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## BIOGRAPHICAL SKETCH

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NAME: Tedra A. Walden

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eRA COMMONS USER NAME (credential, e.g., agency login): tedra.walden

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POSITION TITLE: Professor of Psychology and Professor of Hearing and Speech Sciences

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EDUCATION/TRAINING (*Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.*)

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INSTITUTION AND LOCATION	DEGREE (if applicable)	Completion Date MM/YYYY	FIELD OF STUDY
University of Florida, Gainesville, FL	B.A.	1974	Psychology
University of Florida, Gainesville, FL	M.S.	1976	Psychology
University of Florida, Gainesville, FL	Ph.D.	1978	Psychology
University of NC at Chapel Hill, NC	Postdoc	1979	Developmental Psych.
University of Miami, FL	Postdoc	1980	Developmental Psych.

### A. Personal Statement

Trained as a Social and Developmental Psychologist, I have a broad background in psychology, with specific expertise in conducting experiments, longitudinal projects, and complex data analyses. My areas of expertise are in social and emotional aspects of typical and atypical development. I have participated as PI or Co-PI in numerous collaborative, interdisciplinary projects that have required management, communication, and strong people skills. I have been PI or Co-PI on many university, NIH- and NSF-funded projects. I have strong data analysis skills, with a graduate minor in Biostatistics and have kept up on recent developments in quantitative methods, including analysis of longitudinal and non-normal data. I have a long history of working with young children and their families, particularly those with developmental disabilities such as stuttering, Down syndrome, autism and intellectual disabilities. For the past 10 years I have been collaborating with Dr. Edward Conture, an internationally renowned expert in his field, on studies of preschool children who do and do not stutter. We have published many empirical studies (e.g., Walden et al., 2012), as well as having developed a strong conceptual model (e.g., Conture, et al., 2013). I have a long history of commitment to training students and was a co-PI and then PI of an NICHD-funded T32 for many years. Many of my undergraduate and all my graduate students graduate with excellent training as well as published work in significant journals so they are able to succeed in securing competitive academic positions.

1. Conture, E., Kelly, E. & Walden, T. (2013). Temperament, speech, and language: An overview. *Journal of Communication Disorders*, 46, 125-142, PMID3630249.
2. Walden, T. Frankel, C., Buhr, A., Johnson, K., Conture, E., & Karrass, J. (2012). Dual diathesis-stressor model of emotional and linguistic contributions to developmental stuttering. *Journal of Abnormal Child Psychology*, 40, 633-644. PMID3740566.

### B. Positions and Honors

- 2008-present Professor of Hearing and Speech Sciences: Department of Hearing and Speech Sciences, Vanderbilt University.
- 1996-present Professor of Psychology. Department of Psychology and Human Development, Vanderbilt University.
- 1995-2014 Director of Developmental Training Program
- 1993-1998 Co-Director of NICHD-funded Mental Retardation Training Program (1993-1998)

1998-2010	Director of NICHD-funded Mental Retardation Training Program (1998-2010)
1988-1995	Director of Graduate Studies (1988-1995)
1993-1996	Core coordinator John F. Kennedy Center for Research on Mental Retardation & Human Development
1989-1996	Associate Professor of Psychology. Department of Psychology and Human Development, Vanderbilt University.
1981-1989	Assistant Professor of Psychology. Department of Psychology and Human Development, Vanderbilt University.
1980-1981	Assistant Professor of Psychology. Barry College
1980-1981	Adjunct Assistant Professor of Pediatrics. University of Miami Medical School and Mailman Center for Child Development.

## C. Contributions to Science

### 1. Social influences on how emotions are acquired in very young children.

My work is predominantly on social-emotional development of infants, toddlers, and preschoolers. My early work focused on preschool-age children's ability to discriminate and produce recognizable facial expressions of emotion. I also linked those early emotional skills to children's peer relationships and social competence. While doing this work, I noticed an interesting phenomenon—something young infants and toddlers were not supposed to be able to do—delay responding to emotion-inducing events, reference another person's reaction to the event, and use that information to guide their own responses and emotional reactions toward the event. It came to be called Infant Social Referencing—a process of emotional communication and emotional development—and it was new and exciting because infants were not thought to have the skill to do something so apparently cognitively and behaviorally sophisticated. With one of my graduate students I published one of the first reports of infant social referencing (Walden & Ogan, 1988) and went on with another graduate student to study developmental changes in this ability, as well as the effects of different contexts on infant social referencing (Walden & Baxter, 1989). Originally infant social referencing was thought to be part of the mother-infant attachment system and limited to mother-infant attachment but we showed in our work that infants reference not only mothers but even unfamiliar persons, making it a part of a more general information gathering and emotion processing process (Walden & Kim, 2005). As part of this more general information and emotion processing system we showed that contingency of the provision of social-emotional referential information contingent on children's social initiations was critical in children's processing of that information (Walden, Knieps, & Baxter, 1991).

- a. Walden, T., & Ogan, T. (1988). The development of social referencing. *Child Development*, 59, 1230-1240. PMID3168639.
- b. Walden, T., & Baxter, A. (1989). The effect of age and context on infant social referencing. *Child Development*, 60, 1511-1518. PMID2612256.
- c. Walden, T., Knieps, L., & Baxter, A. (1991). Contingent provision of social referential information by parents of children with and without developmental delays. *American Journal on Mental Retardation*, 96, 177-187. PMID1930948.
- d. Walden, T. & Kim, G. (2005). Infants' social looking toward mothers and strangers. *International Journal of Behavioral Development*, 29, 356-360. PMCID50500166824.

### 2. Social-emotional Development of Individuals with Developmental Disabilities.

Much of my work has focused on children with various developmental disabilities. From the early days of my two postdoctoral fellowships (one at the Frank Porter Graham Center at the University of North Carolina and one at the Mailman Center for Child Development at the University of Miami), I have conducted studies with children at-risk for nonoptimal development or those with diagnosed disabilities. Several studies (e.g., work with children at risk for autism with the Baby-Sibs project funded by NICHD) have been longitudinal (Malesa, et al., 2012), giving me good experience in conducting longitudinal studies in young at-risk or diagnosed children. We have made a number of significant contributions, including demonstrating that the social signals of children with disabilities are often difficult for their interaction partners to decode (Walden, 1996), making it hard for

them to engage in smooth, contingent interactions and findings that social behaviors often predict later disability status.

- a. Walden, T. (1996). Social responsivity: Judging signals of young children with and without developmental delays. *Child Development*, 67, 2079-2085. PMID9022230,
- b. Noland, J., Reznick, J. S., Stone, W., Walden, T., & Sheridan, E. (2010). Better working memory for non-social targets in infant siblings of children with Autism Spectrum Disorder. *Developmental Science*, 13, 1-8. PMC2818009.
- c. Malesa, E., Foss-Feig, J. Yoder, P., Warren, Z. & Walden, T. & Stone, W. (2013). Predicting age 5 language and social outcomes for later-born siblings of children with ASD. *Autism*, 17, 558-570. PMC4115363.
- d. Yoder, P., Stone, W., Walden, T. & Malesa, E. (2009). Predicting Social Impairment and ASD Diagnosis in Younger Siblings of Children with Autism Spectrum Disorder. *Journal of Autism and Developmental Disorders* 39, 1381-1391.

### 3. Attentional/Emotional Processes in Young Children.

There are at least two importantly different aspects of human attention: attentional deployment to various stimuli in the environment and shared (joint) attention with other persons as we refer to aspects of the environment. I have studied both approaches to attention. Using methods we developed in earlier work to sensitively measure the adequacy of joint attention for typically developing children (Walden et al, 2008), in subsequent work we found that joint attention differs for children who are at risk for developing autism (ASD) as compared to low-risk children and joint may serve as a marker for the subsequent development of Autism Spectrum Disorder (ASD, Presmanes, et al, 2007). Results indicated that initial levels of initiating joint attention (IJA) were associated with later language skills in children with ASD. In addition, growth of responding to joint attention (RJA) was associated with social skills at age 5 (Malesa, et al., cited above). In other work we found that infants with ASD have better working memory for non-social, but not social, targets than typically developing peers. We have subsequently continued our research on the role of attention in the development of childhood stuttering using methods adapted from psychology (e.g., Johnson et al, 2012).

- a. Presmanes, A., Walden, T., Stone, W., & Yoder, P. (2007). Effects of different attentional cues on responding to joint attention in younger siblings of children with autism spectrum disorders. *Journal of Autism and Developmental Disabilities*, 37, 133-144. PMID17186366.
- b. Walden, T., Deak, G., & Kaiser, M.G. (2008) Driven from distraction: How infants respond to parents' attempts to elicit and re-direct their attention. *Infant Behavior and Development*, 31, 34-50. PMID17692386.
- c. Johnson, K., Conture, E., & Walden, T. (2012). Efficacy of attention regulation in preschool-age children who stutter: A preliminary investigation. *Journal of Communication Disorders*, 45, 263-278, PMC3695708.
- d. Zengin-Bolat kale, H., Conture, E. & Walden, T. (2015). Sympathetic arousal of preschool-age children who do and do not stutter during a stressful picture naming task. *Journal of Fluency Disorders*, 46, 24-40.

### 4. Social-emotional, Linguistic and Physiological Processes in Very Young Children who Stutter

Among some of the first empirical scientists to systematically study the link between emotional processes and developmental stuttering, our 2006 paper set the stage for a line of work that we and others are pursuing. We showed that emotional arousal, emotion regulation, and attention regulation differ in children who stutter (CWS) as compared to children who do not stutter (CWNS). Our initial findings that temperamentally high emotional arousal, low emotion regulation, and poor attention regulation characterize CWS (stuttering the diagnosis; Karrass et al., 2006) led us to ask whether emotion is more likely prior to and during instances of stuttered speech (stuttering the behavior) than fluent speech (they were; Jones et al., 2014b). We then asked whether positive and negative emotion induced experimentally would affect stuttering (it did, showing an effect of situations and stronger causal inference was possible; Jones et al, 2014a). We have found that children who stutter are more likely than those who do not to be classified as behaviorally inhibited (based on observations, Choi, et al, 2013). Most recently, we included physiological indicators of emotional arousal (e.g., skin

conductance, SC) and emotion regulation (e.g., respiratory sinus arrhythmia, RSA) in our methods and found that longitudinally both SC and RSA predict persistence/recovery of childhood stuttering (Jones et al., 2014b). Physiological measures of emotional processes include skin conductance as a measure of (sympathetic nervous system) emotional arousal and respiratory sinus arrhythmia as a measure of (parasympathetic nervous system) emotion regulation. CWS, when compared to CWNS, have been shown to produce less typical physiological regulation, that is, they did not show the usual higher sympathetic concurrent with lower parasympathetic activity, instead showing more coactivation, that is, high sympathetic concurrent with high parasympathetic activity. Furthermore, several of our empirical studies report that greater the duration and/or number of emotional regulation strategies is significantly correlated with lower stuttering frequency in children who stutter.

- a. Zengin-Bolatkale, H., Conture, E., & Walden, T. (2015). Sympathetic arousal in preschool-age children who stutter during a stressful picture naming task. *Journal of Fluency Disorders*, 46, 24-60. PubMed PMID: 26296616; PMCID: PMC4877440.
- b. Jones, R., Buhr, A., Conture, E., Tumanova, V., Walden, T., & Porges, S. (2014). Autonomic nervous system activity of preschool-age children who stutter. *Journal of Fluency Disorders*, 41, 12-31. PMID 25087166.
- c. Jones, R., Conture, E., & Walden, T. (2014). Emotional reactivity and regulation associated with the fluent and stuttered utterances of preschool-age children who stutter. *Journal of Communication Disorders*, 48, 38-51. PMC4031757.
- d. Choi, D., Conture, E., Walden, T., Jones, R., & Kim, H. (2016) Emotional diathesis, emotional stress and childhood stuttering. *Journal of Speech, Language, and Hearing Research*, 1-15, PMID: 27327187.

## 5. Attitudes and Attributions

My early training in social psychology has given me substantial expertise in the measurement and interpretation of attitudes and attributions and it is a literature I have kept up with and continue to contribute to. Attitudes are considered to be evaluative (good-bad) judgments that can refer to the self or others. Attributions are judgments about the causes of behavior in self or others. Starting with my dissertation focusing on the role of attitudes and attributions on children's judgments of the severity of intentional and accidental moral transgressions (Walden, 1982) and throughout my career, I have applied social psychological attitudinal self- and other-reports to children's locus of control and academic achievement (Walden & Ramey, 1983), judgments of social signals in children with and without developmental delays (Walden, 1996), self-reports of emotional arousal and regulation (Walden, Harris, & Catron, 2003), and factors associated with negative attitudes toward speaking in preschool children who do and do not stutter (Groner, Walden & Jones, 2016). In addition, I am working with a VU undergraduate Honors student on a project that pilots an auditory adult version of the Interpersonal Association test (IAT, described in Specific Aim 1) with undergraduate student participants listening to stuttered and nonstuttered speech, accepted for presentation at the Society for Research in Child Development in April 2017 (Boothby & Walden).

- a. Walden, T., & Ramey, C. T. (1983). Locus of control and achievement in disadvantaged children. *Journal of Educational Psychology*, 75, 347-358. doi: 10.1037/0022-0663.75.3.347.
- b. Walden, T. (1996). Social responsivity: Judging signals of young children with and without developmental delays. *Child Development*, 67, 2079-2085. PMID: 9022230, doi: 10.1111/j.1467-8624.1996.tb01844.x.
- c. Walden, T., Harris, V., and Catron, T. (2003). How I Feel: A self-report measure of emotional arousal and regulation for children. *Psychological Assessment*, 15, 399-412. PMID: 14593841, doi: 10.1037/1040-3590.15.3.399.
- d. Groner, S., Walden, T. & Jones, R. (2016) Factors associated with negative attitudes toward speaking in preschool-age children who do and do not stutter. *Contemporary Issues in Communication Science and Disorders*. 43, 255-267.

List of recent published works in My Bibliography:  
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/bibliography/43335203/public/?sort=date&direction=descending](http://www.ncbi.nlm.nih.gov/sites/myncbi/1po0nTjeQyTQ-/bibliography/43335203/public/?sort=date&direction=descending)

## **D. Research Support**

### **Ongoing Research Support**

R56DC000523 Walden (PI) 8/1/16-7/31/17  
Impact of Emotion and Attention on Childhood Stuttering and its Persistence  
A bridge grant to allow completion of previously funded work on emotional and linguistic contributions to stuttering. \$100,000 including indirect costs.  
Role: PI

Vanderbilt Center for Translational Research: Money allows us to purchase software to run the adult IAT and pay a small number of participants to validate the IAT method. \$6,419.85  
Role: PI

Peabody College Small Grant: Money partially pays an audio engineer to develop half the audio files that experimentally vary stuttering and nonstuttering in audio reading of stories. \$9,250  
Role: PI

### **Recent Completed Research Support**

5R01DC000523 Walden (PI) 8/1/2010-7/31/16  
Emotional and Linguistic Contributions to Developmental Stuttering  
The goal of this longitudinal study is to determine whether select, theoretically-determined behavioral, standardized, and psycho-physiological measures of emotions and speech-language are useful for predicting later recovery from stuttering.  
Role: PI

5R01DC006477 Conture (PI) 02/01/06-01/31/10  
Emotional Reactivity, Regulation & Childhood Stuttering  
The goal of this cross-sectional study was to empirically assess the contributions of emotional reactivity and regulation to childhood stuttering, specifically how emotional reactivity and regulation impact speech disfluencies/stuttering in preschool-age children who do and do not stutter. Results help ground the study of childhood stuttering within the broader context of childhood emotional development, as well as inform diagnostic and treatment protocols for childhood stuttering.  
Role: Co-Investigator