

The Influences of Extraversion and the Implicit Theories on
Classroom Participation and the Adjustment to College Life

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Acknowledgements: This experiment was designed and conducted with Elyse Adler, Jin Yoon, and Nyrah Madon under the direction of Jennifer Lilgendahl.

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Abstract

Two studies were performed looking not only at how extraversion manifests itself in the classroom and affects one's adjustment to college but also at how implicit beliefs influence extraversion. The first study observes the influences of extraversion and the implicit theories on classroom participation, and the second study observes the influences of extraversion and the implicit theories on the transition to college. Both studies consisted of participants filling out a series of questionnaires and answering narrative prompts. It was found that extraverts are more comfortable with more in-class activities, get more enjoyment out of more in-class activities, and find more in class activities to be more conducive to learning. In addition, extraverts were generally more motivated to participate than introverts just as individuals with a growth mindset were more motivated to participate than individuals with a fixed mindset. When it came to the transition to college life, the results were mixed as to whether extraverts or introverts had an easier time with the transition to college; however, it was found that growth mindset individuals were more likely to make negative self-statements when describing their transition to college. The results of the present study show that understanding extraversion and implicit mindsets is essential for creating effective learning spaces and improving the transition to college.

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In Susan Cain's book Quiet, she brings to light the "Extravert Ideal." She talks about how the characteristics of extraverts are idealized and promoted as well as how our society is better shaped to accommodate extraverts. Those who are extraverted are thought to be more competent, attractive, and are better liked. There is evidence of the favoritism in homes, at schools and work, as well as in general social interactions. Words like "outgoing," "friendly," "assertive," "talkative," "fun," and "lively" are all adjectives that can be used to describe extraverts, but are also all characteristics that are valued by Western society. Most parents tell their children to be "friendly" and greet whoever is visiting or talking to them. Teachers of introverts write comments or lower grades because many introverts are not "talkative" in class, or teachers will speak to parents if students are spending what the teachers decide is too much time alone. In social environments, people are most likely to describe the person who is "outgoing," "assertive," and "lively" as "fun."

Yet very little research has been done looking into how society is actually better equipped to accommodate extraverts and how it even tries to promote extraverted characteristics. More specifically, no one has researched how classrooms are designed for extraverts. It has been shown that introverts need more time to reflect when discussing an idea as well as that introverts feel more comfortable in smaller groups, yet most teachers call on the first hand that is raised and whether it is because they think it is easier or think it is a good skill to have, teachers often have discussions with the entire class (Davidson, Gillies, & Pelletier, 2015). Not only do extraverts and introverts vary greatly in the classroom, but they also show large differences in adjusting to college life. There are aspects of college life that may favor extraverts and be more difficult for

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introverts. Social support has been found to be greatly protective against stress, and extraversion is positively correlated with social support. Thus, not only do the characteristics of extraverts allow them to make friends easier, but extraverts also have more practice making friends and maintaining large social support networks (Swickert, Rosentreter, Hittner, & Mushrush, 2002). In addition, extraverts are greatly motivated by rewards and so may be more willing to take social risks in order to experience the reward of active affect (Canli, Zhao, Desmond, Kang, Gross, & Gabrieli, 2001). The “Extravert Ideal,” while it allows and helps extraverts to reach their full potential by continuing to promote extraverted attributes, it stifles and undermines the attributes of introverts causing a large portion of the population to feel the need to change her or himself to please society.

The current study looks not only at how extraversion manifests itself in the classroom and affects one’s adjustment to college but also at how implicit beliefs influence extraversion. If an individual has a fixed mindset, they are more likely to believe that their personality traits are unchangeable; therefore, it is far less likely that an individual with a fixed mindset will attempt to change their personality than an individual with a growth mindset will. Because growth theorists believe that traits are malleable, when they are presented with a challenge, they will attribute any delay in solving the matter at hand to lack of effort as opposed to the problem being their innate ability; thus, growth theorists handle problems better than fixed theorists, for growth theorists will work harder while fixed theorists will give up. It is expected that the differences in mindset will have more of an effect on Introverts than Extraverts because Introverts are more likely to find in-class participation and the adjustment to college to be more challenging than Extraverts.

Extraversion

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Extraversion is one of the most studied traits in the history of personality psychology. It is the only trait of the Big 5 traits that is present in all trait theories. It has multiple overlapping definitions and has been measured using many different facets. Most commonly extraversion is measured by warmth (outgoing), gregariousness (sociable), assertiveness (forceful), activity (energetic), excitement seeking (adventurous), and positive emotions (enthusiastic) (Costa & McCrae, 1990; John & Srivastava, 1999). These facets target different aspects of the trait of extraversion. Extraversion is measured on a continuum so that while some individuals are on one of the extreme ends of the spectrum, there are also people who fall in the middle. For those who are more extraverted, they tend to be warmer, more gregarious, assertive, active, excitement seeking, and display as well as feel more positive emotions (Davidson, Gillies, & Pelletier, 2015). Introverts, on the other hand, tend to be the opposite and are seen as being more reflective, less social, and more inward turning.

The difference between introverts and extraverts is thought to be due to the amygdala's capacity for stimuli. Introverts have been found to have a low amygdala threshold for stimuli while extraverts have a high amygdala threshold for positive, external stimuli (H.J. Eysenck & Eysenck, 1975; H.J. Eysenck, 1991). Thus, extraverts are far more likely to seek out excitement to increase cortical arousal while introverts have a higher baseline for cortical arousal to stimuli. In addition, extraverts also experience greater reward from social interactions (H.J. Eysenck & Eysenck, 1975; H.J. Eysenck, 1991). When positive stimuli such as smiling faces versus negative stimuli are displayed, extraverts have been found in studies using fMRI scans to show brain reactivity in localized brain regions such as the amygdala, putamen, and caudate suggesting that extraverts are more stimulated by socializing (Canli et al., 2001). Extraversion is correlated with positive emotional reactivity; the relationship between extraversion and emotional reactivity is

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important to consider when thinking of the difference in experiences for introverts and extraverts when adjusting to college life as well as when participating in the classroom. Extraverts are more motivated by rewards and so are more likely to take chances socially and through participation in the classroom so as to experience active affect.

Smillie, Cooper, Wilt, and Revelle (2012) performed five different experiments testing the affective-reactivity hypothesis, which says that extraverts are more likely to experience positive affect. The Behavioral Approach System is thought to be at least partially responsible for the biological differences between introverts and extraverts. The BAS motivates people to act in order to receive a reward. It is believed that the BAS is connected to the dopaminergic pathways in the brain; dopamine is a neurotransmitter related to positive emotions (Carver, 2004). The five experiments consisted of giving participants extraversion and affect scales at the beginning, a mood induction task, and then the affect scales again, yet some of the experiments used different questionnaires to measure extraversion and affect as well as different mood induction tasks. The researchers found that extraverts only experienced increased affect for highly appetitive scenarios (i.e. when participants were in pursuit of a reward, were told to imagine positive scenarios such as winning the lottery or finding money) as well as that extraverts experienced increased active affect not pleasant affect. Active affect was defined as being aroused and energized by the situations. Thus, it makes sense that if extraverts see participation in the classroom as a highly appetitive scenario, then extraverts are more likely to feel a more active affect, and the heightened active affect as well as the reward of social attention may be two of the reasons that extraverts have been found to participate more in the classroom (Smillie, Cooper, Wilt, & Revelle 2012).

Extraversion and In-Class Participation

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While extraverts are accommodated in the classroom through the use of participation grades and discussions, introverts struggle to participate in fast moving classrooms and large groups; however, despite the struggle of introverts, there is extensive research showing that group work leads to better learning outcomes such as enhanced academic achievement, retention of material, and student attitudes. There are multiple types of learning that use group work, and each type has slightly different benefits. Active learning consists of engaging students in the learning process. The success of active learning is highly dependent on the type of activity used. The activities must be created to lead to important learning outcomes as well as make the students engage with and reflect on the material. Research shows that active learning can improve students' ability to recall information. Cooperative learning consists of students working together towards a shared goal while being graded on their individual performance. Cooperative learning has been shown to help student achievement as well as increase interpersonal skills. Collaborative learning is when small groups of students work together toward a shared goal (Prince, 2004). Collaboration forces individuals to construct new ideas or opinions, for students go from having their own opinions or divergent ideas to working as a group on collaborative knowledge building to reconstructing their original thoughts. Collaborative learning is most effective when students are able to create new understandings from the group work that they have done (Puntambekar, 2004).

In one study (Terenzini, Cabrera, Colbeck, Parente, & Bjorklund, 2001) college level engineering courses at multiple colleges were compared. The study focused on the difference between lecture and discussion based courses and collaborative learning based courses. The collaborative learning classes were characterized by teaching students through active and collaborative learning techniques. The study tested the comparison by having the students

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complete surveys. Students who were in the collaborative learning classes reported significantly larger advances in design technique, communications, and group skills. There is ample research to support the use of collaborative learning; however, considering the preferences of introverts and extraverts when it comes to participation is important, for while it has been shown that participation greatly benefits students, it is important to ensure that introverts are also able to experience the benefits of participation.

Group work increases academic achievement and self-esteem as well as benefits problem solving ability; however, student motivation is associated with student's satisfaction with a learning strategy, and how much the students enjoy the group work and learn from the activities is greatly dependent on how much the students enjoy the activities and feel they are learning. When students are satisfied, they are more likely to engage in group work and feel as though they learn more. Students tend to be more satisfied when they feel like the workload is evenly distributed (French & Kottke, 2013). Distribution of workload could feel uneven if some individuals speak infrequently or take longer to respond and finish tasks, both characteristics typically attributed to introverts; thus, it is possible that one explanation for uneven workload and dissatisfaction with group work could be that extraverts feel as though they are doing more work and introverts feel frustrated, for they think that they are being perceived as underperformers.

The use of technology in the classroom could allow professors to create an environment more conducive to the learning of introverts as well as extroverts. More frequently researchers have started studying how well technology works in facilitating group work. A new method that allows students to participate and interact with course material while in a lecture-based class is the use of clickers. Physics professors have already started to use clickers for their lectures and

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have found them to be beneficial in increasing student collaboration and giving professors feedback on the level of student understanding. When clickers have been found to lead to gains in student performance, the use of the clickers included some form of student collaboration (McArthur & Jones, 2008). The use of clickers could greatly benefit introverts in the classroom by allowing them more time to think about questions or ideas as well as by allowing them to feel more comfortable sharing ideas in a large group setting.

Because of the biological differences between extraverts and introverts, it is not surprising that when it comes to learning, the two groups prefer and benefit from different activities as well as participate differently. A study by Davidson, Gillies, and Pelletier (2015) aimed to find out how medical students who are introverted are affected by the current model of teaching. They looked at how well the current model of teaching in medical schools fits introverts. In the medical school environment, it was found that introverts struggle to be heard, worry that they will be misunderstood, feel frustrated because of the constant pressure to talk more, wish they had more time to think and reflect before responding, and worry that they are perceived as underperformers. The likelihood of introverts participating was increased when professors used discussion boards, email exchanges, paused after asking a question, notified students of the topic ahead of time, and broke students into small groups before having a whole class discussion. While the researchers did not find that the model of teaching directly affected introvert's health, they did find that the current model induces stress in introverts, and chronic stress can have severe consequences on one's physical health and wellbeing (Davidson, Gillies, & Pelletier, 2015).

Research has also been done looking at how extraverts and introverts interact when asked to work in small groups. French and Kottke (2013) have shown that there is a relationship

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between groups with a larger ratio of extraverts to introverts and better performance and higher satisfaction. Nussbaum (2002) looked more closely at how introverts and extraverts discuss ideas and negotiate. In the study by Nussbaum, groups of introverts and separate groups of extraverts were observed negotiating and discussing different ideas. First, the study observed a group of 6th graders that were divided into one group made up of four introverts and a second group made up of four extraverts. It was found that the introverts were three times more likely to use design claims. A design claim was defined as a claim that explains and justifies a solution to competing considerations. It was also found that Introverts were far less attached to their ideas than extraverts were. Extraverts, on the other hand, were more likely to use contradictions, counterexamples, and backing statements. The study then observed introverted and extraverted groups of pre-service teachers. There were two groups of four introverts and two groups of four extraverts. Nussbaum found the same results observing the pre-service teachers as he did with the 6th grade children except that with the teachers, introverted individuals were far more likely to simply accept ideas. Overall, extraverts were found to be more conflictive when working in groups of extraverts, and introverts were found to be more constructive when working in groups of introverts.

Extraversion and Adjustment to College Life

When students enter their first year of college, they are forced to adjust to the new responsibilities of adult life, cope with the new environment, and often move away from their social support systems of family and friends. Students are taking on many new challenges more often without any type of social support system; thus, it is not surprising that students report moderate to high homesickness, loneliness, and difficulties keeping up with schoolwork. Extraverts face the challenges of adjusting to college life such as coping with the new

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environment and moving away from their social support systems with greater positive affect and greater ability to develop a social support network than introverts.

It has been theorized in the past that the difficulties students face when adjusting to college life are due to the discrepancies between their expectations and the reality. It was thought that if one had more idealistic expectations then they would be more likely to do poorly academically as well as participate less in school activities. However, more recent studies show that students who have positive expectations or feel prepared have an easier time adjusting to college life. It is possible that positivity and preparedness have been associated with positive adjustment to college life because individuals who are more positive or prepared have thought more about the challenges that they will face while adjusting to college life; therefore, the students who have thought about the challenges are far more likely to have also thought about how to handle those challenges (Pancer, Hunsberger, Pratt, & Alisat, 2000).

In one study (Schnuck & Handal, 2011), researchers tested whether personality could be a predictor of adjustment to college life. Participants were 190 first year students who filled out questionnaires online during the second half of the semester. Researchers found that extraversion and agreeableness were associated with positive overall adjustment to college life while conscientiousness was only associated with positive adjustment to academic life. It is thought that because extraverted and agreeable students have a more positive affect, the adjustment to college life was easier, for the individuals felt more positively about the transition and had thought more about the possible challenges they would face. In addition, it has been shown that socializing increases positive affect, so an extravert's social behavior can help him or her to feel more positive most of the time.

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A longitudinal study (DeNeui, 2003) was done looking at first year college student's psychological sense of community (PSC) over time and how the changes over time were related to personality. The study followed 120 first year students (95 women: 23 men) who were enrolled in an introductory psychology class at a large southeastern university. The scales were administered twice; once three weeks after the start of classes and a second time at the end of the semester. The revised NEO personality inventory (NEO-PI-R), campus atmosphere, and demographic questions were administered during the first session while the NEO-PI-R, campus atmosphere, and a checklist of activities on campus were administered during the second session. The results showed that at the first session extraverts felt the largest PSC, moderate extraverts felt the second largest, moderate introverts felt the third largest, and introverts felt the smallest PSC. While the rankings stayed the same for the second session, all group's PSC decreased except for moderate introverts. Extraverts had the largest decrease in PSC over time. It is possible that extraverts have the highest expectations for PSC in college but then find it impossible to actually achieve such PSC.

Another explanation as to why extraverts may have an easier time adjusting to college social life is that extraverts have been shown to use social support far more often than introverts, and social support has been shown to greatly reduce the effects of stressors. The level of support received mediates the positive effects of social support. High levels of social support are correlated with increased wellbeing as well as with protection against physical and mental stress (Lackner, 1999). High levels of perceived social support are also correlated with fewer experiences of depression, anxiety and somatic symptoms during the adjustment to college life (Lidy and Kahn, 2006). Swickert et al. (2002) found positive correlations between extraversion and perceived availability of support, social network size, contact with members of the network,

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and positive social interactions. They found that these correlations continued from young adulthood to midlife. Other studies have found similar results showing that extraversion is not only highly correlated with creating a strong social support network but also with greater social activity and a greater likelihood of seeking support (Von Dras & Siegler, 1997). When extraverts start college, because they have more past experience building and maintaining large social networks, they are also more likely to have an easier time finding social support during the first year of college.

Lidy and Kahn (2006) performed a study looking at the relationship between personality, perceived social support, and ease of adjustment to the first year of college. They found that social support mediates the connection between three different personality traits and three different aspect of the adjustment to college life. Students who are more emotionally stable, take more social risks, and are more practical have better academic adjustment, social adjustment, and institutional attachment. It is possible that students who perceive higher levels of social support feel more comfortable in the classroom because they have the support of their classmates and since higher perceived levels of social support protect against depression, anxiety and somatic symptoms, students are more likely to enjoy their time at the institution and, therefore, feel more attached to it. Since extraverts have been found to have larger perceived social networks, it is likely that the adjustment to college for extraverts will be easier.

Implicit Theories

If college is more challenging for introverts, then the type of mindset an introvert has will matter more when it comes to coping. Carol Dweck (2000) founded the idea of implicit theories. Implicit theories relate to whether someone believes a trait is locked or malleable. Fixed theorists, which are also referred to as entity theorists, believe that their intelligence is fixed.

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Therefore, fixed theorists are more focused on performance goals such as proving their ability to others and avoiding negative evaluations. Growth theorists, which can also be referred to as incremental theorists, believe that their intelligence is malleable. Growth theorists focus on learning goals such as improving their ability by completing challenging tasks; they are mastery-oriented (Pal & Robins, 2002). Growth and fixed theorists have very different goals in academic situations, for fixed theorists are focused on getting good grades while growth theorists want to learn. When fixed theorists are presented with a difficult problem or do poorly, they will become disengaged, blame their own intelligence, and feel negatively; when growth theorists are put in the same situation, they will work harder and attribute the errors to lack of effort (Beer, 2002).

Pals and Robins (2002) found that implicit self-theories do not become stronger or weaker over time nor do they change during college. Thus, one's beliefs about their intelligence do not change over time. Pals and Robins found that fixed theorists had higher academic ability, yet they did not have higher academic achievement. Even though they received similar grades, fixed theorists felt more shame, distress, and upset when it came to their academic performance while growth theorists felt more determination, enthusiasm, excitement, and inspiration. Thus, it is not surprising that there is a trend for growth theorists to have higher perceived performance as well as self-confidence; however, the actual difference between the performance of growth and fixed theorists was not significant.

Implicit theories do not just apply to beliefs about intelligence but instead are domain specific. While an individual can have a fixed mindset about intelligence, they could have a growth mindset for personality. Beer (2002) has found that shy individuals are greatly affected by whether they have fixed or growth mindset about their shyness. Growth theorists believe that shyness is something that can be overcome; thus, shy growth theorists are more likely to believe

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that they can master their shyness than shy fixed theorists are. Because shy growth theorists think it is possible to master their shyness, they are far more likely to try and do so. Thus, it seems that growth mindset introverts will believe that they can and will try to master their introversion. Perhaps, growth mindset introverts will be more gregarious, warm, and show more positive emotions than fixed mindset introverts.

Additionally, growth mindset introverts will feel more comfortable with making social mistakes, for when it comes to social mistakes, having a fixed or growth mindset greatly influences how one deals with the situation. Goetz and Dweck (1980) performed a study looking at children's reaction to social rejection and whether the reaction was dependent on implicit mindsets, children were given an implicit theories questionnaire and then told to tryout for a pen pal club. The children wrote a sample letter that was reviewed by the pen pal acceptance committee. The committee told each student that they were uncertain about their acceptance into the club and gave each student the option to write a second letter in order to gain acceptance into the club. The students first and second letters were later compared to see how much new information each student had added to their second letter. It was found that the performance of children with a fixed mindset was negatively affected after being rejected. Children with a fixed mindset attributed the rejection to their own incompetence, and often refused to try again, rewrote their first letter practically word for word, or proceeded to boast about their popularity (Dweck & Leggett, 1988). Goetz and Dweck's (1980) finding highlight a large obstacle for fixed mindset individuals who are adjusting to college life, for it is impossible handle every social situation perfectly after just arriving in a new environment; thus, if one can react to a mistake by working harder as opposed to withdrawing then they are more likely to have a smooth adjustment to college life.

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Narrative Identity

Depending on whether one is an introvert or extravert as well as whether one has a fixed or growth mindset, one's narrative identity should vary greatly. Narrative identity is the life story that one creates to define oneself. The narrative stories are subjective in that they are one's own interpretation of the past. Psychologists first started using narratives, for humans are natural storytellers and have been narrating and creating stories throughout time. Every person has an internalized story or understanding of himself or herself based on past experiences. McAdams (2006) has found that people start developing their narrative identities as early as during adolescence or young adulthood. Narratives allow researchers greater insight into a participant's general beliefs. They bring to light how individuals make sense of their experiences as well as what their emotions are. When coding narratives, researchers find thematic differences or differences in the overarching themes of narratives. Individuals must choose the setting, plot, characters, and scenes (McAdams, 2006).

Identity development is very active during one's college years, so students are engaged in meaning making both in an academic and social context. Narratives can show how individuals react to and make sense of participating in class and the adjustment to college life. The use of narratives in a study offers more qualitative data about each individual than Likert scale questions are able to. Two important characteristics of narratives are whether or not the narrative has a redemption sequence and which implicit mindset is displayed in the narrative. Self-event connections are looked at in order to determine whether one uses a redemption sequence as well as at which implicit mindset is displayed. Self-event connections are the relationship between an experience and the sense of self that comes from a specific narrative; they are the link between an event and one's sense of self, and they influence not only the development of one's life story

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but also the self-conceptions more generally (Pasupathi, Mansour, & Brubaker, 2009). By observing the self-event connections, one can determine whether the outline of a narrative is a redemption sequence. A redemption sequence is when something negative leads to or becomes something positive. For example, individuals might write about a tragic story but say that the experience taught them a lesson or got them to where they are in the present. By also looking at the number of fixed and negative self-statements one uses as well as the number of growth-oriented self-statements ones uses, it can be determined whether one has a fixed or growth mindset.

Present Study

Based on the results of previous studies, it is clear that extraverts and introverts differ greatly causing them to have different preferences in the classroom. Since introverts prefer interacting with smaller groups of people, need more time to reflect on questions, and are less assertive, while extraverts are the opposite, it would be very difficult for introverts and extraverts to get equal amount of enjoyment out of the same in class activities. Active learning leads to increased academic achievement, improved student attitudes, and better retention of class material; however, all of the benefits of active learning are dependent on student motivation which is mediated by student satisfaction with the classmates they have to work with as well as by whether or not the students feel the activities are helping them. Since it has been proven that active learning such as collaboration is only beneficial for learning when students feel motivated, it is important to know how to make the classroom activities accessible to all students no matter whether they are introverted or extraverted and no matter what their implicit mindset is.

Introverts and extraverts also differ socially. While extraverts are gregarious, warm, and show more positive emotions, introverts tend to be quieter, calmer, and less expressive; thus, it is

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highly unlikely that introverts and extraverts will have the same experience adjusting to college life. Extraverted students are more likely to find the adjustment to college life to be easier (Schnuck & Handal, 2011). Extraverts have been found to have greater perceived social support, to use their social support network more often, and to have more positive experiences with social support (Swickert et al., 2002; Von Dras & Siegler, 1997). Thus, it is likely that when placed in a new environment, extraverts will be better equipped than introverts, for extraverts have more practice reaching out for social support and maintain large social networks.

Similarly to extraversion, implicit theories greatly affect individuals both academically and socially. Having a growth mindset causes one to be more willing to take risks and promotes determination to work harder when one encounters a problem whether it is academic or social. When extraversion and implicit mindsets interact, having a fixed mindset will inhibit introverts and extraverts while a growth mindset will promote determination to be active in the classroom as well as to improve one's social adjustment to college life; however the implicit mindsets will have a greater effect on introverts than extraverts for we expect introverts will have a harder time participating in classes and adjusting to college life.

We are interested in how extraversion and incremental mindsets interact to affect an individual's in-class participation and adjustment to college. In Study 1, we examined class activity preferences, motivations to participate, and narratives about participation. More specifically, we wonder which activities are best suited for introverts. In Study 2, we examined social adjustment in the transition to college.

Study 1

The first study tests which specific activities in the classroom suit extraverts best and which suit introverts best as well as which motivate introverts and extraverts to participate in the

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classroom. The goal of the study was to consider not only who participates more during different activities but also the level of enjoyment, comfort, and motivation that is felt as well as how effective they find the activity. For our first study, we measured extraversion and the implicit theories using questionnaires as well as used a self-designed survey to learn about participation in the classroom. The self-designed survey includes demographic questions as well as questions that look at differences in classroom experiences, coping mechanisms, participation, motives for participating, and the reaction to answering a question incorrectly for introverts and extraverts as well as for growth and fixed mindset individuals. The self-designed survey also had the exploratory goal of gaining more insight about the effects personality in the classroom, so questions that do not directly pertain to the hypothesis were included.

1. We hypothesized that extraverts and introverts would equally prefer smaller interactive activities, that introverts would prefer solo and anonymous activities, and that extraverts would prefer larger group activities.

Based on the results found in previous studies, it was expected that introverts and extraverts would have different preferences in the classroom. The first hypothesis addresses what classroom experiences were expected to be equally preferred by introverts and extraverts, more preferred by introverts, and more preferred by extraverts. We predict that introverts will be more likely to prefer solo and anonymous activities such as solo presentations, solo in class assignments and quizzes, Moodle forums, and anonymous clickers while extraverts would likely prefer large group activities such as large group discussions and class discussions. Both introverts and extraverts would equally enjoy small interactive activities such as small group discussions and lab work in pairs.

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2. Second, we hypothesized that Fixed vs. Growth Mindset would moderate how Extraversion-Introversion relates to motivation to participate in the classroom.
 - a. Fixed Mindset Introverts were expected to be the least motivated to participate in the classroom relative to Growth Mindset Introverts and both types of Extraverts.
 - b. Fixed Mindset Introverts were expected to be more likely than other three groups to not participate because they fear negative judgment; however, when fixed mindset introverts do participate, they would do so for performance reasons (participation grade).
 - c. Students with Growth Mindsets (regardless of E-I) were expected to participate in order to learn and enjoy material.

The second hypothesis concentrates on the interaction between extraversion and the implicit theories, for it was predicted that whether one has a fixed or growth mindset moderates how motivated extraverts and introverts feel about participating in the classroom. We expected that implicit mindset has far less of an effect on extraverts than on introverts. If an individual is introverted and struggles with participating, a fixed mindset would only further inhibit the individual. Fixed introverted theorists believe that their personality is unchangeable as well as that their intelligence is fixed, so they would be more likely to give in to their personality as well as worry that if they answer a question incorrectly or misspeak, their classmates would think of them as stupid. Thus, it was expected that fixed mindset introverts would be the least motivated to participate in the classroom relative to growth mindset introverts and both types of extraverts. Growth mindset introverts should be motivated to overcome their discomfort for the sake of learning, and extraverts should find participating to be natural, regardless of mindset. Fixed mindset introverts would be more likely than the other three groups to not participate for fear of

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being negatively judged. When fixed mindset individuals did participate, the motivation would be to improve their grade or impress their peers or professor; however, when introverted and extraverted students who have a growth mindset participated, the reason would be to enjoy and better learn the material.

3. Third we hypothesized that Fixed Mindset Introverts will have more fixed/negative self-statements in challenge narratives about participating; Growth Mindset Introverts will have more growth-oriented self-statements.

Since it was predicted that fixed mindset introverts would be the least likely to participate due to heightened awareness of other's judgments, more specifically due to the fear of negative judgments, it makes sense that fixed mindset introverts would be more likely than the other groups to remember their negative experiences and interpret those experiences more negatively in relation to themselves. Consequently, when fixed mindset introverts are asked about an instance in class when they incorrectly answered a question, they would describe the situation as being more fixed and use more negative self-statements than growth mindset introverts would. Growth mindset introverts will use more growth-oriented self-statements to describe the situation. In addition, individuals with a fixed mindset will be less likely to end their narratives positively if they are describing difficulty with the transition to college, for unlike growth minded individuals, they will see the negative aspects as fixed, and they will not see a positive side.

Study 2

The second study tested if extraversion and the implicit theories affect one's social adjustment to college life. Not only may extraversion and the implicit theories affect individual's expectations of college life, which could influence their opinions on arriving at college, but they

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most likely also affect how individuals react to any challenges that arise. To test the hypotheses about the affects of extraversion and the implicit theories on how one adjusts socially to college, we used the data from an ongoing longitudinal study called the Identity Pathways Project. The project had been going on for 7 semesters at Haverford College. It was designed, created, and run by Jennifer Lilgendahl and Benjamin Le who are both professors at Haverford College. In order to learn more about the adjustment to college, only a small portion of the data that has been collected was used. Extraversion and implicit mindset were measured before college started and were used to predict social adjustment as well as the qualities of the transition to college narratives. Mid-way through students' first and second year, students were given the Student Adaptation to College Questionnaire and the transition to college narrative prompts.

1. Introverts were expected to describe the social transition as more difficult than Extraverts.

It was expected that introverts would perceive the transition to college to be the most difficult, for they are less gregarious, active, and excitement seeking. They would prefer more intimate socializing while extraverts would be more comfortable with large groups, and the first few weeks of college often include interactions with large groups such as orientation groups or freshmen halls. While extraverts are more energetic and adventurous, introverts are more laid back most likely because of their lower amygdala threshold for external stimuli.

- a. Growth Introverts were expected to have more growth oriented (coping) narratives vs. fixed negative statements by Fixed Introverts.

The implicit theories would have a large effect on one's adjustment to college no matter if the individual were extraverted or introverted. Fixed mindset introverts would have the hardest time adjusting to college life for they would feel less agency in the situation than any other

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group. Thus, when asked to write about their adjustment to college life, fixed mindset introverts were expected to use more negative statements while growth mindset introverts were expected to use more growth oriented narratives. Growth mindset introverts would show the most improvement in adjusting to college life.

2. Introverts were expected to start out with poorer social adjustment; Growth mindset Introverts were expected to improve the most across all students in social adjustment.

Not only is it likely that introverts would have lower expectations than extraverts, so it would be easier for introvert's expectations to be surpassed, but also it is likely that growth theorists would do more to master their introversion than fixed theorists, so growth theorists would work the hardest to improve their adjustment to college life; therefore, growth mindset introverts would improve the most over time.

Study 1 Method

Participants and Design

Participants were 91 college students ranging from 17-22 years old. All students were enrolled at Haverford. There were 62 women participants (68.1%), 28 male participants (30.8%), and 1 participant who selected other (1.1%). There were 28 first years (30.8%), 16 sophomores (17.6%), 24 juniors (26.4%), and 23 seniors (25.3%). For ethnicity, participants were able to select more than one option. 78% participants selected white, 3.3% selected black or African American, 14.3% selected Latino or Hispanic, and 18.7% selected Asian. Participants were recruited via email, posters, and by professors asking their students in the introductory psychology classes to participate. Participants completed the surveys online and were either given \$10 compensation or class credit for their time.

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The variables from the self-designed survey were examined using moderated multiple regressions. Extraversion, implicit mindset, and the interaction between extraversion and the implicit mindset were observed. The extraversion score was determined by the results of the Extraversion subscale from the Big Five Inventory. Implicit mindset was determined by the results of the intelligence subscale of Dweck's Intelligence Version of the Implicit Theory Scale.

Procedure

Participants filled out an informed consent form then completed self-report questionnaires on a computer. All participants completed the Big 5 Inventory Scale, the Eysenck Measure, Dweck's Intelligence version of the Implicit Theory Scale, Cheek and Melchior's Shyness Scale, and a self-designed survey about classroom experiences (See Appendix A for the full self-designed survey). All measures used Likert Scale questions, multiple choice, or narrative prompts. The scales are all described in further detail in the following section. After participants finished the questionnaires, they were debriefed on the study and given compensation.

Measures

The Big 5 Inventory. The scale was constructed by John and Srivastava (1999) to measure the 5 major personality factors: extraversion, agreeableness, conscientiousness, neuroticism, and openness. The scale has 44 items including 8 items for extraversion, 9 items for agreeableness, 9 items for conscientiousness, 8 items for neuroticism, and 10 items for openness. Items are ranked on a 5-point scale from 1 being "strongly disagree" to 5 being "agree strongly." Items that measure extraversion in particular include "is talkative," "is full of energy," "generates a lot of enthusiasm," and "has an assertive personality." The larger the score a participant receives for

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each factor, the more they exhibit that trait. The reliability for the BFI extraversion section of the questionnaire was .91.

The Eysenck Personality Inventory. Sybil and Hans Eysenck designed the Eysenck measure in 1975. The measure gives three scores: a lie score, an extraversion score, and a neuroticism score. The lie score, which makes sure participants aren't choosing answers because they are socially desirable, is out of 9. If a participant gets above a 5 on the lie scale then it is likely that they are choosing socially desirable answers. The extraversion scale, which measures how extraverted or introverted one is, and the neuroticism scale, which measure how neurotic one is, are both scored out of 24. The extraversion and neuroticism scores are plotted on a graph. The closer one is to the outside of the circle represents the personality traits being more striking. The measure has 57 items to which participants respond either "yes" or "no." Participants are told to answer the items in consideration of how they typically act or feel. Neuroticism items include "do you often need understanding friends to cheer you up?" and "do you get attacks of shaking or trembling?" Extraversion items include "do you stop and think things over before doing anything?" and "would you be very unhappy if you could not see lots of people most of the time?" The test is scored by adding up the number of extraverted items to which you answered yes as well as by separately adding up the number of neuroticism items to which you answered yes and then plotting the two points on the graph.

Dweck's Intelligence Version of the Implicit Theory Scale. Dweck (1999) designed the scale to determine the degree to which a person thinks that intelligence and ability are fixed or changeable. Participants are asked to rank the statements on a 6-point scale ranging from 1 being "strongly agree" to 6 being "strongly disagree." Statements include "you can change even your

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basic intelligence level considerably” and “to be honest, you can’t really change how intelligent you are.” The alpha for reliability was .93.

Shyness Scale. Melchior and Cheek (1985) designed a scale to measure shyness by assessing three components of shyness: physiological, observable, and cognitive. The physiological component measures, for example, racing pulse and blushing. The observable component includes measurements of avoidance of other people and reduced eye contact. The cognitive component includes items that ask about feelings of anxiety and embarrassment. The scale contains items, which are ranked on a 5-point scale with 1 being “never” and 5 being “always.” The alpha for reliability for the Shyness scale was .92.

Self-designed survey. The survey was designed for the current study to measure a range of aspects of interactive classroom experiences including differences in classroom experiences, coping mechanisms, participation, motives for participating, and narratives about negative participation experiences. The survey includes Likert-scale questions that ask individuals to rate their level of comfort, enjoyment, and learning effectiveness with different classroom experiences. The survey uses Likert-scale question to ask participants about how they seek help and cope with academic challenges, how comfortable they are participating in different situations, and what their motivations are and are not for participating. The survey asks open-ended questions about how well and often students prepare for class as well as about their general beliefs about participation (i.e. how much do you think you vs. other students benefit from participating in class?). To see the classroom survey in full please refer to the Appendix A.

The self-designed survey also includes a narrative prompt that asks participants about their experiences with participating. The prompt asks participants to “Describe a situation (in as much detail as possible) where you commented in class or answered a question that was

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incorrect or wasn't what the professor was looking for. How did that make you feel at the time? What were you thinking in the time leading up to contributing to the class? Did this affect your future experiences in class or your willingness to participate, if so how? What impact did this experience have on how you feel about yourself or your understanding of who you are as a student (if any)?"

Due to space and time limitations, the results for the Eysenck Personality Inventory and shyness scale are not included in the results section of the current study.

Narrative Coding

Four researchers coded the narratives about negative participation experiences. We started by coding a subset of the narratives as a group in order to learn and develop a sufficient coding system. The narratives were coded independently and then reliability was determined with the rest of the researchers. The narratives were coded for self-event connections including fixed negative self-statements and positive growth self-statements as well as the valence at the end of the narrative. We coded each of the self-event connections on a 3-point scale with 1 representing no indication of a self-event connection in the narrative and 3 indicating obvious evidence of a self-event connection. Self-event connections coding included looking at how elaborate the narratives were, the clarity of conceptual or emotional meaning, the level of development of ideas, and the influence of the event on the self. The inter-rater reliability coefficients are shown in Table 1 in the form of intra-class correlation coefficients.

Table 1
Inter-rater Correlation for Narrative Coding

	Growth Self-Statements	Negative Self-Statement	Ending Valence
Pair 1	.57	.70	.64
Pair 2	.62	.70	.71

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Pair 3	.62	.57	.75
Pair 4	.66	.58	.84
Pair 5	.62	.62	.86
Pair 6	.65	.71	.87

Study 1 Results

In order to test all of our hypotheses, we ran a series of moderated multiple regressions (Aiken & West, 1991). The moderated multiple regressions showed which variables had a significant main effect for extraversion, main effect for implicit mindset, and significant interactions between the extraversion and implicit mindset. We used a hierarchical multiple regression and entered extraversion and mindset in the first step and the term representing their interaction in the second step. The interaction term was created by standardizing extraversion and implicit mindset and then by multiplying them together. When we ran the moderated multiple regressions, we controlled for class year because we discovered an unexpected positive correlation between class year and extraversion such that upper classmen were more extraverted than lower classmen ($r = .29, p < .05$). Table 3 through table 10 show the standardized beta values for extraversion, implicit mindset, and the interaction term for all of the classroom survey variables. The analyses provided not only test our specific hypotheses, but also go further to allow us to examine how extraversion and the implicit theories shape the classroom experience. Thus, the results that address our hypotheses and that go beyond our hypotheses are reported.

Hypothesis 1. Our first hypothesis that smaller interactive activities would be equally preferred by introverts and extraverts, that solo and anonymous activities would be more preferred by introverts, and that large group activities would be more preferred by extraverts was partially supported. Overall, extraverts were more comfortable, got more enjoyment out of, and

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felt that more activities were effective for learning than introverts did as can be seen in Tables 2, 3, and 4. There was a significant main effect for extraversion in that extraverts are more comfortable with small group discussions of 2-4 people, large group discussions of 4-10 people, class discussions with 10-25 people and the professor leading, solo presentations, group presentations, and group in class exercises and activities. Extraverts were significantly more comfortable with large group activities such as large group discussions and presentations than introverts. Introverts were not significantly more comfortable with any of the classroom activities than extraverts were. Introverts and extraverts were equally comfortable with using anonymous clickers, Moodle forums, and solo in-class exercises and activities. Thus, it was not found that introverts are more comfortable with solo and anonymous activities; instead, introverts and extraverts seemed to equally prefer anonymous activities as well as some smaller interactive activities.

In order to test the interactions, Aiken and West's (1991) producer for graphing interaction effects was used. Aiken and West's producer includes solving the regression for one standard deviation above and below the mean for each of the interacting variables. There was a significant interaction for comfort with in-class assignments and quizzes so that fixed mindset introverts were the least comfortable while growth mindset introverts and extraverts no matter their mindset were more comfortable (Figure 1). Though it was not predicted by our hypotheses, the interaction is consistent with our theory in that we predicted that growth mindset extraverts and introverts would be generally more comfortable with class participation than fixed mindset extraverts and introverts.

Extraverts got significantly more enjoyment out of large group discussions of 4-10 people, solo presentations, and group presentations. Introverts got significantly more enjoyment

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out of solo in-class assignments and quizzes. Again, while extraverts enjoyed large group activities, introverts were found to enjoy solo activities. Introverts and extraverts equally enjoyed class discussions with more than 25 people and with the professor leading, Moodle forums, group in-class exercises and activities, and group in-class assignments and quizzes. In addition, there was an interaction between extraversion and mindset for enjoyment of solo in-class exercises and activities. As can be seen in Figure 2, fixed mindset introverts enjoyed solo in-class exercises and activities the least while fixed and growth mindset introverts and growth extraverts enjoyed the solo in-class exercises and activities almost equally.

Finally, extraverts found large group discussions of 4-10 people and lab work in pairs to be significantly more effective ways of learning in the classroom than introverts did. Introverts did not find any classroom activities to be more effective for learning at a significant level than extraverts. Both introverts and extraverts found small group discussions of 2-4 people with no professor, class discussions with more than 25 people and the professor leading, group presentations, solo in-class exercises and activities, and group in-class assignments and quizzes to be equally effective for learning.

When it came to participating in a small group, large group, small class, and large class, extraverts were significantly more comfortable with participating in everyway including commenting, asking a question, answering a question, disagreeing with the professor, disagreeing with another student, and being cold-called except they were not significantly more comfortable with being cold-called in a large class setting (Table 5). Thus, extraverts are more comfortable participating in any size group than introverts are. It was contrary to our hypothesis to find that extraverts were significantly more comfortable participating in a small group setting.

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There was a significant interaction between extraversion and mindset for comfort disagreeing with the professor in a small group. Growth mindset extraverts were the most comfortable with disagreeing with the professor while introverts no matter of mindset were the least comfortable (Figure 3). There was also a significant interaction for comfort with commenting, answering a question, agreeing with another student, and being cold called when in a large group. To look at the interactions for comfort in a large group, we created a composite variable that included all six of the original variables (Figure 4). It was found that growth mindset extraverts were the most comfortable with activities in a large group while growth mindset introverts were the least comfortable.

Hypothesis 2. The second hypothesis that implicit mindset will moderate how extraversion relates to motivation to participate in the classroom received partial support (Table 9). There was no significant interaction between implicit mindset and extraversion for how motivated people feel to participate in class regularly (Table 6); however, fixed mindset introverts were the most motivated to participate for their participation grade while fixed mindset extraverts were the least motivated to participate for their participation grade, and growth mindset introverts and extraverts were about the same (Figure 5). Implicit mindset also moderated how extraversion relates to motivation to participate in class when it came to participating to make the class more enjoyable and interesting as well as participating for a better participation grade. Growth mindset extraverts were the most motivated to participate in order to make the class more enjoyable and interesting while introverts no matter whether they had a fixed or growth mindset were the least motivated to participate in order to make the class more enjoyable and interesting (Figure 6). Implicit mindset didn't moderate extraversion for any of the other variables including when it came to reasons that people are not motivated to participate.

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However, there were some main effects for implicit mindset that are consistent with reasoning. For hypothesis 2b, though it was expected that there would be an interaction between extraversion and mindset in that fixed mindset introverts would participate less for fear of negative judgment, only a main effect for mindset was found. It was found that fixed mindset individuals were motivated not to participate because they did not want to embarrass themselves in front of their peers or in front of their professor as well as because they do not find participating to be enjoyable. For hypothesis 2c, it was found that growth mindset individuals were significantly more motivated to participate in order to further the discussion, to make the class more enjoyable and interesting, and in order to get the most out of their learning experience than fixed mindset individuals.

While motivation for not participating only related to mindset, motivation for participating not only related to mindset but also extraversion. There were also main effects for extraverts being more motivated to participate to further the discussion, to assert or defend a personal opinion, to make class more enjoyable and interesting, to enjoy the class material more, and to get the most of their learning experience.

Hypothesis 3. The third hypothesis that fixed mindset introverts will have more fixed and negative self-statements and growth mindset introverts will have more growth-oriented self-statements was partially supported as can be seen in Table 7. There was a main effect for mindset and negative self-statements so that fixed mindset individuals had more negative self-statements in their narratives.

Tables 8 and 9 show additional interactions that were found but that were not applicable to the current study's hypotheses. Though it was not predicted, it was found that fixed mindset introverts were not comfortable seeking help when it came to getting help from sources other

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than the professor. There were three significant interactions for extraversion and mindset when it came to seeking help. Fixed mindset introverts were the least comfortable when it came to asking for help from centers such as the Writing Center, Math Question Center, etc.; whereas, growth mindset introverts did not differ much from extraverts (Figure 7). Fixed mindset introverts were also the least comfortable with seeking help from a student tutor while growth mindset introverts did not differ from extraverts (Figure 8). Thirdly, fixed mindset introverts were the least comfortable seeking help at TA sessions (Figure 9). In addition, there were two significant interactions when it came to the frequency at which one reaches out for help. Growth mindset extraverts reach out for help by emailing the professor more often than any of the other three groups (Figure 10). Growth mindset extraverts also reach out for help by setting-up an individual meeting time with the professor more often than any of the other three groups (Figure 11).

Study 1 Discussion

Study 1 shows that extraversion and the implicit mindsets influence students' participation in the classroom. Hypothesis one was partially supported. It was found that introverts and extraverts did actually equally prefer smaller interactive activities such as both equally enjoyed group in-class exercises and activities and group in-class assignments and quizzes, and both felt that small group discussions with 2-4 people and no professor and group in-class assignments and quizzes were equally effective for learning. However, introverts and extraverts also equally preferred some anonymous, solo, and large group activities such as both were equally comfortable with anonymous clickers, Moodle forums, as well as solo in-class exercises and activities, and both equally enjoyed class discussions with 25 or more people and the professor leading. One possible explanation as to why introverts and extraverts equally preferred using anonymous clickers and Moodle forums is that in general students at Haverford

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College are not familiar with using technology to participate and so introverts and extraverts have not used technology as a means to participate enough to really know whether they like it or not. Introverts and extraverts also felt that class discussions with 25 or more people and the professor leading, group presentations, and solo in-class exercises and activities were equally effective for learning. Extraverts and introverts may equally prefer class discussions with 25 or more people and the professor leading; however, it is likely that they do not prefer the class discussions for the same reason. Introverts may prefer the class discussions because since the group is so large there is less pressure for them to participate while extraverts may prefer the class discussions because they will be more stimulated in that large of a group. Thus, though introverts and extraverts did equally prefer smaller interactive activities, they also equally preferred some anonymous, solo, and large group activities.

It was expected that introverts would prefer solo and anonymous activities, and the only variable that introverts scored higher than extraverts for was introverts got more enjoyment from solo in-class assignments and quizzes. Thus, introverts did not prefer all solo and anonymous in-class activities as predicted such as anonymous clickers and Moodle forums. As mentioned previously, it may be that introverts have not used anonymous clickers or Moodle forums as a means of participating often enough to know whether or not they like them. It also may be that introverts and extraverts do not like using technology in the classroom.

Overall, extraverts were more comfortable with, got more enjoyment from, and thought more activities were effective for learning than introverts. As expected extraverts did prefer many large group activities; however, they also found lab work in pairs to be more effective for learning than introverts did. Perhaps, extraverts find working in lab pairs to be more effective for learning than introverts do because extraverts are more outgoing and sociable, and when one is

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working in a pair, socializing is unavoidable. In addition, introverts have a low amygdala threshold for stimuli, so perhaps it is hard for introverts to absorb information when working in pairs because they are already over stimulated by the high degree of socializing (H.J. Eysenck & Eysenck, 1975; H.J. Eysenck, 1991). It may be for the opposite reason that extraverts prefer small interactive, intimate settings; perhaps, lab work is more stimulating for extraverts because one must socialize significantly more than when one is in a large group. It may be for similar reasons that extraverts were significantly more comfortable than introverts with small group discussion consisting of 2-4 people. Perhaps, introverts are overwhelmed by the social aspect of working in such a small group, or it is possible that introverts just as the medical students in the study by Davidson, Gillies, and Pelletier (2015) do not feel comfortable in small groups because of the overwhelming pressure to talk more.

The second hypothesis was also partially supported. It was found that extraverts were generally more motivated to participate than introverts just as individuals with a growth mindset were more motivated to participate than individuals with a fixed mindset as was expected. Implicit mindset did moderate how extraversion relates to motivation to participate in the classroom but only when it came to motivation to participate for one's participation grade as well as to participate to make the class more interesting and enjoyable. Fixed mindset individuals were the most motivated to participate for the participation grade of any of the four groups. It fits with our hypothesis that fixed mindset introverts would be most motivated to participate because they feel as though they have to for their participation grade, for introverts based on the previous results of our study have shown that they are less comfortable with, get less enjoyment from, and find participating to be less learning effective than extraverts do. In addition, fixed mindset individuals are more focused on performance goals so as to avoid negative evaluations, so

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participation grade would be especially important important to fixed mindset individuals (Pal & Robins, 2002). Interestingly, growth mindset extraverts were the most motivated to participate to make the class more enjoyable and interesting. Although this was not explicitly hypothesized, it does make sense, for extraverts get more stimulation from participating, and growth mindset individuals care more about learning than performance goals.

While introverts were not significantly more motivated to not participate for any of the variables than extraverts, fixed mindset individuals were more motivated to not participate than growth mindset individuals as was predicted. Fixed mindset individuals were motivated not to participate for fear of embarrassing themselves in front of their peers and professors as well as because they do not find participating to be enjoyable. Since fixed mindset individuals see intelligence as fixed, they would think that if they gave an incorrect answer others might think less of their intellectual ability, and if one is always worried about embarrassing oneself by answering a question incorrectly, participating would not be enjoyable but instead stressful (Pal & Robin, 2002). However, it was surprising given the interactive context that this wasn't especially true for fixed mindset introverts.

Growth mindset individuals were more motivated than fixed mindset individuals to participate in order to learn and enjoy the material as was predicted for growth theorists believe intelligence is malleable, focus on learning goals, and are mastery-oriented. Thus, growth mindset individuals would see participating as a way of furthering their understanding of the material and would not be embarrassed by answering a question incorrectly, for they don't see intelligence as being fixed and don't blame their own intelligence (Pals & Robins, 2002; Beer, 2002).

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Finally, the third hypothesis was partially supported by the results of the narrative coding. The only significant finding was that fixed mindset individuals did have more negative self-statements. It has been found that when fixed mindset individuals encounter a problem, they will blame their own intelligence, feel negatively, and become disengaged while growth theorists will work harder and believe that they just didn't put enough effort in. Thus, if a fixed mindset individual has a bad participation experience in the classroom it is not surprising that they would use more negative self-statements than growth mindset individuals (Beer, 2002). There was also a trending interaction for growth self-statements so that fixed mindset extraverts had the least growth statements and growth mindset extraverts had the most growth statements with introverts falling in between. It follows reason that growth mindset extraverts would have the most growth statements, for not only do they have a growth mindset but extraverts are also in general more comfortable with participating than introverts.

It was found that fixed mindset introverts are the least comfortable seeking help at centers, from a student tutor, and at TA sessions. Though it was not predicted by the hypotheses that fixed mindset introverts would have a more difficult time seeking help, it makes sense that fixed mindset introverts are not as comfortable when it comes to interacting in environments where their role is not as clear, and they may feel vulnerable to being seen as not intelligent. Thus, it makes sense that growth mindset extraverts reach out to professors through email and set-up individual meeting times with professors the most often, for they would not be worried about being seen as not intelligent, for they see intelligence as fluid.

The results of the current study are relevant to everyday life, for living up to Susan Cain's "Extravert Ideal" has become more and more important for academic success, yet attaining the "Extravert Ideal" is far more challenging for some students than others. While for some students,

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the traditional structure of class suits them well, for introverted students and students with a fixed mindset, participating can be challenging and based on the results of the present study uncomfortable and less effective. Introverted students were not more comfortable than extraverted students when it came to participating no matter what type of participation was being asked of them and no matter what setting they were being asked to participate in. When it came to how effective different types of participation were for learning, introverts did not find a single type of participation to be more effective for learning than extraverts did. Similarly, fixed mindset individuals were not more comfortable with any type of participation than growth mindset individuals were nor did fixed mindset individuals find any type of participation to be more effective for learning than growth mindset individuals did.

It has been assumed that introverts are more comfortable in smaller groups of people; however, when it comes to participating in an academic setting, the results of the current study show that this may not actually be true. The only results from the current study that begin to show the preferences of introverts are from the section of the classroom questionnaire that asked about which types of classroom activities individuals enjoyed more. It was found that introverts enjoyed solo in-class assignments and quizzes more than extraverts enjoyed them.

In the future, researchers should look at how significant it is that introverts are less comfortable with and get less enjoyment from most of the commonly used classroom activities than extraverts do. Future research should look at whether introverts are still able to reap the benefits of the commonly used types of classroom activities despite being less comfortable with the activities, getting less enjoyment from the activities, and finding the activities to be less effective for learning. In addition, researchers should question what types of activities introverts

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do find to be effective for learning and test whether, in actuality, the methods are more effective for introverts.

Research has looked at how to help children develop a growth mindset as opposed to a fixed mindset as well as at what can be done for college students who already have a fixed mindset; however, future research should focus more specifically on what professors and classmates can do to make fixed mindset individuals more motivated to participate and less concerned about feeling embarrassed if they answer a question incorrectly.

One of the major limitations of the current study is that the first hypothesis predicts which activities introverts and extraverts will prefer; however, students were never outright asked which activities they prefer on the classroom questionnaire. Students were asked which activities they are most comfortable with, get the most enjoyment out of, and find to be the most effective for learning, yet there is no question that outright asks which activities students most prefer. Thus, though it can be inferred which activities students prefer based on their responses to the questions on the questionnaire, it cannot be known for certain that students actually prefer one activity over another. A second limitation of the study is that there is not enough power considering the number of participants and number of variables that are included in the study. Another limitation is that the results of Study 1 should be interpreted with caution given the increased potential of Type I error having occurred. Because such a large number of variables were tested, it is possible that some of the significant results can be attributed to chance.

Study 2 Method

Participants and Design

Participants were all students who were attending Haverford College and in the class of 2017. There were 64 males (40%) and 93 females (58.1%). Participants ranged from 17-19 years

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old. 71.9% selected white, 7.5% selected black, 11.3% selected Latino/Hispanic, 18.8% selected Asian, .6% selected Native American, 8.8% selected mixed, and 2.5% selected other. The participants were sent an email the summer before they started at Haverford asking them to take a survey before August 25th and telling them that they would receive \$20 through campus mail shortly after arriving on campus. They were told the study was being conducted in order to learn about college student development. The participants were also told that if they chose to participate in the study then they would be asked to fill out surveys periodically during their time at Haverford College.

The same design was used for Study 2 as was used for Study 1. Moderated multiple regressions were used to examine variables from the SACQ and narratives. Extraversion, implicit mindset, and the interaction between extraversion and the implicit mindset were observed. The extraversion score was determined by the results of the Extraversion subscale from the Big Five Inventory. Implicit mindset was determined by the results of the personality subscale of the Implicit Self-Theory Scale.

Procedure

Participants were sent a consent form, the Big Five Inventory, and the Implicit Self-Theory Scale during Wave 1, which was the summer before participants started college. During the winter break freshman year (Wave 2), participants filled out the Transition to College Narratives and the Student Adaptation to College Questionnaire. During winter break of sophomore (Wave 5) and junior (Wave 8) year, participants filled out the Student Adaptation to College Questionnaire.

Coding

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The same method of coding that was used for the narratives in the self-designed survey was also used for the narratives in the Transition to College Narratives questionnaire with the addition of coding for difficulty of the social transition to college life and the effect on social relationships in particular. We will be coding for the difficulty of the academic transition, difficulty of the social transition, for fixed negative self-statements, for positive growth self-statements, and for overall social adjustment from part one and part 2b. The inter-rater reliability coefficients can be seen in table 2. The narrative prompts from the Transition to College Narratives are included below.

1. Part 1: Starting college is often considered to be a pretty significant life transition. Can you tell us about what the transition to Haverford has been like for you? In what ways has it been challenging or difficult? In what ways has it been positive? How has it affected you?
2. Part 2: Now please elaborate further with respect to how the transition has affected you in three specific areas – academics, family life, and social relationships:
 - a. How has the transition to college affected you academically?
 - b. How has the transition to college affected your relationships within your family?
 - c. How has the transition to college affected your social relationships (e.g., romantic partners and friends here and from home)?

Table 10
Inter-rater Reliability Correlation Coefficient

	Academic Difficulty	Social Difficulty	Positive Self- Growth	Negative Self-Growth	Social Adjustment
Pair 1	.688	.62	.54	.55	.76
Pair 2	.70	.61	.61	.52	.77

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Pair 3	.79	.62	.64	.53	.80
Pair 4	.64	.75	.71	.53	.84
Pair 5	.72	.59	.74	.52	.78
Pair 6	.53	.65	.57	.27	.78

Measures

The Big Five Inventory. The same BFI Extraversion scale was used for study 2 as was used for study 1. The reliability was .89.

The Implicit Self-Theory Scale. Dweck (1999) designed the two-part scale to determine the degree to which a person thinks that characteristics are fixed or changeable. One part of the scale measures how fixed or changeable participants believe personality to be and the other part measures how fixed or changeable participants believe intelligence and ability are. Participants are asked to rank the statements on a 6-point scale ranging from 1 being “strongly agree” to 6 being “strongly disagree.” Statements include “you can change even your most basic qualities” and “to be honest, you can’t really change how intelligent you are.” The reliability for personality was .9.

Transition to College Narratives. Jennifer Lingeldahl and Ben Le of Haverford College wrote the narrative prompts in 2013. There are three questions that ask about the transition to college. The first question asks participants generally about their transition to Haverford (what has been challenging and difficult? How has it affected you positively?). The second question asks participants to elaborate on how the transition has affected three domains: academics, family life, and social relationships. The third prompt asks participants to share a specific experience that will help the researchers to understand the overall experience. We plan to focus mainly on the narrative that asks about social relationships.

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Student Adaptation to College Questionnaire. Baker and Siryk developed the questionnaire in 1984. The questionnaire has four subscales including academic adjustment, social adjustment, and personal-emotional adjustment. There are a total of 52 statements all of which are answered on a 9-point scale ranging from number 1 being “doesn’t apply to me at all” to 9 representing “applies very closely to me.” Questions include “I am quite satisfied with my social life at college” and “on balance, I would rather be home than here.” The higher overall score that participants receive the better adjusted they are to college life. The reliability for the SACQ at wave 2 was .9 and for wave 5 was .92.

Study 2 Results

For Study 2 we used the same method of analysis as we did for Study 1, and we ran a series of moderated multiple regressions; however, we did not control for class year. All results for study 2 are reported in Table 11. The first hypothesis, which predicted introverts to describe the social transition as more difficult than extraverts would, was not supported by the results of the narrative coding (Table 11). Extraverts and introverts were found to have the same amount of social and academic difficulty during the transition to college. In addition, it was expected that growth mindset introverts would have more growth self-statements in their narratives while fixed mindset introverts would have more negative self-statements; however, there was no main effect for extraversion when it came to having more growth or negative self-statements. As for implicit mindset, there was no main effect for mindset for growth self-statements, yet it was found that growth mindset individuals were significantly more likely to have negative self-statements in their personal narratives. After reviewing the narratives from the individuals who were found to have scored highly for growth mindset and who also were scored as having a lot of negative self-statements, it was found that many of the statements made tended to be about coming to college

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and realizing that they were not as good at a certain academic subject or as socially competent as they had thought they were. While there was one exception, most of the narratives seemed to be about realizing a certain flaw or experiencing a set back, yet the individuals did not make any statement implying that they did not feel as though they could improve upon these flaws in the future nor did they make any statements implying that they did feel as though they could improve upon these flaws in the future. For example, one student said that the harder academics at Haverford had been a blow to their self-esteem, yet the student did not go on to follow this statement with a more positive one nor did they go on to follow it with a more negative one. If anything the statement alludes to the idea the self-esteem is changeable since this student's self-esteem has decreased. Another student wrote that the transition to college had made them realize that they have "always had difficulty forming close relationships," yet they do not go on to say that this can never change for them.

The second hypothesis that introverts will start out with poorer social adjustment and that growth mindset introverts will improve the most across all students was not supported as can be seen in table 11. Extraverts found the social adjustment to college at wave two and five to be significantly easier than introverts. In addition, fixed mindset individuals found the transition to college at wave 2 to be significantly easier than growth mindset individuals; however, the difference between growth and fixed mindset individuals for ease of social adjustment at wave 5 was not significant.

Study 2 Discussion

Hypothesis one was not supported by the results of the current study. Based on the results of the SACQ, introverts did not describe the transition as more difficult socially. A possible explanation as to why this may be true for first years at Haverford is that Haverford has a unique

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first year orientation, which places students into groups of 12-16 first years with 8 upperclassmen as soon as students move into their dorms. Because students are placed into smaller groups, they are given the opportunity to create social support systems among their peers as well as have a social support system among the 8 upperclassmen who they spend the first week with. One of the explanations as to why extraverts have an easier time transitioning to college life is that because they are more social, they are able to create larger social support networks faster; thus, if introverted first years are able to find a social support system just as or close to as quickly as extraverts, there would be less of a difference in the difficulty of the transition to college life for introverts and extraverts (Lackner, 1999). Social support has been predicted to be essential to having a smooth transition to college, for social support is protective against depression, anxiety, and somatic symptoms (Lidy & Kahn, 2006); thus, it may be that Haverford's orientation program makes it easier for all students including introverts to find a social support network.

Because Haverford tells first years about their orientation program before students arrive, it is also possible that introverted students at Haverford arrive to campus with more positive expectations and feel more prepared than they might at another school, for they know that they will have an entire week to adjust to the campus before upperclassmen arrive. They also know that they will be placed into a smaller group whom they will spend most of the first week with. Pancer, Hunsberger, Pratt, and Alisat (2000) found that students who do feel more positive about and prepared for the transition have an easier time adjusting, for they have thought more about the challenges that they will face during the transition period as well as how to handle those challenges. Therefore, introverts are more likely to feel more positively about and prepared for

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the transition, so they are also more likely to think about the challenges that they will face during the transition period.

The results of the current study also showed that growth mindset individuals were more likely to make negative self-statements in their narratives. It should be noted that few negative statements were found in the narratives, so the results of the current study may not be replicable; however, one possible explanation as to why growth mindset individuals were more likely to make negative self-statements is that saying whether an individual can change their personality might be associated with the desire to change one's personality. Thus, if the growth mindset students are dissatisfied with something about themselves, they would likely include more negative self-statements. Another possible explanation is that growth mindset individuals feel more comfortable making negative self-statements because they do not believe that the negative statements that they make about themselves are fixed; whereas, a student with a fixed mindset might be more hesitant to admit to themselves as well as to others that they have a flaw because they do not believe that the flaw is changeable.

The second hypothesis that introverts will start out with poorer social adjustment and that growth mindset introverts will improve the most across all students was partially supported by the results of the current study. Introverts did start out with poorer social adjustment than extraverts; however, introverts were not any better adjusted as time went on. The hypothesis that growth mindset introverts would improve the most across all students was not found to be true. Fixed mindset individuals were significantly more adjusted to college life than growth mindset individuals, and though the difference between fixed and growth mindset individuals was not significant, as time went on growth mindset individuals remained less adjusted to college life than fixed mindset individuals.

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The results from the SACQ contradict the results from the IPP narratives, for it was found after coding the narratives that introverts and extraverts had a similar amount of social difficulty during the transition to college life, yet the results of the SACQ show that extraverts had a significantly easier time with the adjustment to college life. One possible explanation for the discrepancy is that the SACQ asks different questions than the narrative prompts ask. One part of the SACQ that differentiates it from the narrative prompts is that there are statements on the SACQ that ask about involvement in school activities, yet the narrative prompts only ask about the ease of the transition. It is possible that some students prefer to be less involved in extracurricular. Another possible explanation for the discrepancy is that the SACQ asks questions that may lead students to think about what their ideal college experience would be like while the narrative prompts ask more generally about how things are going. Thus, perhaps, students when answering the SACQ are lead to compare their current experience to what society's ideal or their ideal experience would be; whereas, the narrative prompt leads to students to think more realistically and perhaps to compare their current situation to more realistic expectations. For example, one of the SACQ questions that leads students to compare their current experience to their ideal experience is "I am meeting as many people, and making as many friends as I would like at college;" whereas, the narrative prompt asks "can you tell us about what the transition to Haverford has been like for you?" The narrative prompt also asks students to talk about the challenges that they have faced and the positive aspects of the experience, but they do not ask students if the transition has lived up to what their ideal transition would have been like.

The results of the current study are significant, for it is important that introverts and extraverts both have as easy of a transition to college as possible. The results from the narratives

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and SACQ show that perhaps the college experience does not live up to an introverted individual's expectations; however, introverts do experience just as many challenges and find as much positive about the transition as extraverts. Because it was found that Haverford introverts and extraverts had a similar level of difficulty with the transition to college, future research should compare first year orientation programs at different universities as well as the ease of the social transition at those universities. If it is the case that Haverford's orientation program is responsible for introverts and extraverts having the same amount of difficulty with the transition to college, then other universities should look into how they could change their own orientation program to create the same effect. Future research should also attempt to replicate the current study so as to better understand the unexpected results that growth mindset individuals found the transition to college to be slightly more difficulty and used more negative self-statements in their narratives.

The current study is limited in that it was not designed specifically to answer the research questions being asked by the current study. The IPP study was designed for another purpose and was just used to answer questions from the current study. Because the IPP study was not designed for the current study's hypotheses, it is hard to understand why growth mindset individuals had a harder time with the adjustment to college life. It is possible that the results are not as reliable because the scale for personality mindset is not as well tested as the scale for intelligence mindset. In addition, the participants were never asked about their opinion of growth but rather their opinion of change and whether one can change or not.

Conclusion

Both study 1 and study 2 show that there are significant differences between introverts and extraverts as well as between fixed and growth mindset individuals. The way that introverts

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and extraverts as well as fixed and growth mindset individuals interact in the classroom is completely different, and though it was found that the transition to college life was similar for introverts and extraverts as well as for growth mindset and fixed mindset individuals, it was also found that the way that they all experience the adjustment to college life as measured by the SACQ is very different. The current study shows the importance of understanding the differences between introverts and extraverts as well as between fixed and growth mindset individuals. If introverts and fixed mindset individuals are not comfortable with any in-class activities, do not get any enjoyment from the in-class activities, or find any of the activities in the classroom to be effective for learning, then it is possible that their ability to learn is being impacted. If it is possible to make the transition to college as easy for introverts and fixed mindset individuals as it is for extraverts and growth mindset individuals, then it is also possible to make the classroom environment as conducive to learning for introverts and fixed mindset individuals as it is for extraverts and growth mindset individuals.

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Table 2

Comfort Ratings for Classroom Activities

	Extraversion vs. Introversion	Growth vs. Fixed Mindset	Interaction
Comfort with classroom activities			
Small group discussions (~2-4 people), no professor	.22*	.04	-.11
Large group discussions (~4-10 people), no professor	.48**	.11	-.03
Class discussions (~10-25 people), with professor leading	.31**	-.02	.13
Class discussions (more than 25 people), with professor leading	.11	.05	.02
Anonymous clickers	-.07	.16	.00
Moodle forums (not anonymous)	-.02	-.04	-.00
Solo presentations	.32**	.08	.16
Group presentations	.27*	.22*	-.01
Solo in class exercises/activities	.03	-.09	.06
Group in class exercises/activities	.35**	.00	-.09
Solo in class assignments/quizzes	-.10	-.00	.08
Group in class assignments/quizzes	.14	.14	-.20
Lab work in pairs	.20	.09	-.14
Listening to lecture	-.17	-.11	-.06

Note. *P < .05, **P < .01

Table 3

Enjoyment Ratings for Classroom Activities

	Extraversion vs. Introversion	Growth vs. Fixed Mindset	Interaction
Enjoyment of classroom activities			
Small group discussions (~2-4 people) with no professor	.14	.22*	-.07
Large group discussions (~4-10 people) with no professor	.35**	.26**	.01
Class discussions (~10-25 people) with the professor leading	.17	.14	.13
Class discussions (more than	.09	.03	.04

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25 people) with professor leading			
When using anonymous clickers	-.11	.03	-.17
Moodle forums (not anonymous)	-.07	.01	-.11
Solo presentations	.33**	.07	.19
Group presentations	.22*	.21*	-.05
Solo in-class exercises/activities	-.11	.15	.24*
Group in-class exercises/activities	.09	.19	.06
Solo in-class assignments/quizzes	-.26*	-.01	.01
Group in-class assignments/quizzes	.02	.18	-.19
Lab work in pairs	.21	.05	-.15
Listening to lecture	-.15	-.25*	-.12

Note. *P < .05, **P < .01

Table 4

Comfort Ratings for Classroom Activities

	Extraversion vs. Introversion	Growth vs. Fixed Mindset	Interaction
Learning Effectiveness of classroom activities			
Small group discussions (~2-4 people) with no professor	.06	.16	.09
Large group discussions (~4-10 people) with no professor	.37**	.22*	.12
Class discussions (~10-25 people) with the professor leading	.11	-.09	.11
Class discussions (more than 25 people) with professor leading	.01	-.14	-.00
Anonymous clickers	-.19	-.01	-.01
Moodle forums (not anonymous)	-.1	-.09	-.05
Solo presentations	.11	.16	.16
Group presentations	-.01	.12	-.02
Solo in-class exercises/activities	.03	.15	-.06
Group in-class exercises/activities	.16	.11	-.03
Solo in-class assignments/quizzes	-.16	.05	-.03
Group in-class assignments/quizzes	.01	-.05	.09
Lab work in pairs	.25*	.03	-.06
Listening to lecture	-.17	-.15	-.1

Note. *P < .05, **P < .01

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Table 5

Comfort Participating in a Small Group, Large Group, Small Class, and Large Class			
	Extraversion vs. Introversion	Growth vs. Fixed Mindset	Interaction
Comfort in a Small Group			
Commenting	.29**	.19	.02
Asking a question	.26*	.21*	.02
Answering a question	.27*	.1	.01
Disagreeing with the professor	.38**	.21*	.2*
Disagreeing with another's student	.47**	.09	.02
Being cold-called	.33**	.18	.00
Comfort in a Large Group			
Composite	.38**	.18	.28**
Commenting	.35**	.11	.25*
Asking a question	.3**	.11	.18
Answering a question	.37**	.17	.25*
Disagreeing with the professor	.27*	.15	.13
Disagreeing with another's student	.33**	.14	.23*
Being cold-called	.22*	.15	.28**
Comfort in a Small Class			
Commenting	.26*	.17	.09
Asking a question	.25*	.12	.18
Answering a question	.27*	.18	.11
Disagreeing with the professor	.35**	.18	.18
Disagreeing with another's student	.42**	.18	.17
Being cold-called	.37**	.12	.08
Comfort in a Large Class			
Commenting	.28**	.18	.19
Asking a question	.3**	.17	.17
Answering a question	.28**	.32**	.1
Disagreeing with the professor	.26*	.17	.1
Disagreeing with another's student	.35**	.14	.1
Being cold-called	.19	.21	.17

Note. *P < .05, **P < .01

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Table 6

Motivation to Participate and Not to Participate in the Classroom			
	Extraversion vs. Introversion	Growth vs. Fixed Mindset	Interaction
Motivation for Participating in Class			
How motivated do you feel to be someone who participates vocally in class regularly?	.33*	.04	.16
Participation grade	-.25*	-.11	.23*
Impressing the professor	.09	-.19	.09
Impressing your peers	.08	-.16	.05
Furthering discussion	.37**	.29**	.11
Getting the question answered	.21	.17	.08
Asserting/defending your opinions	.40**	-.02	.15
Impulse	.26*	-.05	.16
To break the silence	.19	.13	.12
To make class more enjoyable/interesting	.39**	.25*	.22*
Enjoyment of class material	.28**	.19	.02
In order to get the most out of my learning experience	.26*	.24*	.00
The professor is not intimidating and encourages participation	.16	.10	.12
There are certain dominant students, which make me feel like I should also participate	-.11	.07	.05
Motivation for Not Participating in Class			
Fear of getting it wrong	-.07	-.09	-.04
Embarrassing self in front of peers	-.20	-.24*	-.02
Embarrassing self in front of professor	-.12	-.23*	-.10
Not enough time to think a response through	-.11	-.05	.11
Fear of being inarticulate	-.19	-.02	-.07
Don't want to break the silence	-.09	-.02	.09
Not prepared for class	.18	-.14	-.01
Avoiding conflict	-.20	-.11	.06

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Participating is not enjoyable	-.19	-.25*	-.16
Don't enjoy class material	-.08	-.18	-.02
The professor is intimidating or talks too much			
There are certain dominant students, which makes it hard to participate	-.10	-.19	-.18

Note. *P < .05, **P < .01

Table 7

Narrative Coding

	Extraversion vs. Introversion	Growth vs. Fixed Mindset	Interaction
Narrative Coding			
Growth statements	.05	.10	.20
Negative self-statements	.05	-.23*	-.01
Ending valence	.02	.12	.17

Note. *P < .05, **P < .01

Table 8

Comfort and Frequency Ratings for Different Ways of Seeking Academic Support

	Extraversion vs. Introversion	Growth vs. Fixed Mindset	Interaction
Comfort Seeking Help			
Asking peers for help	.35**	-.00	-.1
Emailing professors	.33**	.08	.14
Setting up a meeting with professor	.2	.08	.14
Professor's office hours	.3**	.04	-.13
TA sessions	.24*	.06	-.21*
Student tutor	.17	.14	-.23*
OAR, MQX, CQC, etc.	.09	.13	-.23*
Writing center	.1	.05	-.13
Online resources	-.11	-.09	.01
Asking the professor during class	.4**	.21*	.18

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Asking a peer during class	.38**	.04	.11
<hr/>			
Frequency of Seeking Help			
Asking peers for help	.29*	.1	-.13
Emailing professors	.11	.11	.33**
Setting up a meeting with professor	.08	.21*	.31**
Professor's office hours	.06	.08	.05
TA sessions	.13	-.01	-.04
Student tutor	.05	.03	-.14
OAR, MQX, CQC, etc.	-.13	.03	-.14
Writing center	.04	.1	-.14
Online resources	.08	-.12	.06
Asking the professor during class	.35**	.15	.11
Asking a peer during class	.35**	-.1	.11

Note. *P < .05, **P < .01

Table 9

General Questions	Extraversion vs. Introversion	Growth vs. Fixed Mindset	Interaction
<hr/>			
General Questions			
How often do you come to class prepared?	.06	.17	-.03
How often do you come to class having done the readings?	-.11	.24*	.16
How often do you participate in class?	.39**	.21*	.14
Overall, how much do you think you benefit from participating/presenting?	.23*	.18	.20
Overall, how much do you think you benefit from others participating/presenting?	.06	.34**	.08
What is your GPA?	-.17	-.11	.06

Note. *P < .05, **P < .01

Table 11

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IPP Narrative Coding and SACQ

	Extraversion vs. Introversion	Growth vs. Fixed Mindset	Interaction
Narrative Coding			
Academic difficulty	-.06	.12	-.00
Social difficulty	-.09	-.16	.07
Growth Self-Statements	.15	-.07	-.09
Negative Self-Statements	-.12	.27**	-.05
Social Adjustment	.13	-.01	.05
Social Adjustment to College Questionnaire			
Wave 2 SACQ Social adjustment	.22*	-.19*	-.09
Wave 5 SACQ Social adjustment	.2*	-.18	-.05

Note. *P < .05, **P < .01

Figure 1

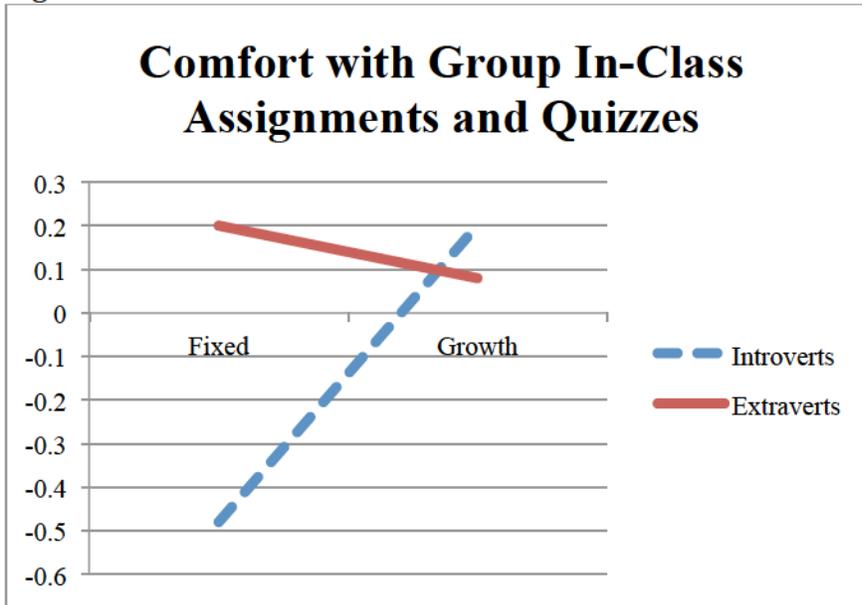


Figure 2



Figure 3

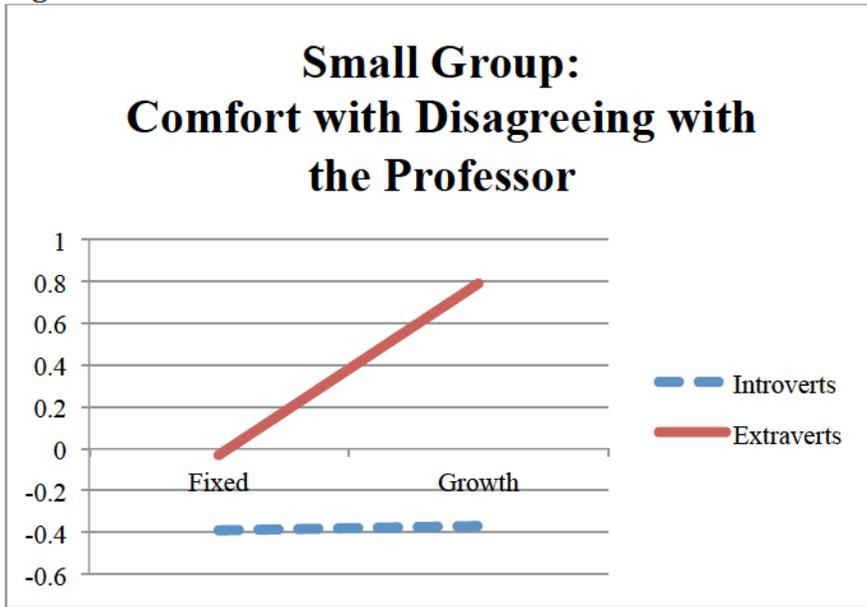


Figure 4

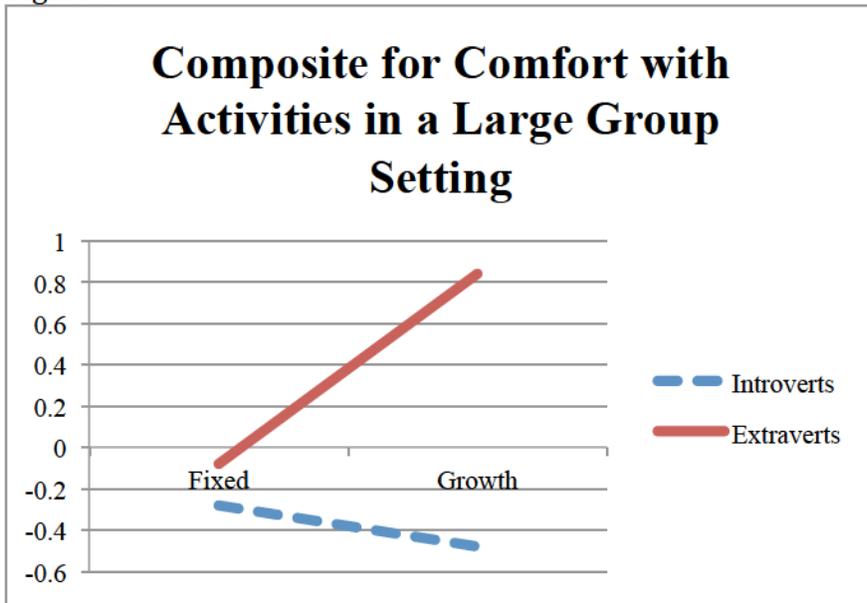


Figure 5

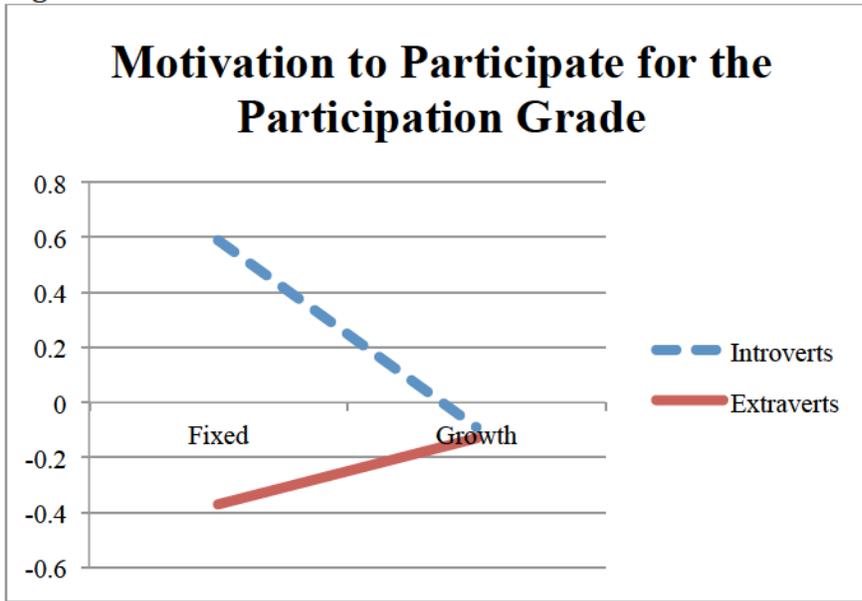


Figure 6

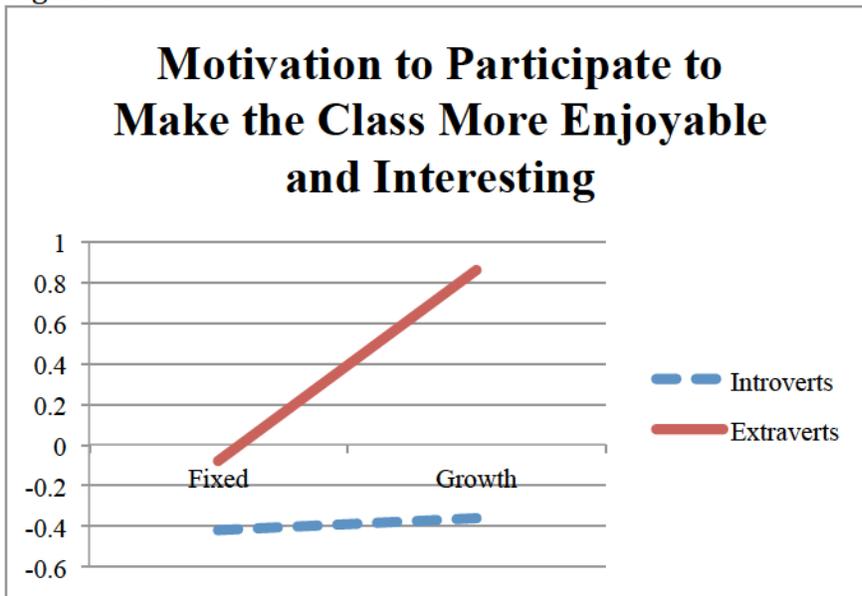


Figure 7

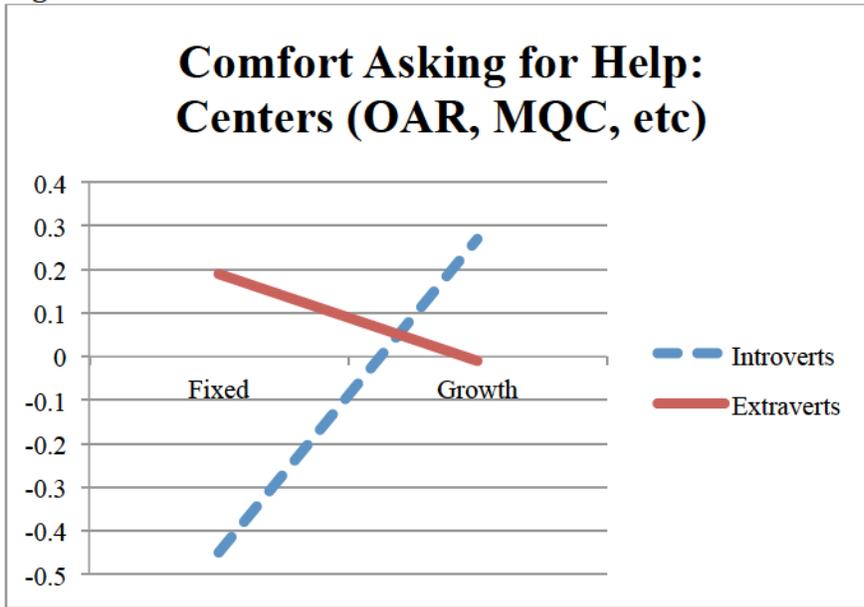


Figure 8

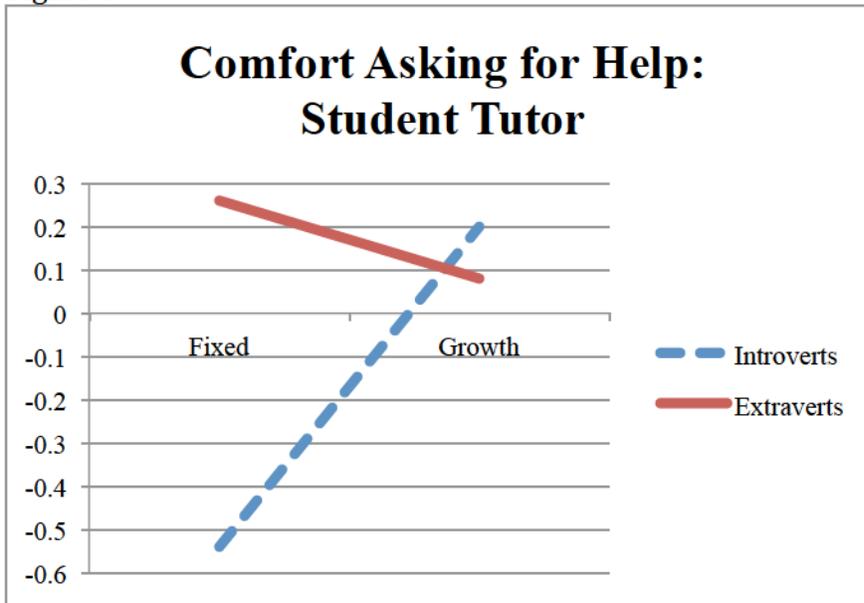


Figure 9

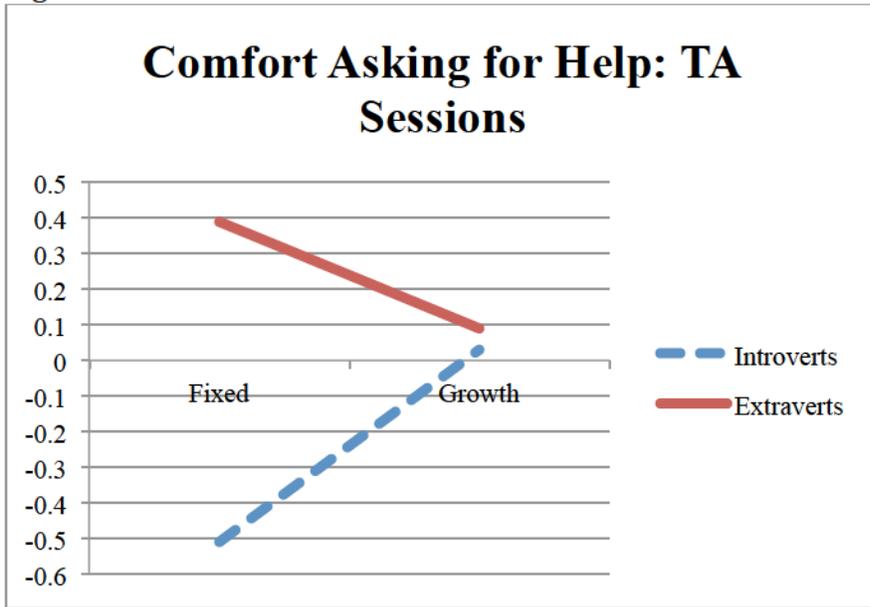


Figure 10

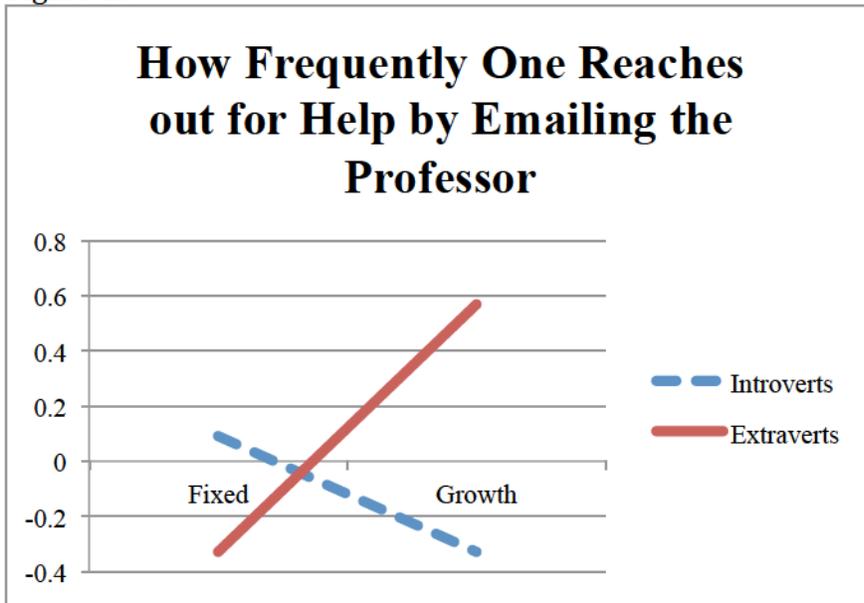
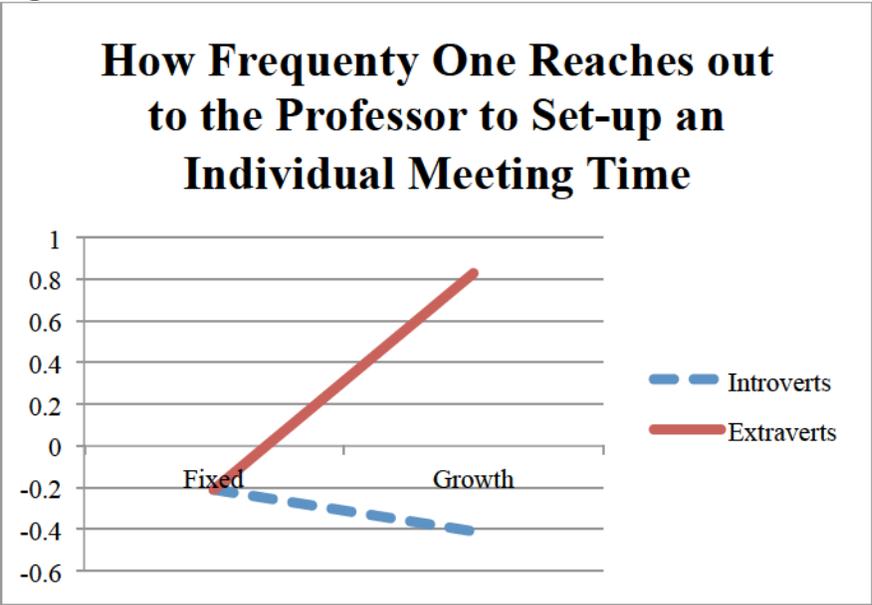


Figure 11



Appendix A: Outline of Questions Developed for Study 1 Classroom Survey

I. Questions about classroom experience

In this section, participants will rate each of the following classroom activities on a 1 to 5 scale on comfort, enjoyment, and learning effectiveness (or indicate N/A if haven't used; do you feel like you would enjoy it if you were exposed to it)

1. Small group discussions (~2-4 people), no professor
2. Large group discussions (~4-10 people), no professor
3. Class discussions (~10-25 people), with professor leading
4. Class discussions (more than 25 people), with professor leading
5. Anonymous Clickers
6. Moodle forums (not anonymous)
7. Solo Presentations
8. Group Presentations
9. Solo in class exercises/activities
10. Group in class exercises/activities
11. Solo in class assignments/quizzes
12. Group in class assignments/quizzes
13. Lab work in pairs
14. Listening to lecture

II. Questions about seeking help and coping

In this section, participants will rate level of comfort with the following ways of reaching out when in need of academic support or assistance

1. Rate how often you utilize these resources
2. Asking peers for help
3. Emailing Professors
4. Setting up separate/individual meeting with Professor
5. Professor's office hours
6. TA sessions
7. Student tutor
8. OAR, MQC, CQC, etc.
9. Writing Center
10. Online resources (Khan Academy, Sparknotes, etc.)
11. Asking professor during class
12. Asking peers during class

III. Comfort Level with Different Settings

Participants will rate each of the following class types (Small group, large group, small class, large class) on the extent to which they feel comfortable doing each of the following:

1. Commenting
2. Asking a question
3. Answering a question
4. Disagreeing with the professor
5. Disagreeing with another student's answer or comment
6. Being cold-called on by the professor (or other group member)

THE INFLUENCES OF EXTRAVERSION AND THE IMPLICIT THEORIES

IV. Motivation for Participating

Participants will rate each of the following types of motivations in terms of how much it motivates them to participate in class (never → all the time)

1. Participation grade
2. Impressing the professor
3. Impressing your peers
4. Furthering discussion
5. Getting the question answered
6. Asserting/Defending your opinions
7. Impulse
8. To break the silence (or The other students are quiet, which makes me feel like I should participate)
9. To make class more enjoyable/interesting
10. Enjoyment of class material
11. In order to get the most out of my learning experience
12. The professor is not intimidating and encourages participation
13. There are certain dominant students, which makes me feel like I should also participate

V. Motivations for not Participating

Participants will rate each of the following types of motivations in terms of how much it does not motivate them to participate in class (never → all the time)

1. Fear of getting it wrong
2. Embarrassing self in front of peers
3. Embarrassing self in front of professor
4. Not enough time to think a response through
5. Fear of being inarticulate
6. Don't want to break the silence (or The other students are quiet, which makes me feel like I should not participate)
7. Not prepared for class
8. Avoiding conflict
9. Participating is not enjoyable
10. Don't enjoy class material
11. The professor is intimidating or talks too much
12. There are certain dominant students, which makes it hard to participate

VI. General Questions

1. How often do you come to class prepared?
2. How often do you come to class having done the readings?
3. How often do you participate in class? (never → all the time)
4. How motivated do you feel to be someone who participates vocally in class regularly?
5. Overall, how much do you think you benefit from participating/presenting
6. Overall, how much do you think you benefit from others participating/presenting
7. What is your current GPA (#.##)?

Narrative Prompts

THE INFLUENCES OF EXTRAVERSION AND THE IMPLICIT THEORIES

Describe a situation (in as much detail as possible) where you commented in class or answered a question that was incorrect or wasn't what the professor was looking for. How did that make you feel at the time? What were you thinking in the time leading up to contributing to the class? Did this affect your future experiences in class or your willingness to participate, if so how? What impact did this experience have on how you feel about yourself or your understanding of who you are as a student (if any)?