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Rhea Paul

paulr4@sacredheart.edu, paulr4@sacredheart.edu

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Profiles of toddlers with slow expressive language development

Rhea Paul, PhD
Associate Professor
Speech and Hearing Sciences Program
Portland State University
Portland, Oregon

ONE OF THE MOST puzzling problems confronting clinicians is the toddler who appears normal in every way, but fails to begin talking. Although retrospective data suggest that children with learning disabilities frequently have histories of slow language growth (Catts & Kamhi, 1986; Maxwell & Wallach, 1984; Weiner, 1985), very little is known about the prognosis for 2-year-olds with delayed onset of language. Traditional wisdom counseled a "wait and see" attitude, and parents are still frequently told that their 2-year-old will grow out of the delay. Some researchers (see Whitehurst et al., this issue) continue to advocate this position. Although, no doubt, spontaneous improvement does occur for some children, there are other 2-year-olds for whom early expressive delays presage long-term difficulty in language and school achievement. The problem for clinicians is to decide which 2-year-old with slow speech development can confidently be left alone to outgrow the problem, and which should

be monitored closely or provided with some form of intervention.

NORMAL LANGUAGE DEVELOPMENT IN TODDLERS

Children exhibit communicative intentions by using gestures and nonconventional vocalizations to express requests and protests and to call attention to themselves and their actions before they say their first word at about 12 months (Chapman, 1981). Coggins (this issue) provides some details about the acquisition of communicative skills in this age group. By 15 months, average *expressive* vocabulary size is 10 words (Reich, 1986). Throughout this early period, receptive vocabulary size exceeds the number of words the child can produce. Comprehension of the first word is usually about 3 months earlier than production, and the first word understood is usually not the same one as the first produced. Comprehension of 50 words generally occurs at about 13 months of age (Benedict, 1979).

First words are acquired slowly in production, a word or two at a time from 12 to 18 months in normal children. At the point at which the child's expressive vocabulary reaches about 50 words, generally at about 18 months, two important things happen. First, there is a spurt of vocabulary growth. Spoken vocabulary increases to an average of over 150 words at 20 months (Dale, Bates, Reznick, & Morisset, 1989) and to over 200 words at age 2 (Reich, 1986). Second, children begin to combine words into simple two-word sentences, often called "telegraphic utterances" (Brown, 1973). These telegraphic utterances usually encode a small range of meanings,

known as semantic relations, that are related to the child's developing cognitive notions (see Thal, this issue), such as object permanence ("allgone milk") and possession ("my cookie").

Although these ages represent averages around which considerable variability exists, the data on the normal range of variation for expressive vocabulary size and use of telegraphic utterances suggests that 24 months is a point at which delays in these areas can be identified (see Rescorla, this issue). Miller (1981) reported that average mean length of utterance (MLU) in morphemes at 24 months is 1.5 to 2.4, indicating that 2-year-olds within the average range of language acquisition are using at least equal numbers of one- and two-word utterances. Several large-scale studies used to establish norms for standardized developmental scales (Bzoch & League, 1971; Capute et al., 1986; Coplan, Gleason, Ryan, Burke, & Williams, 1982; Frankenburg & Dodds, 1967; Rescorla, 1989; Resnick, Allen, & Rapin, 1984) support the notion that children who fail to produce 50 words and two-word combinations at 24 months can be considered delayed in expressive language development.

Stoel-Gammon (this issue) discusses the acquisition of phonology during this period. Briefly, children by the age of 2 produce about 70% of their target consonants correctly, produce 9 to 10 different consonant phones, and a variety of syllable types (Stoel-Gammon, 1987a), suggesting that they are at least moderately intelligible to those in their immediate environment.

Thus, by the age of 2, normal children produce frequent intentionally communi-

cative acts, have an expressive vocabulary of at least 50 words and a substantially larger receptive vocabulary, have begun to put together multiword utterances, and are generally intelligible to those who know them well. It is possible to identify children who are delayed in language development by age 2, but there is little empirical evidence to resolve the issue of whether these early delays persist into the preschool and school-aged periods, or as many believe, simply resolve on their own. Many of the authors in this issue are engaged in trying to find the answer to this question.

TODDLERS WITH SLOW EXPRESSIVE LANGUAGE DEVELOPMENT

In the Portland Language Development Project (PLDP), a longitudinal study, Paul (1991) has been following children between 18 and 34 months of age whose parents reported small expressive vocabularies on the Language Development Survey (Rescorla, 1989), and comparing them with a group of normally speaking children.

Children in the PLDP study were considered slow in expressive language development if they produced fewer than 10 intelligible words at 18 to 23 months, or fewer than 50 words or no two-word combinations by 24 to 34 months.

A group of 30 children meeting the above criteria for slow expressive language development (SELD) was matched to a control group of 30 children on the basis of age, socioeconomic status (SES), race, birth order, and sex ratio. Average age was 25.4 months (SD 4.6) for the

SELD group and 25.2 months (SD 4.0) for the normal speakers. Sixty-nine percent of the normals and 76% of the SELDs were male. There was no difference in birth order between the two groups. The mean socioeconomic levels on the Hollingshead Scale (Myers & Bean, 1968) were similar, with the mean falling at the middle to lower-middle class level and a similar distribution of levels across the two groups. The proportion of homes in which English was the only language spoken (100% and 97%) was also similar. There were more children from nonwhite ethnic groups in the normal sample than in the SELD group (17% and 0%; respectively). All the subjects passed hearing screening at 25 dB. All had developmental quotients on the Bayley Scales of Infant Development (Bayley, 1969) of 85 or better, and all passed informal observational screening for neurological disorders and autism performed by author.

All the subjects were given an intensive assessment battery for receptive language, cognitive development, oral motor function, and adaptive behavior. Parents filled out questionnaires regarding demographic information, medical history, and child behavior. A videotaped free-play interaction between parent and child was analyzed for maternal linguistic input, child communicative behavior, and child phonological characteristics. Characteristics of this cohort at age 2 are presented here in order to draw a portrait of the toddler with SELD.

History of ear infections

Parents were asked to indicate the number of ear infections the child had experienced before the first evaluation. The

number of ear infections reported in both diagnostic groups—SELD and normal—was high, 4 to 6 on the average, and not significantly different between the two. Although this is a very rough estimate of history of otitis media (OM), the fact that both groups report similar figures suggests that OM is very common in all children under 2. Paul, Lynn, and Lohr-Flanders (1990) noted that history of ear infections as reported by parents, a very rough estimate of otitis media, did not predict language outcome at either age 3 or 4 years, suggesting that OM is not the primary determining factor in either initial delay or persistence of delay in this population. Studies of OM report conflicting results on this issue (Friel-Patti, 1990). Clearly, more research is needed on this topic.

Pre- and perinatal history

Parents were asked to describe any pre- or perinatal problems experienced by the subjects, as well as any family history of language delay. Neither pre- nor perinatal problems reported by parents distinguished the groups. One factor that did differ between groups is the reported incidence of history of language, speech, or learning problems in other family members. This history was reported 3 to 4 times more frequently in the SELD group, indicating a possible genetic basis for at least some cases of the disorder. It may be that families with a late-talking child tend to think more of other family members who were slow to start talking, and this increased sensitivity to the issue could also be the source of the difference. Further research is needed to pursue this question.

Cognitive skills

On the Bayley Scale of Infant Mental Development, (Bayley, 1969), both groups scored within the normal range, but the normal group did score significantly higher, with a mean developmental quotient of 116, as opposed to 97 for the SELDs. Although it might appear that the normal group is performing at a superior, rather than average, level of intellectual development, recent data on the Bayley suggest that it may produce inflated scores in normal children (Campbell, Siegel, Parr, & Ramey, 1986). This factor may account for the apparent superior performance of the normal subjects. Nonetheless, the fact is that there is a significant difference in favor of the normals on this measure. Because many of the Bayley items require comprehension or expression of verbal material, it was possible that the difference between the two groups was attributable to low performance of the SELD group on the verbal items. To determine whether the verbal portion of the Bayley influenced SELD group performance, an item analysis was completed.

All the children tested passed all the items on the Bayley up to and including item 123. The last 40 items on the test (123–163) are equally distributed between verbal and nonverbal. There are 10 items that require expressive language, such as naming objects, naming pictures, and producing sentences; 10 that require responses based on understanding language, such as discriminating objects, pointing to pictures, and understanding prepositions; and 20 that require nonverbal responses, such as building a tower, imitating crayon

strokes, and completing puzzles. A comparison was made between the proportion of the last 20 verbal items and the proportion of the last 20 nonverbal items passed by the subjects in the two diagnostic groups. First, the analysis revealed that the normal group passed a significantly higher proportion of both the receptive and expressive items, as well as the combination of both types of verbal items. There was no significant difference, though, in the average number of nonverbal items passed by subjects in the two groups. It would seem, then, that the SELD children are roughly comparable to their normally speaking counterparts in terms of nonverbal cognitive ability.

Adaptive skills

Parents of children in both groups were interviewed using the Vineland Adaptive Behavior Scales (Sparrow, et al, 1984; see Paul, Spangle-Looney, & Dahm, 1991, for a more detailed discussion). The groups did not differ on the Daily Living scale, consisting primarily of self-help items, or on the Motor scale, which assesses gross and fine motor development. There were, however, significant differences in expressive language, receptive language, and socialization on this measure.

The difference between the groups in terms of receptive level was examined further to look for subgroups based in receptive language skill within the SELD sample. Although the SELD group did not perform as well, on the average, as the normals, 71% of the SELD toddlers scored within 6 months of age level on this scale. Only 29% of the SELD sample identified solely on the basis of small expressive

vocabulary size, then, appear to show deficits on receptive skill concomitant with their expressive delays.

The significant difference between the groups in terms of socialization skill on the Vineland also was explored. Here, the results revealed that 62% of the SELD toddlers scored more than 6 months below age level, whereas none of the normal group did so. Because some of the items on the socialization scale required verbalization, such as saying "please" or addressing people by name, an item analysis to determine the influence of verbal performance on this scale was conducted. Results indicated that the normal subjects passed a significantly greater absolute number of nonverbal items, suggesting that the poor performance of the SELD children on the socialization scale went beyond an inability to engage in verbal social routines. These data imply that social skill deficits are associated with SELD. It could be that slowness in language growth and poor socialization are both related to an underlying decrement in motivation to interact. These children may experience somewhat less drive for interaction than other toddlers, which could result in less need to acquire language, even when the potential to do so exists. Although this suggestion is highly speculative, data on communicative intentions produced in this population can be interpreted in a similar light.

Communicative intentions

The box entitled "Scheme for Coding Communicative Intentions," provides the coding scheme used for analyzing expression of communicative intentions in the 10-minute, free-play, mother-child inter-

Scheme for Coding Communicative Intentions

<i>Regulatory intentions</i>	<i>Social interactional intentions</i>	<i>Joint attentional intentions</i>
Request action	Request social routine	Comment
Request object	Greet	Request information
Protest	Call	Request clarification
	Request permission	
	Acknowledge	

Source: Wetherby, A., Cain, D., Yonclas, D., & Walker, V. (1988). Analysis of intentional communication of normal children from the prelinguistic to the multiword stage. *Journal of Speech Hearing Research*, 31, 240-252.

actions that were videotaped. (See Paul & Shiffer, 1991, for a more detailed discussion.)

Paul and Shiffer (1991) showed that the SELD group produced significantly fewer communicative initiations, including nonverbal gestures and vocalizations, than did the normal children. Although SELD children expressed all the types of intentions that were expressed by the normal children, their overall frequency of communicative initiation was lower. However, the difference in frequency could primarily be accounted for by a difference in one particular type of communicative intention: the comment or joint attentional intention, used to focus the mother's attention on an object or activity. Commenting was the most frequent intention for both groups, but the normals commented significantly more often than the SELD group did. The difference between the groups in terms of expression of communicative intentions was a quantitative one, and limited to the intention primarily concerned with interaction for its own sake, rather than for the attainment of environmental ends. Again, the SELD group looked as if it was some-

what less interested in interacting with others, even nonverbally.

Behavior

The two groups were compared on the Childhood Personality Scale (Cohen, 1975), a parent questionnaire. (See Paul & James, 1990, for a more detailed discussion.) The items on this scale were divided into four factors: (1) hyperactivity, (2) conduct, (3) relationships to others, and (4) affect/mood. Here, significant differences were found between the two groups on the hyperactivity and conduct factors only.

In addition, parents were asked to complete a questionnaire that listed a series of possible "problem behaviors" and to rate the presence of these problems in their child on a scale of "not at all," "some problem," or "serious problem." The SELD group was rated as showing significantly more problem behaviors on this instrument than was the normal group. The SELD toddlers, then, seemed to be perceived by their parents as overly active and more difficult to manage than normally speaking 2-year-olds.

Phonology

Paul and Jennings (in press) investigated syllable structure characteristics of the subjects' productions in both vocalizations and meaningful words, using an adaptation of Stoel-Gammon's (1987b) procedure for evaluating phonological structures in young children. The box entitled, "Scheme for Coding Syllable Structure Level" gives the coding criteria for this procedure, which scores syllable structures at three levels. Level 1 includes vowels, syllabic consonants, and consonant (C) vowel (V) syllables containing only glottal stops or glides; level 2 includes utterances with CV, VC, or CVC syllables with a single consonant type; level 3 includes syllables with more than one consonant type.

Paul and Jennings (in press) reported that the SELD toddlers were significantly less mature in terms of the complexity of

their syllable structures. Whereas most normally speaking 2-year-olds produced a majority of syllables rated at level 3, with more than one different consonant, very few of these syllables were produced by the SELD group, whose syllables were primarily of the level 1 and level 2 variety. Similarly, the SELD group had significantly fewer consonants in their phonetic inventories—an average of 8, as opposed to 16 for the normal toddlers. The percentage of consonants produced correctly relative to adult target words was also significantly reduced in the speech of SELDs, with the normal toddlers producing about 70% correct consonants, and the SELDs producing only 56%. It seems clear, then, that SELD toddlers showed less maturity in phonological production than their peers with normal expressive vocabulary size.

This finding accords well with those of Whitehurst et al. (this issue). They report that, although expressive vocabulary size moves relatively quickly within the normal range after the slow start in these children, articulation skills continue to be poor throughout much of the preschool period. Our follow-up studies of these children (Paul, 1991) also suggest that a large proportion of 3- and 4-year-olds with a history of SELD have articulation deficits, both with and without concomitant expressive language delays. Whitehurst et al. (this issue) report that articulation deficits in their SELD subjects resolved more or less spontaneously by age 5. However, Shriberg and Kwiatkowski (1988) showed that 20% to 30% of children with apparently specific articulation difficulties in the preschool period required special education services once the child was in school,

Scheme for Coding Syllable Structure Level

Score 1: Utterances consisting of voiced vowel(s), syllabic consonants, or CV syllable(s) with only glottal stops or glides as consonants. Examples: /wawa/, /n/, /i/.

Score 2: Utterances consisting of CV, VC, or CVC syllable(s) in which only one consonant type appears (disregarding voicing differences). Examples: /gigi/, /dada/, /t di/.

Score 3: Utterances consisting of syllables with two or more different consonants. Examples: /c p/, /dali/.

Source: Stoel-Gammon, C. (1987b). Language production scale. In L. Olswang, C. Stoel-Gammon, T. Coggins, & R. Carpenter. (Eds.), *Assessing linguistic behaviors*. Seattle, WA: University of Washington.

even though the articulation disorder itself may have been resolved by this time. Thus, it would appear that the SELD toddlers' delays in phonological acquisition presage a substantial risk for articulation delay during the preschool period. This delay, in and of itself, and even if it appears to resolve by school age, seems to constitute a risk for special educational needs, possibly stemming from phonological processing problems (Catts, 1989).

Summary

These data indicate that children identified at age 2 on the basis of small expressive vocabulary alone resemble their normally speaking peers in terms of medical history of ear infections, and nonverbal cognitive skills. They differ from other toddlers, though, on a range of verbal and nonverbal parameters, including social skills, communicative behavior, maladaptive behavior, and phonological maturity. These differences suggest that late-talking toddlers may not be slow simply in the development of the ability to say words. These differences could be construed to suggest that the children would be at a substantial risk for long-term delay. What is the evidence for this position?

OUTCOMES OF SLOW EXPRESSIVE LANGUAGE DEVELOPMENT

Several researchers, including Paul (1991), Rescorla (1990), and Thal (1989) have reported follow-up studies on relatively large groups of toddlers identified at age 2 as slow in expressive vocabulary

development. These researchers are consistent in reporting that 40% to 50% of their subjects do not "outgrow" their delays by age 3 years, when expressive language deficit is no longer measured by vocabulary size, but by maturity of sentence structures as indexed by MLU in morphemes (Miller, 1981), structural stage (Miller, 1981), Developmental Sentence Score (Lee, 1974), or productive syntactic level (Scarborough, 1990). Paul (1991), like Whitehurst et al. (this issue), reports that expressive vocabulary size quickly moves within the normal range in this population, without intervention. However, more complex expressive skills, such as sentence structures and use of complex sentences, remain delayed in a substantial proportion of the 3-year-olds studied.

Paul and Smith (1991) followed 28 SELD toddlers to age 4 and showed that 57% of the group continued to show expressive deficits, as indexed by MLU and Developmental Sentence Score. In addition, Paul and Smith found that SELD children with persistent expressive language delay also demonstrated significant deficits in their narrative skills, when assessed with a standardized story-retelling task (Renfrew, 1977). This finding is particularly significant because narrative skills in preschoolers have been shown to be one of the best predictors of school success. Thus, when fine-grained measures of expressive skills that tap more complex abilities than size of expressive vocabulary or general verbal fluency are employed, a substantial proportion of children with a history of SELD evidence chronic deficits, at least until age 4.

The children in the present study have not yet reached age 5, and, as such, cannot be compared directly with the subjects reported to have "caught up" to normals in the Whitehurst et al. work reported in this issue. Similarly, the children in this study were evaluated for receptive language skill on an instrument that is more sensitive to deficits in receptive language than is the Peabody Picture Vocabulary Test-Revised (PPVT-R) (Dunn & Dunn, 1981), which only evaluates receptive vocabulary under quite restrictive conditions. Even random pointing to one of four pictures provides a one-in-four change of being "correct." Thus, it is not clear whether the present sample is, in fact, more receptively impaired than Whitehurst et al.'s, or simply assessed in more depth in this area. In any case, studies that examine children with a variety of types of language delay in the preschool period and follow them into the school years consistently show very high risk for academic difficulty (Aram, Ekelman, & Nation, 1984; Aram & Nation, 1980; Garvey & Gordon, 1973; King, Jones, & Lasky, 1982).

Tallal (1988) suggests that many children who are diagnosed as language impaired in the preschool period frequently have their diagnoses changed to "learning disabled" when they reach school age, because it is the reading and writing deficits that become more obvious and salient. She argues that the two disorders are really manifestations of the same underlying deficit that is expressed in different ways at different points in development. Like Whitehurst et al. (this issue), Tallal observes that the oral language deficits that accompany the reading difficulties in

this population at school age are no longer obvious to the "naked ear," and may require more in-depth assessment in order to be tapped.

Scarborough and Dobrich (1990) present a model of the course of development of language skills in children with a history of SELD that includes a period of "illusory recovery" at about age 5, when SELD children appear to move within the normal range primarily because the rate of growth of their peers has slowed down considerably, only to speed up and again surpass the SELD children's rate at age 6 to 7. Thus, the issue of whether SELD children can be said to "catch up" by age 5, as Whitehurst et al. (this issue) claim, must be considered in light of

- whether the full range of language skills that are important at this age—and not detectable in measures of expressive vocabulary size, general verbal fluency, or unstructured conversation (such as complex sentence use and narrative skill)—is evaluated,
- whether any recovery that does appear to be completed by age 5 is stable, or will again be outpaced by development in normal children over the course of the next year or two, when their rate of language growth accelerates, in conjunction with the acquisition of literacy skills, and
- even if oral language skills do appear to eventually remain within the normal range by the end of the preschool period, whether the underlying processes that slowed them down at first continue to operate, now influencing primarily the learning of reading, writ-

ing, and spelling, as seems to be the case for so many youngsters with a history of language delay.

It would seem that the question of spontaneous recovery from early language delay must be phrased in terms of what we mean by "catch up." If we mean that children who start out with small expressive vocabularies and little speech achieve normal expressive vocabulary sizes and generally fluent production by age 5, the answer may be "yes" (Whitehurst et al., this issue). If we mean that children who start out with small expressive vocabularies do not have increased risk for long-term difficulties with complex, sophisticated language use or with the school curricula, then the answer is not yet clear. This author's view of the evidence available from a range of sources at this point in time suggests that 2-year-olds who are slow in their expressive development do experience considerable risk for chronic delays in advanced language skills and in school achievement, although many will recover spontaneously. The issue, therefore, is to find reliable predictors of good and poor outcomes that can be used to make decisions about which toddlers should be closely monitored or provided with early intervention, and which can be confidently left alone to undergo spontaneous recovery.

INTERVENTION ISSUES

Should toddlers or young preschoolers with SELD be provided with speech-language intervention? Although some might argue that intervention has only short-term effects and does not change the

long-term course of SELD, this conclusion is based on the belief that SELD toddlers become normal by age 5, and thus, no intervention is required. For example, Whitehurst et al. (this issue) measured outcome only in terms of expressive vocabulary size and general verbal fluency, and not in terms of the areas intervention was most likely to have addressed, that is, sentence structure and complexity. If it is the case, as I have argued, the SELD changes its form with development and is manifested in deficits in complex language, advanced discourse skills, and academic achievement in the late preschool and school-aged period, then some attempt to lay the basis for these skills in an early intervention program may be effective, although further research will be needed to substantiate this view.

If the decision to provide intervention at age 2 is made, on what skills should intervention focus? One thing we do know about this population is that increasing expressive vocabulary may have little effect on outcome (Whitehurst, et al., this issue). Although it is tempting to say that because these children have small expressive vocabularies, what they need is to be taught larger ones, this approach does not seem to produce positive results. The deficits seen in these children in socialization and communication skills suggest that their slow language growth may be associated with immature or underdeveloped interpersonal abilities. If this is the case, then intervention must focus first on the interpersonal, or pragmatic, aspect of language in order to be effective. Naming and

labeling drills in and of themselves will not reach this goal.

These findings suggest a management program that should take place in a pragmatic context with a focus on interpersonal communication. Activities would include the production of multiword utterances encoding early semantic relations, at first using the words the child is already producing in holophrases. Later, new vocabulary items with controlled phonological shapes can be taught and eventually incorporated into the multiword utterances.

For example, a child who at 24 months produces only the words *mama*, *car*, *bye*, *shoe*, *hug*, and *doggy* might be engaged in a game in which photos of his mother, his dog, a shoe, and a toy car were lined up on the floor. The clinician might take one of the items and say to the child, "Hide mama. I'll close my eyes. You hide mama. I'll see if I can find mama. Hide mama." This could then be repeated with the other items. Then the clinician might say, "Now let's hug mama. I'll do it first. I'll hug mama. Now you do it. Hug mama." This would then be repeated for all items. Next the clinician could say, "Now you tell me what to do. I could hug mama or I could hide mama. I could hug the doggy or I could hide the doggy. What should I do? You tell me." If the child only produced one word, the clinician could feign confusion, and ask "Mama? Shall I hide mama? Or should I hug mama? You tell me what to do." The child could then be encouraged to take several turns. When two-word combinations of the agent-action form are produced consistently, new vo-

cabulary items, either nouns or verbs, can be added to the game.

It should be noticed that the words used contain only consonants already produced by the child, and only simple CVC syllable shapes. Also, the game is structured so that in order to accomplish the goal, to get the clinician to hide or hug one of the items, the child must produce both the target words. Neither alone will be sufficient to communicate the message. Finally, the game puts the child in an assertive position, where he tells the clinician what to do.

As the child gets older and improves in sentence length, intervention might focus on those skills known to be associated with school success, because this seems to be the area of deficit that is most likely to persist in this population. Given SELD children's poor phonological skills, and the known association between deficits in phonological awareness and in reading (Catts, 1989), a program during the late preschool period that focused on the development of phonological awareness through rhyming and segmentation activities may be useful (Bradley & Bryant, 1985). Even if phonological errors in production are the only obvious deficit these children are displaying in this period, phonological awareness activities, as an adjunct to articulation training, may have a preventative effect in helping to stave off early reading delay. Similarly, intervention that targeted the development of narrative skill and the comprehension and production of complex sentences may be of value. Of course, ongoing assessment is necessary both to ensure that the interventions are effective and to determine whether the child has

moved within the normal range in the specific skills being addressed. Although these suggestions are speculative, their intent is to begin to connect the knowledge emerging about late-talking toddlers

with more informed principles on which intervention may be based, and to stimulate research that will allow us to demonstrate whether such intervention is efficacious in either the short or long term.

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