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Is Expressive Language Disorder an Accurate Diagnostic Category?

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Abstract

Purpose—The purpose of this paper is to propose that the diagnostic category of “expressive language disorder” as distinct from a disorder of both expressive and receptive language might not be accurate.

Method—Evidence that casts doubt on a pure form of this disorder is reviewed from several sources, including the literature on genetic findings, theories of language impairments, and the outcomes of late talkers with expressive language delays. Areas of language that are problematic in production but not readily amenable to comprehension testing are also discussed.

Conclusions—The notion of “expressive language disorder” has been formalized in classification systems and is implicit if not explicit in the organization of many standardized tests. However, a close inspection of the evidence suggests that deficits in language expression are typically accompanied by limitations in language knowledge or difficulties processing language input. For this reason, the diagnostic category “expressive language disorder” should be used with considerable caution. This view has implications for both research and clinical practice.

Introduction

In the literature on children with language impairments, it is common to find reference to the heterogeneity of this population. Although some patterns of strengths and weaknesses are more common than others, exceptions to the common patterns can easily be found. These differences among children have encouraged attempts to identify subgroups of children with language impairments (Aram & Nation, 1975; Wolfus, Moscovitch, & Kinsbourne, 1980; Rapin & Allen, 1983, 1987; Wilson & Risucci, 1986; Korkman & Häkkinen-Rihu, 1994; Rapin, 1996; Conti-Ramsden, Crutchley, & Botting, 1997; van Daal, Verhoeven, & van Balkom, 2004). Often these subdivisions reflect domains of language (e.g., grammar, vocabulary) that may be especially weak in some but not other subgroups. However, just as frequently, subdivisions are based on the modality – comprehension and/or production – that may be affected. This modality distinction is most often a division between children with “expressive” language deficits and children with “receptive-expressive” language deficits. Children in the first category have problems that are principally confined to language output; children in the latter category exhibit significant weaknesses in language comprehension as well as language expression.

The distinction between expressive language disorder and receptive-expressive language disorder is not simply an informal clinical sorting of children; it has been formalized. “Expressive language disorder” and “(mixed) receptive-expressive language disorder” constitute DSM-IV-TR categories (American Psychiatric Association, 2000) and carry

different codes (315.31 and 315.32 for the expressive and receptive-expressive forms of the disorder, respectively). In the ICD-10 system, the two subtypes are referred to as “expressive language disorder” and “receptive language disorder” (with codes of F80.1 and F80.2, respectively) (World Health Organization, 2005). Although the latter term does not include the word “expressive”, the ICD-10 definition of this subtype specifies that “in virtually all cases expressive language will also be markedly affected.” To avoid confusion, the term “receptive-expressive language disorder” will be used here.

An inspection of standardized language tests can give the impression that the distinction between expressive language disorder and receptive-expressive disorder should be part of a clinician’s *a priori* assessment strategy. Many tests have a separate score for expressive and receptive language, and those tests with multiple subtests have provisions for combining scores of particular subtests to arrive at an expressive language composite score and a receptive language composite score. Tests that provide separate expressive and receptive scores include: the Clinical Evaluation of Language Fundamentals – Preschool (Wiig, Secord, & Semel, 2004), the Clinical Evaluation of Language Fundamentals – 4 (Semel, Wiig, & Secord, 2003), the Comprehensive Assessment of Spoken Language (Carrow-Woolfolk, 1999), the Oral-Written Language Scale (Carrow-Woolfolk, 1995), the Preschool Language Scale – 4 (Zimmerman, Steiner, & Pond, 2002), the Reynell Developmental Language Scales (Reynell & Gruber, 1990), the Sequenced Inventory of Communication Development – Revised (Hedrick, Prather, & Tobin, 1984), the Test of Adolescent and Adult Language – 3 (Hammill, Brown, Larsen, & Wiederholt, 1994), the Test of Early Language Development – 3 (Hresko, Reid, & Hammill, 1999), the Test of Language Development – Intermediate 4 (Hammill & Newcomer, 2008), the Test of Language Development – Primary 4 (Newcomer & Hammill, 2008), and the Test of Narrative Language (Gillam & Pearson, 2004), among others.

The distinction between expressive and receptive language has also become highly relevant to evidence-based practice. For example, Law, Garrett, and Nye (2004) made use of this distinction in their meta-analysis of intervention studies meeting the criteria for randomized controlled trials. One of their conclusions from their secondary analyses was “that there may be a differential effect of intervention for expressive syntax, with intervention being effective for those children who do not also have receptive language difficulties” (p. 931).

In this paper, I point out significant limitations in the expressive versus receptive-expressive dichotomy as applied to vocabulary, grammar, and narrative skills. I recognize that children with weak expressive language ability in these areas can vary widely in their language comprehension ability. I also acknowledge that, using psychometric criteria, it is often possible to group children into expressive and receptive-expressive categories. However, I question whether, at a deeper level, the distinction is accurate.

A simple example can be used to introduce this idea. Mainstream American English-speaking children with language impairments often produce *not* in contexts requiring *doesn’t* (e.g., *Mommy not like carrots*). It is highly likely that children making this error in production can understand sentences such as *Mommy doesn’t like carrots*, as the form *doesn’t* will have been heard before in similar contexts. (One can imagine that, in response to “Show me *Mommy doesn’t like carrots*”, children might select a picture of a woman who is frowning while looking at a plate of carrots rather than a foil that depicts a woman smiling at the carrots.) I would argue that the children’s failure to produce the correct form is due to insufficient knowledge; the children may have sufficient familiarity with *doesn’t* and the contexts in which it appears to interpret its meaning, but not know this form well enough to recognize that it should be retrieved for use in their own speech.

It is important to stress that such children might well earn age-appropriate scores on sentence comprehension tests and low scores on sentence production tests. This pattern of performance might give us license in a technical sense to say that these children have an expressive language disorder. However, this is not the same as saying that their problems in using forms such as *doesn't* are limited to output. Insufficient knowledge is also a factor. In making my case, I will try to keep separate the concept of psychometrically defined gaps between expressive and receptive scores on the one hand, and the concept of limitations in language knowledge on the other. Children showing gaps between scores on expressive and receptive language tests might be described differently from children showing low scores on both types of tests, but it seems risky to describe the output problems of the first group as a limitation in expressive language only. In subsequent sections of this paper, I pursue these issues more fully. I begin with some of the pitfalls in defining expressive language disorder based on differences between expressive and receptive language test scores, and then follow with a more extended discussion of how expressive language disorder may be an inaccurate characterization because the degree or type of language knowledge needed for language expression may differ from that needed to succeed in language comprehension.

Empirical Discrepancies and Gaps in the Data

There is little doubt that early methods of defining children as exhibiting an expressive or receptive-expressive language disorder were fraught with problems. Bishop (1979) pointed out some of these difficulties in a now-classic study. She administered both the Peabody Picture Vocabulary Test (PPVT; Dunn, 1965) and the Test for Reception of Grammar (Bishop, 1977) to children who had been classified as showing either an expressive language disorder or a receptive-expressive language disorder. Bishop found that both groups of children scored well below the level of age-matched typically developing children on both tests. The typically developing children in this study were not unrepresentative; their standard scores averaged approximately 100. Given the lower scores of the expressive language disorder group on two different comprehension measures, Bishop argued that there was no clear justification for giving these children a clinical label that excluded reference to receptive language.

We now have greater sophistication in using test scores as a basis for classifying children as exhibiting an expressive language disorder or a receptive-expressive language disorder. Factors now considered include the need to select only those expressive and receptive language tests that have acceptable levels of sensitivity and specificity, and the need to ensure that the standard errors of measurement of the expressive and receptive language tests are taken into account before concluding that the two types of scores are truly different.

Of course, it is also important to take into account the domains of language that are assessed. For example, Deevy and Leonard (2004) studied a group of children with language impairments who earned low-average scores on the PPVT-III (Dunn & Dunn, 1997), a receptive vocabulary test, but scored poorly on tests of expressive language. When tested for their understanding of Wh-questions of the type *Who was the happy brown dog chasing?* the children performed significantly below the level of a group of slightly younger typically developing children who were matched according to raw scores on the PPVT-III. Even though these children's low-average receptive vocabulary scores were not clinically significant, their poorer understanding of Wh-questions relative to younger typically developing children would seem to render a classification of "expressive language disorder" quite insufficient.

Perhaps the greatest obstacle to using test scores to classify children as showing an expressive language disorder rests in the fact that some of the details of expressive language that are most problematic for children with language impairments – and are often of great diagnostic importance – are extremely difficult to test in comprehension. A clear example is seen in the

area of grammatical morphology. In production, morphemes that reflect tense and agreement, such as auxiliary *is*, third person singular *-s*, and past tense *-ed* often pose significant problems for children with language impairments. These children often use these morphemes inconsistently for an extended period. This inconsistency represents an especially good means of distinguishing children with language impairments from their typically developing peers; sensitivity and specificity values approximate or exceed 80% (Bedore & Leonard, 1998; Rice & Wexler, 2001). However, tests of the comprehension of these morphemes are difficult to develop, for several reasons. First, given the structure of English, verb morphemes that reflect subject-verb agreement (e.g., auxiliary and copula *be* forms, third person singular *-s*), are accompanied by the subject of the sentence that provides a supporting (or, in the case of testing, a confounding) cue. To control for this fact, items with invariant nouns must be employed. Unfortunately, children may not know that nouns such as *fish*, *deer*, and *moose* are identical in singular and plural. Thus an item on a picture pointing task such as “Show me *The fish are swimming*” may be difficult either because the child does not understand that auxiliary *are* marks third person plural, or because the child does not know that *fish* is the form used for plural as well as singular. (In contrast, in languages such as Spanish and Italian in which the subject is optional when the referent is clear, the item can be presented without the subject, thus avoiding subject number cues and the need for invariant nouns.)

Johnson, deVilliers, and Seymour (2005) avoided this problem in a picture pointing task with the clever innovation of using verbs with word-initial/s/. By ensuring that there were no pauses between the subject and the verb, contrasts such as *The duck swims in the water* and *The ducks swim in the water* could be used without providing confounding cues. Unfortunately, typically developing children do not appear to perform above the level of chance until five years of age on this type of task. As noted by Johnson et al., typically developing children produce third person singular *-s* to a greater degree than their performance on this task would predict. Therefore, the type of knowledge required for production must be somewhat different than the knowledge required to succeed on this task.

As children reach four years of age, the assessment of children’s understanding of certain agreement morphemes is possible through the use of grammaticality judgment tasks. In the Rice/Wexler Test of Early Grammatical Impairment (Rice & Wexler, 2001), children’s judgments of sentences with missing agreement morphemes (e.g., *He running away*; *Now the bear want a drink*) and agreement morphemes reflecting incorrect agreement (e.g., *He are mad*; *I drinks milk*) are evaluated, along with sentences possessing correct use of these morphemes. The advantage of this assessment tool is that a separate evaluation can be made of the children’s judgments of sentences most likely to resemble their own production errors (notably, the omission of agreement markers) and their judgments of sentences whose errors are not those likely to be used by the children (those with overt agreement errors such as *I drinks milk*). However, because grammaticality judgment tasks require some degree of metalinguistic skill, high levels of both sensitivity and specificity are not seen until approximately six years of age.

The assessment of children’s comprehension of past tense poses a different type of problem. When assessed by means of a picture pointing task, past tense is typically distinguished from present tense by contrasting a drawing of an action that was just completed with a drawing of an action still in progress. For example, the drawing for an item assessing comprehension of *The girl jumped* could depict a girl landing after having just jumped over a fence, contrasted with a drawing of a girl still in the air. However, such a past tense item conflates past tense with completion or perfective aspect. Within a picture pointing format, it would be very difficult to test for past tense without providing cues of this type; yet the absence of such cues is necessary to determine if the child understands past tense independent of perfective aspect.

I suspect that our limited ability to assess certain language details in comprehension – or the older ages at which we have had to assess them – has contributed to the impression that some children have deficits restricted to language expression. Quite possibly, this complication has been responsible in part for the apparent instability of this diagnostic category. For example, using the categories of expressive and receptive-expressive language deficits, Conti-Ramsden and Botting (1999) found that many of the children who were classified as exhibiting an expressive language disorder were re-classified as showing a receptive-expressive language disorder when tested 12 months later. Tomblin and Zhang (2006) tested alternative models for their suitability in accounting for children's scores on standardized language test batteries at four different ages. They found that a single-dimension model – in which all language tests were treated as a single factor – was superior to a model that treated expressive and receptive scores as separate factors. There was some evidence that, across time, grammatical abilities and vocabulary abilities became differentiated, but an expressive versus receptive distinction did not emerge.

Limitations in Language Knowledge Underlying Seemingly Pure Cases of Expressive Language Disorder

With further development and refinement of testing procedures, it is likely that we will move toward a greater understanding of children's language comprehension. However, I believe that problems in expressive language may be due in part to limitations in the degree of children's language knowledge, and this graded level of knowledge may prove very difficult to measure given current methods of testing in which a response to any receptive test item is either correct or incorrect. The subtle but important role played by language knowledge can be seen if we consider those operations that are most often associated with expressive language disorders.

These operations include those involved in retrieving and preparing linguistic material for output. (The problematic operations cannot be confined to the physical act of speaking. If this were the case, all children with expressive language disorders would have significant phonological difficulties and there would be no way to distinguish problems in a domain such as grammar from those in a domain such as vocabulary.) I believe that the difficulties that children with expressive language disorder have with operations of retrieval and preparation for output are exacerbated by limitations in language knowledge. I consider the operations of word retrieval and sentence formulation in turn.

Word Retrieval Problems

Word retrieval difficulty is usually defined as a problem in accessing words that are already known by the child. However, the word-finding literature offers an alternative interpretation. McGregor, Newman, Reilly, and Capone (2002) provide an illustrative study in this regard. These investigators performed a comprehensive examination of the semantic knowledge possessed by a group of children with specific language impairment (SLI) who were found to commit a substantial number of naming errors for age-appropriate objects. They found that the children's drawings, definitions, and recognition responses were also relatively poor for objects that were incorrectly or inadequately named. Most of the children earned age-appropriate scores on the PPVT-III. McGregor et al. summarized their findings succinctly: "This study demonstrates that the degree of knowledge represented in the child's semantic lexicon makes words more or less vulnerable to retrieval failure and that limited semantic knowledge contributes to the frequent naming errors of children with SLI." (p. 998).

Limitations in degree of word knowledge can also affect naming response time (RT), even when children produce the correct name for an object (e.g., Kail & Leonard, 1986). The typical explanation for this view is that repeated encounters with a word lead to stronger and more

numerous associations in semantic memory. Words with stronger and more numerous associations can be retrieved more quickly than words that are represented in semantic memory with fewer and weaker associations. For this reason, typically functioning adults show faster RTs for names that have high frequency of occurrence in the language than for names with lower frequency of occurrence. Obviously, these adults do not have selective retrieval deficits; rather, the RT differences reflect differences in the degree to which the high and low frequency words are known. It would follow that the slower RTs for children with language impairments that have been reported in some picture naming studies might well be attributable to limitations in the degree to which the children knew the words.

Sentence Formulation Problems

Another possible deficit of a strictly expressive nature is a problem of sentence formulation, that is, a deficit in preparing already-acquired language material into sentences for output. One relevant line of evidence is the study of speech disruptions in children with language impairments. If children insert pauses or fillers (e.g., *uh*, *well*), or repeat syllables or words in the sentences they produce, they may be having difficulties with sentence formulation, even when the sentences contain no grammatical errors. Finneran, Leonard, and Miller (in press) found that a group of nine-year-olds with SLI produced grammatical sentences with significantly more speech disruptions than a group of same-age peers. Similar results were reported by Guo, Tomblin, and Samelson (2008) who found that children with SLI had a significantly higher number of pauses than same-age peers in their production of narratives. The fact that the rate of pauses was higher at phrase boundaries led these investigators to conclude that these pauses may have been due to lexical and/or syntactic weaknesses in the children with SLI. As we saw in the discussion of word retrieval problems, speech disruptions occurring during sentence production could reflect words or syntactic structures that are simply not as well known by children with language impairments as by typically developing peers, thus requiring more of a struggle to accurately retrieve. The source of the difficulty, then, may occur prior to the point of preparing the utterance for production.

Another look at sentence formulation is provided by studies that employ syntactic priming. Leonard et al. (2000) found that children with language impairments who were inconsistent in using auxiliary *is* were more likely to describe a target picture with this morpheme (e.g., *The Grinch is reading the book*) if they had just repeated a prime sentence such as *The cats are drinking the milk* than if they had just repeated a sentence such as *The bird flew away*. The difference between these two priming conditions was greater in the group of children with language impairments than in a group of younger typically developing children who were also inconsistent in their use of auxiliary *is*. The priming effects seen in both groups were interpreted as reflecting the prior activation of a syntactic frame. In the case of *The cats are drinking the milk*, the frame is appropriate for use when describing the target picture, and its prior activation renders it easier to retrieve. Once retrieved, the content words and function words (including the specific auxiliary form, *is*) can be retrieved and inserted into the frame. The fact that the priming effects were larger in the group with language impairments led Leonard et al. to propose that these children had greater difficulty with sentence formulation, and this process was greatly assisted through prior activation of an applicable syntactic frame. Similar results were obtained in a subsequent study by Leonard, Miller, Deevy, Rauf, and Charest (2002).

Although formulation of an utterance seems to fall on the expressive side of language, it is not an insulated process. More recent work provides a strong indication that priming crosses modalities. In both children (Shimpi, Gámez, Huttenlocher, & Vasilyeva, 2007) and adults (Branigan, Pickering, Stewart, & McLean, 2000), simply hearing prime sentences without repeating them also leads to increased use of the syntactic frame in production. The fact that production is influenced by prime sentences that are heard but not repeated has led to the view

that language production relies on the same type of structural knowledge as language comprehension (Bock, Dell, Chang, & Onishi, 2007). It would follow that, in the Leonard et al. studies, the prime sentences facilitated the children's knowledge of the sentence structure, not just their ability to call on the structure for use in a target sentence.

It can be seen, then, that the findings from word retrieval and sentence formulation studies do not provide sufficient evidence to conclude that the problem lies exclusively in language expression. Limitations in language knowledge are also implicated.

The Expressive versus Receptive-Expressive Distinction in the Identification, Prediction, and Explanation of Language Impairments

There are additional reasons to question the notion of expressive language disorder. An inspection of the literature on the identification of language impairments, the prediction of later language impairments, and theories of language impairments provides very little (if any) evidence that expressive language problems occur in isolation. Instead, they seem to be accompanied by weaknesses in language comprehension and/or knowledge.

Genetic Studies and the Expressive versus Receptive-Expressive Distinction

Twin studies have provided valuable information concerning the genetic and environmental influences on children's language abilities. Bishop, Adams, and Norbury (2006) employed the twin-study methodology and identified two heritable weaknesses associated with risk for language impairment. One was a limitation seen on a nonword repetition task. The other was a weakness in grammatical computation, as reflected on tasks of tense and agreement morpheme production and syntactic comprehension. Although heritable, these two weaknesses were separable; one could occur without the other. Neither of these weak ability areas suggests a division between receptive and expressive skills. The grammatical computation measure involved tasks of both production and comprehension. The nonword repetition task, although requiring a production response, is often taken to be a measure of verbal short-term memory (e.g., Gathercole & Baddeley, 1990), and thus cannot be viewed as a purely expressive task.

Theories of Grammatical Impairment and the Expressive versus Receptive-Expressive Distinction

There are several prominent explanations for the types of grammatical difficulties experienced by children with language impairments. However, all of these accounts seem to assume that the problem is not limited to language expression but extends to the children's incomplete grasp of particular linguistic principles, or to their inability to process linguistic information in the input. Although there is debate among researchers about the descriptive and explanatory adequacy of some of these accounts, most of these accounts would have been dealt a fatal blow if a significant minority of the children serving as participants in these studies performed adequately on the comprehension or receptive language processing tasks that were used to test these accounts. For example, the extended optional infinitive (EOI) account of Rice, Wexler, and their colleagues holds that children with language impairments fail to grasp the notion that tense and agreement are obligatory in main clauses (Rice & Wexler, 1996; Rice, Wexler, & Hershberger, 1998; Rice, 2003). Instead, they treat tense and agreement as optional. In production, this problem leads to inconsistency in the use of tense and agreement morphemes. In comprehension, it is seen when the children judge sentences such as *The boy am running* as wrong but treat both *The boy is running* and *The boy running* as acceptable. Similarly, in the Representational Deficit for Dependent Relationships account of van der Lely, children with language impairments not only have difficulty in the use of certain grammatical details, they also have difficulty comprehending them (van der Lely, 1998; van der Lely & Battell, 2003). Thus wh-questions that require movement of wh-words and auxiliary verbs, as in *Who was the*

girl kissing? are more difficult for these children in both comprehension and production than *wh*-questions that can be produced or interpreted with no such movement, as in *Who was kissing the girl?* Recent approaches that describe the movement deficit somewhat differently nevertheless find that comprehension is affected (Friedmann & Novogrodsky, 2007).

Ullman and Pierpoint (2005) propose that many children with SLI have a deficit in the neural circuitry responsible for procedural memory, the system involved in the learning and execution of sequential cognitive (including linguistic) information. This procedural deficit is assumed to affect comprehension as well as production. Although more research is needed to test this proposal, recent evidence on procedural learning difficulties in children with language impairments indicate that the problem is not limited to language expression (Tomblin, Mainela-Arnold, & Zhang, 2007).

Accounts that assume processing capacity limitations in children with language impairments also implicate comprehension as well as production. Put more precisely, these accounts assume that the problem of these children rests in a limited processing capacity that restricts the amount and timeliness of information that can be taken in, thus impeding the development of comprehension as well as production. Perhaps the dominant proposal of this type is that these children have significant limitations in verbal working memory (e.g., Montgomery, 2000; Hoffman & Gillam, 2004; Leonard, Ellis Weismer, Miller, Francis, Tomblin, & Kail, 2007). Studies that have examined verbal working memory in children with language impairments consistently report difficulties in this population.

It is tempting to treat differences between linguistically-based accounts and those that assume processing limitations as equivalent to a difference in competence versus performance. A limitation in competence can easily be viewed as a receptive-expressive problem given that language knowledge is affected. However, a processing limitation affects more than on-line performance; if the information is not adequately processed, it cannot serve to form or strengthen an underlying representation in the child's developing language system. As a result, knowledge is affected, not simply the child's performance in the moment.

It is striking that there are no theories of expressive (only) language disorder apart from proposals that pertain to segmental phonology or prosody (e.g., Gerken & McGregor, 1998; Goffman, 2004). Despite the fact that the expressive component has been front and center in the existing theories of grammatical impairments, the proponents of all theories have seen the need to assume deficits that extend beyond language output.

Late Talkers and the Prediction of Outcomes

Several excellent prospective studies have been conducted that follow late talkers for several years with the aim of determining which factors represent risk factors for language impairment at a later age. Children are defined as late talkers according to expressive language criteria, specifically, as producing fewer than 50 words and no word combinations (e.g., Rescorla, 1989, 2005), or as falling below the 10th percentile in word use at 24 to 30 months (e.g., Thal, Tobias, & Morrison, 1991; Thal, 2005; Ellis Weismer, 2007). Many of the late talkers in these studies earned age-appropriate scores on tests of language comprehension. A careful review of this literature reveals one puzzling fact. The percentage of late talkers with outcomes that lead to a diagnosis of SLI at a later age is consistently much lower than would be expected given that the prevalence of SLI is approximately 7% at five years of age (Tomblin et al., 1997). For example, Thal (2005) found that only 8.8% of the late talkers in her prospective study met the criteria for SLI when the children were five years old. Ellis Weismer (2007) found that only 7.5% of the late talkers in her investigation met the criteria for SLI when they reached five years of age. These percentages are close to the prevalence figures for SLI among five-year-olds in the general population, and suggest that an early pattern of slow expressive

language development is not a good predictor of later language impairment. Instead, early, slow expressive language development seems to predict later language functioning that is below average but within normal limits (e.g., Rescorla, 2005). Importantly, when 24-month-olds are found to have low comprehension as well as production ability, their outcomes are poorer (Thal et al., 1991). Ellis Weismer (2007) reported that late talkers' comprehension at 30 months was the strongest single predictor of these children's language production scores at 66 months.

In a more recent investigation, Rice, Taylor, and Zubrick (2008) assessed the language abilities of seven-year-olds who had been identified as exhibiting either late language emergence or language emergence at a typical age. Late language emergence was defined as a small expressive vocabulary (70 words or fewer) or no word combinations at 24 months of age. At seven years of age, a higher percentage of the late language emergence group met the criterion for "affectedness" on 7 of the 17 language measures obtained. The percentage of children in this group who met the criterion ranged from 4 to 23, depending on the language measure. These percentages are somewhat higher than those of previous studies. However, it should be noted that the criterion used for affectedness for each language measure was -1 SD. Such a criterion is not especially stringent as it represents the lowest 16% of a distribution.

Implications for the Study of Heterogeneity

If a conventional distinction such as the expressive versus receptive-expressive distinction becomes suspect, can other conventional distinctions be far behind? For example, ever since the influential work of Bloom and Lahey (1978), the distinction among content, form, and use (including areas of overlap) has been viewed as important for the description of language impairments in children, even making its way into the definition of "language disorder" by the American Speech-Language-Hearing Association (1993). This distinction has served as a useful heuristic, by focusing our attention on broad dimensions of language that might be adversely affected. However, to my knowledge, it has not yet been demonstrated that children can be reliably placed into subtypes that conform to these particular divisions. The degree to which these and other conventional distinctions can be substantiated would seem to be an important topic for future investigation.

It is possible that meaningful subtypes might be identified through genetic studies of potential "endophenotypes" (clusters of related abilities) that arise from theoretical proposals of causal factors in language impairment (Bishop, 2006). For example, if weaknesses in several theoretically related abilities appear to cluster together in monozygotic twins to a greater extent than in dizygotic twins, this cluster might constitute a meaningful subtype of language impairment. Additional clusters might also be discovered in this way and these might prove to be genetically distinct from each other. Still other weaknesses may prove to be rather frequent but unreliable in their patterning. The latter weaknesses might be regarded as secondary deficits that may accompany one or more of the core subtypes but not enter into a formal classification scheme.

Implications for Clinical Research and Practice

One goal for future clinical research would be to develop or refine methods for assessing children's understanding of language details that are often problematic for these children in production but have proven to be difficult to assess in comprehension. As noted earlier, one such language detail is subject-verb agreement. Current methods are suitable for ages five years and older, but less than ideal for younger children. However, it might be possible to assess children's sensitivity to subject-verb agreement at a younger age. McNamara, Carter, McIntosh, and Gerken (1998) found that preschool-aged children with SLI were more likely

to point to a correct picture (e.g., a picture of a bird) in response to a sentence containing an appropriately used article (e.g., *Find the bird for me*) than in response to a sentence containing an inappropriate morpheme (e.g., *Find was bird for me*). Sentence contexts appropriate for a subject-verb agreement morpheme were not employed (e.g., contrasting *Mom is running* with *Mom the running*), but it seems that this task might allow for items of this type. Of course, as I argued earlier, an awareness that a morpheme seems to be in an appropriate (or inappropriate) context is no assurance that the child has sufficient knowledge to use the morpheme. Additional forms of assessing children's receptive command of subject-verb agreement will still be needed.

The assessment of children's comprehension of past tense has also proven to be challenging. However, it may be possible to develop informative tests of past tense comprehension by adapting existing procedures seen in the normal child language literature. Wagner (2001) developed a task used with young typically developing children in which a toy character is made to proceed along a path, performing actions in the middle of the path and then again at the end of the path. The actions performed in the first location can have definable endpoints (e.g., filling a toy bucket with small toy apples). In some items, this action might be completed before the character moves on to the next location (e.g., all the apples are placed in the bucket) and in other items, the action might not be completed before the character resumes the journey along the path (e.g., some of the apples remain on the ground next to the bucket). The action at the end of the path is identical to the first action. While the character is performing the action at the end of the path, the examiner can ask the child to point to the location of the named action. A request such as *Show me where the girl filled up the bucket* is most appropriate when the first action had been completed (all apples were placed in the bucket). A request such as *Show me where the girl was filling up a bucket* can be made both when the first action had been completed and when it was left incomplete, because the past progressive does not entail completion, only past time. To contrast past with present tense, the request *Show me where the girl is filling up a bucket* can be made. In this instance, of course, the correct response is the location of the action being performed at the end of the path.

The views expressed in this paper also carry implications for clinical practice. When children show a significant gap between their expressive and receptive language test scores, clinicians should carefully examine the details of expressive language that are problematic for the children. If these details are not reflected adequately in the receptive language tests that were administered, there is a possibility that the children lack the prerequisite knowledge for successful production. If receptive measures that do tap into these details are available, clinicians might then employ them to supplement the receptive language testing of the children.

Treatment decisions, too, might be influenced by the views conveyed here. Treatment focused on details of expressive language for which the children's prerequisite knowledge has not been established should involve an approach that provides the children with information about meaning, grammatical function, and/or contexts of use along with any production practice that is provided. For young children, of course, such information might have to be provided through examples rather than through formal instruction.

I think it rather paradoxical – and consistent with the views expressed here – that approaches such as recasting have proven promising as a method for facilitating young children's expressive language (e.g., Camarata, Nelson, & Camarata, 1994; Camarata & Nelson, 2006; Leonard, Camarata, Paw owska, Brown, & Camarata, 2008). In this approach, clinicians respond to children's utterances with conversationally appropriate utterances that resemble the children's preceding utterances but contain the language target. Such an approach provides children with contextual information and contrasts between their own utterance and the recast utterance, yet no expressive use of the target is even required of the children. Of course, future

research may reveal that some children require practice in producing the language target. However, I suspect that any treatment approach that is found to meet the highest levels of evidence will have a significant component devoted to providing children with information that goes well beyond the act of production.

Conclusions

At the outset of this paper, I introduced the idea that children may exhibit deficits in expressive language that are caused by limitations in knowledge that extend beyond a problem with the retrieval and preparation of language material for output. These limitations might not be reflected in the children's scores on language comprehension tests. As I have tried to show, current methods of assessing comprehension abilities do not yet allow us to test children's grasp of certain details of language that are known to be problematic in language expression.

It is also difficult to demonstrate that a pure expressive language disorder can even exist, given the types of language knowledge that seem to underlie operations such as word retrieval and sentence formulation. I am also struck with how little the notion of expressive language disorder enters into attempts to explain grammatical impairments. Outside of the realm of segmental phonology and prosody, there seems to be no theory of expressive language problems that does not also assume a limitation in language knowledge or a problem in processing language input. Furthermore, it does not seem plausible that the existing theories would remain viable if many of the children with language impairments in these studies could succeed in the comprehension and receptive language processing tasks that were employed to test these theories. Genetic evidence, too, seems to point to weaknesses in ability areas that incorporate receptive as well as expressive language. Finally, early delays in expressive language (only) do not serve as good predictors of later language impairment; on the other hand, if comprehension delays are also seen at a young age, later problems in language are more likely.

It may be that the term "expressive language disorder" is useful in particular circumstances, as a type of shorthand to refer to children whose receptive language test scores are demonstrably higher than their expressive language test scores. However, considering the questions that remain about this diagnostic category, we should be alert to the possibility that children may lack the knowledge needed to produce language adequately even when their receptive language scores might suggest otherwise.

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