levels within that range of possibilities; perhaps we did not choose the optimal noise level for such a test. Similarly, it is possible that IDS provides a benefit in some types of noise, but not others. Colombo et al. (1995) used white noise, whereas we used multitalker babble; perhaps advantages of IDS are greater when the noise is not speech-based.

The second finding of this study—a preference for IDS over ADS only in the youngest infants—extends research on IDS that has often assumed such preferences would continue to hold throughout infancy. Recent work has called this assumption into question, demonstrating a U-shaped developmental pattern, with no preference for IDS between 7 and 10 months of age, but strong preferences both earlier and later (Hayashi et al., 2001). The present work likewise shows a developmental trend. But although we found a decrease in the preference for IDS at 9 months of age, we did not find the comparable increase as infants neared 1 year.

This discrepancy may be the result of the particular stimuli. Hayashi et al. (2001) suggested that infants go through three stages in their IDS preference. In Stage 1, infants have an emotional attachment to the exaggerated prosody of IDS.

This results in longer listening to IDS, as was found here. In Stage 2, this emotional attachment wanes, and infants no longer show a listening preference. However, by the time infants reach the end of their first year, they have begun to attend to structural components of spoken language, and IDS exhibits these structures more clearly. The structure of the messages, rather than their prosodic properties, drives older infants' IDS preferences. Because Hayashi et al.'s stimuli consisted of natural recordings of a mother speaking to her infant or an adult, they undoubtedly differed in the actual content of what was said, in addition to their prosodic properties. This presumably was sufficient to drive older infants' listening preferences. The current stimuli, in contrast, were matched for content; samples differed only in how they were spoken, not in what was spoken.[3] When differences in content were minimized, older infants showed no IDS preference, despite the presence of clear prosodic differences.

It may also be that, because the passages in this study consisted of stories, the content in all cases was somewhat infant-directed in speaking style. This, combined with the relatively slow speaking rate may have been sufficient to make all of the stimuli seem infant-directed to an older child, whereas the content may have had less influence on the younger children. That is, if older infants focus more on content than on prosody, or if their greater experience gives them a broader category for what constitutes IDS, perhaps all of the items sounded like IDS to these older infants. In either case, the results suggest that the prosodic differences present in the stimuli were sufficient to differentiate them into separate categories for younger, but not older, children.

The fact that 4.5-month-olds preferred IDS passages argues that cues for IDS must have been both present and audible to young listeners, and thus presumably to older infants as well. However, older infants may attend to different cues in IDS than younger infants. To explore this further, we asked 11 adult listeners to rate each recording on two 7-point scales: one for register, ranging from 1 (*IDS*) to 7 (*ADS*), and the other for emotionality, ranging from 1 (*happy*) to 4 (*neutral*) to 7 (*sad*). Because adult listeners are likely to be influenced by passage content, we low-pass-filtered each passage at 350 Hz prior to presentation. All four IDS passages were rated as more infant-directed than their ADS counterparts: $t(10) = 7.70$; $t(10) = 4.63$; $t(10) = 2.79$; $t(10) = 2.06$; all $ps < .05$ (see Table 1). Three were also rated as more "happy "than their matched ADS passages: $t(10) = 2.16$; $t(10) = 2.35$;

[3]Another issue is that no infant was present during the actual recordings made here; this raises the possibility that the recordings were not fully "IDS-like." Yet clearly the items were similar enough to IDS to be preferred by the youngest infants; whatever acoustic properties were sufficient to make these stimuli preferable to 4.5-month-olds were not having a similar effect for older infants, indicating a change in what makes a stimulus sound IDS-like across infancy. Thus, there would still be an age-related change according to this argument.

$t(10) = 7.70$; all $p < .05$; Passage 2: $t(10) = 0.34, p > .05$).[4] In general, adult listeners found the IDS passages both happier and more infant-directed than ADS passages. These passages may have matched the expectations of younger infants (who focus primarily on pitch variability and affect; Fernald & Kuhl, 1987; Kitamura & Burnham, 1998; Singh et al., 2002), but not those of older infants. If so, older infants might still show a preference for some types of IDS—just not for the same types as younger infants.

Thus, this work supports Hayashi et al.'s (2001) proposal that there are developmental changes both in infant preferences for IDS and in what properties drive that preference. Apparently, changes in pitch, word duration, and affect may be sufficient to increase listening times for young infants, but not for older infants. Future work should examine infant preferences for passages differing in content (with some passages containing more IDS-like structural components, such as simpler, more repetitive sentences, and others containing more adult-like structural components), but matched in prosody. If Hayashi et al.'s proposal is correct, older infants should show a preference for passages with IDS structure, whereas younger infants would not.

In conclusion, this study suggests that although changes in F0 are sufficient to increase young infants' listening times, such cues alone do not result in differential preferences for infants aged 9 or 13 months. Moreover, at none of the three ages tested was there any greater advantage for IDS in the presence of noise than in quiet. This raises questions regarding whether IDS actually aids infants in perceiving speech in noisy environments.

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[4]Excluding Passage 2 from infant looking analyses did not change the results: The lack of an IDS effect for older infants continues to hold even when only those passages containing an obvious affect difference are included.

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# APPENDIX

## Passage Transcriptions and Durations

### *Passage 1: 16.4 sec*

Once upon a time there was a boy and a girl. They lived with their father, a poor woodcutter, in a little house besides a forest. Often, the family went to bed hungry, because there was not enough food to eat.

### *Passage 2: 15.3 sec*

"Oh dearie me, Ducky Lucky!" cried Henny Penny." I was in the woods, gathering nuts, and a piece of the sky fell on my feathered head! Now I'm off to see the king and tell him the sky's a fallin'."

### *Passage 3: 15.6 sec*

Pinocchio decided to be a good boy. Maybe, if he were very good, Pinocchio could be a real boy, not just a puppet. But first, Pinocchio had to prove himself worthy.

### *Passage 4: 16.3 sec*

There once was an emperor who loved new clothes. He spent hours putting on clothes for all occasions. Like robes for breakfast, and shirts just for tea.