Speech Convergence Among Talkative and Reticent Three Year-Olds

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ABSTRACT

The purpose of this study is to examine speech convergence as a primitive form of socialized speech. Specifically, we examine (1) the extent of speech pattern matching by three year-old children, and (2) whether a talkativeness/reticence factor influenced degree of convergence. Four three-year-old girls individually interacted with 6 to 8 previously unfamiliar adults in free-play settings. From video recordings and verbatim transcripts, the degree of children's convergence to adult speech (i.e., moves toward similarity) is assessed on dimensions of speech rate, response latency, utterance length, and number of utterances. Three conclusions are drawn from the results. First, at age 3, speech convergence on these behaviors is evident, though the convergence mechanism is still relatively unstable. Second, only one reticent child consistently performed below the level of the talkative children. Third, adults tend to compensate for a child's lack of conversational activity by talking more to maintain the flow of interaction.

Scholars in various disciplines have long been interested in nonverbal elements of speech such as pauses, rate, inflection, intonation, pitch, intensity, and so forth. These behaviors may be called "extralinguistic" in that they represent vocal features of a message rather than lexical and syntactic components (Siegman 1978). Nevertheless, theoretical perspectives within the domain are quite diffuse. A cursory inspection of the literature reveals varied terminology (e.g., paralinguistics, noncontent speech, suprasegmentals, prosody, metalinguistics, etc.) apparently referring to similar vocal elements of speech. Though lacking a unified theoretical front, researchers have made two distinctions between characteristics and functions of extralinguistic speech (see, for example, Martin 1981 and Siegman 1978). First, it appears that some vocal behavior is discretely coded and functions referentially,

grammatically, or regulatively. For example, either the rise or fall of intonation, the presence or absence of juncture, or the presence or absence of stress on particular words can serve to clarify meaning in a message (e.g., whether a remark is to be taken as a compliment or as sarcasm) or to signal a partner's conversational turn. Second, some extralinguistic behaviors may be continuously coded and are indicators of affective and attitudinal states. Such behaviors tend to be comprised of speech rate, turn duration, pause duration, vocal intensity and pitch, accent, and utterance length (see, for example, Feldstein and Welkowitz 1978; Cappella and Planalp 1981; Giles 1977).[2] In this paper, we focus on this latter group of behaviors.

The manner in which interactants structure their speech patterns and rhythms represents a fundamental feature of social interaction. The nature of interactants' speech adjustments **relative to one another** appears to have important behavioral and evaluative implications. A large body of research indicates that, during the course of interaction, participants often become more similar, or **converge** their vocal speech (see Giles 1977; Cappella and Planalp 1981; Feldstein and Welkowitz 1978; Street 1982 for reviews). Other labels describing this response-matching phenomenon include "congruence," "pattern matching," "synchrony," and "symmetry" (Feldstein and Welkowitz 1978). Several researchers have claimed that speech convergence facilitates interaction management and contributes to favorable impressions (see Giles 1977; Street and Giles 1982, for reviews), thus could be considered characteristic of effective communicators.

The purpose of this paper is two-fold: (1) to examine children's speech convergence from a communication competence framework, and (2) to investigate the impact of talkativeness/reticence, a factor purportedly influencing communicative skill, on the convergence processes.

EXTRALINGUISTIC SPEECH CONVERGENCE AND THE DEVELOPMENT OF COMMUNICATION COMPETENCE

Communication competence encompasses multidimensional phenomena. As Wiemann (1977) notes, the competent communicator is one who is affiliative, empathetic, can adapt behavior to different situations, and manage interaction. Convergence on vocal behavior appears instrumental to these outcomes. For example, though usually occurring with little or no communicator awareness, speech convergence nevertheless facilitates smooth and effective conversation (Knapp *et al.* 1980), enhancing communicative effectiveness (Natale 1975), social integration (Giles 1977), attraction (Giles and Smith 1979; Street 1982), and maintenance of desired expressive behavior levels (Cappella 1981; Cappella and Green 1982).[3]

The preponderance of evidence indicates the convergence mechanism is very stable in adults (Cappella 1981). A tendency to response match also appears very

early in life. For example, there are moderate correlations between infants' (1 to 12 months) pitch levels (Lieberman 1967; Kessen *et al.* 1979) and vocalizations (Anderson *et al.* 1977; Stern *et al.* 1975; Lewis 1972) to those of adult partners. However, the convergence process involves more than just a biologically pre-programmed imitative mechanism (see Hoffman 1977). As Helfrich (1979) contends, whereas the **desire** to converge extralinguistic speech may be innate, the **ability** to do so reflects a developmental social skill. Compared to older children or adults, young children may attempt to make some speech adjustments toward listeners on syntactic and paralinguistic levels (Helfrich 1979) but may lack the desire or stable structures for monitoring social activity to allow consistent performance (Lougee *et al.* 1977). Thus, degree of convergence should increase with age. In support of this, Welkowitz *et al.* (1976) reported that in same-aged pairs, older children (ages 6;4 to 7;2 years) increased similarity of pause duration more so than younger children (ages 5;4 to 6;1 years). In a study of children varying in age from 3 to 5, Garvey and BenDebba (1974) observed that children's ages were positively related to their degree of convergence toward partners' number of utterances in dyadic pairs. From this evidence, Welkowitz *et al.* concluded that speech pattern-matching indexes a child's degree of **socialization** since it represents coordinated speech with that of interlocuters and apparently improves with age.

However, as Feldstein and Welkowitz (1978) note, researchers still know little about the development of convergence abilities and should investigate the speech behavior of younger children and multiple behaviors as well as utilize other indices of social development. A promising variable is a child's degree of talkativeness/ reticence.

TALKATIVENESS AND RETICENCE

McCroskey (1977: 78) defines reticence as "a trait of an individual which results in that individual characteristically remaining silent rather than participating in communication." The talkativeness/reticence factor may influence communication skill for three reasons. First, degree of talkativeness may reflect a child's propensity to engage in social discourse; that is, talkative children are more inclined to interact with others than their reticent counterparts. Second, talkative children may also talk more when alone, thereby practicing and refining their verbal and vocal skills. Several child language theorists (see, e.g., Shatz 1977; Dale 1976; Wood 1981) suggest that practice, either alone or with others, enhances children's communicative abilities. Third, highly communication apprehensive (a subconstruct of reticence) children are possibly more delayed in their development of communication skills than low apprehensive children (McCroskey 1977.) These factors suggest the possibility of less communicative ability among reticent children.

Of course, we do not mean to imply that talkativeness represents communication competence. Indeed, other factors such as whether one's remarks (or silence) are appropriate to the situation and/or to interlocutors entail dimensions of competence. However, because of the reasons outlined above, talkative children may have greater linguistic and extralinguistic resources available for adapting to particular communicative demands than do reticent children. Unfortunately, though much research has documented the pervasiveness of negative perceptions of quiet children, there has been little research emphasis on the relationship between reticence and communication behavior (Van Kleeck 1980). A study by Van Kleeck and Street (1982) did observe that reticent children used fewer discourse functions (e.g., comments, obliges, questions, requestives, etc.) than did more talkative children. Given the apparent social and communicative consequences of reticence, more research is warranted on its impact on the development of speech behavior.

RESEARCH QUESTIONS

In sum, extralinguistic speech convergence appears indicative of a skill which facilitates conversational interaction. The research reviewed suggests convergence ability follows developmental patterns, that is, becomes more apparent as children grow older or acquire more sociocentric orientations. A child's degree of talkativeness/reticence may also influence development of communication skills. If talkative children do display more advanced abilities, we would expect greater speech convergence among talkative rather than reticent children.

The purpose of this study was to offer exploratory data on speech convergence of very young children for four behaviors: speech rate, response latency, utterance length, and utterance number. Three-year-olds were examined because: (1) the researchers were interested in early development of speech pattern-matching, and (2) this is the minimum age at which phonological and syntactic skills are sufficiently advanced to allow meaningful study of the vocal behaviors accompanying them. The children's degree of talkativeness was quasi-experimentally manipulated to determine if desire to participate in and practice social interaction enhances convergence ability. Specifically, two questions were examined: (1) to what extent do three-year-old children converge rate, response latency, utterance duration, and number to these of adult partners, and (2) does a talkativeness/reticence factor influence children's degree of convergence?

METHOD

Subjects

Children. Four 3 1/2 year-old girls served as subjects. Only four children were

included in the sample, because of the exploratory nature of the study and because we sought to provide an in-depth analysis of speech convergence on a variety of levels and behaviors. Two of the children, Kay and Sue (fictitious names) had participated in another study where it had been informally noted that they differed in the amount of talk they each contributed to spontaneous conversations. Two other children were selected by preschool teacher report. Following data collecton, a *post hoc* definition of the talkative/reticent dimension was formulated on the basis of average number of child utterances per 100 adult utterances across 6 to 8 interactions per child. Consistent with informal and teacher reports, the most talkative child was Mary ($X = 92$ utterances) followed by Kay ($X = 63$), Angie ($X = 40$), and Sue ($X = 36$). The results of several standardized tests (Dunn 1959; Carrow 1973; Lee 1974) indicated all four children were developing language structure normally for their age level.

Adults. The investigators chose to use adults as the children's partners for two reasons. First, relative to children, adults have faster information processing capacities and more routinized speech patterns. Thus, they should be more consistent and competent performers than children whose speech performances are more variable (Shatz 1977). Second, adults could more easily exert control in the event that the children moved beyond the camera's viewing angle or attempted to dispose of the collar-mounted microphones.

Young adult women under age 30 served as the children's partners. Each had experience interacting with young children since they were either graduate students in speech pathology or mothers.

Procedure

Convergence is generally a product of **mutual** speech modification by interactants. Since we were interested in the children's adaptations, the study was designed to elicit data representative of the child's speech adjustments. First, each child interacted with 6 to 8 previously unfamiliar adults (Mary and Angie participated in 6 and Kay and Sue in 8 dyads). Second, convergence scores were calculated for each child. Thus, the design emphasized the individual child's speech responses to those of different adults. Finally, implicit in this study is the assumption that the adults' speech behavior would be relatively consistent across children. To test this belief, trend analyses were conducted on adults' performances of each behavior, treating the four children (from least to most talkative) as levels of a between-subjects factor. Nonsignificant linear trends would indicate that adult speech to different children did not vary meaningfully.

Each child-adult interaction lasted 30 minutes. They took place and were video recorded in a small room at a university speech and hearing clinic. The adult

was told simply to interact naturally with the child (a few toys were provided) for the duration of the half-hour session.

Speech Convergence

During a conversation, a person can respond toward speech characteristics of different partners (e.g., to partners who have different speech rates) and to behavior changes within an interaction with the same partner. In this study, convergence **across** and **within** conversations were examined.

Across-interaction scores were acquired by correlating child and adult speech behavior means per interaction across all interactions. Thus, for each speech behavior, every child had one coefficient representing degree of across-interaction convergence.

Within-interaction scores were measured for each interaction by computing correlation coefficients between participants' speech behaviors over three 15-turn segments. The within-interaction data were examined two ways (a similar procedure has been used by Cappella and Planalp [1981]). First, within-interaction speech performances were pooled for each child for each behavior. Thus, for Kay and Sue, the pooled within-interaction data consisted of 24 paired scores for each behavior since they participated in 8 interactions. Of course, for Mary and Angie the paired scores numbered 18. Second, for each interaction and behavior, convergence scores were formulated for the three 15-turn segments. These scores are descriptively presented as the number of coefficients greater than .4, between .4 and $-.4$, and greater than $-.4$ for each child and each behavior. The within-interaction data were analyzed in this manner since the former method produces scores: (1) indicative of the child's general within-interaction convergence ability, and (2) more stable than the latter. The latter method in turn provides greater insight into individual interactions.

Speech convergence is typically measured by the intra-class correlation which is appropriate when only one variate, e.g., pause duration, is being correlated (Haggard 1958). Use of this statistic assumes interactants are equally capable of matching each other's behaviors. With three-year-olds, this assumption is tenuous. Because their speech patterns are not as learned or habituated as adults', a young child's speech consists of more hesitations and pauses thus slower rates and longer latencies (Kowal *et al.* 1975). In addition, a three-year-old's language complexity, as reflected by mean length of utterance, will certainly be less than that of an adult. These claims were upheld in this study. The adults had faster rates, shorter latencies, longer and more utterances than the children. The only exception was Kay, the most talkative child, who performed similarly to (but still somewhat below) adults on speech rate and utterance length. Because of this speech performance discrepancy

between adults and children, the Pearson product-moment was used to measure convergence. A positive correlation, then, does not represent matching of behaviors but changes in a similar direction, e.g., the child increasing rate toward a faster talking adult.

Speech Behaviors

The speech behaviors were computed by two coders using stop watches and following transcripts and videotapes. **Speech rate** was measured in syllables per minute (Webb 1972), and calculated for each subject per fifteen turn segment. Since participants were engaged in play, extended periods of silence were sometimes evident within a turn. Therefore, within turn pauses longer than two seconds were extracted from the total articulation time. **Response latency** is defined as the "length of interval between the beginning of a pause heard by a listener and the beginning of a reply" (Matarazzo and Wiens 1972). The time between turns is attributed to the forthcoming speaker. **Utterance number** was determined by counting the number of utterances for each participant per interaction from the transcripts. **Utterance length** is generally measured by words or morphemes per utterance. In this study, however, some vocalizations were "play talk" such as "grrr," "ruf," and "yumma." For this reason, utterance length was measured in syllables per utterance.

RESULTS

Reliabilities

Data Coding. Reliability of data coding was established by recomputing behavior scores of six randomly selected interactants (3 adults and 3 children). Intraclass correlations indicated sufficient test-retest reliabilities of .81 for speech rate, .88 for response latency, .98 for utterance number, and .89 for utterance length.

Adults Speech to Different Children. Implicit in this study is the assumption that adult behavior would not vary meaningfully to different children. The trend analyses for speech rate ($F(1,24) = .06$), response latency ($F(1,24) = .01$), and utterance length ($F(1,24) = .06$) verified that adults did not significantly differ in their behavior across increasingly talkative children. However, there was a significant linear term regarding utterance number ($F(1,24) = 6.26$, $p < .02$) and is discussed below.

Across-Interactions

Table 1 contains the across-interaction correlations for each child and each behavior.

Table 1

Across-interaction Correlations for Each Child and Speech Behavior

Behavior	Child			
	Mary (6 interactions)	Kay (8 interactions)	Angie (6 interactions)	Sue (8 interactions)
Speech Rate	.92, $p < .01$	.75, $p < .05$	.79, $p < .1$	−.70, $p < .1$
Response Latency	.76, $p < .1$	.85, $p < .01$	.25, N.S.	.67, $p < .1$
Utterance Length	.52, N.S.	.80, $p < .01$	−.28, N.S.	.69, $p < .1$
Utterance Number	−.49, N.S.	−.87, $p < .01$	−.31, N.S.	−.39, N.S.

Speech Rate. As expected, the most talkative child, Mary, converged most across adults ($r = .92$, $p < .05$). However, there were also strong correlations between adult speech rate and that of Kay ($r = .75$, $p < .05$) and Angie ($r = .79$, $p < .1$). The most reticent child, Sue, not only converged least but **diverged** at a level approaching significance by producing slower rates to faster talking adults ($r = -.70$, $p < .1$). This latter finding perhaps indicates her limited ability to consistently manipulate speech rate. As we will discuss later, Sue converged consistently on other behaviors and on speech rate within individual dyads.

Response Latency. As suggested in Table 1, though correlations for the two talkative children were greater ($r = .76$ and $r = .85$) than for the two reticent children ($r = .25$ and $r = .67$), the quiet girls nevertheless showed some convergence toward the response latencies of adult partners.

Utterance Length. As revealed in Table 1, correlations between adult and child utterance length were somewhat below those achieved for speech rate and response latency. Nevertheless, the scores for Mary, Kay, and Sue were in a positive direction and Kay's reached significance ($r = .80$, $p < .01$). However, a negative coefficient was observed for one reticent child, Angie ($r = -.28$).

Utterance Number. As noted above, there was a significant linear relationship between adult and child utterance number. Adults produced more utterances to increasingly reticent children. In addition, all correlations between adult and child utterance number were negative, ranging from −.87 to −.31 (see Table 1). This finding is discussed later in terms of adult compensation for children's conversational inactivity for the purpose of regulating optimal interaction levels.

Within-Interactions

Table 2 presents the within-interaction convergence scores for the pooled data. Excluding utterance number, Mary, Kay, and Sue showed significant levels

Table 2

Within-interaction Correlations for
Each Child (Pooled Data)

	Child			
Behavior	Mary	Kay	Angie	Sue
	(6 interactions)	(8 interactions)	(6 interactions)	(8 interactions)
Speech Rate	.53, $p < .05$	.65, $p < .001$	.26, N.S.	.52, $p < .02$
Response Latency	.70, $p < .01$	.51, $p < .02$	.31, N.S.	.72, $p < .01$
Utterance Length	.26, N.S.	.68, $p < .01$	−.13, N.S.	.64, $p < .01$
Utterance Number	−.11, N.S.	−.28, N.S.	−.26, N.S.	−.21, N.S.

of within-interaction convergence when the data of individual dyads were combined, (the only exception being Mary on utterance length, $r = .26$). However, no apparent relationship appeared between Angie's and the adults' speech behaviors. Table 3 (see next page) reveals that the tendency to adjust speech in similar directions also held up for particular interactions. Half or more of the convergence scores for each child were greater than .4 (again excluding utterance number).

Collectively, the two sets of within-interaction data suggest that these children modified direction of speech rates, response latencies, and utterance length in conjunction with that of adults. However, Angie consistently performed at levels below the other children.

As with the across-interaction data, the pattern of results differed for utterance number. Within-interactions, children and adults also tended to vary their utterance numbers in opposite directions.

DISCUSSION

We have proposed that extralinguistic speech convergence is a feature of communication competence since it leads to favorable outcomes (e.g., communication effectiveness, social integration, maintaining desired expressive behavior levels) and requires perceptual acuity and speech behavior flexibility for effective performance. The purpose of this study was to examine: (1) the extent to which three-year-olds converged their speech levels to that of adults, and (2) whether a talkativeness/reticence factor influenced degree of convergence.

Table 3

Distribution of Individual Dyad
Correlations for Each Child and Behavior

Behavior	Child Mary	Kay	Angie	Sue
Speech Rate				
Above .4	3	6	2	6
.4 to −.4	3	2	4	1
Below −.4	0	0	0	1
Response Latency				
Above .4	3	4	5	5
.4 to −.4	3	2	1	1
Below −.4	0	2	0	2
Utterance Length				
Above .4	4	4	3	4
.4 to −.4	0	3	2	2
Below −.4	2	1	1	2
Utterance Number				
Above .4	1	3	0	0
.4 to −.4	4	3	3	3
Below −.4	1	2	3	5

Speech Rate, Response Latency, and Utterance Length Convergence of Three-Year-Olds

In general, these three-and-a-half-year-old girls tended to adjust speech rate, response latencies and utterance lengths in concordance with those of adults. As can be seen in Tables 1 and 2, most of the within- and across-interaction correlations were greater than .5. Most of these scores either were or approached significance even with the relatively low power of statistical tests. The trend toward convergence was also upheld for individual dyads (see Table 3) where convergence scores greater than .4 were observed in 58.3% of the interactions.

If children's ability to match the speech patterns of others increases with age

(Welkowitz *et al.* 1976), it would appear that these three-year-olds have not fully acquired the convergence mechanism. For example, though they attempted to modify speech in **directions** similar to grown-ups, the children's behavior did not **match** the adults' performance levels. As a rule, the children talked more slowly, had longer pauses between turns, and produced shorter utterances.

These results, then, coupled with other research, indicate a development pattern of convergence ability. Whereas efforts to response match appear soon after birth, the ability to do so improves as a function of the behavior and the necessary cognitive and behavioral capabilities. For example, vocal pitch variation is probably relatively easy to monitor and produce since it is a physical feature of the voice. Thus, as we reported earlier, one of the earliest forms of convergence (though in small increments) involves pitch. On the other hand, speech timing and tempo, influenced by behaviors such as pauses and articulation rate, are significant features of coordinated interaction (Feldstein and Welkowitz 1978; Jaffe and Anderson 1979). Before communicators can adapt toward an interlocutor's response latencies and speech rates, they must be able to orally produce utterances, know basic conversational rules (e.g., turn-taking sequences), and be willing to integrate these behaviors with conversational partners. Convergence on this level, then, occurs later in childhood. From our data on these three-year-olds, this skill initially manifests itself as adaptations in similar directions. As discourse abilities improve with age, convergence skills become more stabilized as children are able to match and move with partners' vocal behavior levels as demonstrated by the 5 to 7 year-olds in the Welkowitz *et al.* (1976) study.

Finally, the children were most inconsistent at matching adult utterance length. This could be attributed to two factors. First, compared to other behaviors examined here, adapting utterance length requires a relatively more advanced skill, the ability to manipulate syntactical complexity. These young children were probably least developed on this dimension. Second, utterance length convergence may be influenced by a host of situational variables such as status and type of interaction (Thakerar *et al.* 1982; Street and Hopper 1982). Even adult interactants frequently fail to adapt toward each others' utterance lengths (Cappella 1981; Jaffe and Feldstein 1970).

Adult Compensation for Children's Verbal Output

The pattern of results for number of utterances was essentially opposite that of other speech dimensions. Across-interaction and pooled within-interaction scores were uniformly negative. Twenty of 28 individual interactions (71%) were also characterized by negative coefficients. In addition, adults significantly varied their utterance number in a linear fashion to individual children's degree of

talkativeness. That is, increases (or decreases) in a child's utterance number lead to decreases (or increases) in adult utterances. The most parsimonious explanation for this finding is that the adults were **compensating** (see, for example, Cappella and Greene 1982; Cappella and Planalp 1981) for verbal output differences among children.

This explanation resembles one offered by Matarazzo *et al.* (1968). These authors noted an inverse relationship between therapists' and patients' utterance durations. Matarazzo *et al.* claimed that the therapists were apparently following a "therapeutic set" which led them to talk more and for longer periods of time in order to stimulate a quiet person and conversely to talk less in sessions where the patient was more verbally productive. Thus, in the present investigation, adults modified the frequency of their contributions in the opposite direction to that of the child in order to avoid long periods of silence, let a talking child retain the floor, or elicit more talk from a quiet child. Under certain conditions, then, compensatory speech moves may also be a communicative skill, facilitating interaction maintenance.

Talkativeness and Reticence

Though lacking empirical attention, several writers have suggested that communication performances of quiet children may be inferior to that of talkative children because of: (1) less favorable attitudes toward social interaction, (2) less practice, or (3) skill delay. The most noticeable difference between talkative and reticent children was in the across-interaction data (see Table 1). Compared to the reticent ones, the talkative children more **consistently** converged response latency, speech rate and utterance length. For those scores, all were above .5 and, save one, statistically significant. The reticent children were more inconsistent, converging on some but not all behaviors as only three (speech rate for Angie and response latency and utterance length for Sue) positive scores even approached significance.

Again, the within-interaction data showed strong convergence tendencies (excluding utterance number) for the talkative children (see Tables 2 and 3). However, one reticent child, Sue, also achieved significant convergence scores. Only for Angie was no noticeable relationship observed between her speech and that of the adults. In brief, though Sue did not perform as consistently across different partners, her scores more closely resembled those of the two talkative children than those of Angie.

The small sample precludes discovery of a convincing explanation accounting for Angie's relatively poorer performance. Elsewhere Van Kleeck and Street (1981) have proposed that there may exist a subgroup of reticent children who are somewhat delayed in the social use of language. Though pretests indicated that all children were developing language **comprehension** normally, perhaps Angie's linguistic **skill** lags somewhat behind the others. Reticence is perhaps too global a

construct to meaningfully discriminate among children's communication skills. For example, children may be socially inactive because of a communication deficiency **or** of an unwillingness to participate. Certainly the former would have a greater impact on communication performance than the latter which primarily stems from one's attitude and not skills toward social encounters.

Conclusions

Though exploratory, this study offers some insight into the development of extralinguistic speech convergence as a feature of communication competence. First, though these children showed convergence tendencies, their performances were somewhat below the more stable levels characteristic of older children (Welkowitz *et al.* 1976) and adults (see Cappella and Planalp 1981, for review). Since some speech skills appear earlier than others, research should examine communication competence in terms of social speech "forms" occurring on a continuum toward increased adeptness of the speaker's cognitive, behavioral and sociocentric abilities (see James 1980). As Helfrich (1979) contends, because of less complicated requirements upon information processing skills, social knowledge and behavioral repertoires, children can effectively adapt some speech behaviors such as paralanguage and syntax (see also Shatz and Gelman 1973) before having the perspective-taking abilities and lexical repertoire for more complex competencies such as persuasive effectiveness (see Flavell *et al.* 1968 and Delia *et al.* 1979). As noted in this study, there also appears a developmental progression of extralinguistic speech forms as some (e.g., vocal pitch) appear earlier than others (e.g., utterance length).

Second, the notion of compensatory adjustments needs further study. Though the discrepancy between adult and child speech was sometimes noticeable for all behaviors, only utterance number reflected inverse relationships, presumably to maintain the flow of interaction or to allow for greater verbal output by the children. Thus, in some situations dissimilar speech patterns may facilitate interaction (see also Giles 1977).

Third, the talkative children tended to converge more consistently across partners than did the reticent children. However, only one reticent child uniformly displayed lack of convergence. More research is needed to ascertain whether some causes of reticence involve more skill deficiencies than others and whether the talkativeness/reticence dimension is indeed a significant individual difference variable regarding children's communication abilities. Finally, would a three-year-old's pattern-matching be similar in interactions with peers rather than adults? Differences in power and status may mediate degree of convergence.

NOTES

1. The authors would like to thank Joe Cappella, Stanley Feldstein, Bob Hopper, and two anonymous reviewers for comments on earlier versions of this manuscript. Requests for reprints should be addressed to the first author at Department of Speech Communication, Texas Tech University, Lubbock, Texas 79409, U.S.A.
2. Of course, some behaviors such as pitch can serve both functions. Though beyond the scope of this paper, more theoretical and empirical work is needed regarding functions and attributes of extralinguistic behavior.
3. Some situations, however, may call for dissimilar speech styles due to differences among participants' power and status. Giles (1977) has called speech styles reflecting these differences "speech complementarity."

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