

Sleep is a universal necessity across the lifespan—yet, as any exhausted academic could tell you, not everyone sleeps enough, or sleeps well when they do. Who is at greater risk for poor sleep and *why*? *How* does poor sleep affect health and behavior? These fundamental questions regarding both contextual elements surrounding sleep and the downstream effects of sleep drive my current program of research and framed my doctoral training in Human Development and Family Studies at Purdue University. I approach developmental science through an interdisciplinary, collaborative lens. My work therefore leverages a unique combination of developmental, behavioral, physiological, and advanced methodological approaches—providing a diverse toolbox to answer important developmental questions. Broadly, my research aims to understand the behavioral and physiological correlates of sleep in children with diversified pathways to both typical and atypical development (e.g., autism, premature birth, and early stress exposure) and involves collaborations with faculty and students from diverse disciplines including clinical psychology, behavior analysis, biobehavioral health, neuroscience, and nursing. Figure 1 below provides an overarching conceptual framework for my programmatic research. I subsequently discuss three categories of my interdisciplinary research interests, all of which fall within this conceptual framework of sleep and development.

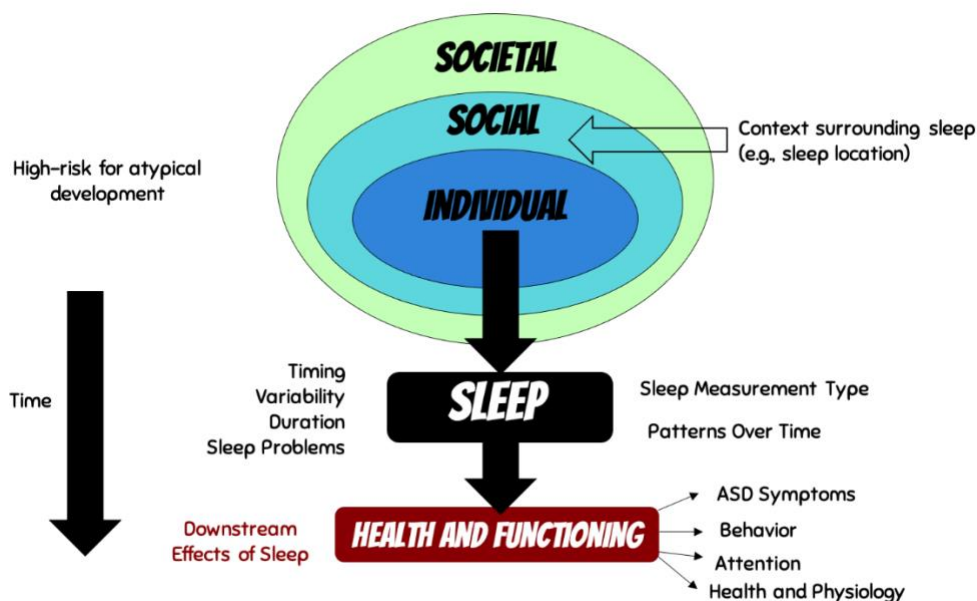


Figure 1. *Overarching Conceptual Model for Programmatic Research*

Longitudinal Developmental Surveillance, Early Sleep Trajectories, and Sleep Methodology

My substantive research stems from two intertwined scientific passions: autism spectrum disorders (ASD) and sleep, both of which are brain-based phenomena and share some overlapping genetic components (Abel et al., 2020, *Journal of Autism and Developmental Disorders*). Although my interest in improving social and behavioral outcomes in ASD developed first, I now tackle this goal in-part by assessing how sleep problems unfold in early development among children at high-risk for atypical development. My early graduate training was highly clinical and focused on the infant sibling design, a unique prospective longitudinal approach designed to monitor early behavioral markers for ASD among infant siblings of children with an ASD diagnosis. Infant siblings of children with ASD are approximately 20% more likely to receive an ASD diagnosis than are infants with only typically developing siblings and are additionally at higher risk for other atypical outcomes (e.g., speech and language difficulties; Seidl, Cristia, Soderstrom, Ko, & Abel, et al., 2018). My clinical training at

Purdue University encompassed gold-standard autism (e.g., Autism Diagnostic Observation Schedule) and developmental assessments (e.g., Mullen Scales of Early Learning) and subsequently administering in-depth developmental batteries in the context of an NIH-funded infant sibling study (PI: Schwichtenberg R00 MH092431). I later completed the advanced training for the Autism Diagnostic Observation Schedule-2 (ADOS-2) and obtained research reliability with certified ADOS trainer Dr. Fiona K. Miller during my training at the Yale Child Study Center in 2019-2020. I am now certified to independently administer and score all modules of the ADOS-2 for current and future research studies.

As with each infant sibling study in the [Baby Siblings Research Consortium](#), the study at Purdue had a unique focus—sleep. Thus, in addition to expertise in developmental assessments, I am also heavily trained in advanced sleep methodologies using a multimethod, multi-informant approach. My current research and expertise involve both objective (actigraphy, videosomnography) and subjective (e.g., sleep diary, Children's Sleep Habits Questionnaire) sleep measures in order to comprehensively track sleep trajectories across early childhood and examine sleep as a potential biomarker for ASD. Through this training, I am interested in improving the accessibility and automaticity of video-based approaches to sleep measurement (Schwichtenberg, Choe, Kellerman, & **Abel** et al., 2018, *Frontiers in Pediatrics*). Through my dissertation, I also aim to improve the current understanding and characterization of early sleep patterns for children with typical development (Abel et al., in prep) ASD, and other well-documented developmental outcomes. My dissertation also explores how these sleep patterns relate to important developmental competencies (e.g., attention) both within and across time.

Much of my ongoing research, including my dissertation, continues to involve prospective longitudinal surveillance methods to understand 1) the timing, characteristics, and persistence of sleep problems across early development, 2) whether sleep problems precede or co-occur with ASD symptoms in high-risk samples, and 3) whether the timing and nature of early sleep trajectories differ significantly for children who develop ASD compared to those who exhibit other atypical outcomes or typical development. My research on early sleep patterns also extends to other high-risk samples, including children with syndromic/genetic risk for ASD (**Abel** & Tonnsen, 2017, *Sleep Medicine*; Kellerman, Hassan, **Abel** et al., under review). At Niagara University, I could continue my work in sleep and early developmental trajectories through secondary analyses in large birth cohort studies, such as the Avon Longitudinal Study of Parents and Children, which includes detailed measures of sleep, autism, and development. I am also interested studying early sleep trajectories through remote sleep and development assessments, which would allow me to conduct high-quality research with atypical populations even in circumstances where it is not feasible to conduct assessments in a lab setting.

Sleep and Behavior in Atypical Populations

A large portion of my work also examines the role of sleep in behavioral and health outcomes among children with atypical development (e.g., autism, pre-term birth; Schwichtenberg, Christ, & **Abel**, 2016, *Journal of Developmental and Behavioral Pediatrics*). I recently explored the role of sleep in challenging behaviors for children with ASD in the context of intensive behavioral intervention. This study, which was funded by the Purdue University Center for Families and the Gadamski Foundation, resulted in two first-authored papers: one conceptual (**Abel** et al., 2017, *Behavior Analysis in Practice*) and one empirical (**Abel** et al., 2018, *Journal of Autism and Developmental Disorders*). These papers highlight the interdisciplinary nature of my work and suggest that clinicians and community care providers should be both informed about child sleep and subsequently consider the potential role of sleep in a child's behavioral/treatment progress. Further stemming from this work, I am interested in translational research that explores community interventions aimed to improve sleep and health

outcomes in atypical samples (Jackson, **Abel**, et al., under review), in addition to understanding how pediatric sleep interventions can be best tailored to the diverse children and families they are intended to serve (Schwichtenberg, **Abel**, et al., 2019, *Sleep Medicine Reviews*).

Sleep, Bio-behavioral Development, and Advanced Statistical/Developmental Methodology

Finally, I am quite interested in how sleep both impacts and is impacted by toxic stress, adversity, and stress physiology (Ordway, Condon, Ibrahim, & **Abel** et al., in press; *Sleep Medicine Reviews*)—in conjunction with other health outcomes (e.g., obesity; Marceau, **Abel**, et al., 2019, *Obesity*). My research interests in the physiological implications of sleep on development continue to grow with exposure to new methods and disciplines, for example, my training in the Developmental Electrophysiology Lab at the Yale Child Study Center.

Finally, through these research collaborations (as well as my graduate certificate in psychological statistics), I also have extensive training in advanced statistical and research methods, especially those applicable to repeated measures, longitudinal designs, multi-informant approaches, and nested data. My expertise and interests extend to both large extant datasets (e.g., the Early Growth and Development Study as used in Marceau, **Abel** et al., 2019) and small samples that are common when working with atypical populations such as genetic syndromes. I hope to further apply my knowledge of longitudinal and advanced research methods by mentoring undergraduates, serving as a methodology resource for my colleagues, hosting statistical workshops for the Department of Psychology, and continuing to produce rigorous empirical papers and conference presentations with student co-authors.

Conclusion

The research experiences mentioned above are not exhaustive; however, they highlight my interdisciplinary, clinical, and methodologically focused training, skills, and promise for future research productivity. My research has involved numerous undergraduate student co-authors and trainees—an experience which proved invaluable for building my independent program of research and establishing mentorship skills and qualities that I am committed to carrying forward to my next institution. As an Assistant Professor at Niagara University, I would dedicate myself to mentoring the next generation of scholars in developmental psychology using a hands-on approach and blend of statistical, research, and scientific writing skills, ultimately forging my own innovative program of research as part of a faculty-student collaborative team.

I look forward to offering student research collaborations through existing data and coding opportunities, in addition to building new studies where students can actively participate in data collection and experience the full research process from conceptualization through analyses. I also look forward to approaching new collaborations within the Department of Psychology that combine my expertise in sleep and development with ongoing faculty and student interests, such as infant attention (i.e., with Dr. Thompson in the infant learning lab).