# Translational Research Group

**at the USMC Center for Advanced Operational Culture Learning (CAOCL)**

**The Teen Brain vs. Teen Behavior: Which is more useful to understand?**

Dr. Wendy Chambers

**BLUF**: While the Marine Corps has a vested interest in understanding the behavior of a young force, psychological research to date on how the teen brain responds to psychological stimuli **–** such as human emotions, peer influence, and fear **–** does not increase understanding of teen behavior. Despite including some measures of behavior, the summarized studies below focus primarily on monitoring brain activity. As illustrated by the proposed alternative questions, research dedicated to understanding or shaping teen behavior as a primary aim would be of much greater benefit to the Marine Corps than the current research on how the teen brain functions.

**Emotional Control:** Some psychological studies have shown that adolescents have difficulty in controlling behavioral reactions to emotional content (e.g., facial expressions), but not to unemotional content.[i] Yet in another study, this emotional control (or lack thereof) existed at age four and persisted into middle age, indicating that for some this could be a personality trait and not a skill correlated with age at all.[ii] All of these studies involved monitoring behavior and brain activity simultaneously, but the identified brain activity did not aid in understanding why some teens did or did not struggle with emotional control.

- Helpful research for the Marine Corps could address these questions instead: Why do some teens have emotional control? Can the right training or education cultivate emotional control, and if so, what tools or techniques would be most effective for teens? How much training or education would be required to sustain the behavior and for how long (months, years)?

**Peer influence:** When in the presence of peers (people of the same age group), some studies show that adolescents are more likely than adults to engage in greater risk-taking and prefer more immediate rewards than when alone.[iii] In comparison to adults and children, adolescents have also expressed greater embarrassment when they think peers are observing them.[iv] The power of peer influence among teens is well established, but measuring brain activity in these studies did not further our understanding of why this influence is so powerful.

- Helpful research for the Marine Corps could address these questions instead: How do the thoughts, attitudes, and behaviors of the teens unaffected versus affected by peer influence differ? Can the right training or education help teens determine when to resist vs. support peers in certain contexts or all contexts? How would this training or education impact unit cohesion?

**Fear & Stress:** Some research shows that adolescents appear more likely than adults or children to have a persistent fearful response to a situation,[v] though understanding the associated brain activity with the fearful behavior[vi] does not help in understanding why the adolescents had the fear response. Similarly, Posttraumatic Stress Disorder (PTSD)[vii] is characterized in part by a persistent fear response to a past event. In a study of 248 Vietnam veterans, a combination of youth, pre-war vulnerabilities (e.g., childhood abuse), and severity of combat trauma were all associated with a much greater likelihood of experiencing PTSD post-deployment.[viii] Further research in this area could benefit the Marine Corps.

- If more research were conducted with warfighters and the above findings stood the test of time, would it be beneficial to offer extra support, education, or training to young warfighters (both pre and post-combat) with a history of key vulnerability factors? Would this support, education, or training differ according to the types of vulnerability factors? Is there a threshold regarding the impact of these vulnerability factors in terms of age or duration (e.g., past a certain age or if the aversive event was short or only happened once, do they still adversely affect the individual)?

In short, if a young Marine engages in an unwanted activity, it is not helpful at this stage of psychological research to understand that such unwanted activity corresponds with activity in certain areas of the brain. It would be much more helpful to understand the various behaviors that actually led to the unwanted activity and the needs behind them.

Center For Advanced Operational Culture Learning (CAOCL): 1019 Elliot Road (Bldg 711, 6th Street), Quantico, VA 22134 703.432.1504
Lead Researcher: Wendy Chambers, 703-432-0222, WChambers@prosolassociates.com

[i] B. J. Casey and Kristina Caudle, "The Teenage Brain: Self Control," *Current Directions in Psychological Science* 22, no. 2 (April 2013): 82– 87.

[ii] B.J. Casey et al., "Behavioral and Neural Correlates of Delay of Gratification 40 Years Later," *Proceedings of the National Academy of Sciences, USA*, 108 (2011): 1-6.

[iii] See summary of Albert et al., "Peer Influences on Risk Taking in Young Adulthood" (poster, Society for Research in Child Development in Denver, Colorado, April 2009) and conference paper by A. Weigard, J. Chein, & L. Steinberg, "Influence of Anonymous Peers on Risk-Taking Behavior in Adolescents," (presented at the 11th Annual Stanford Undergraduate Psychology Conference, Stanford, CA) as described in Dustin Albert, Jason Chein and Laurence Steinberg, "The Teenage Brain: Peer Influences on Adolescent Decision Making," *Current Directions in Psychological Science* 22, no. 2 (April 2013): 116-117; L. O'Brien, D. Albert, J. Chein, & L. Steinberg, "Adolescents Prefer More Immediate Rewards When in the Presence of Their Peers," *Journal of Research on Adolescence* 21, (2011): 747–753.

[iv] Somerville et al. in press, as described in Leah H. Somerville, "The Teenage Brain: Sensitivity to Social Evaluation," *Current Directions in Psychological Science* 22, no.2 (April 2013): 124.

[v] S.S. Pattwell et al., "Altered Fear Learning Across Development in Both Mouse and Human," *Proceedings of the National Academy of Sciences USA*, 109 (2012): 16318–16319 (re: human study only).

[vi] M.R. Milad and G.J. Quirk, "Fear Extinction as a Model for Translational Neuroscience: Ten Years of Progress," *Annual Review of Psychology,* 63 (2012): 129–151; as described in Siobhan S. Pattwell, B. J. Casey and Francis S. Lee, "The Teenage Brain: Altered Fear in Humans and Mice," *Current Directions in Psychological Science* 22, no.2 (April 2013): 147.

[vii] U.S. Department of Veterans Affairs, "DSM V Diagnostic Criteria for PTSD Released," (July 3, 2013) http://www.ptsd.va.gov/professional/pages/diagnostic_criteria_dsm-5.asp

[viii] Bruce P. Dohrenwend et al., "The Roles of Combat Exposure, Personal Vulnerability, and Involvement in Harm to Civilians or Prisoners in Vietnam-War-Related Posttraumatic Stress Disorder," *Current Clinical Psychological Science* 1, no. 3 (February 15, 2013): 223–238.