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Diversity in Children's Temperament: Perspectives on Shyness in Interaction

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Introduction and aims

One key dimension of individual differences that affects children's development, interactional behavior, and cognitive processes is temperamental shyness—a tendency to be reluctant or anxious in the face of new social situations. Prior research has documented shyness holds the potential to negatively impact a child's social functioning, psychological health, and language abilities. However, emerging research from different disciplinary angles sheds a more positive light on shyness by illustrating adaptive aspects such as benefits in social cognitive and communicative functioning (Viertel, 2019). Furthermore, there is accumulating evidence that shyness may not necessarily have a detrimental effect on language learning, especially when knowledge is assessed under familiar conditions (Kucker, Zimmerman, & Chmielewski, 2021; Tolksdorf, Viertel, & Rohlfing, 2021). However, although considered a ubiquitous phenomenon, the relation between shyness and other cognitive, perceptual, and social processes in childhood remains far from understood. Thus, by drawing together multiple levels of analyses and perspectives, the aim of this symposium is to emphasize the diverse manifestations of shyness in interactional settings and its impact on empathy, language, and social interactions. Bringing together scholars from different disciplines each of the organizers of this symposium is at the forefront of their respective fields: **Kucker** has been pioneering the mechanisms and processes underlying word learning, categorization, and cognitive development and a focus on the interaction of individual differences and context. **Poole** is a recognized expert on the social and emotional development of shy children and has conducted research on the development and heterogeneity of shyness. **Hilton's** work has highlighted the importance of examining the effect of shyness on language development with reference to the role of attentional processing. **Tolksdorf and Viertel** have made key contributions to shy children's long-term language learning and interactional behavior with artificial interaction partners such as social robots. Together, this symposium will present novel and innovative methodological approaches as well as new empirical data that challenge the prevailing negative perspective of shyness by providing interactional, behavioral, and experiential patterns of shy children multidimensionally in order to inform future research.

Approaches for capturing temperament across children and contexts

Sarah C. Kucker, Sneh Jhaveri, Oscar Guevara, Michael Chmielewski

Capturing individual differences, such as temperament, is critical to fully understand diversity in developmental trajectories. Unfortunately, many studies do not assess temperament, ignoring its important impact on children's behavior. Yet, capturing individual differences in children can be challenging. Traditional approaches have utilized parent-report, or lab-based behavioral tasks. However, concerns have been raised about potential bias and lab tasks are tedious and time-consuming. Thus, there is a pressing need for alternative measures of temperament, especially ones that can be implemented when temperament was not directly assessed. The current study tests a downward extension of the thin slice approach to infants and toddlers. Naïve observers rated 550 17-46-month-old children's temperament from short slices of videos while the children completed a series of standard cognitive and language tasks in the lab. Observers ratings were

reliable and aligned with parent reports. This suggests a novel, ecologically valid approach for capturing diversity in children's temperament during interactive tasks. Importantly, this offers a new method for incorporating temperament across a wider range of ages and critically, contexts.

Children's shyness and empathic physiological arousal to a peer's social stress

Kristie L. Poole, Emma Green, McLennon Wilson, Linda Sosa-Fernandez, Heather A. Henderson

The experience of empathic or vicarious anxiety—feeling anxious on behalf of someone else—has been documented in adults, but relatively little is known about this phenomenon in children. We examined how individual differences in children's temperamental shyness was related to empathic anxiety as indexed by autonomic nervous system arousal. Children aged 9-12 years were paired with a same-age, same-sex, unfamiliar peer and engaged in a series of tasks while electrocardiogram (ECG) was recorded. We modeled changes in children's heart rate while they observed a peer prepare and deliver a speech. Results revealed that the observing child's own shyness positively predicted increases in their own heart rate from baseline to their peer's speech preparation period. Further, we found that the presenting peer's anxious behavior while delivering their speech moderated the relation between the observing child's shyness and change in heart rate while watching the speech. Specifically, if the presenting child displayed high levels of anxious behavior, the observing child's shyness related to further increases in their heart rate from the preparation period, but if the presenting child displayed low levels of anxious behavior, the observing child's shyness was related to decreases in heart rate from the preparation period. These findings suggest that some shy children may experience empathic physiological arousal and are sensitive to detecting their peers' anxious behavior.

How context familiarity modulates the effect of shyness on 2-year-old children's word learning

Matt Hilton, Birgit Elsner

We investigated whether the negative impact of shyness on children's attention during word learning is neutralized, or even reversed, when the familiarity of the learning context is boosted. In a typical lab-based word-learning task, 53 2-year-old children were presented with pictures of one novel and two familiar objects on a screen, while either a familiar or a novel was labeled. Children were randomly assigned to a familiar-context condition or an unfamiliar-context condition, in which the voice that labeled the target objects during eye-tracking was from either a familiar or an unfamiliar experimenter, and attention-getters between trials consisted of a short video of the familiar or unfamiliar experimenter speaking to the child. Results revealed a significant positive relation between shyness and target looking in the familiar-context condition: When a novel label was presented, increased shyness was related to increased looking to the novel object. No relation between shyness and target looking was found in the unfamiliar-context condition, or when hearing the label of a familiar object. We conclude that familiarity of the context in which learning takes place is a critical modulator of children's attention during novel object labeling, which could help explain shy children's reduced word learning performance on lab-based tasks.

How shyness affects children's attention during word learning in a long-term interaction with a social robot

Nils F. Tolksdorf, Franziska E. Viertel, Katharina J. Rohlfing

Analyses of word learning in shy children have focused primarily on their ability to recall novel words, rather than on the learning process itself–although research has shown that children's attentional patterns during the actual learning situation are substantially related to their word learning in naturalistic situations. In addition, given that familiarity with a situation strongly influences shyness, it remains a vital question how shyness modulates a child's attentional behavior across repeated interactions. We present data from a study in which we systematically assessed shyness in 28 preschoolers, and observed over the course of three consecutive sessions how children interacted with a social robot as a social partner during a word-learning task, and how shyness influenced children's attention during labeling novel words. Results revealed that attention to the referents of the new words from all children decreased over time, however, shy children differed in their attentional behavior from less shy children, especially in terms of looking time towards the new presented items. In particular, shyer children showed significantly longer attention to the overall items presented at a later stage of the long-term interaction, namely, in the third session. These results suggest that shy children interpret the communicative cues of a social robot after familiarization pragmatically differently than their less shy peers, as reflected in their attention patterns.

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