

Running Head: TRAIT ANXIETY AND THE FAE

The Effect of Trait Anxiety on the Fundamental Attribution Error

By

Eliot Tear

\* \* \* \* \*

Submitted in partial fulfillment  
of the requirements for  
Honors in the Department of Psychology

UNION COLLEGE  
June, 2013

### **Abstract**

Previous research has been conducted that suggests that those who have trait anxiety have lower working memory capacity. Lower working memory capacity has also been shown to increase the likelihood that one commits cognitive heuristics. In the current research, we examined the relationship between one's level of trait anxiety and their chances of committing the fundamental attribution error (FAE). In the experiment participants were randomly selected into one of four different conditions. Then participants completed the Spielberger trait anxiety scale which was used to separate participants into low and high trait anxiety groups. In each condition participants read an essay about a course policy change and answered questions about the essay and the author to test whether or not they committed the FAE. The essay was either pro- or anti-policy change and was either written under a choice condition or an assigned condition. Results showed that trait anxiety had no effect on one's likelihood of committing the FAE. The only significant main effect was that of essay position which is consistent with previous research. Future directions for research are discussed to explore this concept further.

### The Effect of Trait Anxiety on the Fundamental Attribution Error

Throughout their lives people make many errors in judgment and make irrational decisions. People can sometimes unknowingly commit obvious judgmental errors on relatively simple tasks. One error that is very prevalent among the general population is the fundamental attribution error. The fundamental attribution error is the tendency for people to underestimate the impact of situational forces and overestimate the role of dispositional factors when making judgments (Forgas, 1998). That is, people tend to overestimate the internal factors and underestimate the external factors when explaining the behavior of other people. If a person was walking along a path in the woods and tripped someone committing the FAE would likely believe that that person is clumsy instead thinking that there may have been a root or rock that caused the person to trip. The FAE is what is known as a cognitive heuristic which is a simplifying process used to reduce cognitive effort (O'Sullivan, 2003). Heuristics can replace complex mental algorithms which can lead to reasonable judgments but they can also lead to severe irrational errors in judgment (Tversky & Khaneman, 1974). Different variations of the FAE have been studied under different names such as the correspondence bias or the over-

attribution bias (O'Sullivan, 2003). The theory of FAE all began with the well renowned study conducted by Jones and Harris in 1967 on the attribution of attitudes (Jones & Harris, 1967).

The study by Jones and Harris (1967) is the best known experiment that demonstrates the FAE even though they studied it under the name of the correspondence inference theory. In the experiment subjects were given one of several short essays written about Castro's dictatorship in Cuba. The essay was written with either a pro-Castro stance or an anti-Castro stance. The subjects were then either told that the person who wrote the essay had the freedom of choice to pick which side to defend or that the author was assigned which position to defend. The subjects then answered a series of questions about the personal qualities of the author and the subject's attitude about the topic. The most important question was what the study subject believed was the authors true attitude toward Castro. Results showed that the direction of the essay was the greatest factor in what people thought the authors true opinion was. This is to be expected in the choice conditions but the results in the no choice conditions were also highly significant. There was greatest variance in the no choice-pro condition which makes sense as that is the condition where the person is being told to argue against the popular belief. However, subject's still rated the author's true opinions as being pro-Castro. The main result of the experiment was that there was a tendency to attribute correspondence between the behavior of writing a pro-Castro essay and the private attitude of the author even when the author was assigned to write that way. This is the basis of the FAE as the subjects unreasonably attributed attitudes, either pro or anti-Castro, to the author even in the no choice conditions.

Prior research has been done on what affects the probability that someone will commit the FAE. One such study was that conducted by Forgas (1998) who examined whether someone's mood would affect the chances that they would commit the FAE. In this experiment

subjects first took a test of their verbal abilities. They then received positive, neutral, or negative feedback about their abilities which induced a corresponding happy, neutral, or negative mood in the participants. They then were asked to read essays on a familiar issue written by a student participating in a debate and were either told that the student chose to represent the position or was assigned the position. Participants were then asked to give their opinions on the writer by answering several 7-point bipolar questions. Results showed that those who were in the good mood condition were more likely to commit the FAE than were those in the bad mood condition. These results provide evidence that mood could be associated with someone's likelihood that they commit or do not commit the FAE.

Mood is not the only factor that has been tested on the likelihood that someone will commit the FAE. Horhota and Blanchard-Fields (2006) tested how beliefs and attributional complexity influenced someone's correspondence bias. In this study participants were asked their opinions about the author of an essay that was written on a topic of interest. They were told that the author either chose to write on the topic or was assigned to write about that topic. The results showed that older adults tended to have a more extreme attitude attribution rating than young adults. This shows that older people may be more likely to commit the FAE error than younger people.

Accountability is another factor that has been tested to see if it has an influence on the likelihood that someone will commit the FAE. Tetlock (2006) tested how one's level of accountability for their answers impacted their likelihood to commit the FAE. This experiment was set up in a similar manner to other experiments testing the FAE. Subjects were presented with either a pro- or anti-affirmative-action essay that was written under high- or low-choice conditions. The subjects were also asked to answer questions about the writer of the essay.

Study subjects were then led to believe that they would either be held accountable for their impressions of the writer or not. In the accountability condition subjects learned of being accountable for their opinions either before or after exposure to the essay. Results showed that accountability was a significant moderator of the over attribution effect. Subjects who did not feel accountable for their judgments were significantly more likely to have strong inferences about the attitudes of low-choice essay writers.

A fourth study was conducted testing how social influence as a stimulus control influenced people's likelihood to commit the FAE. There were five different vignettes that subjects read where three were treatment vignettes and two were controls. In the treatment vignettes there were two conditions in which the actor in the story was either alone or in the presence of others, which served as the social influence. Subjects were then asked to attribute any percentage they chose to situational, dispositional, or purpose factors to explain the actions of the actor in the vignette. The results of this study showed that the presence of others in the vignette led to an increase in subjects committing the FAE.

As shown there has been plenty of research on variables which affects the likelihood that a person may commit the FAE. An area which has not been explored yet is the effect that anxiety may have on one's chances of committing the FAE. Spielberger (1983) defined anxiety as, "the subjective feeling of tension, apprehension, nervousness, and worry associated with an arousal of the autonomic nervous system" (p. 1). Spielberger (1972, 1983) also made a distinction between two different types of anxiety; trait or state anxiety. Trait anxiety is used to describe a relatively stable personality variable whereas state anxiety is used to describe a transient emotional state where the feelings of anxiety can change based on the situation. Measures of anxiety are usually measured using the State-Trait Anxiety Inventory (Spielberger,

Gorusch, Lushene, Vagg, & Jacobs, 1983). Anxiety seems to be an important factor to consider because research has shown that use of cognitive heuristics is a result of limited resources in working memory and research has show that anxiety reduces the limited resources of working memory.

For the purposes of this study the most important effect of stress and anxiety has to do with their impact on the working memory component of the brain. Baddeley's model is the most well known and established theoretical conceptualization of working memory (Baddeley, 1986, 2000, 2003). According to Baddeley's model working memory is where information is actively manipulated, processed, and temporarily stored. Information in working memory can be rehearsed and then encoded in long-term memory or it will decay and be forgotten. Working memory is also restricted by a limited capacity (Baddeley, 1986). Working memory capacity is usually defined as the amount of information that can be processed and temporarily stored for a limited amount of time (Daneman & Carpenter, 1980). Baddeley also broke working memory down into four components. The main component is the central executive and then there are three "slave" systems known as the phonological loop, the visuospatial sketchpad, and the episodic buffer (Baddeley, 2000). The most important component is the central executive which is responsible for processing the information temporarily held in working memory. Prior research has been conducted on how reduced working memory leads to an increase in the use of cognitive heuristics.

A study conducted by Verschueren, Shaeken, and D'Ydewalle (2005) was done to test how working memory differences led to different methods for answering conditional reasoning questions. They tested two different methods for answering conditional reasoning questions. The mental models account was when the person forms a mental representation of the content of

all relevant situations and draws a conclusion that is congruent with these models. This method is believed to use a majority of the working memory resources. The other method is less strenuous on working memory and this method is known as the probabilistic heuristic. In this method people solve conditional inferences by taking into account the likelihood of the conclusion given the categorical premise of the problem. In this study participants were separated into low, medium, and high working memory capacity groups using the operation span test (La Pointe & Engle, 1990; Turner & Engle, 1989). The participants were then asked a series of inference problems and were asked to state their reasoning out loud. The results of the study showed that those higher in working memory were more likely to use the mental models method than those with lower working memory. Those with lower working memory relied more on the probabilistic heuristic to solve the inference problems. This study supports the idea that those with lower working memory resources or limited working memory resources are more likely to use heuristic reasoning processes. This is essential to this study as anxiety has been shown to reduce working memory capacity.

There are two leading theories with supportive evidence about the effects of anxiety on cognitive performance. One of the theories is known as the processing efficiency theory developed by Eysenck and Calvo in 1992. Processing efficiency theory distinguishes between cognitive effectiveness and cognitive efficiency. Effectiveness is related to the quality of performance on a certain task. Efficiency is the relationship between effectiveness and the processing invested in the performance. Thus, high processing efficiency is when there is a high level of performance while using relatively minimal cognitive resources. Anxiety has a role to play in the processing efficiency theory (Eysenck & Calvo, 1992), as anxiety has an effect on the central executive component of working memory. The cause for anxiety's effect on the central



executive is believed to be that anxiety produces worry which then uses up some of the processing resources of working memory and thereby reduces processing efficiency (Baddeley, 1986, 2002). The task irrelevant thoughts that are produced as a result of anxiety are believed to affect performance by reducing the limited amount of attentional resources in working memory available to be allocated to the main ongoing task.

The second theory about the affects of anxiety on cognitive performance is the attentional control theory (Eysenck, Derakshan, Santos, & Calvo, 2007). Attentional control theory is based on the premises of processing efficiency theory. Eysenck et al. (2007) cited several reasons for the need to expand upon the premise of the processing efficiency theory and thus devised the attentional control theory. One of their reasons was that the processing efficiency theory failed to specify which functions of the central executive were affected most by anxiety. A second was that there were no assumptions about the effects of distracting stimuli on anxious individuals. The third was that the theory focused only on cognitive tasks involving neutral and nonemotional stimuli. The fourth cited reason was that the processing efficiency theory does not consider cases in which high anxious individuals may outperform non-anxious individuals. It is theorized that the central executive is responsible for attention and is involved with managing the allocation and focus of attentional systems (Conwan, 2001). As the name implies a core assumption of attentional control theory is that anxiety has an effect on attention. The theory states that anxiety impairs attentional control which is a function of the central executive component of working memory. If this is the case anxious individuals are more likely to allocate attentional resources to threat-related stimuli. These stimuli can either be internal, such as worrisome thoughts, or they can be external, such as threatening task-irrelevant stimuli.

Attentional control theory also relates to an attentional system theory developed by Corbetta and Shulman (2002). According to their theory there are two attentional systems. There is the goal-directed attentional system, which is influenced by knowledge and current goals, and there is the stimulus-driven attentional system, which is influenced by salient stimuli. The goal-directed system is referred to as top-down processing whereas the stimulus-driven system is referred to as bottom-up processing. According to the attentional control theory proposed by Eysenck et al. (2007) anxiety interrupts the balance between the two different systems. Theoretically, anxiety increases the influence of bottom-up processing and decreases the influence of top-down processing. Anxiety decreases performance by decreasing the goal-driven attentional control system, especially the ability for the central executive to inhibit information, shift attention, and update information in working memory. This causes a person to rely more on stimulus-driven attention (Eysenck, et al., 2007). Tests have shown that anxiety has been associated with adverse effects on cognitive performance, especially when these tasks require attentional control (Derakshan & Eysenck, 2009). Studies have shown that the ability to control attention and remain focused is a large determinant of performance on working memory tasks (Engle, 2002; Kane, Bleckley, Conway & Engle, 2001).

As previously stated worry is associated with the onset of anxiety within an individual. Worry is associated with uncontrollable thoughts about possible future negative events (Hayes, Hirsch, & Matthews, 2008). The difference between a high worrier and a low worrier is the uncontrollability of negative thoughts once worry begins (Borkovec, Robinson, Pruzinsky, & DePee, 1983). Research has shown that there are performance deficits on target tasks under high-memory load conditions for all participants but the deficits are greater in those with high-anxiety than those with low-anxiety. Eysenck and Calvo (1992) believe that the deficits are a

result of worrisome thought which deplete working memory capacity by reducing the amount of resources available to complete the target task.

A study by Hayes, Hirsch, & Matthews (2008) tested the effect of worry versus nonworrisome thinking on working memory capacity in high and low worriers. In the study participants filled out the Penn State Worry Questionnaire (PSWQ; Meyer, Miller, Metzger, & Borkovec, 1990). Participants then performed a random key-press task while either thinking about a worry topic or a positive topic in counterbalanced order. After completing one task participants completed mood and thought ratings. Participants then performed a filler task for two minutes to prevent a carryover effect. After this they were asked to complete the other thought condition and then complete the mood and thought ratings once again. The results supported previous studies about anxiety that high worriers had less working memory capacity available when engaging in worrisome tasks than in positive thought tasks. Also consistent with prior research were the results that high worriers reported higher levels of anxiety and depression. Through covariance analysis the results supported prior research that the reduction in working memory capacity in high worriers was a result of the worry component of anxiety rather than the effect of one's mood state (Rapee, 1993). Overall, the results of the study by Hayes, Hirsch, & Matthews (2008) support prior research that worry affects working memory capacity.

Research was conducted by Derakshan & Eysenck (1998) on verbal reasoning performance for high and low anxious subjects under high and low memory load conditions. Participants in the study completed the State-Trait Anxiety Inventory (Spielberger et al., 1983) as well as a scale which measures defensiveness called the Marlowe-Crowne Social Desirability Scale (Corwne & Marlowe, 1964). The participants were then divided into low-anxious,

repressor, high-anxious, and defensive high-anxious groups. Repressors are those who report low scores of anxiety on scales but are physiologically and behaviorally anxious (Newton & Contrada, 1992; Derakshan & Eysenck, 1997). The same loading paradigm as MacLeod and Donnellan (1993) was used in the experiment. Participants were presented with a reasoning task and either responded that the display was either true or false. In low memory load trials a set of six zeroes was presented to participants before the display of the reasoning task. In the high memory load trials there was a set of six random digits presented before the display of the reasoning task. Participants were measured in both accuracy and response time. In all groups the response on the verbal reasoning task was slower in the high memory load condition but this effect was greater for high-anxious groups than both the low-anxious and repressor groups. Response latencies on the memory test were also greater in the high memory load condition rather than the low memory load condition. This was also qualified by an interaction with the high-anxious and defensive-high anxious groups being more affected than the low-anxious and repressor groups. The error rate on the verbal reasoning task and memory load task was nonsignificant between the four groups. These results support the theory that high-anxious and defensive-high anxious groups have more restricted working memory capacity than low-anxious and repressor groups.

A study conducted by Eysenck, Payne, & Derakshan (2005) tested the affect that anxiety would have on working memory during a cognitive task. Their study used the Corsi Blocks Test (Corsi, 1972) which involves the central executive and the visuospatial sketchpad. Participants were divided into high- and low-anxious groups based on their scores on the State-Trait Anxiety Inventory (Spielberger et al., 1983). In the Corsi Blocks Test participants needed to tap blocks in the same pattern as the experimenter did after a five second delay. There were also four different

secondary tasks. The first was counting backwards by ones from a two-digit number out loud, the second was a spatial tapping task in which participants had to tap out a “z” pattern, the third was to repeat the letters A, B, C, and D out loud, and the fourth was a simple tapping task in which participants had to tap one spot on a tapping pad continuously. The simple tapping task served as the control condition. There was a significant difference in performance between the high- and low-anxious groups in the Corsi Blocks Test when the secondary task involved counting backwards. The two anxiety groups did not differ in the three other secondary task conditions. This is believed to be a result of the fact that only the counting backwards task required use of the central executive. This experiment provided further evidence that high-anxiety groups had reduced working memory capacity leading to more errors in the main and secondary tasks.

A study conducted by Wiener, Ehbauer, & Mallot (2009) tested the affects of working memory capacity when it came to the use of planning heuristics in a spatial problem solving task. The spatial task was based on the traveling salesman problem which consists of finding the shortest closed loop connecting a starting location with multiple target locations. There were three spatial planning heuristics that Wiener et al. discussed in the study. The first was the nearest neighbor method in which participants visit the closest target that has not been visited until all targets have been visited. The second was the cluster-strategy in which neighboring targets are clustered together and that the closest and largest clusters are visited first. The third is the region-based strategy in which participants try to minimize the number of region boundaries they cross during navigation when trying to get to the nearest target. By using these strategies participants reduce working memory demands when trying to navigate their routes.

In the first experiment participants were given a list with symbols defining their starting location and their target locations which they needed to maintain in working memory. These corresponded to markers with the same symbols which were organized in a grid pattern throughout the room. Results showed that with an increasing number of targets performance for discovering the optimal path decreased and start time increased. This is believed to be due to the increased strain on working memory due to the higher number of target locations that must be kept in it.

The second had three different conditions; the no memory condition, the spatial working memory condition, and the spatial working memory and long term memory condition. In the no memory condition target location were marked in the environment. In the spatial working memory condition participants were given a list of their target locations and needed to maintain that list in their working memory. In the spatial working memory and long term memory condition the symbols in the environment were covered and participants had a training phase prior to the experiment where they learned the positions of the symbols. Then participants were given a list of their target locations to find. There were also two types of navigation tasks, region-strategy-adequate tasks and region-strategy-inadequate tasks. For the optimal path in region-strategy-adequate tasks participants would need to visit all target locations in one region before going to the next region. In region-strategy-inadequate tasks this region-based strategy planning would not lead to participants finding the optimal path. Results indicated that there were significant effects for the number of targets and condition. Planning performance decreased with an increased number of target locations. Performance was best in the no memory condition and worst in the spatial working memory and long term memory condition. Participants were also more likely to find the optimal route in region-strategy-adequate tasks.

However, the influence of region-based planning was weakest in the no memory condition whereas it was stronger in the other two. This is most likely due to the fact that in the other two conditions working memory was strained leading to the region-based planning heuristic.

Overall, performance decreased while use of region-based planning heuristics increased with an increased working memory load. This study showed that increased working memory strains led to an an increase in the use of heuristics.

Based upon all of this previous research, we tested the affect of trait anxiety on one's likelihood of committing the fundamental attribution error. Research has shown that people use heuristics due to strains on their working memory capacity. Studies have also shown that anxiety reduces working memory capacity. Therefore, it is logical to believe that anxieties affects on working memory can lead to an increase in the use of cognitive heuristics. Due to all of the prior research conducted on the negative effects of anxiety on working memory capacity we hypothesized that those high in trait anxiety would be more likely to commit the fundamental attribution error than those low in trait anxiety.

## **Method**

### **Participants**

Data was collected over a period of five weeks in a psychology laboratory at Union College. One hundred and thirty-nine Union College students participated in the study and were recruited through a college-wide online research signup system. Three of the participant's responses were disregarded due to the fact that they did not fully complete the questionnaire. Participants received either course credit or compensation for their participation in the study. Sixty males and seventy-nine females participated. Their ages ranged from eighteen to twenty-two years of age.

### **Procedure**

Participants were randomly assigned to one of four conditions. In all of the conditions participants read an essay about a potential course policy change at Union College that would raise the mandatory course load from three to four classes per trimester. Participants were told the essay was the opening statement written by a student for their debate class. In one condition, participants read an essay that was pro-course policy change. They were also told that the author had a choice in which position they could take in the essay. In the second condition, participants read an essay that was anti-course policy change. They were also told that the author had a



choice in which direction they could write the essay. In the third condition, participants read the same pro-course policy change essay as the participants in the first condition did. However, these participants were told that the author was assigned to write for that position. In the fourth condition, participants read the same anti-course policy change essay as participants in the second condition did. These participants were told that the author was assigned to write for that position. The essays were almost identical with only some substitutions of single phrases or qualifiers reversing the meaning of some sentences. Each participant signed a consent form before beginning in which they were told the purpose of the study was to learn more about social perception.

Participants were first asked to fill out a questionnaire which was actually the trait anxiety subscale of the Spielberger state-trait anxiety inventory (Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983). This inventory asked twenty questions about how participants feel generally and asked them to rate it on a 4-point scale with *not at all* being one and *very much* being four. Participants were then asked to read the essay corresponding to whichever condition they were randomly assigned as well as fill out a questionnaire about the essay. After reading the essay, participants were then asked about the essay and the author and rated their responses on a 7-point scale. For questions pertaining to the participants thoughts about the author and the essay, one on the 7-point scale was *extremely against* and seven was *extremely for*. The most important question was the one which asked the participants to what extent they believed the position advocated in the essay expressed the writer's true opinion. On this 7-point scale one was *not sure at all* and seven was *very sure*. Then participants answered several questions about their global impressions of the write and these too were answered on a 7-point scale. After this participants were debriefed and dismissed.

## Results

There were thirty-five subject's in the assigned for condition, forty-two in the assigned against condition, thirty-four in the choice for condition, and twenty-eight in the choice against condition. The participants were divided into high and low trait anxiety groups by splitting the groups using the median score on the trait anxiety subscale of the Spielberger state-trait anxiety scale. Sixty-eight participants were categorized as low trait anxiety as they scored a forty-seven or below on the anxiety scale. Seventy-one participants were categorized as high trait anxiety.

The participants were asked what they believed was the typical undergraduate's opinion was on the policy as well as their own personal opinion on the policy. Results indicated that the participants believed that the typical undergraduates opinion would be against a course policy change ( $M = 2.05$ ). The average participant's own personal opinion was also against a policy change ( $M = 2.48$ ). Thus, the proposed policy did elicit a negative response from the student populace as expected. An independent samples t-test was used to test whether there was a difference in the means between the pro- and anti-policy change essays for the question regarding the position of the essay. There was a significant difference between the two conditions ( $t(137) = 12.59, p < .001$ ). This was expected and shows that the essays did reflect pro- and anti-policy change positions as was intended.

It was then tested whether there was an effect for choice, position, and anxiety on whether the participant's believed that the position of the essay was the true opinion of the author. Scores on the question regarding the extent to which participant's believe the position advocated in the essay expressed the writer's true opinion, the means of which are presented in Figure 2, were submitted to a 2x2x2 univariate analysis of variance (ANOVA). It was tested whether there was a difference between conditions and participant's likelihood of believing the

essay advocated the author's true opinion. The only significant effect was for position ( $F(1,139) = 7.00, p = .01$ ). Those in the anti-policy change condition ( $M = 5.41$ ) were more likely to believe that the essay advocated the author's true opinion than those in the pro-policy change condition ( $M = 4.79$ ). There was no effect for anxiety ( $F(1,139) = 1.75, p = .19$ ) or choice ( $F(1,139) = .89, p = .35$ ). The means did reflect that those with high anxiety ( $M = 5.24$ ) had higher scores than those with low anxiety ( $M = 4.96$ ) but this was not a significant difference. Those with high anxiety in the choice anti-policy change condition had the highest mean score ( $M = 5.93$ ) while those in the low anxiety no choice pro-policy change had the lowest mean score ( $M = 4.36$ ). Overall, the only significant effect on whether people believed the essay advocated the author's true opinion was the position of the essay.

The next question examined was whether there was an effect for choice, position, and anxiety on what the participant believed the author's personal opinion toward the course load policy was. Scores on this question, the means of which are presented in Figure 4, were submitted to a 2x2x2 ANOVA. The only significant main effect was the position of the essay ( $F(1, 139) = 148.36, p < .001$ ). Those in the pro-policy condition ( $M = 5.64$ ) were more likely to believe that the author's personal opinion was pro-policy change while those in the anti-policy condition ( $M = 1.93$ ) were more likely to attribute an anti-policy change attitude to the author. There was almost a significant 2-way interaction between choice and position ( $F(1, 139) = 3.39, p = .068$ ). Also, although there were no significant effects besides position there were interesting mean scores. Those with low anxiety in the pro-policy change condition had higher mean scores than those with high anxiety for both the choice ( $M = 5.95$ ) and no choice ( $M = 5.79$ ) conditions than those with high anxiety ( $M = 5.75$ ) and ( $M = 5.29$ ) respectively. The same was not the case for those in the no choice anti-policy condition as those with high anxiety ( $M = 2.73$ ) had a

higher score than those with low anxiety ( $M = 1.85$ ). Overall, there was no real difference between high anxiety ( $M = 3.75$ ) and low anxiety ( $M = 3.79$ ) attitude attribution scores. In the pro-policy condition those with high anxiety had lower scores ( $M = 5.40$ ) than those with low anxiety ( $M = 5.88$ ). The opposite was true in the anti condition where those with high anxiety had higher scores ( $M = 2.14$ ) than those with low anxiety ( $M = 1.71$ ). The means show that there is no effect besides position on what subjects thought the personal opinion on the policy change was.

The third important question examined whether there was an effect for choice, position, and anxiety on what the participants' confidence in their judgment was regarding the question about the author's personal opinion. Scores on the question regarding how confident the participant was in their judgment in terms of answering the question about the author's personal opinion on the policy, the means of which are presented in Figure 6, were submitted to a  $2 \times 2 \times 2$  ANOVA. There was no three way interaction between the three conditions ( $F(1, 139) = .21, p = .65$ ) nor were there any other main effects. The means for the low anxiety participant's between the choice and no choice conditions were different in both the pro- and anti policy change conditions. In the choice pro-policy change condition low anxiety participant's mean was lower ( $M = 5.15$ ) than those in the no choice condition ( $M = 6.07$ ). The same applied to the anti-policy change conditions where those in the choice condition ( $M = 5.14$ ) had a lower mean than those in the no choice condition ( $M = 5.85$ ) for low anxiety participant's. There was not as much of a difference in the means for those who had high trait anxiety. Overall, there was no effect for any of the conditions on participants' confidence in their judgments of the author's attitude.

## Discussion

Throughout life people sometimes unknowingly make errors in decision making and in judgment about many different facets of life. It is all part of living in a world where not everything is always as it seems. One such common error in judgment that people tend to make is the fundamental attribution error. If one commits the fundamental attribution error they are overestimating the internal factors and underestimating the external factors when explaining the actions of other people. Prior research has shown that a variety of factors can influence the likelihood that someone would commit FAE. People who are in a good mood are more likely to commit the FAE than those who are in a bad mood (Forgas, 1998). Older people also seem to be more likely to commit the FAE than younger people (Horhota & Blanchard-Fields 2006).

The current study examined if there was a correlation between someone's trait anxiety and their likelihood to commit the FAE. The hypothesis that those with high trait anxiety were more likely to commit the FAE than those with low trait anxiety was not supported by the data. The only significant effect was the position of the essay, as essay direction was the strongest indicator of attitude attribution which is consistent with existing literature (Jones & Harris, 1967). Those who were in the anti-policy change condition were more likely to attribute an anti-policy attitude to the author than those in the pro-policy change condition. This is expected in the choice condition but was also found in the no choice condition. This shows that even though participants were explicitly told that the author was assigned to take the position they wrote about, the participants still attributed that attitude to the author. Thus, they were committing the FAE.

It is reasonable that those in the anti-policy change condition were more likely to attribute that attitude to the author as the results did indicate that the student population was against the proposed policy change. It was anticipated that the student population would be against the

proposed policy change and the results corroborated that expectation. The anti-policy change essay could also have been more convincing overall and thus people were more likely to believe that that was the author's true opinion.

It was anticipated that those with high anxiety would have the highest likelihood of committing the FAE. Overall, those with high anxiety did have a higher mean score than those with low anxiety but it was not a significant difference. The choice condition did have a higher score which is logical as participants would believe that the essay reflected the authors true opinion if the author chose to take that specific stance in the essay. However, the only significant effect was position in regards to the attitude attributed to the author by the participant's.

There was a significant main effect in terms of the direction of the essay for the question regarding what the participant's believed the author's opinion on the policy change was. This was to be expected as that was answered using a bipolar scale. Participants with an anti-policy change essay thought that the author was against the policy change while those who had a pro-policy essay thought that the author was supportive of the policy change. This showed that the position of the essay greatly influenced what the participant's believed the author's opinion on the policy was.

There was no significant difference between the different conditions and the participant's confidence in their judgment. This was not expected as it was anticipated that those in the choice condition would be more confident in their responses than those in the no choice condition. This was because it would make sense that if it was known that the author chose the position then the participant's should be more confident in their attribution of the attitude to the author. The

results were actually the opposite of what was expected as those in the no choice condition were more confident in their judgment of the author's opinion than those in the choice condition.

A possible limitation in the study was that the participants may not have correctly paid attention to or remembered the sentence regarding the choice, or lack of choice, that the author had in regards to the position taken in the essay. This may have been a cause for the fairly similar means regarding participant's beliefs of the author's true opinion and their confidence in such judgments between the choice and no choice conditions. A second possible limitation is that trait anxiety did not have the desired effect of decreasing the working memory capacity of participants. Thus, there may have been no difference in the working memory resources between the high and low anxiety patients which could have lead to the lack of a significant difference between the groups.

Future direction for research regarding trait anxieties influence on the likelihood one commits the FAE could explore increasing the strain on the limited resources of working memory. One explanation for the lack of a main effect for anxiety is that trait anxiety alone does not occupy enough working memory resources in order to increase the chance that someone will commit the FAE. Perhaps state anxiety, or both state and trait anxiety, would have more of an effect on one's likelihood of committing the FAE.

A second possible area that could be looked into would be to give the participant's a working memory task to increase the strain on their working memory. A task that would increase the strain on the limited capacity of working memory, such as the loading paradigm used by MacLeod and Donnellan (1993), could be used to see if that in conjunction with trait anxiety would have an effect on the likelihood one would commit the FAE. Participants could be divided into high and low memory load conditions and tested in the same manner as the

current study. The combined strain of the working memory task and trait anxiety may have more of an influence than just trait anxiety on its own.

In conclusion, the current study did not give any insight into a factor that will increase a person's likelihood of committing the FAE as expected. However, further investigations into the effects of strained working memory on the chances that someone commits the FAE should be explored as it may lead to new insights as to why people commit the FAE.

### References

- Baddeley, A. D. (1986). *Working memory*. Oxford: Oxford University Press.
- Baddeley, A. D. (2000). The episodic buffer: A new component of working memory? *Trends in Cognitive Sciences*, 4(11), 417-423.
- Baddeley, A. D. (2002). Is working memory still working? *European Psychologist*, 7, 85-97
- Baddeley, A. D. (2003). Working memory: Looking back and looking forward. *Nature Reviews: Neuroscience*, 4, 929-939.
- Borkovec, T., Robinson, E., Pruzinsky, T., & DePree, J. (1983). Preliminary exploration of worry: Some characteristics and processes. *Behaviour Research Therapy*, 21, 9-16.
- Conwan, N. (2001). The magical number 4 in short-term memory: A reconsideration of mental storage capacity. *Behavioral and Brain Sciences*, 24, 87-185.
- Corbetta, M., & Shulman, G. (2002). Control of goal-directed and stimulus-driven attention in the brain. *Nature Reviews Neuroscience*, 3, 201-215.
- Corsi, P. (1972). *Human memory and the medial temporal region of the brain*. *Dissertation Abstracts International*, 34, 891.
- Crowne, D., & Marlowe, D. (1964). *The approval motive: Studies in evaluative dependence*.



New York: Wiley.

- Daneman, M., & Carpenter, P. A. (1980). Individual differences in working memory and reading. *Journal of Verbal Learning and Verbal Behavior*, 19, 450-466.
- Derakshan, M., & Eysenck, M. (1997). Manipulation of focus of attention and its effects on anxiety in high trait-anxious individuals and repressors. *Cognition and Emotion*
- Derakshan, N., & Eysenck, M. (1998). Working memory capacity in high trait-anxious and repressor groups. *Cognition and Emotion*, 12, 697-713.
- Derakshan, N., & Eysenck, M. (2009). Anxiety, processing efficiency, and cognitive performance. *European Psychologist*, 14, 168-176.
- Engle, R. (2002). Working memory capacity as executive attention. *Current Directions in Psychological Science*, 11, 19-23.
- Eysenck, M., & Calvo, M. (1992). Anxiety and performance: The processing efficiency theory. *Cognition and Emotion*, 6, 409-434.
- Eysenck, M., Payne, S., & Derakshan, N. (2005). Trait anxiety, visuospatial processing, and working memory. *Cognition and Emotion*, 19, 1214-1228.
- Eysenck, M., Derakshan, N., Santos, R., & Calvo, M. (2007). Anxiety and cognitive performance: Attentional control theory. *Emotion*, 7, 336-353.
- Forgas, J. (1998). On being happy and mistake: Mood effects on the fundamental attribution error. *Journal of Personality and Social Psychology*, 75, 318-330.
- Hayes, S., Hirsh, C., & Matthews, A. (2008). Restriction of working memory capacity during worry. *Journal of Abnormal Psychology*, 3, 712-717.
- Horhota, M., & Blanchard-Fields, F. (2006). Do beliefs and attributional complexity influence age differences in the correspondence bias?. *Social Cognition*, 24, 310-337.

- Jones, E., & Harris, V. (1967). The Attribution of Attitudes. *Journal of Experimental Social Psychology*, 3, 1-24.
- Kane, M., Bleckley, M., Conway, A., & Engle, R. (2001). A controlled-attention view of working-memory capacity. *Journal of Experimental Psychology: General*, 130, 169-183.
- La Pointe, L. B., & Engle, R. W. (1990). Simple and complex word spans as measures of working memory capacity. *Journal of Experimental Psychology: Learning, Memory, & Cognition*, 16, 1118-1133.
- MacLeod, C., & Donnellan, A. (1993). Individual differences in anxiety and the restriction of working memory capacity. *Personality and Individual Differences*, 15, 163-173.
- Meyer, T., Miller, M., Metzger, R., & Borkovec, T. (1990). Development and validation of the Penn State Worry Questionnaire. *Behaviour Research and Therapy*, 28, 487-495.
- Newton, T., & Contrada, R. (1992). The autonomic-verbal response dissociation: The influence of social context. *Journal of Personality and Social Psychology*, 62, 159-167.
- O'Sullivan, M. (2003). The fundamental attribution error in detecting deception: The boy-who-cried-wolf effect. *Personality and Social Psychology Bulletin*, 29, 1316-1327.
- Rai, M., Loschky, L., Harris, R., Peck, N., & Cook, L. (2011). Effects of stress and working memory capacity on foreign language readers' inferential processing during comprehension. *Language Learning*, 61, 187-218.
- Rapee, R. (1993). The utilization of working memory by worry. *Behaviour Research and Therapy*, 31, 617-620.
- Spielberger, C. (1972). *Anxiety: Current trends in theory and research: I*. New York: Academic Press.
- Spielberger, C., Gorsuch, R., Lushene, R., Vagg, P., & Jacobs, G. (1983). *Manual for the State-*

*Trait Anxiety Inventory*. Palo Alto, CA: Consulting Psychologists Press.

Tetlock, P. (1985) Accountability: A social check on the fundamental attribution error. *Social Psychology Quarterly*, 48, 227-236.

Turner, M. L., & Engle, R. W. (1989). Is working memory capacity task dependent? *Journal of Memory & Language*, 28, 127-154.

Tversky, A., & Kahneman, D. (1974). Judgment under uncertainty: Heuristics and biases. *Science*, 185(4157), 1124-1131.

Verschueren, N., Schaeken, W., & D'Ydewalle, G. (2005). Everyday conditional reasoning: A working memory-dependent tradeoff between counterexample and likelihood use. *Memory & Cognition*, 33, 107-119.

Weatherly, J., Miller, K., & McDonald, T. (1999). Social influence as stimulus control. *Behavior and Social Issues*, 9, 25-45.

Wiener, J., Ehbauer, N., & Mallot, H. (2009). Planning paths to multiple targets: Memory involvement and planning heuristics in spatial problem solving. *Psychological Research*, 73, 644-658.

Appendix A

<b>Between-Subjects Factors</b>			
		Value Label	N
choice	1.00	choice	62
	2.00	no choice	77
position	1.00	pro	69
	2.00	anti	70
codeanxiety	1.00	high	71
	2.00	low	68

*Figure 1: Subjects By Condition*

**Descriptive Statistics**

Dependent Variable: trueopinion

choice	position	codeanxiety	Mean	Std. Deviation	N
choice	pro	high	5.0000	1.70970	14
		low	4.7000	1.83819	20
		Total	4.8235	1.76619	34
	anti	high	5.9286	1.07161	14
		low	5.2857	1.13873	14
		Total	5.6071	1.13331	28
	Total	high	5.4643	1.47779	28
		low	4.9412	1.59433	34
		Total	5.1774	1.55262	62
no choice	pro	high	5.0000	1.48324	21
		low	4.3571	1.54955	14
		Total	4.7429	1.52128	35
	anti	high	5.1818	1.05272	22
		low	5.4000	1.78885	20
		Total	5.2857	1.43622	42
	Total	high	5.0930	1.26893	43
		low	4.9706	1.74920	34
		Total	5.0390	1.49069	77
Total	pro	high	5.0000	1.55299	35
		low	4.5588	1.70900	34
		Total	4.7826	1.63482	69

anti	high	5.4722	1.10805	36
	low	5.3529	1.53509	34
	Total	5.4143	1.32417	70
Total	high	5.2394	1.35715	71
	low	4.9559	1.66109	68
	Total	5.1007	1.51464	139

Figure 2: Mean Scores for Question Pertaining to Author’s True Opinion on Policy

**Tests of Between-Subjects Effects**

Dependent Variable: trueopinion

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	23.317 <sup>a</sup>	7	3.331	1.488	.177
Intercept	3485.861	1	3485.861	1557.075	.000
choice	1.987	1	1.987	.887	.348
position	15.669	1	15.669	6.999	.009
codeanxiety	3.906	1	3.906	1.745	.189
choice * position	.175	1	.175	.078	.780
choice * codeanxiety	.561	1	.561	.251	.618
position * codeanxiety	.561	1	.561	.251	.618
choice * position *	3.027	1	3.027	1.352	.247
codeanxiety					
Error	293.273	131	2.239		
Total	3933.000	139			
Corrected Total	316.590	138			

a. R Squared = .074 (Adjusted R Squared = .024)

Figure 3: Interactions Between Different Factors for Question Pertaining to Author’s True Opinion on Policy

**Descriptive Statistics**

Dependent Variable:authorsopinion

choice	position	codeanxiety	Mean	Std. Deviation	N	
choice	pro	high	5.5714	2.06488	14	
		low	5.9500	1.60509	20	
		Total	5.7941	1.78851	34	
	anti	high	1.2143	.42582	14	
		low	1.5000	1.09193	14	
		Total	1.3571	.82616	28	
	Total	high	3.3929	2.65747	28	
		low	4.1176	2.62580	34	
		Total	3.7903	2.64350	62	
	no choice	pro	high	5.2857	2.32686	21
			low	5.7857	2.00686	14
			Total	5.4857	2.18782	35
anti		high	2.7273	2.25054	22	
		low	1.8500	1.49649	20	
		Total	2.3095	1.95670	42	
Total		high	3.9767	2.60483	43	
		low	3.4706	2.59645	34	
		Total	3.7532	2.59633	77	
Total		pro	high	5.4000	2.19893	35
			low	5.8824	1.75404	34
			Total	5.6377	1.99242	69
	anti	high	2.1389	1.91465	36	

	low	1.7059	1.33778	34
	Total	1.9286	1.66221	70
Total	high	3.7465	2.62253	71
	low	3.7941	2.61202	68
	Total	3.7698	2.60800	139

Figure 4: Mean Scores for Question Pertaining to Author’s Personal Opinion

**Tests of Between-Subjects Effects**

Dependent Variable:authorsopinion

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	506.841 <sup>a</sup>	7	72.406	21.967	.000
Intercept	1865.290	1	1865.290	565.904	.000
choice	4.170	1	4.170	1.265	.263
position	489.005	1	489.005	148.358	.000
codeanxiety	.172	1	.172	.052	.820
choice * position	11.174	1	11.174	3.390	.068
choice * codeanxiety	2.266	1	2.266	.687	.409
position * codeanxiety	4.514	1	4.514	1.370	.244
choice * position * codeanxiety	3.446	1	3.446	1.045	.308
Error	431.792	131	3.296		
Total	2914.000	139			
Corrected Total	938.633	138			

a. R Squared = .540 (Adjusted R Squared = .515)

Figure 5: Interactions Between Different Factors for Question Pertaining to Author’s Personal Opinion on Policy



**Descriptive Statistics**

Dependent Variable: confidence

choice	position	codeanxiety	Mean	Std. Deviation	N
choice	pro	high	5.5714	2.17377	14
		low	5.1500	1.56525	20
		Total	5.3235	1.82110	34
	anti	high	5.2857	1.77281	14
		low	5.1429	2.14322	14
		Total	5.2143	1.93136	28
	Total	high	5.4286	1.95180	28
		low	5.1471	1.79448	34
		Total	5.2742	1.85693	62
no choice	pro	high	5.5714	1.56753	21
		low	6.0714	.91687	14
		Total	5.7714	1.35225	35
	anti	high	5.5909	1.43623	22
		low	5.8500	1.56525	20
		Total	5.7143	1.48629	42
	Total	high	5.5814	1.48376	43
		low	5.9412	1.32439	34
		Total	5.7403	1.41795	77
Total	pro	high	5.5714	1.80336	35

	low	5.5294	1.39773	34
	Total	5.5507	1.60455	69
anti	high	5.4722	1.55813	36
	low	5.5588	1.82891	34
	Total	5.5143	1.68319	70
Total	high	5.5211	1.67212	71
	low	5.5441	1.61554	68
	Total	5.5324	1.63876	139

Figure 6: Mean Scores for Question Pertaining to Participants Confidence in Judgment

**Tests of Between-Subjects Effects**

Dependent Variable:confidence

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	12.115 <sup>a</sup>	7	1.731	.632	.728
Intercept	4086.624	1	4086.624	1493.342	.000
choice	7.810	1	7.810	2.854	.094
position	.511	1	.511	.187	.666
codeanxiety	.079	1	.079	.029	.865
choice * position	.017	1	.017	.006	.937
choice * codeanxiety	3.658	1	3.658	1.337	.250
position * codeanxiety	.003	1	.003	.001	.974
choice * position * codeanxiety	.564	1	.564	.206	.651
Error	358.490	131	2.737		
Total	4625.000	139			
Corrected Total	370.604	138			

a. R Squared = .033 (Adjusted R Squared = -.019)

Figure 7: Interactions Between Different Factors for Question Pertaining to Participants Confidence in Judgment