

# Measurement of child directed speech: Bridging the gap between research and practice

Jayne Newbury, PhD

Dean Sutherland, PhD

Te Tari Matai Hauora Reo

Department of Communication Disorders

University of Canterbury

# Linguistic nutrition

Get  
your  
jacket!



Yes, you do  
have to wear  
pants!


Where are  
your shoes?

Be nice to  
the cat!



# Measuring CDS in research

- ▶ Language samples
  - ▶ SALT e.g. MLU, NDW, TNW etc.
  - ▶ Counts of specific linguistic targets / opportunities
- ▶ Behavioural coding from videos e.g. in time segments
- ▶ LENA – adult word count, child vocalisations, turns



# Who cares about measurement of CDS?!

- Adults around the child and clinicians alike need to know if they are changing their behaviours in everyday life and maintaining these changes over time
- If not, then working on CDS will probably not benefit the child in a long term way
- Therefore it is really important clinicians measure and document CDS and adults too can measure and self monitor the improvements



# Research cf. clinical practice

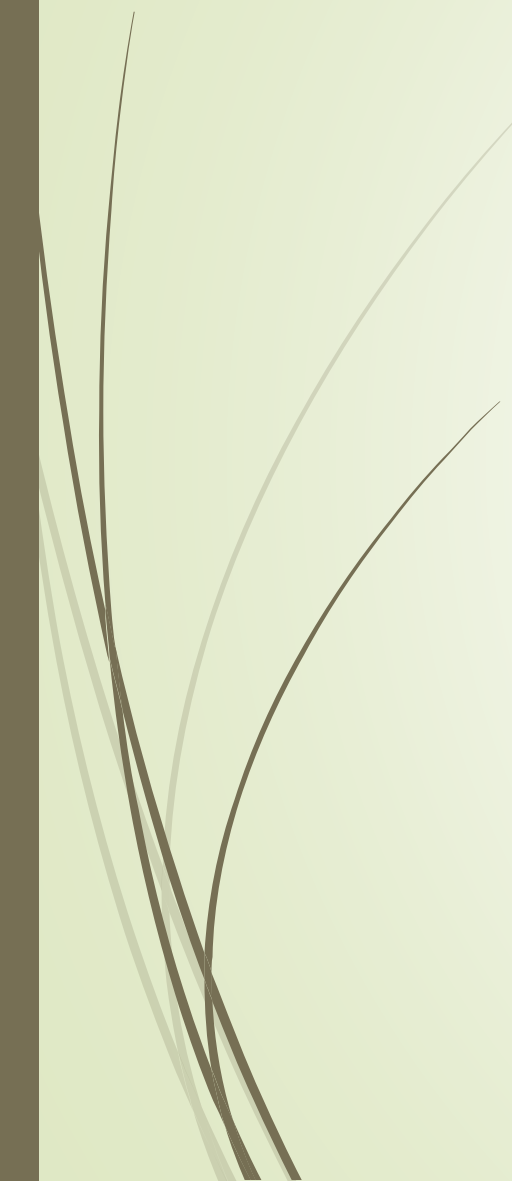
- ▶ Specific aims vs broader aims
- ▶ Measurement accuracy vs client satisfaction
- ▶ Time and resources

Hypothesis: Mismatch between established research methods of assessing CDS and what is feasible in clinic



# Research questions

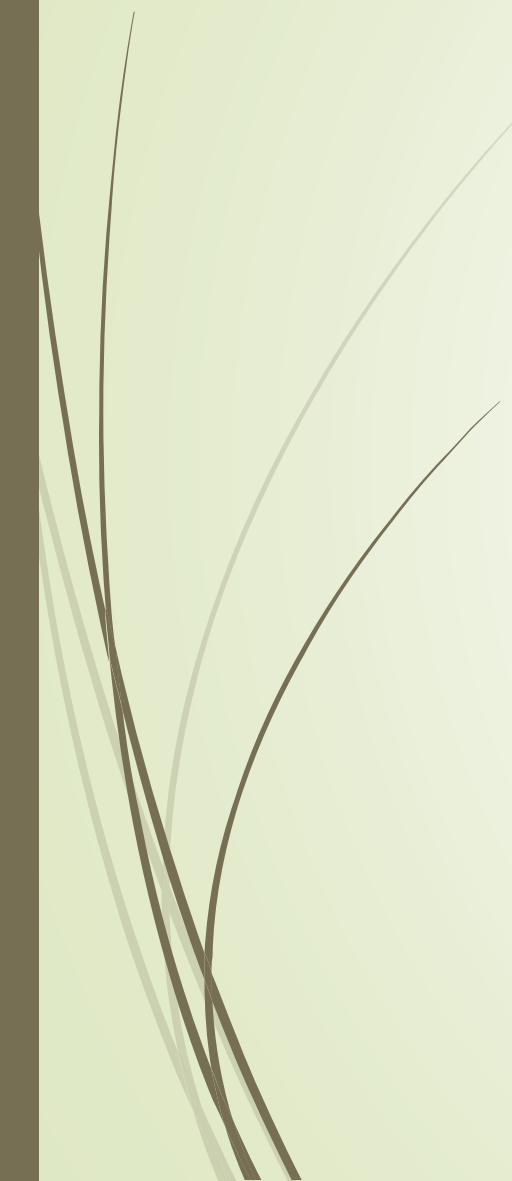


- How often do clinicians use interventions to optimise CDS?
  - How often do clinicians report measuring CDS?
  - What measures of CDS are clinicians using?
  - What reasons do clinicians state for using these measures?
  - What barriers do clinicians perceive in measuring CDS?
- 





# Survey / participants

- Ethics approved
  - Qualtrics online survey
  - Recruitment through NZSTA, SPA, MOE and personal networks
  - Potential pool of 4000 clinicians
  - Link available April – June 2018
  - 3 sections – demographics, perspective on CDS, measurement of CDS
- 



# Participants

- ▶ 116 responses analysed
- ▶ NZ (n=66; 57%) Australia (n=50; 43%)
- ▶ All held clinical qualifications and working with children
- ▶ Majority n=56 (48%) had over 10 years experience
- ▶ Variety of settings e.g. early childhood centres, home, schools






# How often do clinicians report aiming to optimise CDS in intervention?

For children with language delay / disorder aged 0-8 years:

- ▶ Two thirds of participants reported aiming to optimise CDS half of the time or more (56/84)




# How often do clinicians report measuring CDS?

- ▶ A third of participants reported measuring CDS 'most of the time' or 'always' (28/84)
- ▶ Aiming to improve CDS is more common than measuring it

# What measures of CDS are clinicians using?

- ▶ Mainly observations of adult-child interaction (recorded or unrecorded)
  - ▶ Analyses of these were mostly informal or checklists
- ▶ Interviews / questionnaires also popular
- ▶ Some used time sampling from video
- ▶ No one used SALT (or similar) on the adult's language
- ▶ One used LENA


N=74



# What reasons do clinicians cite for using these measures?

- Clinical information 39%
- Time constraints 32%
- Adult considerations 26%
- Familiar / Available 25%
- User friendly 22%

N=69



# What barriers do clinicians experience in measuring CDS?

- ▶ Time constraints (38%)
- ▶ Adult considerations (22%)
- ▶ Psychometric properties (22%)
- ▶ Lack of suitable tools (14%)
- ▶ SLT lack of knowledge (11%)
- ▶ None (8%)

N=73

# So is there a match between what's available from research and what clinicians need?

Answer – sort of!

- The Starling / LENA (or similar technology) will be an affordable solution in time
- Hanen checklists are most suited to clinician needs
  - Psychometric properties have not been reported
  - Must be Hanen trained



# Current research at UC Child Language Research group

We are planning to develop tools to measure CDS –

- Based in research as to what is needed at each age
- Psychometrically validated
- Readily available

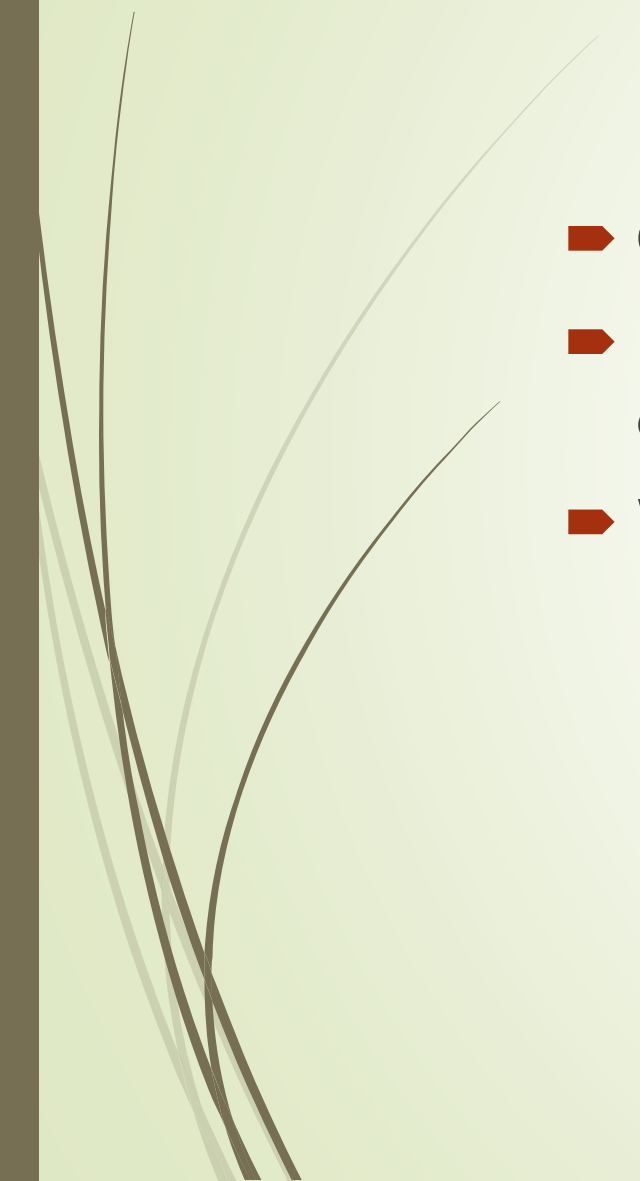
We will need some SLTs to trial them 2019

If you are interested in helping let us know!





# Take home messages

- ▶ Consider the importance of measuring CDS accurately
  - ▶ Partner with us in developing new tools designed for clinical use
  - ▶ Watch out for automated speech analysis technology!
- 

# References

- Bornstein, M. H., Tamis-LeMonda, C. S., Hahn, C.-S., & Haynes, O. M. (2008). Maternal responsiveness to young children at three ages: Longitudinal analysis of a multidimensional, modular, and specific parenting construct. *Developmental Psychology, 44*(3), 867-874. doi: 10.1037/0012-1649.44.3.867
- Carter, A. S., Messinger, D. S., Stone, W. L., Celimli, S., Nahmias, A. S., & Yoder, P. (2011). A randomized controlled trial of Hanen's 'More Than Words' in toddlers with early autism symptoms. *Journal of Child Psychology and Psychiatry, 52*(7), 741-752. doi: doi:10.1111/j.1469-7610.2011.02395.x
- Cartmill, E. A., Armstrong, B. F., Gleitman, L. R., Goldin-Meadow, S., Medina, T. N., & Trueswell, J. C. (2013). Quality of early parent input predicts child vocabulary 3 years later. *Proceedings of the National Academy of Sciences of the United States of America, 110*(28), 11278-11283. doi: 10.1073/pnas.1309518110
- Cologon, K., Wicks, L., & Salvador, A. (2017). Supporting caregivers in developing responsive communication partnerships with their children: Extending a caregiver-led interactive language program. *Child Language Teaching and Therapy, 33*(2), 157-169. doi: 10.1177/0265659016650978
- Gilkerson, J., & Richards, J. A. (2008). *The LENA foundation natural language study (Technical Report LTR-02-2)*. Boulder, CO: LENA Foundation.
- Girolametto, L., Weitzman, E., Wiigs, M., & Steig Pearce, P. (1999). The relationship between maternal language measures and language development in toddlers with expressive vocabulary delays. *American Journal of Speech - Language Pathology, 8*, 364-374.
- Girolametto, L., Weitzman, E., & Greenberg, J. (2000). *Teacher Interaction and Language Rating Scale (The Hanen Early Language Programme)*. Toronto, Canada: Hanen Centre
- Hart, B., & Risley, T. (1995). *Meaningful differences in the everyday experiences of young American children*. Baltimore, MD: Paul H. Brookes.
- Hoff, E. (2003). The specificity of environmental influence: Socioeconomic status affects early vocabulary development via maternal speech. *Child Development, 74*(5), 1368-1378.



Levickis, P., Reilly, S., Girolametto, L., Ukoumunne, O. C., & Wake, M. (2014). Maternal behaviors promoting language acquisition in slow-to-talk toddlers: Prospective community-based study. *Journal of Developmental and Behavioral Pediatrics, 35*(4), 274-281. doi: 10.1097/DBP.0000000000000056

McConachie, H., Randle, V., Hammal, D., & Le Couteur, A. (2005). A controlled trial of a training course for parents of children with suspected autism spectrum disorder. *The Journal of Pediatrics, 147*(3), 335-340. doi: <https://doi.org/10.1016/j.jpeds.2005.03.056>

Roberts, M. Y., & Kaiser, A. P. (2011). The Effectiveness of Parent-Implemented Language Interventions: A Meta-Analysis. *American Journal of Speech-Language Pathology, 20*(3), 180-199. doi: 10.1044/1058-0360(2011/10-0055)

Rowe, M. L., Raudenbush, S. W., & Goldin-Meadow, S. (2012). The pace of vocabulary growth helps predict later vocabulary skill. *Child Development, 1-18*. doi: 10.1111/j.1467-8624.2011.01710.x

Newbury, J. & Sutherland, D. (under review). Measurement of child-directed speech: Bridging the gap between research and practice. *International Journal of Speech-Language Pathology*.

Schneidman, L. A., Arroyo, M. E., Levine, S. C., & Goldin-Meadow, S. (2012). What counts as effective input for word learning? *Journal of Child Language, 40*(3), 672-686. doi: 10.1017/S0305000912000141

Suskind, D. L., Leffel, K. R., Graf, E., Hernandez, M. W., Gunderson, E. A., Sapolich, S. G., . . . Levine, S. C. (2015). A parent-directed language intervention for children of low socioeconomic status: a randomized controlled pilot study. *Journal of Child Language, FirstView, 1-41*. doi: doi:10.1017/S0305000915000033

Xu, D., Yapanel, U., & Gray, S. (2009). *Reliability of the LENA Language Environment Analysis System in Young Children's Natural Home Environment (Technical Report)*. Boulder, CO: LENA Foundation.