**Specific Aims**

Whether meeting strangers or trusting old friends, social situations are often rife with uncertainty. This uncertainty yields pervasive, negative feelings that can be hard to manage 1. Established paradigms capture uncertainty in perceptions (e.g., assessing luminance changes) and calculations (e.g., maximizing earnings) 2–5 but lack key characteristics mirroring how social uncertainty judgments are formed beyond the lab. For example, information relevant to how certain we can be to trust a person may be revealed across a narrative and a time course (e.g., learning a potential friend’s life story), must be sorted from irrelevant information (e.g., learning that person’s favorite color), and may also be subject to idiosyncratic personal biases (e.g., finding relevance between favorite color and friendship potential). As such, we know little about how judgments of social uncertainty form, and how domain-specific these formation processes might be. While relevant throughout the lifespan, how social uncertainty is resolved may be especially pertinent during early development, a period when individuals are first learning how to navigate the *complex* social world 1.

Extant developmental literature highlights that adolescents differ from adults by not demonstrating pronounced aversion to economic ambiguity (i.e., uncertain outcomes and unknown probabilities)  6, which is distinct from risk (i.e., uncertain outcomes and known probabilities) 2. Social Exchange Theory frameworks suggest non-social responses should generalize to the social domain 7, but paradigms explicitly exploring this hypothesis yield mixed results. Contrary to this theory, adolescents demonstrate behaviors to resolve social ambiguity 8, and the presence of ambiguous social stressors during this period predicts long-term susceptibility to, and severity of, anxiety and depression 9. Furthermore, adolescence represents a period of pronounced attention towards and prioritization of social stimuli 10,11, which might make adolescents especially sensitive to potential social losses. This evidence supports the existence of an interaction between developmental stage and domain-specificity in ambiguity responses. Characterizing differences in certainty judgments should be of importance to clinical and non-clinical researchers alike, as early intolerance of uncertainty predicts anxiety, emotion dysregulation, and other psychopathologies 5,12,13 as well as suboptimal performance in risk-taking paradigms 6, and peer-pressure susceptibility 14. Furthermore, immature prefrontal regulatory circuitry 15–19 may leave adolescents without adequate cognitive resources to manage these experiences, potentially resulting in heightened susceptibility to the negative outcomes of social uncertainty. As such, identifying the behavioral and neural bases of uncertainty resolution in development is of critical importance for better understanding how to manage the aversive emotion, and vulnerability to negative outcomes, associated with uncertainty exposure.

My goal in this grant proposal is to investigate how behavioral and neural representations of uncertainty mature through adolescence, as well as how these certainty judgements might be self-regulated to mitigate aversive emotional responses. My specific aims are as follows:

***Aim 1. The Dissertation Research Project (F99 Phase) – To explore the formation of outcome-based social uncertainty judgements across normative adolescent development.*** Using a novel social uncertainty paradigm, and age-appropriate video stimuli, we will identify neural correlates demonstrating differential activation underlying certainty judgments through adolescent development (13 – 20 years). This paradigm has participants watch a novel video stimulus (e.g., a crime mystery) while continuously rating how certain they are of a socially-relevant outcome (e.g., a character’s guilt or innocence). This will be followed by a surprise free recall for the video’s contents. Using this approach, we can identify patterns in which features are more or less relevant towards certainty judgments 20. Furthermore, intersubject representational similarity analyses will be employed to explore the extent to which similar information processing yields similar neural representations of certainty across development and across domains. This paradigm has already been successfully employed among adult populations and has yielded promising results (*See* **Research Strategy A.2.2.**)

***Aim 2. The Postdoctoral Research Direction (K00 Phase) – To compare the efficacy of and mechanisms behind regulatory strategies to manage uncertainty.*** In my postdoctoral fellowship, I will expand upon my predoctoral work by testing how effective competing regulatory strategies (i.e., reappraisal, role-play) are at managing social uncertainty. My prior research found that the magnitude and variance of certainty judgments could be manipulated by assigning participants to adopt a role relevant to the stimulus (e.g., detective, friend of the accused) prior to the start of the task. As role-play develops as early as 3 years of age 21 and relies upon different neural circuitry than other well-studied self-regulatory techniques 22, it may be an effective form of regulating uncertainty independent of age. Using the same methods outlined in Aim 1, I will compare reappraisal and role-play as regulatory strategies for reducing the negative emotions associated with uncertainty across development.

Taken together, this combination of training in computational neuroscience, developmental neuroimaging, and early developmental self-regulatory neuroscience literature will facilitate my long-term goal of establishing my own lab dedicated to computational social affective developmental neuroscience research.