Critical Review:
Associations Between Child Temperament and Expressive Language

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This critical review examines the evidence related to the association between expressive language skills and temperamental characteristics in children under the age of six. Nine studies were included in this review employing correlational analysis to investigate the presence of a statistically significant association between temperamental features and expressive language development. Although overall findings were mixed, factors such as inattention, inhibition, and detachment were more common in children with delayed language development, while persistence, activity level, high intensity pleasure, and approach were associated with stronger expressive language skills. Recommendations for clinical practice and future research are discussed.

Introduction

In many circumstances, language impairments are not identified until students present with notable academic or social difficulty. However, as language skills are a necessary precursor for effective learning and for the development of strong communication skills, it is important to treat language disorders as early as possible. When carried out at the appropriate time, early intervention may significantly alter a child's developmental course in favour of more positive outcomes (ASHA, 2008). In order to engage in early intervention with children who are at risk of language impairment, those children first need to be identified.

Understanding child factors that are commonly associated with language disorders may help parents and speech-language pathologists in the identification of children who could benefit from early intervention. One such factor that may correlate with language development is child temperament. Temperament refers to characteristics of a child's emotionality, and social tendencies that influence their behaviour. As "temperament" can encompass a variety of different dimensions ranging from emotional affect to fussiness, studies exploring any aspect of child temperament were considered for the purposes of this critical review.

Critically evaluating the current literature on temperamental characteristics in children and whether these features are correlated with their expressive language skills allows for the identification of factors that may be commonly associated with language delays. These identified risk factors related to child temperament may then be used by parents and speech-language pathologists to highlight those children that may be at greater risk for language impairment, and to provide those individuals with early language intervention as soon as possible to facilitate more successful academic and social outcomes.

Objectives

The primary objective of this paper is to critically review existing literature in order to determine whether an association exists between child temperament and expressive language skills.

Methods

Search Strategy

Online databases such as PubMed, Taylor & Francis Online, and Google Scholar were searched using the following keywords: (language) OR (expressive language) AND (temperament) AND (child).

Search was limited to articles available in English and published after 2005.

Selection Criteria

Studies selected were required to examine expressive language skills and temperament in children under six years of age. Studies that additionally considered other factors were included, but only information related to temperament and expressive language were considered for the purposes of this critical review.

This review is specifically concerned with the development of expressive language in children who are otherwise typically developing. Therefore, studies involving specific populations (e.g. participants from low SES families, pre-term infants) were excluded.

Data Collection

Results of this search yielded nine studies which each employed correlational analyses to investigate the

relationship between expressive language and child temperament.

Results

Carson, Carson, Klee, and Jackman-Brown (2007) applied a correlational analysis to examine child temperament and behaviour in 47 toddlers between 25 to 31 months of age from a town in western USA. These participants belonged to a broader longitudinal study that took place over a four-year period. Parents completed a gold-standard temperament and behaviour scale, and an examiner then administered a gold-standard standardized language test in order to determine which participants would qualify as having a language delay. Seventeen participants were identified as having a speech-language delay, while the remaining 30 were considered to be typically developing. Appropriate statistical analyses were conducted and found that toddlers with speech-language delays presented with greater detachment and underreactivity. No statistically significant correlations were identified between the presence of a speech-language delay and the temperamental features of hyperactivity or dysregulation.

A minor limitation in this study is that an alternative assessment procedure was used to evaluate expressive language skills in four children. The small sample size is a significant limitation, particularly as the data related to children with speech-language delays was derived from only 17 subjects. Furthermore, the authors state that the sample of participants was homogeneous and representative of the socioeconomic and ethnic demographics of the area, but they only specify that 93% of the participants were Caucasian and 7% were Hispanic. No specific data related to socioeconomic status of participants was provided. As recruitment was conducted on a volunteer basis, the sample of participants may not have been truly representative of the population.

Overall, these findings are suggestive that 25 to 31-month old children with language delays tend to exhibit greater detachment and less reactivity.

Garello, Viterbori, and Usai (2012) used a correlational analysis to explore the relationship between child temperament and expressive and receptive language. Participants included 109 children ages 24 to 30 months whose language exposure was limited to Italian. Teachers and parents completed two gold-standard questionnaires related to language and child temperament. These assessment results were used to generate categories of temperamental profiles. Notably, teachers received more training than parents in completing the questionnaire. A standardized Italian language test of questionable validity (due to being relatively outdated) was also administered by independent testers to objectively assess child language. Appropriate statistical analyses revealed that children with temperaments characterized by inattentiveness and inhibition had poorer lexical skills, poorer morphological skills, and less developed vocabularies. This was relative to children with more "typical" temperaments, who had larger expressive vocabularies and more semantically advanced productions. Some discrepancies between the temperamental profiles reported by teachers and parents were observed.

A strength of this study is that they accounted for discrepancies in parent and teacher reporting by incorporating independent language testing by a third party. A notable limitation is that the chosen standardized language test appears inappropriate. Having been developed in 1993, the sample upon which this test was initially normed may not be representative of the population of Italian infants.

The results of this study are suggestive that inattentiveness and inhibition are associated with poorer expressive language skills in children 24 to 30 months of age.

Harrison and McLeod (2009) studied 4983 Australian children ages four to five who were participating in the Longitudinal Study of Australian Children in order to evaluate 31 variables related to child, parent, family, and community that may be risk or protective factors for speech and language impairment. Temperament was among the variables considered, and a correlational analysis was employed to identify any associations with expressive language. Relevant outcome measures included parent-rated expressive speech/language concern, and reported use of speech-language pathology services. This information was obtained by parent and teacher reports, as well as assessment by a trained interviewer. Temperament was assessed by a gold-standard scale which ranks children according to sociability, persistence, and reactivity. Appropriate statistical analyses revealed significant associations between temperament and expressive language. Sociability and persistence were both identified as protective factors in using SLP services. Persistence was a protective factor for parental concern regarding expressive language, while reactivity was a risk factor for this outcome measure.

A strength of this study is its use of a large and nationally representative sample. The use of parents, teachers, and trained interviewers also allows for a more comprehensive assessment of the various outcome

measures of interest. The choice of parent-rated expressive speech/language concern remains questionable due to the subjective nature of this measure. Although use of speech-language pathology services as reported by teachers and parents is a second outcome measure that encompasses expressive language, it was broadly defined and included any speech-language pathology service without differentiating between speech, expressive language, and receptive language. Therefore, while both sociability and persistence were protective factors for using SLP services, it cannot be assumed that they are protective factors for using SLP services specifically for expressive language impairments.

Overall, these findings provide a compelling overview of the potential involvement of 31 variables in risk for speech and language impairment. For the purposes of this critical review, these results provide suggestive evidence that having a persistent temperament is a protective factor for parental concern regarding expressive language, while having a more reactive temperament may be a risk factor in children four to five years of age.

Laake and Bridgett (2014) used a correlational analysis to consider the relationship between positive affect (PA) in toddlers and language development. Participants were recruited from a rural Midwest region in the US. The mothers of eighty-three infants completed the PA portion of a gold-standard infant behaviour questionnaire in order to assess participants on sub-scales involving characteristics such as activity level, high intensity pleasure (i.e. level of pleasure expressed in response to high intensity stimuli), amount of smiling and laughter observed, vocal reactivity, approach, and perceptual sensitivity at 10 months of age. When the participants were 14 months old, several language subtests from a gold-standard formal language test were administered by trained graduate students. Appropriate statistical analyses revealed that activity level, approach, and high intensity pleasure predicted expressive language, but not receptive language.

A strength of this study is their consideration of gender and maternal demographic factors which they then used to identify a score of Cumulative Risk for each child. These help to account for the variance in language abilities that are not attributable to differences in PA. As well, their use of gold-standard assessment tools provide valid and reliable results.

This study provides highly suggestive evidence that certain dimensions of PA including activity level, approach, and high intensity pleasure at 10 months of age are positively correlated with expressive language development at 14 months.

Nozadi et al. (2013) employed a longitudinal study design to examine maternal sensitivity, children's expressions of anger, and language skills. Correlational analysis was use to observe the relationship between anger expressions and expressive language. Two home visits were conducted, involving 247 children at 18 months of age, and 216 children at 30 months (with 212 children participating at both visits). Participants were recruited at birth from three local hospitals from a southwestern metropolitan area in the US. At each visit, mothers completed the short form of a gold-standard communication inventory. Maternal sensitivity was assessed by observing mother-child interactions during free play, and anger reactivity was evaluated during toy removal task. Appropriate statistical analyses identified discrepant correlations between anger expressions and expressive language at different ages. Anger expressions at 18 months were positively predictive of expressive language skills for both girls and boys, while anger expressions at 30 months were negatively correlated with language skills for boys only.

A limitation of this study is that some participants were from bilingual households, thereby reducing uniformity of the sample population. Potential discrepancies resulting from this were limited by employing measures of total vocabulary (i.e. total number of English and Spanish words). Another limitation is the context in which anger expressions were observed. While the use of the structured toy removal task to assess anger reactivity ensured that every child was presented with the same stimulus, it may have been the case that not every child found the toy as enticing, or that this artificial stimulus did not elicit typical or realistic reactions. A strength of this study was consideration of other relevant factors including the sex of the child, and SES. In doing so, the authors were able to identify associations that were sex-specific.

Overall, this study provides highly suggestive evidence that the association between anger expressions and age may vary, depending on the age and sex of the child.

Prior, Bavin, Cini, Eadie, and Reilly (2011) assessed three aspects of temperament (approach/sociability; problems with attention/persistence; and overall difficultness of temperament) in 1559 four-year old children. The authors applied correlational analyses to identify differences between participants with language impairment (LI), and typically developing children in these areas of temperament, as well as in behaviour and maternal sensitivity. Participants were from six of Melbourne's metropolitan local government areas, and

were involved in the Early Language in Victoria Study (ELVS), a longitudinal study investigating language development. Expressive and receptive language were assessed by either speech pathologists or trained graduate students with the Australian version of a gold-standard American language assessment tool. A gold-standard Australian temperament scale was completed by parents to assess temperament. Language scores were used to indicate the presence of impairment, and a total of 310 participants were identified as having LI. Appropriate statistical analyses indicated group differences on attention/persistence and difficultness, but not on approach/sociability.

A strength of this study is its large sample size. As this study was part of the broader ELVS study, its results are also able to be compared to earlier findings that have been established on the same sample (i.e. Prior et al., 2008). Their use of the language assessment tool was also appropriate, as this is a widely used, gold-standard test. These results are limited in their clinical applicability as the methods failed to distinguish between expressive and receptive language impairments. Furthermore, the labels of “language impairment” and “typically developing” categorize language skills into binary groups. These labels do not acknowledge the range of language skills that children may have (e.g. impairment ranges from mild to severe, and children with typically developing skills may still fall above or below the average range of scores).

These findings provide suggestive evidence that persistence and difficultness are associated with language ability at four years of age. However, failure to distinguish between expressive and receptive language skills make this evidence equivocal in addressing the clinical question of interest in this critical review.

Schjølberg, Eadie, Zachrisson, Øyen, and Prior (2011) investigated potential child, family, and environmental factors that may have a role in predicting delayed language development. Correlational analysis was used to identify associations between language development and child fussiness. Participants consisted of 42107 toddlers involved in the Norwegian Mother and Child Cohort Study (MoBa), an ongoing prospective study in Norway. Data was obtained during pregnancy, as well as throughout the children’s development up to 18 months of age. A four-item Norwegian screening questionnaire (based on an American test) was used to assess language at 18 months of age. Participants were then identified as having either normal or slow language development. Temperament was assessed at six months of age using seven items of a gold-standard parent questionnaire related to fussiness/difficultness. Children were accordingly identified as either "difficult" or "normal". Correlational analyses revealed that fussy temperament was not statistically significant as a predictor of slow language development.

A strength of this study is its large sample size. Omission of any participants with parent-reported neurodevelopmental disorder, deafness, or cerebral palsy also supported the generalizability of these findings across a typically developing population of Norwegian toddlers. A limitation in this design is the choice of questionnaire used to evaluate child language. Although this tool has been previously identified as being comparable in validity to the American version, and also has evidence to support its construct validity in a Norwegian population, it appears to be inappropriate for the purposes of this study. This questionnaire is a screening tool containing only four items, and therefore only highlights the need for further assessment rather than definitively identifying impairment. Therefore, it may be the case that some participants were mistakenly identified as having slow language development.

These results are constrained by their failure to differentiate between expressive and receptive language, and therefore are equivocal in addressing the clinical question of interest in this critical review.

Spere, Evans, Hendry, and Mansell (2009) recruited 67 junior kindergarten students from four school boards in southwestern Ontario in order to examine the range of expressive vocabulary skills in these groups, and the potential influence of assessment contexts. Correlational analysis was completed in order to identify any differences in language skills between groups of shy and non-shy children. Nineteen participants were identified as shy, 25 were non-shy, and 23 fell in between the two categories. Parents completed two gold-standard questionnaires related to literacy and temperament. Children were each seen once at home and once at school. Parallel forms of a gold-standard standardized vocabulary test were completed at school by trained graduate students, and at home by the child’s parent. Statistical analyses indicated that although there were effects of the assessment context with all students performing better at school than at home, no between-group differences were observed in terms of expressive vocabulary skills.

There are several notable limitations in this study. The relatively small sample size limits the generalizability of these results. The assessment contexts were artificial in design, and this may have influenced the child’s performance in either setting. In a home environment, children may not be accustomed to being formally

tested by their parent while an unfamiliar examiner observes from a distance, and this may have hindered the naturalness of the parent-child interaction. Finally, although the language test used is gold-standard, its expressive language norms begin at age five. Most of the children assessed in this study were only four years of age. Therefore, statistically valid expressive vocabulary scores could not be obtained for most of this study's participants.

This study offers equivocal evidence to suggest that there are not group differences between expressive language skills in shy and non-shy preschoolers.

Westerlund and Lagerberg (2008) examined a number of maternal and child factors and their associations with expressive vocabulary and reading skills. Correlational analysis was used to examine the relationship between expressive vocabulary and child difficultness. Participants included 1091 children ranging from 17 to 19 months of age who had visited Swedish Child Health Services. The mothers of these children completed a comprehensive questionnaire which contained a gold-standard communication screening tool in order to assess expressive vocabulary. Also included in this questionnaire was also a measure of child difficultness with demonstrated internal consistency and test-retest reliability. Appropriate statistical analyses were conducted, and ultimately found no significant associations between difficultness and vocabulary skills.

Strengths of this study include the large sample size, and the use of well-established, gold-standard assessment tools. However, there may have been some discrepancies in maternal reports of difficultness, as mothers were to compare their child with an imagined "average" child. Maternal definitions of "average" may have varied, and their perception of where their child's skills were relative to the average child may not have been accurate.

Overall, these findings offer highly suggestive evidence that there is not an association between difficultness and temperament in children at 18 months of age.

Discussion

This critical review examines the available evidence related to associations between child temperament and expressive language skills in children under six years of age. Overall, results from the selected studies were mixed. There appeared to be differences in associations between expressive language skills and certain components of temperament at different ages. For instance, results indicated the presence of a positive correlation between anger and reactivity at younger ages (e.g. 18 months), while these same temperamental factors were negatively associated with expressive language development in older children (e.g. at 30 months) (Nozadi et al., 2013). No group differences in expressive language skills were identified between groups of shy and non-shy children (Prior et al., 2011; Spere et al., 2009).

Several studies did not find any statistically significant correlations between expressive language and the dimension of temperament that they assessed (Spere et al., 2009; Schjølberg et al., 2011; Westerlund & Lagerberg, 2008). However, some features that were more consistently identified as being present in children with weaker expressive language skills included inattention, inhibition, and detachment (Garello et al., 2012; Carson et al., 2007). Factors that were determined to be positively associated with expressive language included persistence, activity level, high intensity pleasure, and approach (Harrison & McLeod, 2009; Laake & Bridgett, 2014; Prior et al., 2011).

Contributions from some studies were limited due to failures in those methodological designs to separate expressive and receptive language results (Prior et al., 2011; Schjølberg et al., 2011). Several studies also involved the use of inappropriate assessment tools, small sample sizes, and artificial assessment contexts (Carson et al., 2007; Garello et al., 2012; Nozadi et al., 2013; Spere et al., 2009; Schjølberg et al., 2011). Most of the evidence reviewed involved assessing child temperament and expressive language at a single point in time. However, two studies employed longitudinal designs to assess temperament and language skills at different ages. (Laake & Bridgett, 2014; Nozadi et al., 2013).

Many of the studies included in this critical review also considered additional factors that may influence language development in children (Harrison & McLeod, 2009; Laake & Bridgett, 2014; Nozadi et al., 2013; Prior et al., 2011; Schjølberg et al., 2011; Westerlund & Lagerberg, 2008). Though not a direct objective of this study, broad review of these findings related to additional child, parent, and community factors suggest that they may similarly contribute to expressive language development.

Conclusion

Overall, review of the current evidence related to temperament and child language indicates that certain factors are more consistently associated with language impairment, such as inattention, inhibition, and detachment. In contrast, other factors including

persistence, activity level, high intensity pleasure, and approach are more often positively correlated with expressive language. A considerable portion of the evidence yielded mixed results related to the associations between temperament and expressive language. Future research is recommended to provide stronger evidence related to this association.

Clinical Implications

Given that review of the available research yielded mixed findings, parents and speech-language pathologists should be cautious in assuming that specific temperamental features are absolute indicators of impairment. However, these factors may be used to identify children who are potentially at risk, so that they can be provided with additional language stimulation. This support may pre-emptively improve their language skills to facilitate more positive academic and social outcomes. In cases of children who possess temperamental features that are characteristic of language delays, but who nevertheless develop language age-appropriately, additional language exposure is not likely to be detrimental. Therefore, providing additional language support will help to facilitate more positive outcomes, with little negative impact.

Further study is required to strengthen the current body of evidence. In order to do so, it is recommended that future research take the following into consideration:

1. Expressive and receptive language should be assessed and considered as separate outcome measures, rather than broadly evaluating language as a single measure.

2. Associations between temperament and expressive language may vary depending on the child's age. Therefore, longitudinal study designs may be effective in better characterizing the dynamic relationship between temperamental characteristics and expressive language skills.

3. Additional variables including characteristics related to the child, caregiver, and/or environment should continue to be considered in relation to the development of expressive language skills. Obtaining evidence to support associations with other potential factors will provide a more comprehensive set of risk/protective factors for practical clinical use.

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