

**DOES
TEMPERAMENT
MAKE A
DIFFERENCE?**

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OVERVIEW

This session presents results from a UK study which identified the temperament profiles of children with early language delay and their progress in receptive and expressive language development over a 12 month period.

WHAT WE KNOW

- Early language delay affects around 17% of children under 5 years old in the UK¹.
- Factors around the child interact to influence language development:^{2,3}
 - Child: Gender, pre/postnatal difficulties, hearing status, temperament⁴, multiple birth, health
 - Parent: Family history of language difficulty, mother's age, education
 - Community: Socioeconomic factors, family size
- Studies of late talkers and children referred early to SLT services highlight a substantial rate of 'catch up', with recovery rates for expressive language between 2 and 4 years varying between 29-74% on different measures^{5,6}.

TEMPERAMENT



Biologically based differences in reactivity and self-regulation that are relatively stable across contexts and time and expressed in the domains of emotion, activity, attention and sensory responses^{7,8}.



DIMENSIONS OF TEMPERAMENT⁹

Activity Level: motor activity when awake or asleep.

Adaptability: how easily a child adjusts to changes.

Approach: child's initial response to novelty/transition.

Distractibility: how easily the child is distracted by stimulation extraneous to a task.

Intensity: the reactive energy of a response.

Mood: the basic quality of disposition.

Rhythmicity: predictability of bodily functions/patterns.

Persistence: ability to continue an activity when it is difficult or faced with obstacles.

Sensory Threshold: the level of stimulation required to evoke a response.



TEMPERAMENT LINKS TO LANGUAGE

- Research is starting to identify temperament in specific populations¹⁰ e.g. people with autism¹¹, to look for behavioural phenotypes and shape interventions in their light.
- High levels of emotional reactivity have been significantly correlated with language difficulties, whilst high persistence appeared to provide protection from them¹².
- Investigation of the language skills of shy and non-shy pre-schoolers and found that shy children scored significantly less well and concluded that shyness may exert an inhibiting effect on language development¹³.
- Children who stutter - temperamental profiles that are high in intensity and distractibility hypothesized to exacerbate and maintain stuttering¹⁴.

RESEARCH QUESTIONS

- What progress do children make in receptive and expressive language over 12 months?
- Do the children have a characteristic temperament profile?
- What factors most effectively predict language scores after 12 months?

THE STUDY

- A longitudinal design investigated relationships between language development and temperament. Two points of data collection (start, T1 and 12 months later, T2).
 - 80 children with Early Language Delay were recruited via SLT services in North West England after ethical approval.
 - mean age 32mths (2;08), range = 24–45mths (2;00 -3;09)
 - 90% (72) completed the study
- Measures: Informal developmental and family history interview, Toddler Temperament Scale, Behavioural Style Questionnaire and Pre-school Language Scales 3-UK
- Data collected through home visits
 - Parental interview with the researcher to identify risk factors.
 - Language was assessed using the PLS3-UK at a second home visit.

CHILDREN'S CHARACTERISTICS

- Children: 60 boys, 20 girls,
- Medical support aged 0-2 months, 26%; routine medical surveillance, 74% .
- 0-2 colds lasting longer than a week, 74%; 3+ colds, 26% (in past year).
- 1⁰ relative with a history of language/literacy difficulty, 55%; 2⁰ relative, 9%; no known family history, 46%.
- 5 GCSEs or above, 89%; below 5 GCSEs, 11% .
- Bilingual environment, 11%; monolingual English, 89%.
- Singletons, 24%; Siblings, 76% (range 1-6; one sibling, 53%).
- Family position: first born, 45%, second child 39%, later born 16%
- 77% lived in the top 75% of SES ranks; 23% had postcodes in the lowest 25%.

Results





What progress do
children make in
receptive and
expressive language
over 12 months?

AUDITORY COMPREHENSION

Entry to the study:

- Mean standard score = 88, with a range of 56-131.
- 47% had scores \downarrow 1SD of the mean, 44% had scores within \pm 1SD and 9% of the children had scores \uparrow 1SD.

12 month follow up:

- Mean standard score = 100.5, with a range of 60-148.
- 25% of the children had scores \downarrow 1SD of the mean, 49% had scores within \pm 1SD and 26% of the children had scores \uparrow 1SD.

Was this progress significant?

- paired *t*-test of standard scores: $t(71) = -8.86, p < .001$ (one tailed), confirmed that this was a statistically significant improvement (medium effect size).
- strong positive relationship between entry and follow up scores: Pearson's $r = .853$
- increase in standard score was seen for 89% of the children.
- no change evidenced in standard scores for 11% of the children.

EXPRESSIVE LANGUAGE

Entry to the study:

- Mean standard score = 75, with a range of 60 -109
- 85% had scores \downarrow 1SD of the mean, 15% had scores within \pm 1SD and no scores were 1SD or more above the mean.

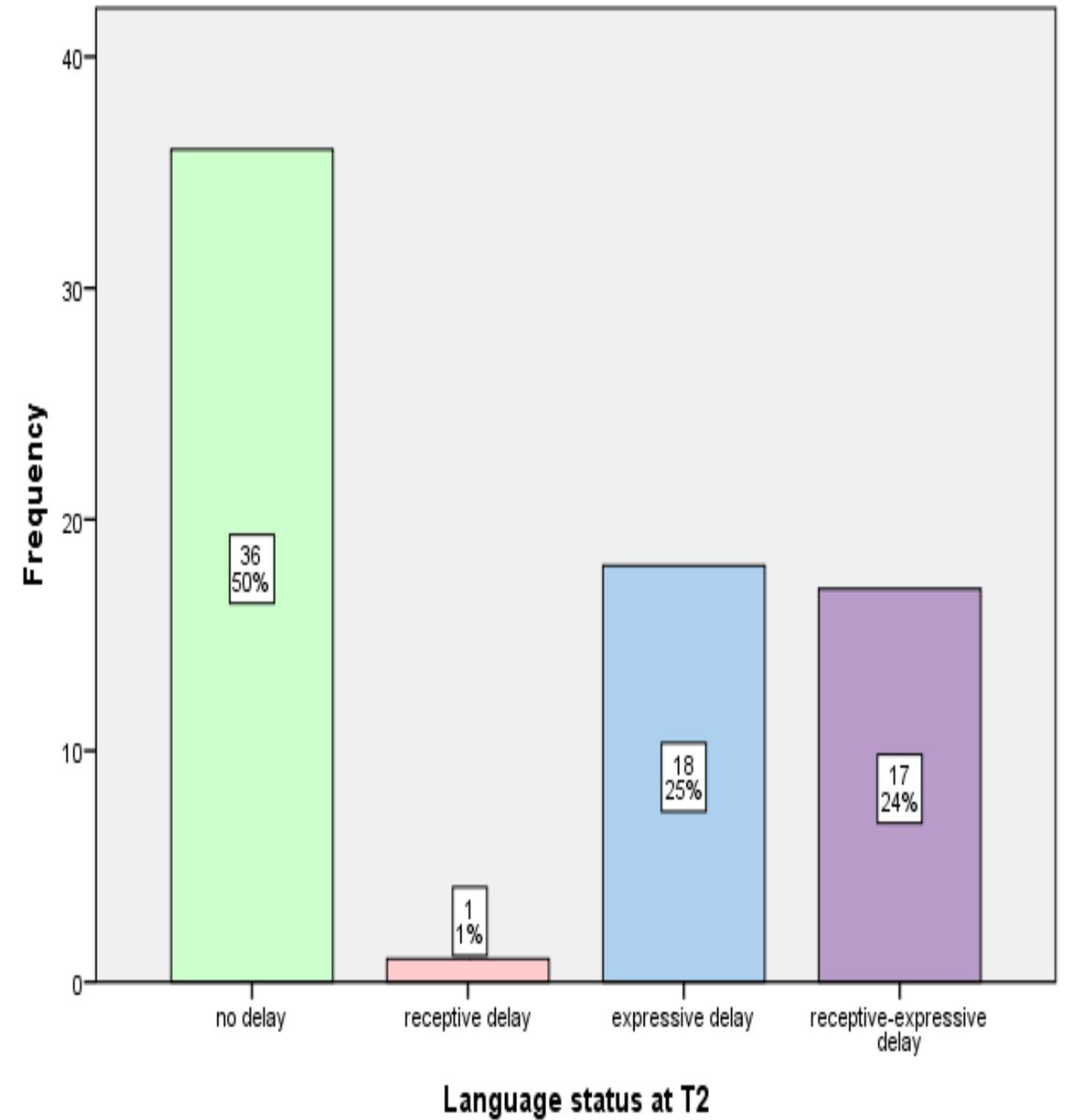
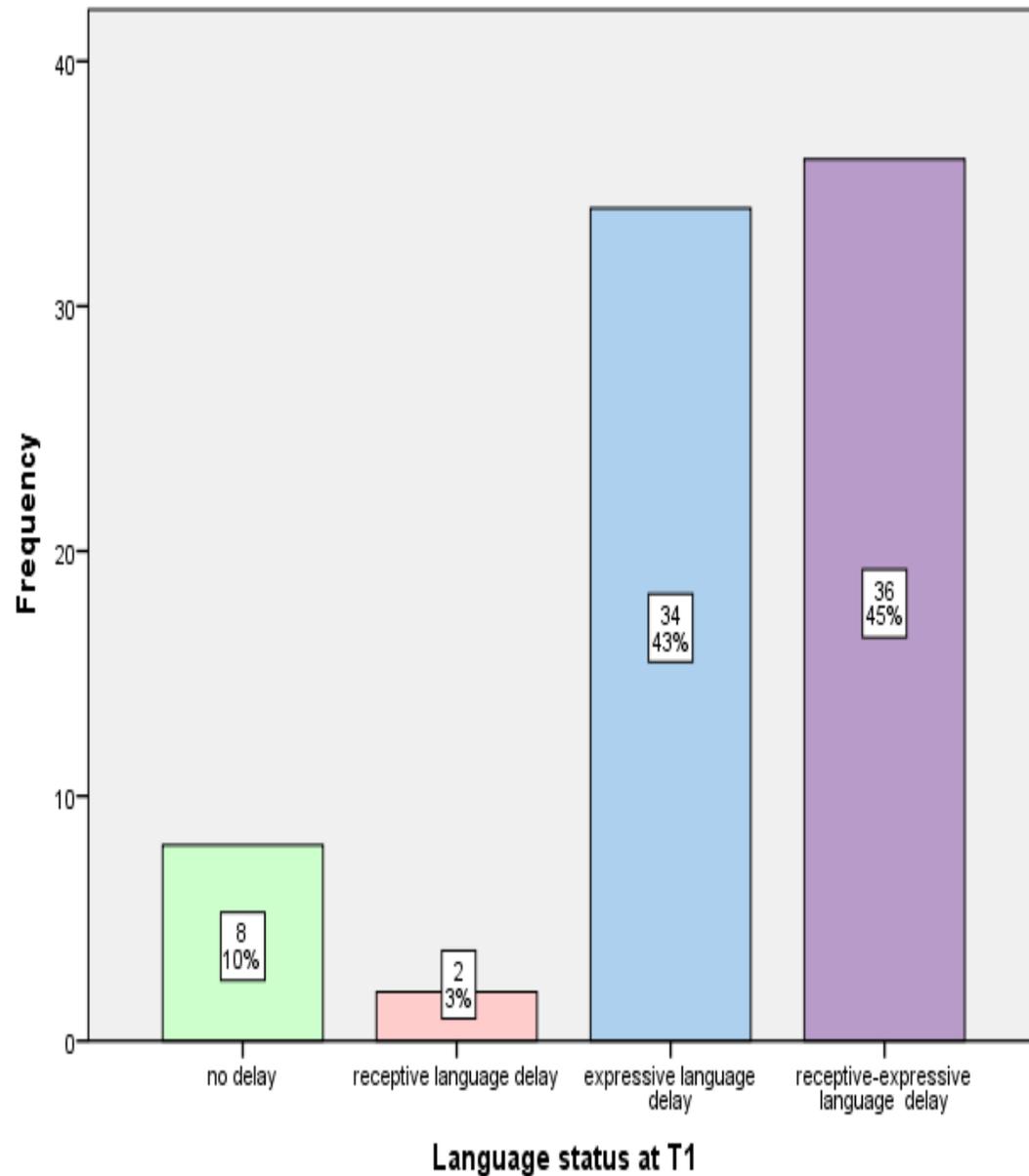
12 month follow up:

- Mean standard score = 88, with a range of 55-121
- 50% of the children had scores \downarrow 1SD of the mean, 39% had scores within \pm 1SD of the mean and 11% had scores \uparrow 1SD.

Was this progress significant?

- paired *t*-test of standard scores: $t(71) = -6.85, p < .001$ (one tailed), confirmed that this was a statistically significant improvement (large effect).
- strong positive relationship between entry and follow up scores: Pearson's $r = .56$
- increase in standard score was seen for 74% of the children.
- no change in standard scores for 26% of the children.

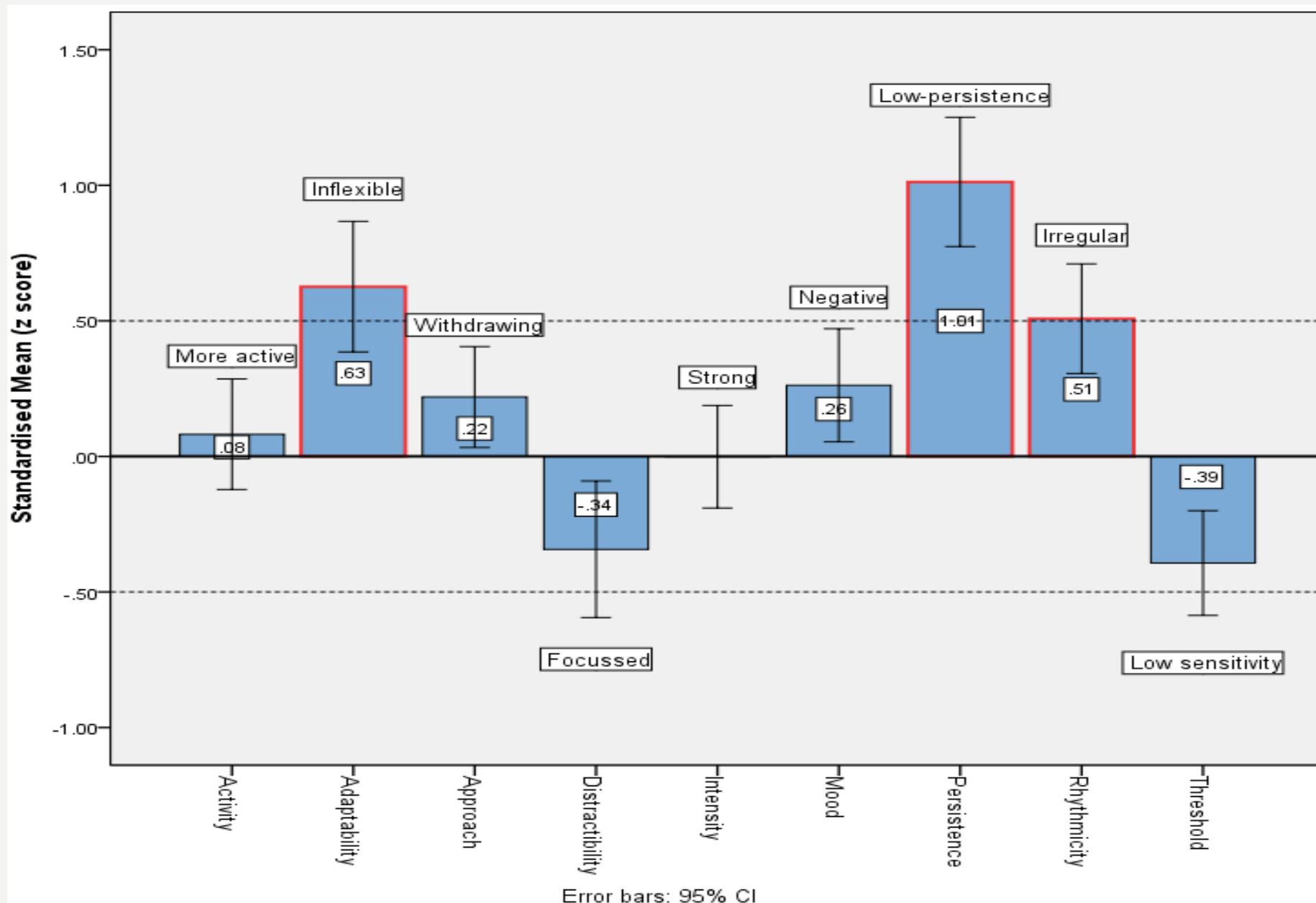
COHORT LANGUAGE PROFILES



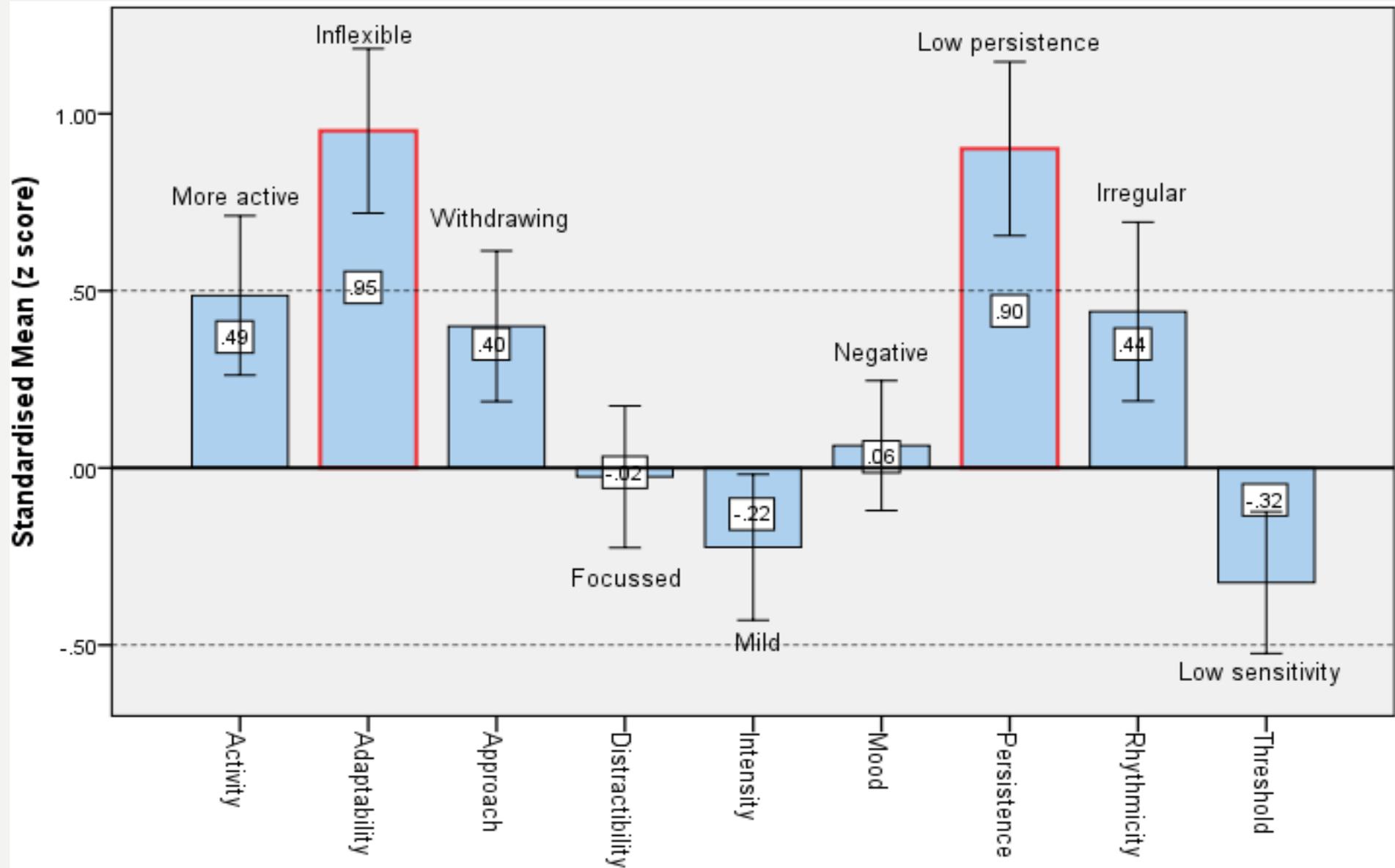


Do the children
have a
characteristic
temperament
profile?

TEMPERAMENT AT STUDY ENTRY



TEMPERAMENT AFTER 12 MONTHS



Error bars: 95% CI

SUMMARY:

- This group of children with language delay had a distinctive temperament profile, characterised by:
 - slow adaptability to changes in their environment and
 - low persistence, meaning that they were more likely to ‘give up’ if faced with tasks that were difficult for them and did not finish activities before moving on to something new.



Which factors
most effectively
predict language
scores after 12
months?

PREDICTING RECEPTIVE LANGUAGE OUTCOMES

- A series of linear regression analyses were used to predict performance after one year from language skills, temperament dimensions and known risk factors.
- 78% of the variation in receptive language scores after 12 months was predicted from initial scores in
 - auditory comprehension (76.5 %) and
 - (higher) distractibility (1.6%).

PREDICTING EXPRESSIVE LANGUAGE OUTCOMES

- 59.5% of the variation in expressive language scores after 12 months were predicted from initial scores in
 - auditory comprehension (34%),
 - expressive communication (13.8%),
 - higher adaptability (more flexible) (5.6%),
 - lower persistence (3.1%) and
 - negative family history of language difficulties (3%).



Discussion:

Does temperament
influence language
development?

- The best and clearest predictors of language outcome for the children were their initial receptive and expressive language skills.
- These children with ELD do appear to have a specific temperament 'signature' involving low adaptability and low persistence
- This echoes other research in relation to children with language problems³.
- Temperament characteristics made a contribution to expressive language outcomes one year after a diagnosis of ELD.

- After 12 months, adaptability moved significantly further away from the standardised mean.
- It may be that the children were becoming *more* resistant to trying new things and their slower language development is encouraging carers to ‘stick to what they know works’, rather than challenge their children with new experiences.
- Unexpectedly, within the regression model, **lower persistence** added to the prediction of **better** expressive language scores.
- Could it be that low persistence allows parents to try different ways to develop their child’s language and buffers low adaptability? (ie they are less persistent in their inflexibility)

SUMMARY

- These results give insight into the temperament profiles of young children with ELD: they are lower in persistence and adaptability.
- Further work is needed to validate standardisation of temperament scales on a UK population (these based on US) before any firm conclusions can be drawn.
- Does temperament influence language development? Yes, it possibly does - further research is needed to replicate the findings in this study and to begin to investigate the underlying causal mechanisms
- Including consideration of a child's temperament may be useful for individualising intervention plans for children with ELD.

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REFERENCES

1. Law et al (2013) Early Language Delays in the UK, Save the Children.
2. Bishop, D. (2006). What Causes Specific Language Impairment in Children? *Current Directions in Psychological Science* 15, 5, 217–221
3. Harrison & McLeod (2010). Risk & Protective Factors Associated with Speech and Language Impairment in a Nationally Representative Sample of 4-5 Yr Old Children. *Journal of Speech, Language & Hearing Research* 53, 508-529.
4. Marshall, J., Goldbart, J. and Phillips, J. (2007). Parents' and speech and language therapists' explanatory models of language development, language delay and intervention. *IJLCD*, 42, 5 , 533-555.
5. Law, J., Boyle, J., Harris, F., Harkness, F. & Nye, C. (2000). The feasibility of universal screening for primary speech and language delay: findings from a systematic review of the literature. *Developmental Medicine & Child Neurology*, 42, 190–200.
6. Nelson, H. D., Nygren, P., Walker, M., & Panoscha, R. (2006). Screening for speech and language delay in preschool children: Systematic evidence review for the U.S. Preventive Services Task Force. *Pediatrics*, 117, 298-319.
7. Rothbart, M. K. (2011). *Becoming who we are: Temperament, personality and development*. New York: Guilford Press.

8. Zentner and Bates (2008), Zentner, M., & Bates, J.E. (2008). Child temperament: An integrative review of concepts, research programs, and measures. *European Journal of Developmental Science*, 2, 7-37.
9. Thomas, A., & Chess, S. (1977). *Temperament and development*. New York: Brunner/Mazel.
10. Prior, M., Bavin, E., Cini, E., Eadie, P. & Reilly, S. 2011. Relationships between language impairment, temperament, behavioural adjustment and maternal factors in a community sample of preschool children. *IJLCD*, 46, 4, 489–494
11. Hepburn, S.L. & Stone W.L. (2006). Using Carey Temperament Scales to Assess Behavioural Style in Children with Autism Spectrum Disorders. *Jnl of Autism Developmental Disorders*, 36, 637-642.
12. Harrison & McLeod (2010). Risk and Protective Factors Associated With Speech and Language Impairment in a Nationally Representative Sample of 4- to 5-Year-Old Children. *Journal of Speech, Language, and Hearing Research* Vol.53 508-529.
13. Spere, K., Schmidt, L., Theall-Honey, L. & Martin-Chang, S. 2004. Expressive & receptive language skills of temperamentally shy preschoolers. *Infant & Child Development*, 13, 123-133.
14. Kefalianos, E., Onslow, M., Block, S., Menzies, R. and Reilly, S. (2012) Early stuttering, temperament and anxiety: Two hypotheses. *Journal of Fluency Disorders*, 37, 151–163.