

Individual differences in emotion are among the most compelling aspects of psychology. I am applying to UCLA for graduate school in psychology because I am intrigued by the sophisticated—and unique—ways that emotions are embedded in each person. My interest in individual differences in emotion stems from my passions for the richness of psychological theory and the crispness of deductive reasoning in mathematics. These long-standing fascinations grew during my years as an undergraduate taking courses and volunteering at Stanford's Bridge Peer Counseling Center. They finally connected when I began conducting research on emotion and individual differences in Professor James Gross' Stanford Psychophysiology Laboratory, where I saw how the deductive logic I learned in mathematics classes could be applied to emotion with clever experimental design. I became further convinced that emotion research integrates the most appealing parts of psychology and mathematics while working at Professor Patrick Suppes' Center for the Study of Language and Information. I firmly believe that graduate work in psychology is the best way to synthesize my strong interests in these fields.

As an undergraduate at Stanford I was pulled between my fascination with the complexity and subtlety of emotions studied in psychology on the one hand and the formal reasoning of mathematics on the other. Psychology appeals to me because I enjoy thinking about people and the rich, spontaneous surfacing of emotion in our lives. Math appeals to me for the opposite reason—for the perfect predictability of structures in a domain that is carefully specified and bounded. I am motivated by the tension between psychological constructs such as emotion and the well-defined, formal symbol manipulation of mathematics. In my classes on set theory, for example, I enjoyed the simple elegance of combining logical rules with properties of mathematical objects—however abstract they may be—to yield important results about our physical world. In my work as a peer counselor working with clients and managing other staffers I was exposed to emotions ranging from the crippling sadness of depression to the euphoria of the end of finals. I sought to examine the underlying emotional processes and complex patterns I was seeing in my counselees using the principles of set theory.

Unlike my counseling peers who were interested only in the clinical implications of emotions, from my first day as a research assistant in the Stanford Psychophysiology Lab I knew that my stronger passion was to study emotion in a rigorous and controlled way. This kind of research is stimulating because it allows me to integrate the deductive logic and causal inferences of math and logic into my natural queries about human behavior. Shortly after I joined the lab I became part of a team headed by Professor Gross that was conducting a longitudinal study of the freshman class, the Transition to Stanford Study. In the summer before the participants' freshman year, I helped compile a battery of measures relevant to personality, stress coping, and emotion regulation. We then gathered data from students during the notoriously chaotic freshman year to investigate the link between emotion regulation style and the ability to cope with stressful life events. Over the next three years, we used various self- and peer-report tools to take a detailed picture of the emotional lives of the freshman class. As my involvement in the transition project and the lab grew, I learned how to think about psychology in terms of hypotheses and prediction testing. With my background in mathematics and computers I felt immediately at home in the data-rich and technical atmosphere of a psychophysiological laboratory. I became expert at computing inferential statistics using the Statistical Program for Social Scientists and also perfected the conversion of pencil-and-paper tools into hyper-text markup language (HTML) for web-based assessments. My role in the lab involved both performing lab managerial duties and thinking conceptually about theory and study design in a multi-method laboratory.

As a senior I wrote my honors thesis in the Stanford Psychophysiology Lab as an extension of what I learned in the transition study. After spending the summer doing background research on the literature on humor coping, I returned to campus prepared to conduct a study of how humor is used to cope with stress. Coincidentally, study participants returning to Stanford for their sophomore year had to cope with both the adjustment of returning to school and the fear, anger, sadness, and grief caused by the tragic terrorist attacks on September 11, 2001. I decided to seize this important opportunity to use the humor data collected more than a year earlier to examine how participants would cope with the stressors surrounding 9/11.

Previous research on coping mechanisms considers humor to be an adaptive form of coping. All other things being equal, people who tend to use humor to cope are more psychologically healthy than people who do not. But I noticed that there are times when joking about a situation is inappropriate and might not be an effective strategy for dealing with stress. Combining these insights, my contribution to the literature on humor coping was to hypothesize an interaction effect between person and situation. I predicted that people who tend to use humor to cope would fare better than those who do not, but only in situations of relatively mild stress. Under severe stress, I hypothesized that humor might not be an effective

copied mechanism. This is just the interaction I observed: for those who were psychologically distant from the attacks and thus experienced only slightly elevated stress, the tendency to use humor to cope before 9/11 predicted lower stress and depression levels after 9/11. However, for participants who were psychologically close to the attacks and experienced higher levels of stress, a greater tendency to use humor to cope was *positively* correlated with stress and depression—higher use of humor coping before 9/11 was associated with lower functioning after 9/11. I concluded that while humor is an effective way to cope with mild levels of stress, it might not be effective during times of high stress.

The experience of completing my honors thesis intensified my interest in emotions. Before the thesis I could not have said exactly what intrigued me about this field. After contemplating my results I realized that emotion research, particularly the investigation of coping mechanisms, epitomizes the interaction between situational and personality variables. Neither personality nor social psychology can independently explain the results—both are required to form a coherent story. In the case of the humor study, participants who happened to be further away from the attacks—a situational variable—and who also used humor to cope with stress—a personality variable—fared better than any of the other subjects. However, a slight perturbation in either variable proved sufficient to negatively impact the psychological well being of my subjects. I am fascinated by the interplay between person and situation, and motivated by the challenge faced by emotion researchers to tease these factors apart.

Following my work on emotion and individual differences using self-report measures, I sought to expand my research experience to encompass other approaches to studying emotion. With the strong encouragement of advisors and fellow students I joined the team in Professor Patrick Suppes' laboratory within the Center for the Study of Language and Information for my master's degree. This lab specializes in cross-subject invariants in electroencephalographic brain signals. With my background in both psychology and math, I realized that I could spearhead a collaboration between the engineers in Suppes' lab and the emotion researchers in the Department of Psychology that promised to enrich both fields by integrating psychological theory with some hard-nosed data computation techniques. The premise of my master's thesis was to import the computational classification algorithms and sophisticated data analysis methods used by Suppes and colleagues and apply them to emotions. I tested an existing model of emotion by scrutinizing the evoked brain waves and then classifying them according to theoretical predictions.

For this study I used affective stimuli meant to elicit approach and withdrawal reactions. According to the biphasic theory of emotions set forth by T.C. Schneirla, emotions are elicited by stimuli that are relevant to survival and can be classified into two underlying behavioral themes: approach emotions are reactions to attractive stimuli such as a delicious meal or a member of the opposite sex (in heterosexuals); withdrawal emotions are reactions to aversive stimuli like rancid meat or fearful predators. The purpose of the study was to show that these classes of emotions are differentiable from each other on a single-trial basis in the brain. Using custom filtering and classification algorithms developed by Suppes and colleagues, I was able to classify emotions among approach, neutral, and withdrawal images. I concluded that there might be an invariant within approach and withdrawal emotion experiences that allowed computer classification on a single-trial basis. I am currently testing the hypothesis that the invariant approach, neutral, and withdrawal signal is the same across subjects. Positive results would indicate stable cross-subject representations of different emotion classes, whereas negative results would provide evidence for idiosyncratic representations. Either way, subsequent experiments promise exciting insights into the biphasic theory of emotion and individual differences.

My goal for graduate school is to deepen my knowledge and broaden my skills relevant to emotion and individual differences research. I am certain that my avid desire to fuse psychological theory and mathematical reasoning will thrive in graduate school. My long term goal is a career at a research university serving a passionate commitment to establish my own lab as an emotion researcher. UCLA is one of my top choices for graduate school because its psychology department is renowned for the study of emotion and individual differences. I am confident that I would receive excellent training in the multi-method approach to studying emotion there, where I would benefit from working with researchers who specialize in the physiological and facial components of emotion, as well as researchers who use a self- and peer-report approach, and still others who use a combination of these methods.

I'd particularly like to work with Professor Lieberman because of our mutual interest in emotions and individual differences. I've been extremely impressed with his work on disruption of automatic affect and am certain that a collaboration would prove fascinating and productive. Professor Lieberman has succeeded in integrating high-level and intuitive psychological theory with imaging techniques, and I'm certain I would learn a great deal from him.

Statement of Purpose

I am also interested in working with Professor Taylor. I like the way she blends sophisticated social psychological theory with health psychology to yields something valuable to society. I am excited to engage in research that produces rich and practical results about emotion. With my background in emotion regulation I'm confident that I would have much to contribute to and learn from Professor Taylor's research.