1. Research Title:
Becoming a Team: Identifying Dynamic Patterns of Shared Cognition and Team Communication in Cooperative Team Tasks

2. Individual Sponsor
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3. Academic Area/Field and Education Level
Cognitive Science, Psychology, Communication, Operation Research, Computer Science, Mathematics (Master's or PhD)

4. Objectives:
The Collaborative Technologies Branch (711 HPW/RHWT) is working to identify advanced metrics and models of team dynamics and performance to aid the warfighter. The objective of the current research is to identify the physio-behavioral markers of effective teamwork to aid in building, evaluating, and improving human-human and human-autonomy teams in complex task environments.

5. Description:
The researcher will identify and measure key physio-behavioral responses collected during team-based tasks by, for example, extending recent experimental studies conducted at AFRL on team-level measures of physiological responses (e.g., heart rate synchrony, joint eye movement), team cognition (e.g., shared knowledge, team trust and identification), and team performance (e.g., collective efficacy, team errors). The researcher is expected to develop system-level models of team cognition, state, and performance that identify the key relationships and critical phases that shape when and how a group of individuals becomes an effective team. This project will help identify the key task contextual elements (e.g., technology interface, multi-task switches) and team communication strategies (e.g., reducing cognitive load through calibrated communications, promoting perspective taking, and employing theory of mind) that can facilitate team building and improve team performance. One way this objective can be accomplished is to include key team communication measures based on group communication and message design research into AF relevant task environments. Additional methods that may be employed include traditional models of team dynamics, but advanced and novel methods, e.g., nonlinear models and quantum cognition models, that can be developed to understand the "blackbox" of psychological processes at the interpersonal level (e.g., attention weighting, belief updating, perspective rotation) are encouraged.

6. Research Classification/Restrictions: Unclassified, no restrictions

7. Eligible Research Institutions: Universities in OH (DAGSI eligible)

8. PA Approval: Originator Reference Number: RH-23-124782
Case Reviewer: Katie Brakeville
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