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The Influence of Others' Opinions on Individual Judgment

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Abstract— *Previous research has established that people tend to show high levels of conformity in face-to-face interactions. However with the rise of the internet and new ways of more informal communication, physical proximity is not as applicable anymore. This study investigated the degree of conformity in non face-to-face settings. It employed an experimental design, with others' opinions as the independent variable and the degree of conformity as the dependent variable. The experiment, in which all participants were asked to rate various paintings, was conducted with both college students (ages 18-23) and adults (age 30+). It was expected that subjects would conform to majority judgments (hypothesis 1) and that the degree of conformity would be lower in older individuals (hypothesis 2). Results revealed some degree of conformity in both groups, albeit not statistically significant. Furthermore, hypothesis 2 was rejected. Reasons for these results are discussed and possible confounding variables such as ambiguous paintings and low task incentive, among other things, are identified.*

The phenomenon of social conformity has been widely explored and supported in various studies in the past (e.g. Bond & Smith, 1996; Gerard, 1964; Perrin & Spencer, 1981; Gavanski & Hoffman, 1987). Most of these studies have been based on Asch's (1952) famous line judgment task, in which the extent of conformity was first revealed. In this experi-

ment, participants were asked to judge the length of different lines when in the presence of other people (confederates of the researchers) who deliberately misjudged the length of the lines. Researchers found that participants adjusted their judgments according to what the confederates said.

Many replications of this study have been done. Some of these also considered the influence of possible extraneous variables such as culture (e.g. Bond & Smith, 1996), gender (e.g. Cooper, 1979; Eagly, Wood, & Fishbaugh, 1981) or age (e.g. Costanzo & Shaw, 1966; Pasupathi, 1997, 1999; Walker, & Andrade, 1996) on conformity. This study suggested that in collectivistic cultures, younger people and women tend to show more conformity. Furthermore, research indicates that the degree of task difficulty influences conformity, with participants displaying less conformity when being confronted with an easy task (e.g. Baron, Vandello, & Brunsman, 1996).

Recently, however, a different issue regarding conformity has arisen. With the rise of the internet and new ways of more informal and non face-to-face communication, physical proximity is not as applicable anymore. Instead of meeting personally, more and more people communicate indirectly with each other via email, or social networks, among other methods (e.g. Guadagno, & Cialdini, 2003). Opinion polls previously conducted in person are now increasingly conducted online (e.g. Smith, 1997). Because of these new trends in non face

-to-face communication, it is important to investigate whether conformity is affected differently by physical versus psychological proximity. Some of the more recent studies indicate that conformity in computer-mediated communication contexts is indeed lower (Cinnirella & Green, 2007; Smilowitz, Compton, Flint, 1988). Overall, however, only few studies have considered the concept of conformity in non face-to face settings. Furthermore, research has found contradictory results about whether conformity is applicable at all in non face-to-face settings. While Cinnirella, & Green (2007) found that participants were influenced by others' opinions, Cilesiz & Ferdig's (2003) research on conformity in internet-based polls did not produce similar results. For these reasons further investigation of this topic is necessary. Therefore the purpose of this study is to test the phenomenon of psychological proximity. Two hypotheses are proposed: First, it is hypothesized that a person's individual judgment will be influenced by other peoples' opinions, even though the other people are not physically present. This suggests physical proximity has psychological effects on us. Second, it is expected that older people will display less conformity than younger people.

Method

Participants

The study included a total of 60 participants. Half of the sample included eighteen female and 12 male college students from a northeastern university ($N=30$). The mean age was 19.33 ($SD = 1.42$) with a range of 18 to 23. The ethnicity of participants was 24 Caucasian, 3 Hispanic, 2 Asian-American and 1 African-American. Students were recruited from Introduction to Psychology and Social Psychology classes. The investigators announced and explained the nature of the study in each class and then passed around sign-up sheets for students who were interested in participating.

All participants received extra credit in their respective classes. Extra credit is optional for all students and they receive credit for one of their courses. At any time they have the choice not to participate in extra credit and there are no alternatives.

The other half of the sample included 30 adults who are employed at the State of New Jersey Department of Human Services, Division of Developmental Disability. Approval for recruitment was obtained prior to the actual recruitment. Approval was given from the boss of the Department of Human Services. All participants volunteered and received no incentive for their participation. The mean age was 45.53 ($SD = 12.18$) with a range of 30 to 76. Twenty-two female and 12 male adults were recruited for this study. The ethnicity of participants was 25 Caucasian, 2 African-American, 2 Hispanic and 1 Asian-American.

Materials

The materials consisted of 16 pictures of paintings that were obtained from the Internet. Some of the paintings' artists were fairly well known, whereas others were not (see Table 1 for a few examples). We used a 9-point numerical rating scale. All participants were required to assess the quality of each painting. We chose a 9-point scale instead of a 3, 5, or 7-point scale, to provide enough differentiation in perception of a painting's quality. Furthermore, we believe that a 9-point scale was more suitable than a 10-point scale, because participants were given a true midpoint on the scale.

Procedure

We used a factorial design with two independent variables. The first of these was the condition the participants were in: experimental (receiving an average rating of each painting) versus control (receiving no average rating) condition. The second variable was the age of the participants: college students (age

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18-23) versus older adults (30+). The dependent variable was the rating of each individual painting as determined by the participant. The goal of the experiment was to measure the degree of conformity that participants would display. We reasoned that a person's rating of each painting would be influenced by the previous average rating of the painting. Thus, we believed that if the rating of a painting was similar to the average rating that individuals had received, the participant has displayed conformity as seen in Asch's study (1952). An example would be that if the average rating of a painting was 6.7 (*IV*), for instance, and participants gave the painting a rating of 6 (*DIV*), then it can be assumed that the individual was influenced by the average rating and conformed to it. Conformity was determined by the identical or similar rating of a painting by an individual compared to its average rating. Conformity was established, if the individual rating of a painting was within a 1.5 range of the average rating. The overall number of similar or identical ratings was totaled and then divided by the number of participants (see Table 3). To control for the possibility that individuals might give the paintings a similar rating by chance, we used a control group that did not receive an average rating. We used one control group for both age groups.

As mentioned earlier, previous research on conformity has also identified various confounding variables, such as age, gender and culture. We used two separate sample groups: college students and adults. College students were defined as 18-23 olds, and adults were at least 30 years old. We were also aware of the possibility that gender and/or culture might play a role in the degree of conformity. Unfortunately, due to time constraints and limited access to a more diverse population (the university only has a 25% minority student population), we were not able to control for these confounding variables.

Prior to the beginning of the experi-

ment, participants were asked to sign an informed consent form. Participants were told that they are taking part in a study that measures the degree of art knowledge in the general population. It was necessary to withhold the true nature of the study, because participants would most likely not display natural responses otherwise. Anonymity of each participant was guaranteed, as each person was assigned to a participation number at the beginning of the study. Consent forms were kept separate from this. After completing some demographic information, such as age, gender and ethnicity, participants were randomly assigned to either the experimental or control condition using even or odd numbers. Every even number was placed in the experimental condition and every odd number was placed in the control condition. This study was performed in a classroom with a few students participating at one time. Some participants completed this study alone, and some with others. Each participant was asked to rate the quality of the paintings according to their own belief/expertise. In doing so, participants had to use a 9-point numerical rating scale, with one indicating terrible quality and 9 indicating outstanding quality (see Table 2 for an example painting). Next to each painting, participants in the experimental group also received a rating of the painting. Participants were told that this was the average rating of the painting of previous participants. This number was fictional and made up by the instructors. Participants within the control group did not receive this rating. Before rating the actual paintings that were part of the study, the individuals were instructed to rate an example painting and asked to raise any questions that they were having. Afterward, all participants proceeded to rate 16 different paintings. At the end of the study, each participant received a full debriefing (regardless of his/her group condition) which revealed the true purpose of the study. All participants were then asked to sign a debriefing form.

Results

Results showed that college students conformed in 42% of the cases and that adults conformed in 46% of the cases, i.e. the mean score for conformity was 6.66 (*SD*=1.44) for students and 7.13 (*SD*=2.77) (see table 1 and

Overall, there were no statistically significant results found. Therefore, both hypotheses need to be rejected. There were however, statistically significant results found for specific paintings, e.g. painting 6, $F(1, 58) = 5.98, p = .018$ (see figure 1) and painting 10, $F(1, 58) = 4.093, p = 0.48$ (see figure 2).

Table 1

Counts:(# in each group within + 1.5 pts. of pseudo mean)

Means	College	Adult	Counts	College	Adult
Exp.	6.66	7.13	Exp.	42%	46%
Control	5.20	5.13	Control	32.5%	32%

2). In contrast, the control groups conformed in 32.5 % of the cases (college students) and 32% of the cases (adults), respectively, in the absence of a pseudo mean. The mean scores were 5.2 (*SD*=1.32) and 5.13 (*SD*=1.44); respectively.

Discussion

The purpose of the study was to measure the degree of conformity in non face-to-face settings. This was measured by asking people to rate a series of paintings presented on a 9-point numerical scale. Participants in this study performed a test in a test packet using pen and paper. Depending on their group condition, participants either received a fictional average rating of each painting prior to their own rating, or they did not. Conformity was operationalized as ratings within +1.5 pts. of the fictional rating. Furthermore, it was hypothesized that college students would conform more than adults. Neither hypothesis was supported. Data analysis, however, revealed statistically significant differences in ratings between the (rating/no rating group) for some paintings. This indicates that confounding variables might have played a role in this experiment and that a more careful selection of the paintings might have yielded different results.

Table 2

Confirmation Scores

Number of times each Individual conformed

Participant #	College Students	Adults
1	6	2
2	9	6
3	6	9
4	10	6
5	6	6
6	6	8
7	8	12
8	7	9
9	6	3
10	4	10
11	7	8
12	7	6
13	6	8
14	6	10
15	6	4

Furthermore, as mentioned before, task difficulty possibly influences conformity as well. Rating various paintings is a very easy task and no incentive for being right or wrong was given. This might be a reason why people

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displayed less conformity. Similarly, some individuals may not have put in their full effort while rating these paintings. Students and adults run busy lives. With a judgment task there is no right or wrong answer. This can give license to forgo an assignment, because it does not involve a consequence. This factor might have particularly influenced the college students group, because they received extra credit for their participation regardless of the way they chose to rate the paintings. Thus, this might be a possible explanation for the fact that adults actually conformed more than college students.

Moreover, art appreciation is subjective. Even though we stressed that people were required to rate the paintings in terms of quality, likeability of a painting might have still influenced a person's rating. Similarly, people might have had different definitions of quality, which in turn affected their rating.

Another aspect that should be considered is the fact that some of the ratings that were given to the individuals might have appeared to be too unlikely to be true. Therefore a painting that was of poor quality, yet received a fictional rating of 8 (high quality) for instance, might have raised suspicion in the participant and caused him/her to disregard the fictive rating.

Given these confounding variables, no decisive conclusion can be reached; therefore further research is crucial. Nevertheless, the study did reveal a degree of conformity in both college students and adults, which indicates that psychological proximity might affect conformity in a manner similar to physical proximity.

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Appendix 1

Examples of Paintings



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Appendix 2

Example of a painting with entire rating scale and average rating

Rating
3.3



1 2 3 4 5 6 7 8 9

Terrible Quality	Very Poor Quality	Poor Quality	Barely Acceptable Quality	Average Quality	Decent Quality	Good Quality	High Quality	Outstanding Quality
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Friendship Quality and Interparental Conflict as Predictors of Relationship Status

Andrea M. Phillips

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Abstract—*This study examined the importance of friendship quality and parental marital status on young adult romantic relationships. Eighty-three participants were surveyed about current relationship status, friendship quality, and observed interparental conflict. Results showed that there was a strong correlation between friendship quality and the length of participants' relationships. There was also a significant difference between males and females regarding how often they talk to their friends. Results also indicated that participants who report experiencing more interparental conflict growing up are likely to fight more often in their current relationships. The implications for parents understanding the impact of their own conflict on the later relationships of their children are discussed.*

The emotional spillover from an unhealthy romantic relationship can be destructive and unhealthy in other physical and emotional aspects of daily life (Shelton & Harold, 2008; Soons & Liefbroer, 2008). Why are some romantic relationships successful, where others fail? Parents are the first relationship for a child, and thus the first relationship model. There is an established association between interparental conflicts and maladjusted children (Larsen, Branje, van der Valk, & Meeus, 2007). As children reach adolescence, they begin to explore friendships and romantic relationships. Adolescent well-being is posi-

tively associated, while anxiety and aggression are negatively associated, with quality of friendship (Larsen, et al., 2007). To what degree is interparental conflict associated with the relationship status of the offspring? To what degree is friendship quality associated with relationship status?

Efficacy beliefs (Cui, Fincham, & Pasley, 2008) as well as individuation, defined as the social process in which individuals become differentiated from each other (Kruse & Walper, 2008), influence how one responds to conflict. Efficacy is an individual's belief in the ability to resolve conflict in intimate relationships. Securely individuated adolescents show high emotional autonomy and positive adjustment, and therefore have strong efficacy beliefs. Distinct patterns of individuation are a reflection of family structure and the quality of family dynamics (Kruse & Walper, 2008). Higher levels of conflict are associated with significantly higher levels of anxious attachment in romantic relationships (Rodriguis & Kitzmann, 2007). Considering the impact of divorce on childhood adjustment is not enough. Rather than only focusing on the end result of parent divorce, research is needed on the effects of interparent conflict (Cui, et al., 2008) as well as the child's perception of conflict (Larsen, et al., 2007).

Interparental conflict has been shown to be related to difficulty in romantic relationships among late adolescents (Rodriguis &

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Kitzmann, 2007). Some studies, such as Larsen, et al. (2007), show that friendships provide opportunities for disclosure, support and security, which allow for the effects of family conflicts to be decreased. On the other side, interparental conflict that is hostile or aggressive negatively affects the offspring. This can result in lower levels of play and lower friendship quality (Rodriguis & Kitzmann, 2007). It is recognized that adolescents need to be provided with the opportunity to develop social relationships outside of the immediate family system (Gorbett & Kruczek, 2008). This transition into adolescence is framed by how parents react to offspring striving for independence and autonomy. Young adulthood is a time marked by relational experimentation (Soons & Liefbroer, 2008) as well as increasing cognitive abilities (Kruse & Walper, 2008). Primary development tasks include forming romantic relationships (Soons & Liefbroer, 2008) and relying on peers and increasing independence from parents (Larsen, et al., 2007). Forming successful relationships that result in healthy marriages is an important marker of emotional well-being (Soons & Liefbroer, 2008).

Much research on the effects of divorce has been conducted on children and adolescents. Between the ages of 18 and 30, many young adults begin to have serious relationships, marry, and have children of their own. The goal of this study was to look at how parental marital status along with the quality of friendship among peers affects efficacy beliefs and relationship status of young adults.

It was expected that young adults who did not experience interparental conflict and who have quality friendships will be better able to form a long-term, healthy and intimate romantic relationship. The corollary to this hypothesis is that young adults who experienced and perceived high levels of interparental conflict, and who do not have strong friendships to rely on, are less likely to form long-

term, successful relationships with fewer relational conflicts.

Method

Participants

There were 91 participants. They self-selected into the study through Experimentrix, a web-based computer software program. All participants were students at Boise State University enrolled in general psychology. The ages of the participants ranged from 16 to 46 ($M = 20.75$, $SD = 4.57$). The results of this study were based on data from the eighty-three participants ranging in age from 18 to 30 ($M = 20.02$, $SD = 2.68$). Of the participants, 35 were male and 48 were female.

Materials

For this study, Boise State University general psychology students were surveyed. The survey was composed of questions generated for several studies being conducted simultaneously. Questions were posed about relationship quality, friendship quality and perceived interparental conflict. Survey questions were formed exclusively by the author and were pilot tested. Refer to Table 1 for the survey items used.

Procedure

The participants were surveyed in groups in large lecture halls. They were given 50 minutes to complete the survey. Participants were debriefed and thanked.

Results

I used SPSS software (Statistical Package for the Social Sciences) version 16.0.2 to analyze and test all collected data.

Descriptive Statistics

The means and standard deviations for all survey items are listed in Table 1. "What is the marital status of your parents" was an-

Table 1
Survey Items with Means and Standard Deviations

Items	<i>M</i>	<i>SD</i>
1. How often was there conflict between your parents before you were 18?	1.44	0.81
2. How often do you fight with your current partner? If single, how often did you fight in your last relationship?	1.12	0.82
3. How often do you confide in your friends about problems you have at home?	1.64	0.89
4. When my parents fought, it was violent or aggressive	2.03	1.31
5. I was negatively affected by conflict between my parents before I was 18	2.65	1.33
6. After I have talked to my friends about my problems, those problems do not seem as big	3.73	0.76
7. How long have you been with your current partner (in months)?	11.39	14.15
8. I am married or am in a long-term relationship (12 months or more)		

Notes. Only the answers for participants ranging in age from 18 to 30 were used. Items 1-3 were answered on a frequency scale from 0 = *never* to 3 = *always*. Items 4-6 were answered on an agreement scale from 1 = *strongly disagree* to 5 = *strongly agree*. Item 8 was answered on a dichotomous scale, with 72.3% no responses and 27.7% yes responses.

swered with 53.8% *married*, 7.5% *never married but together*, 8.8% *never married and separated*, 2.5% *married and separated*, and 27.5% *married and divorced*. There were 57.8% female participants and 42.2% male.

Question-by-Question Analysis

The first hypothesis was that young adults who did not experience interparental conflict will be more likely to have successful, long-term relationships.

When examining the effects of parental marital status on the item “how often do you fight with your current partner? If single, how often did you fight in your last relationship?” using a frequency scale of 0 = *never* to 3 = *always*, there was not a significant difference between participants whose parents are married (*M* =

1.14, *SD* = 0.91), never married but together (*M* = 0.60, *SD* = 0.55), never married but separated (*M* = 1.29, *SD* = 0.95), married and separated (*M* = 2.00, *SD* = 0.00), and married and divorced (*M* = 0.96, *SD* = 0.73) on frequency of fights, $F(4, 77) = 1.28$, n.s.

There was not a significant difference between participants whose parents are married (*M* = 17.74, *SD* = 24.01), never married but together (*M* = 9.33, *SD* = 10.03), never married but separated (*M* = 3.00, *SD* = 5.20), married and separated (*M* = 3.00, *SD* = 4.24), and married and divorced (*M* = 29.53, *SD* = 71.28) on the item “how long have you been with your current partner (in months),” $F(4, 52) = 0.50$, n.s.

There was not a significant relationship between the item “how often do you fight with

Interparental Conflict

Table 2

The Interaction of Items 5 and 6 on length of current relationship (in months)

Item 5	Strongly Disagree		Disagree		Neutral		Agree		Strongly Agree	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Item 6										
Strongly Disagree	0.00	0.00	24.00	0.00	15.00	20.10	5.25	4.99	12.00	11.53
Disagree	0.00	0.00	0.00	0.00	5.38	8.67	10.60	15.34	0.00	0.00
Neutral	0.00	0.00	0.00	0.00	5.00	0.00	16.67	7.79	0.00	0.00
Agree	0.00	0.00	0.00	0.00	9.75	10.05	6.56	9.13	24.00	31.11
Strongly Agree	0.00	0.00	0.00	0.00	0.00	0.00	2.50	2.12	60.00	0.00

Notes. Items 5 and 6 correspond to Item 5 “I was negatively affected by conflict between my parents before I was 18” and Item 6 “after I have talked to my friends about my problems, those problems do not seem as big” in Table 1. There is a significant interaction on the item “how long have you been with your current partner (in months),” $F(6, 38) = 2.78, p < .05$.

your current partner? or If single, how often did you fight in your last relationship?” and the item “I was negatively affected by conflict between my parents before I was 18,” $r(74) = 0.04, n.s.$

The second prediction was that participants who have friends to rely on will be more likely to have successful, long-term relationships. Using a frequency scale, there was a significant relationship between the item “how often do you confide in your friends about problems you have at home?” and the item “how often do you fight with your current partner? If single, how often did you fight in your last relationship,” $r(76) = 0.25, p < .05$.

On the item “how often was there conflict between your parents before you were 18,” there was a significant difference between participants who answered *never* ($M = 0.57, SD = 0.53$), *seldom* ($M = 1.53, SD = 0.68$), *often* ($M = 2.00, SD = 0.96$), and *always* ($M =$

2.13, $SD = 0.83$) on the item “how often do you confide in your friends about problems you have at home,” $F(3, 76) = 7.42, p < .05$. There was not a significant relationship between the item “when my parents fought it was violent or aggressive” and the item “How often do you confide in your friends about problems you have at home,” $r(77) = 0.21, n.s.$

Regarding the item “I was negatively affected by conflict between my parents before I was 18,” there was not a significant difference between participants who answered strongly disagree ($M = 12.00, SD = 13.93$), disagree ($M = 7.38, SD = 11.37$), neutral ($M = 13.13, SD = 9.39$), agree ($M = 9.73, SD = 13.19$) and strongly agree ($M = 21.67, SD = 33.23$) on the item “how long have you been with your current partner (in months),” $F(4, 38) = 0.97, n.s.$

On the item “after I have talked to my friends about my problems, those problems do

not seem as big,” there was a significant difference between participants who answered strongly disagree ($M = 0.00$, $SD = 0.00$), disagree ($M = 12.00$, $SD = 16.97$), neutral ($M = 9.00$, $SD = 12.71$), agree ($M = 9.15$, $SD = 10.10$), and strongly agree ($M = 24.00$, $SD = 24.34$) on the item “how long have you been with your current partner (in months),” $F(3, 38) = 3.81$, $p < .05$.

For the interaction between items “I was negatively affected by conflict between my parents before I was 18” and “after I have talked to my friends about my problems, those problems do not seem as big” on “how long have you been with your current partner (in months),” see Table 2.

There was not a significant relationship between the item “how often do you fight with your current partner? If single, how often did you fight in your last relationship?” and the item “when my parents fought, it was violent or aggressive,” $r(74) = 0.04$, n.s. There was not a significant relationship between the item “how often do you fight with your current partner? If single, how often did you fight in your last relationship?” and the item “what is the marital status of your parents,” $r(73) = 0.04$, n.s. There was a significant relationship between the item “how often do you fight with your current partner? If single, how often did you fight in your last relationship?” and the item “how often was there conflict between your parents before you were 18,” $r(74) = 0.26$, $p < .05$.

Although no gender differences were predicted, on a frequency scale there was a significant difference between males ($M = 1.18$, $SD = 0.72$) and females ($M = 1.64$, $SD = 0.82$) on the item “how often was there conflict between your parents before you were 18,” $t(79) = 2.64$, $p < .05$. There was also a significant difference between males ($M = 1.34$, $SD = 0.08$) and females ($M = 1.87$, $SD = 0.90$) on the item “How often do you confide in your

friends about problems you have at home,” $t(80) = 2.76$, $p < .05$.

Discussion

The overall goal of this study was to examine the association between relationship status and the quality of parents’ relationships among young adults. The two measurements of relationship quality are how often participants fight within their relationships and the length of the current relationship. There were not significant relationships between how often fights occur in participants’ current relationships and parents’ fights being violent, self-reporting being negatively affected by interparental conflict, or the current marital status of parents. However there was a strong correlation with how often the participants experienced interparental conflict and how often they reported fighting with their current partner. This indicates that the number of fights between parents was more important in shaping the child’s later romantic relationships than how severe the fights were. If a child is around parental fights, those fights are the strongest model a child has to base future relationships upon.

The secondary hypothesis was that friendship quality would also be a factor in length and quality of romantic relationships. When measuring quality of relationship in terms of how often participants fight with their partner, this hypothesis was supported in that there was a significant relationship between how often participants report confiding in their friends and how often they fought with their partners. When participants talked to their friends more, they fought with their partners less. Talking to friends acted as a mediator and took pressure off of the romantic relationship. Based on the item “after I have talked to my friends about my problems, those problems do not seem as big,” friendship quality was also related to length of relationship. Participants tended to report being with their partners

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for a longer period of time when they also answered *strongly agree*. It was also noteworthy that how often participants talk to their friends about problems at home was also related to how often they experienced interparental conflict, however it was not related to how violent or aggressive parental fights were.

There was a significant interaction between the items “I was negatively affected by conflict between my parents before I was 18” and “after I have talked to my friends about my problems, those problems do not seem as big” on the item “how long have you been with your current partner.” However, on length of relationship, there was not a significant difference between participants on the item “I was negatively affected by conflict between my parents before I was 18” when this item was considered alone. This finding refers back to the finding that how often parents fight has more impact than how severely they fight. The interaction found supports the findings of Larsen, et al (2007) whose research found that low friendship quality was a risk factor for adolescent adjustment because friendships can mediate the effects of high interparental conflict.

Although no gender differences were hypothesized, females were more likely to report experiencing interparental conflict before the age of 18. When this information is seen independently, it seems strange and surprising. However, females are also more likely to answer that they talk to their friends about problems at home. Males are more likely to rely on their partner for social support, and have fewer social resources than females. In addition, it seems that females benefit more from their social resources (Soons & Liebroer, 2008). I therefore speculate that females report more interparental conflict because they are used to talking about their problems and will therefore be more open about it on a survey.

Consistent with the findings of Cui, et al. (2008), parental marital status was strongly

correlated with the amount of interparental conflict and the severity of interparental conflict. Many studies look at offspring of divorced versus married children. Although divorce can be a marker of high levels of conflict, parents’ divorce alone should not be seen as the determining factor in the emotional well-being of the offspring. In fact, after divorce or separation, the frequency of conflict between parents should decline.

Within long-term romantic relationships, people will have disagreements with their partners and fight. While this cannot be avoided, if a couple has children, certain considerations need to be made. Parents need to choose a setting away from children in order to resolve conflict. If the couple does see a counselor, the counselor needs to stress this point and work with the couple to find strategies to do this.

Counselors can also be helpful in being a resource for children to talk to about their experience with interparental conflict. Although this will not act as a social resource in the strictest sense, the more children and adolescents are able to talk about their problems at home, the more prepared they will be to enter into their own relationships later. In many schools, there is only one counselor/psychologist for the entire school population. If there is an average of 20 students per class, and 3 classes per grade, an elementary school may have a counselor/student ratio of 1:300. It is impossible for the counselor to have sufficient time to talk to every child. Increasing the number of counselors per school could greatly mediate the effects of interparental conflict.

Over half of the participants came from traditional families with parents still married and living together. Within the sample, there was an even smaller sample of participants whose parents are divorced or separated. Future researchers should look at the differences in relationship quality of young adults whose

parents fought a lot but remained together, and young adults whose parents divorced. This was in contrast to comparing young adults whose parents are married or divorced. It will also be helpful to conduct a longitudinal study, following children of divorce through young adulthood.

My study not only addressed important issues, but also looked at an important age group that has rarely been addressed. In looking at the effects of divorce and interparental conflict, many studies look at the direct impact on children and adolescents. It is important to remember that those children will grow up and will have romantic relationships of their own. In addition, many studies to this point have looked at the severity of interparental conflict and the effects which divorce has on children. It is important to note that when raising children, constant bickering and having more fights is more harmful than infrequent fights, regardless of severity of the fights.

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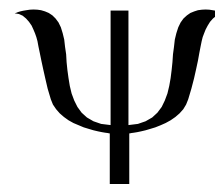
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Difficulty of Quitting Smoking-Emotion, Withdrawal Coping Failures, and Relapse

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Abstract—*This paper will examine emotions such as mood, depression, and anxiety to see what role they play in quitting cigarette smoking. Next, the paper looks at the quitting experience which includes coping failure, withdrawal symptoms, and relapse. Last, the paper examines gender differences in smoking behavior, as well as differences between mature adults and adolescents' smoking behavior. This is included to give a more in dept look at similarities and differences in the patterns of smoking across gender and age. The paper ends with a discussion on social group's ability to help people with their smoking addiction.*

Introduction

Cigarette smoking is dangerous. It is a health risk to the individual, as well as the most preventable cause of death and disability (Reid, Pipe, Riley, & Sorensen, 2009). The prevalence of cigarette smoking is high with smoker's worldwide (Reid et al., 2009). The question becomes why would people risk their health to smoke?

Several studies have been done on cigarette smoking and the battle people deal with when trying to quit smoking. Many of the studies have focused on key factors that hinder people who are trying to quit their smoking

habit. A key factor investigated is the emotional link the smoker has to cigarette smoking. These emotions can hinder the cigarette smoker's ability to quit.

Several factors that are considered part of the quitting experience of a cigarette smoker are coping failures, withdrawal symptoms, and relapse. Many of the studies that have been performed have these three concepts in common. Many smokers are hesitant to quit smoking because of the anticipated withdrawal symptoms. Other smokers are not only afraid of the anticipated withdrawal symptoms but, lack coping skills in order to deal with the withdrawal symptoms of nicotine. After successfully quitting, many smokers experience relapse, particularly during times of high stress.

These factors can interact in different ways in different groups of people. For example, difficulties that adolescents and women experience may be different than those experienced by more mature adults, and men. Social support groups can play a very important role in successful and long-term smoking cessation.

Effects of Mood, Depression/Anxiety on Quitting

There are typical psychological patterns that smoker's exhibit. These patterns will predict whether an individual will attempt to

quit smoking or not. A study performed by Zhou et al. (2009) compared individuals who have never made an attempt to quit smoking in the past to those who have. Findings showed individuals who quit smoking in the past were more likely and more willing to make another attempt to quit smoking. Those who never made the attempt to quit smoking were not as likely or willing (Zhou et al., 2009). These findings may suggest that those individuals who quit cigarette smoking in the past and subsequently relapsed were either more accepting of the thought of quitting or less afraid of withdrawal symptoms because of prior experience.

Several studies have shown a link between depression/anxiety and the severity of symptoms individuals may experience while trying to quit smoking (Hendricks et al., 2009). Most individuals who attempt to quit smoking experience withdrawal symptoms from lack of nicotine. Findings show that individuals with depression, depressive like symptoms, or anxiety have a more difficult time quitting smoking cigarettes than those who do not. In addition, those with depression, depressive like symptoms, and/or anxiety also tend to have worse, or imagine worse withdrawal symptoms than those without complicating depression or anxiety. Those with underlying depression and/or anxiety also experience greater and more variable mood swings while attempting to quit (Hendricks et al., 2009).

The Quitting Experience -withdrawal symptoms

Many individuals are reluctant to attempt to quit smoking because of their concern or fear of withdrawal symptoms. Anticipation of withdrawal symptoms may be linked to people's reluctance to attempt to quit smoking. This fear of withdrawal symptoms generally subsides for those who have already attempted to quit. The withdrawal symptoms are subjective as Copeland, Kulesza, and Hecht (2009) describes further. Their study found that people, who suffer from depression or depressive

like symptoms, also describe more intense symptoms related to mood after quitting smoking. Therefore, people who are depressed, or have depressive symptoms also experience more severe emotional instability during the quitting period. In addition, Copeland et al. (2009) also suggests that females report having more withdrawal distress than do males. Copeland et al. (2009) suggests that because of the perceived distress during quitting, those with depression are less likely to be successful at quitting than those who are not depressed.

In addition to depression some people develop anxiety regarding the anticipated severity of withdrawal symptoms. Hendricks, Wood, and Hall (2009) described this anticipated fear further in their group study. The study group described what they were expecting when they quit smoking. The results show that the majority of the group (73%) expected withdrawal symptoms to occur. 63% of the group also expected behavioral withdrawal when attempting to quit smoking. Behavioral withdrawal included relief of stress, and prevention of negative mood (Hendricks, Wood, & Hall, 2009). This suggests that individuals use smoking as their coping mechanism. This individual is at a disadvantage because they lack alternative coping skills. This perpetuates the addictive cycle that they are in.

The individual's perception of the risks of quitting smoking can also be enough to cause real, increased feelings of withdrawal symptoms. A study done by Weinberger, Krishnan-Sarin, Mazure, and McKee, (2008) found that individuals who sought out treatment but had high perceived risks associated with quitting smoking, actually report increased levels of withdrawal, depressive-like symptoms, and cravings (Weinberger et al., 2008). This shows expectancy. Perceived associations of the risks involved in quitting smoking seem to be a strong factor in the actual process of quitting. Also, as stated previously depressive-like symptoms can cause an in-

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crease in relapse as well as a shortened period of abstinence from smoking cigarettes.

The Quitting Experience-relapse

Part of the difficulty in quitting is the tendency for smokers to relapse. Zhou et al. (2009) found that people who had trouble sleeping as the result of nicotine withdrawal had a higher incidence of relapse than those who slept well after quitting. People who had depression and/or anxiety also experienced an increased rate of relapse (Zhou et al., 2009). Another variable that was introduced in Zhou et al. (2009) study was the individual's nicotine dependence. Individuals who had higher dependence on nicotine were not only less likely to quit than the individuals who did not have a high dependence on nicotine, but also had higher rates of relapse. This may suggest that the individuals with high nicotine dependency will also have more severe withdrawal symptoms. An individual's symptoms may be so severe, that he or she may give up and relapse. In addition, it seems that the more the withdrawal symptoms affect the individual's normal behaviors, the more likely the individual is to relapse. This suggests that people with complicating psychological issues could have co-morbidity with addiction. In the case of addiction to cigarette smoking, nicotine may help reduce some of the symptoms of depression and anxiety thus allowing the individual to feel better.

Anger issues also play an important role in the success of quitting and the incidence of relapse. A study done by Patterson, Kerrin, Willeyto, and Lerman, (2008) examined if increased anger after the cessation of cigarette smoking increased the likelihood of relapse (Patterson, Kerrin, Willeyto, & Lerman, 2008). Patterson et al. (2008) found that anger is shown to increase when the cessation of smoking occurs. This may suggest that nicotine has the ability to reduce anger. Patterson et al. (2008) also found that feeling increased an-

ger was associated with faster relapse. The increased anger was independent of other symptoms related to withdrawal from nicotine. Furthermore, individuals who felt an increase in anger after the first week of quitting smoking were significantly more likely to relapse than individuals who were not. These findings may suggest that the first few weeks of quitting cigarette smoking is crucial (Patterson et al., 2008). In addition, an increase of anger early in the treatment of cigarette smoking may be a predictor in early relapse. A program could be implemented on how to handle anger better in hopes to decrease anger and reduce that association with smoking.

Another study looked at a way to help people continue abstinence from cigarette smoking in a healthy way. Prochaska et al. (2008) looked at the effects that physical activity had on people who were trying to abstain from smoking (Prochaska et al., 2008). The study found that individuals who continued physical exercise and ceased smoking thought about not smoking less frequently than those who did not exercise (Prochaska et al., 2008). Also this suggests that physical activity encouraged and/or reminded people of a healthier lifestyle that did not include smoking. Prochaska et al., (2008) study also found that individuals, who continued physical activities such as walking, were more confident about being able to cease smoking. This was also seen with people who not only continued their physical activity, but increased it. In addition, physical activities can also help to minimize or eliminate symptoms related to nicotine dependency such as sleep problems and fatigue (Prochaska et al., 2008). This study suggests a positive way to help people who are addicted to smoking, to quit and to continue abstinence. It seems as if though people who become physically active have a greater chance of continuing abstinence from cigarette smoking. Additionally, it seems people who are participating in a physical activity feel they are being healthy. The positive feelings individuals give

themselves from being healthy in turns helps those people want to continue being pro-active about their health, which does not include the habit of cigarette smoking.

Smoking and Women

Addiction is a condition that can be encountered by men and women. Addiction is also a condition that seems to affect the two sexes differently. As stated previously, depressive mood can make it harder on the smoker to cease smoking. Women are at a disadvantage according to a study done by Copeland, Kulesza, and Hecht (2009). According to Copeland et al. (2009) smokers state a major cause for their habit is for mood management. For instance, smoking helps to reduce negative mood (Copeland et al., 2009). This suggests that people who smoke do so in order to deal with negative mood caused by depression, anxiety, or stress. However, smoking is an ineffective stress management tool in the long term to deal with emotions such as negative mood. Women have more difficulty quitting smoking. Women tend to have more mood fluctuations than men (Copeland et al., 2009). This can be attributed to having menstrual cycles which create hormonal fluctuations in the body. Hormonal fluctuations cause women to have more depressed mood than men. Furthermore, women report that they have greater withdrawal distress from cigarette smoking than do men (Copeland et al., 2009). Women having hormonal fluctuations related to depressed mood can create an uphill battle when trying to quit smoking.

In a study conducted by Addicott, Gray, and Todd (2009) women were induced in either elated mood or depressed mood condition. Moods were induced using the Velten Mood Induction Procedure (Addicott et al., 2009). This procedure consisted of the depressed mood condition group saying pessimistic statements. The elated mood group consisted of the member's stating optimistic statements (Addicott et al., 2009). This study

found that women who have dietary restraint, felt very confident about quitting smoking while in the elated mood condition. On the other hand, women who could control their food intake felt more temptation to smoke while in the depressed mood condition. Women who had very little dietary restraint when put in the elated mood condition had no impact on their confidence to abstain from smoking. Also, women with little dietary restraint in the depressed mood condition did not have an impact on their confidence to abstain from smoking (Addicott et al., 2009). This suggests that women, who have more control over their weight, feel as though they have more control over their smoking habit when in an elated mood. It seems as though women who have no control over their diet, also feel they have no control over their smoking habit despite being in an elated or depressed mood. Mood can be a major factor in the inability for women to stop smoking. It appears as though women use smoking as a way to not only manage mood, but also to manage weight.

In a study done by Reid, Pipe, Riley, and Sorensen (2009) women listed more reasons for smoking when compared to men. Also, women explained the use of smoking cigarettes as an appetite suppressant, more often than men (Reid et al., 2009). As seen in earlier studies, females seem to be using cigarette smoking as a way to control their weight. Why are women using cigarette smoking, a major health risk, and possible life time addiction as a way to control their weight? In addition, the Reid et al. (2009) study states when both females and males go to the doctor, the physician inquires about their smoking status. Although the doctor seems to be interested for the well being of the patient, only 39% of women and 26% of men said that their doctor actually provided help for their cigarette smoking habit. This is of concern in that so many physicians ask about the well being of their patients, yet so few actually provide treatment

Difficulty of Quitting Smoking

in order for the patients to quit smoking. Lastly, Reid et al. (2009) study found that women also use smoking more often than men, as a coping mechanism (Reid et al., 2009).

A possible solution for women who use cigarette smoking for an appetite suppressant is physical activity. As stated earlier, physical activity is related to confidence in the ability to continue to abstain from smoking, as well as a method to stay healthy. Women who use cigarette smoking in order to reduce their appetite could use this method instead of smoking to help them stay healthy as well as maintain their physical appearance.

Smoking and Adolescents

Many studies have been performed to examine the effects of quitting smoking on adults. Little has been researched in terms of the effect that smoking cigarettes has on adolescents. A study done by Bailey et al. (2009) examined withdrawal symptoms that occurred based on nicotine dependence in adolescents (Bailey et al., 2009). The researchers wanted to study adolescents because most individuals who smoke as young teens also continue to smoke into adulthood (Bailey et al., 2009). Bailey et al. (2009) found that nicotine dependence was a key variable in the severity of withdrawal symptoms. The test used to identify Nicotine withdrawal was the American Psychiatric Association 2002 criteria for Nicotine Withdrawal. The test administered to assess nicotine dependence was the Modified Fagerstrom Tolerance Questionnaire (Bailey et al., 2009). Adolescents who scored high on nicotine dependence, also experienced more severe withdrawal symptoms when compared to the adolescents who scored moderate to low. Additionally, anxiety and cravings were common withdrawal symptoms in young adults. Bailey et al. (2009) study found that when compared to adults, adolescents stated that cravings were their most difficult problem while trying to quit (Bailey et al., 2009). This

study suggests that adolescents have similar, but different withdrawal symptoms than do adults. Also, the higher the nicotine dependence, the more severe the withdrawal symptoms will be. This study could be used to examine treatment programs for adolescents. The treatment programs could incorporate nicotine dependency tests for the young adults. Knowing how severe the withdrawal symptoms will be, could help the staff take care of the patient better.

Social Support Groups

For many people, social support groups help the individual to do things that he/she could not do on their own. A study done by Carlson, Goodey, Bennett, Taenzer, and Koopmans (2002) examined not only the effects of social support groups for the cessation of smoking, but also examined gender differences in the social support groups (Carlson et al., 2002). Carlson et al. (2002) looked at individuals who got treatment and continued abstinence from smoking cigarettes. Post treatment was examined at three, six, and twelve month time intervals. Carlson et al., (2002) found that smokers, who had social support such as friends or family, had higher rates of continued cessation of smoking. At three months post treatment, men and women same sex groups; abstained from smoking with support (Carlson et al., 2002). Gender differences started to emerge at six months post-treatment. At six months data showed that men continued to succeed at abstaining from smoking, but women did not. This became apparent when there was no difference between the support group females and non-support group females in relation to abstinence from smoking post-treatment (Carlson et al., 2002). The data shows that there was no difference between females who had support, and the data from the women who did not. This suggests that females had a hard time long-term to stay abstinent from smoking. Perhaps females support groups became less supportive as the time

lapsed for their recovery.

A study done by Secker-Walker et al. (2000) seems to contradict the Carlson et al. (2002) study because the study indicated women could abstain from smoking long-term with support. In Secker-Walker et al. (2000) study they examined women who were between the ages of 18-64. They had particular interest in women of low-income, as well as women who were able to still have children. The study was then carried out for the next five years. The program consisted of several intervention methods such as telephone support from peers. The results of the study showed that after five years, there was an increase in women who stopped smoking cigarettes. In addition, there was a reduction in the prevalence of women who currently smoked as well. Women who were considered of particular interest because of the wide age range, and concentration of age to smoke (women who could bare children and of low-income) seemed to benefit particularly from the intervention. This group of women had higher rates of quitting cigarette smoking. The study had an impact on the community norms as well. After five years of the intervention in the two counties in Vermont and New Hampshire, the results showed that it was less acceptable to smoke in the intervention counties when compared to the non-intervention counties (Secker-Walker et al., 2002).

Coping and Smoking

Many studies have found that one of the difficulties in quitting smoking is the lack of coping skills. Individuals feeling negative emotions would rather smoke to relieve the stress than to deal with the emotion itself. A study done by Kennett, Morris, and Bangs (2006) examined coping mechanisms acquired by those who have successfully quit smoking (Kennett et al., 2006). Kennett et al., (2006) study found that people who never smoked, and people who were able to successfully quit

smoking are significantly more resourceful than people who were unsuccessful at quitting smoking. Also, people who were unsuccessful at quitting smoking found the cessation of smoking to be unimportant and were extrinsically motivated to quit (Kennett et al., 2006). These results suggest that having coping skills is a tool to enable individuals to quit smoking. Furthermore, having good coping skills is a way to prevent smoking to ever occur. In addition, it seems as though individuals who were successful at quitting smoking could be self motivated to do so, whereas those who were unsuccessful at quitting smoking expected to be motivated by others.

A study by Jannone and O'Connell (2007) also looked at coping strategies, but in adolescents who were trying to quit smoking. Jannone and O'Connell, (2007) found that students that had developed the ability to cope cognitively and behaviorally significantly helped those adolescents resist the urge to smoke. The data showed that the more common behavioral coping strategies used by the adolescences were keeping busy, avoiding certain situations, and chewing gum (Jannone & O'Connell, 2007). The commonly used cognitive coping strategies used by the adolescents were to think about smoking as negatively affecting their health. The findings of this study suggest that adolescents who develop or learn ways to cope such as behaviorally or cognitively, will be better equipped to resist the urge to smoke, or to start smoking. Also, in order to help adolescents to quit smoking a program could be set up in the school. Young adults who have developed coping skills and have been successful at quitting smoking could talk about their experience. This could include the skills they have acquired to help them to continue to abstain from smoking.

Conclusion

Smoking cigarettes is a behavior that can lead to addiction to nicotine. Cigarette

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smoking is wide spread from adolescents to adults, and both males and females engage in this harmful behavior. As seen in several of the studies cigarette smoking relapse is common. It is especially common in those who have anxiety, depression, or depressive like symptoms. These individuals use smoking as their tool to cope with their negative emotions. It is seen in individuals with anxiety, depression, or depressive-like symptoms, an increase in severity in withdrawal symptoms. Many smokers have and will relapse. It seems there are some predictive factors that increase the likelihood of relapse, such as anger. As seen in Patterson et al. (2008) study, increased anger seems to be a major predictive factor after the cessation of smoking. In addition, it seems as though the first few weeks of any program are the most critical to the smoker. The first few weeks of a program are when the most withdrawal symptoms are seen, and the more cravings are experienced by the smoker.

Many of the studies examined the perceived risks that people who wish to quit have. The more perceived risks, the more severe the withdrawal symptoms. Gender differences seem to be observed in one study, and contradicted in another. Women did not do as well as men in social support groups. However, women are and can be successful at community intervention groups when trying to quit smoking. Women overall seem to have more trouble with continued abstinence from cigarette smoking. Some of the issues related to women having a harder time than men with the cessation of smoking can be attributed to menstrual cycles. Menstrual cycles cause fluctuations in hormones in which impact mood, and as seen in previous studies depressive like symptoms and negative emotions can cause an increased chance of relapse. Thus, outlining a more complex pattern of smoking for women which include hormones, moods, and menstrual cycles.

Adolescent smokers should be looked

at and treated differently than adult smokers. Withdrawal symptoms are similar in many aspects when comparing adults and adolescents, but there are some main differences. A main factor of difficulty that adolescents have with quitting smoking cigarettes is the cravings.

One of the main solutions to the problem of smoking cigarettes is coping. Coping seems to be the solution for most people to be successful at quitting smoking, as well as to be successful at abstaining from smoking again. If all smokers learned coping skills, they may be able to use these skills to deal with negative emotions more effectively than smoking a cigarette. Also another helpful method is for smokers to be able to become intrinsically motivated to quit smoking, instead of extrinsically motivated.

Finally, physical exercise has helped motivate people to want to quit smoking, and has helped their confidence in wanting to continue to abstain from smoking. Physical exercise was seen to not only help women with using smoking as an appetite suppressant, but was also useful in men as well. Physical exercise enabled many smokers to feel healthier, and want to continue to be healthy by not smoking cigarettes. Although there are many people addicted to cigarette smoking, there are still many methods and ways to help them to finally quit.

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Hypermasculinity, the Media, and the Drive for Muscularity

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Abstract—*The effect of the media on body dissatisfaction and the drive for muscularity was studied. Forty eight male Central Connecticut State University students participated. Participants completed the Body Assessment (BA) (Lorenzen, Grieve, & Thomas, 2004), the Drive for Muscularity Scale (DMS) (McCreary & Sasse, 2000), and the Hypermasculinity Scale (Burk, Burkhart, & Sikorski, 2004) after viewing one of two conditions: a slideshow depicting images of muscular men, or no slideshow. Two, two way analyses of variance were performed to compare groups based on the degree of hypermasculinity (low, medium, or high), and slideshow condition on the scores on the BA and DMS. No significant differences were found across the slideshow condition. However, a significant difference was found showing less hypermasculine men had the greatest drive for muscularity. Awareness of this relationship may help to reduce body harming activities in the male population.*

from these types of self-evaluations. This type of thinking has led to a lack of research on the topic of male body image and the effect of that perceived image on self-esteem (Baird & Grieve, 2006).

It was thought that men used other avenues to judge their own worth. These other avenues include, but are not restricted to, type of occupation, income, and objects of worth obtained like vehicles. In recent years; however, there has been an increase in male anabolic steroid use, eating disorders, and muscle dysmorphia (Baird & Grieve, 2006). Body dissatisfaction is a likely contributor to these problems. Research done on body dissatisfaction for both males and females has typically focused on thinness, which has been shown to be inaccurate when discussing male body satisfaction (Schooler & Ward, 2006). In contrast, men are exposed to increasing pressure to be overly muscular, with enhanced biceps and broad shoulders. Therefore, men emphasize working towards increased weight gain rather than weight loss (Schooler & Ward, 2006). Because of this, anabolic steroid use and anorexia rates are comparable for boys and girls respectively during adolescence (Botta, 2003). Findings such as these shows the need for continued study on this topic to better understand the male perspective and better educate the general public on the effect the media is having on both biological sexes. The purpose of this study is to further support the claims that media is having a significant impact on the male population as it relates to body dissatisfaction

Many studies have been done on the impact of media on female body image and self-esteem. Almost unequivocally, the results of these studies have shown that the media consistently exposes women to the ideal thin female body (Baird & Grieve, 2006). Baird and Grieve (2006), contend that this ideal feminine body image is typically unattainable and contributes to women having a general dissatisfaction with their current body weight. Men have long been thought to be excused

and a desire to be more muscular.

Social comparison theory is used in this study to better understand how media impacts male body image. Festinger's (1954) social comparison theory states that individuals evaluate themselves based on comparisons made in society (Morrison, Morrison, & Hopkins, 2003). These social comparisons can trend either downward or upward on the dimension of interest. Downward trends are comparing oneself to others viewed as less well off and upward comparisons are comparing oneself to others viewed as more well off. Studies show that comparisons trending downward have a positive effect on how one perceives him/herself, and conversely, comparisons trending upward have a negative effect on how one perceives him/herself (Morrison et al. 2003). When discussing body image researchers focus on two types of targets: distant sources, such as actors and models referred to as universalistic, and more closely related sources of influence such as family and friends, referred to as particularistic (Morrison et al. 2003). For the purposes of this study we will be focusing on upward comparisons and universalistic sources.

When individuals compare themselves physically to unrealistic characters, the result is shown to be a negative body self-image (Morrison et al. 2003). Although many believe social comparison is less important than other standards, studies have shown that in many cases comparisons that are socially specific are equally or more important (Hobza, Walker, Yakushko, & Peugh, 2007). For example, Foddy and Crundall (1993) found that students who received their graded assignments were more concerned with how they scored in comparison to the class, rather than the objective information of their actual grade (Hobza et al. 2007). Therefore, individuals are relying just as heavily on social comparisons as they are on objective information when making personal self-assessments (Hobza et al. 2007).

In addition to social comparisons, a new trend established by McCreary and Sasse (2000) is called the drive for muscularity (Morrison et al. 2003). It is described by Morrison, Morrison, and Hopkins (2003) as possessing the need to acquire a muscular body type typically idealized in American culture. Findings have shown that exposure to the ideal male body on television has led to increased muscle dissatisfaction (Schooler & Ward, 2006). It has also been shown that readers of fitness and body magazines report body dissatisfaction (Schooler & Ward, 2006). This implies that there is a current trend for males to more frequently compare themselves to images in magazines and on television than in the past. These unrealistic images of male muscularity are not only seen in magazines and on television, but also in the toys of today's youth. For instance, if the popular action figure GI Joe were extrapolated to average human size the figure would be overtly muscular. GI Joe's muscle and physique today are just as unreachable for the average American male as the Barbie Doll is for females (Pope, Olivardia, Gruber, & Borowiecki, 1999).

Men's bodies are increasingly being used to sell common products that are completely unrelated to the body (Pope, Olivardia, Borowiecki, & Cohane, 2001). A study found that the number of undressed men in advertisements has dramatically increased over time, trending upward from 3% in all of the 1950's, to 35% in only one year of the 1990's (Pope, Olivardia, Borowiecki, & Cohane, 2001). In magazines where men are the focus, such as Playgirl Magazine, this trend stays consistent with the male centerfolds increasing in size and muscularity over time (Leit, Pope, & Gray, 2001). Men are now entering a realm that has been historically dominated by women, selling products through the use of physically appealing images.

Both body dissatisfaction and the drive for muscularity seem to be affected by the atti-

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tudes of contemporary western society. More frequently, men are being told that their bodies define them and they are increasingly viewing advertisements that focus on insecurities relating to the physical body (Duggan & McCreary, 2004). Men are told through different media outlets, (men's magazines, commercials, fitness programs, sexual enhancing drugs), that they are simply not good enough. This constant bombardment leads to an overall message that men need to forever improve themselves and can never be happy with the status quo (Duggan & McCreary, 2004). Because men are commonly conditioned to be strong and not complain about such feelings, they will commonly suffer without ever saying anything. This silence can lead to body harming activities such as steroid use or over exercise and support a false body self-image leading to body dissatisfaction (Duggan & McCreary, 2004). These attitudes of western society could be another possible cause as to why male body dissatisfaction remains hidden to the public at large. It also supports the social comparison theory as males are forced to compare themselves to the media hyped unrealistic image of men and interpret the comparative undertones within many products designed specifically for men.

To further evaluate the changing male perspective, another factor is analyzed. Burk, Burkhart, and Sikorski (2004) have defined hypermasculinity as, "a construct describing men who exhibit an exaggeration of the traditional male gender role, including characteristics such as supervaluation of competitive, aggressive activities and devaluation of cooperative, care taking activities" (p. 1). Those with high levels of hypermasculinity believe strongly in relying on oneself and place great importance on status when compared to others (Burk, Burkhart, & Sikorski, 2004). Women are typically not viewed as equals but rather sexual endeavors (Burk et al. 2004). Dangerous and dominating behavior is embraced and

normalized as a natural characteristic of the male gender (Burk et al. 2004). The hypermasculine male may be more prone to avoid emotional expression, limiting avenues of expression to anger and fear (Burk et al. 2004). An increasing trend in hypermasculinity may be another factor in body dissatisfaction and a drive for muscularity.

Previous research has aimed to prove that body dissatisfaction and the drive for muscularity are connected and affected by the ever evolving media. The value of a muscular body has increased and the attitudes towards body image satisfaction have decreased (Pope, Olivardia, Borowicke, & Cohane, 2001). Many theories could be used to explain this phenomenon; however, the present study focused on social comparison theory to explain both body dissatisfaction and a drive for muscularity (Festinger, 1954). This theory states that people compare themselves to those they perceive as better than themselves in society. The present study's purpose was to better understand body dissatisfaction, the drive for muscularity, and the effect of idealistic images of the male body typically found in today's media on these two constructs. This study also examined hypermasculinity as another possible factor contributing to body dissatisfaction and a drive for muscularity.

Research discussed earlier indicates that repeated exposure to images of idealized figures may affect body image. Therefore, body satisfaction and the desire to change one's physical appearance may be impacted by simple exposure to very muscled figures. Further, it is believed that hypermasculinity may also affect body satisfaction and a desire to be more muscular because of the inherent characteristics of the hypermasculine man. Hypermasculine men would be expected to place greater importance on being physically capable and consequently want to change their physical appearance, perhaps desiring to be more muscular.

Based on social comparison theory and research done on these topics, six hypotheses were drawn. It is hypothesized that men exposed to images depicting muscular men will have a lower drive for muscularity than men not exposed to such images. The second hypothesis states that men with a high degree of hypermasculinity will have a higher drive for muscularity than men with a low degree of hypermasculinity. The third hypothesis states that men low in hypermasculinity and exposed to images depicting muscular men will have a lower drive for muscularity. The fourth hypothesis states that men exposed to images depicting muscular men will have a more negative assessment of their body than men not exposed to images. The fifth hypothesis states that men with a high degree of hypermasculinity will have a more positive body assessment than those with a low degree of hypermasculinity. The sixth hypothesis states that men low in hypermasculinity who are exposed to images depicting muscular men will have a negative body assessment.

Method

Participants

Forty-eight men participated in this study. All participants were sampled from Central Connecticut State University. All students were in introduction to counseling or introduction to psychology classes and were at either the freshman or sophomore level. Thirty-two participants (79.1%) were twenty years of age or younger, and the remaining individuals were between the ages of twenty and twenty-eight (20.9%). Race of participants varied as: 62.8% (n = 27) European American, 9.3% (n = 4) African American, 7% (n = 3) Asian American, 4.7% (n = 2) Latino, 2.3% (n = 1) Biracial American, and 14% (n = 6) other. The majority of participants were freshman (n = 28, 65.1%). 25.6% (n = 11) were sophomores and 9.3% (n = 4) were at the junior level.

Materials/Measures

Demographics were obtained using a form attached to the survey. Age, ethnicity, class standing, and biological sex were assessed for each participant using the demographic questionnaire (see Appendix A).

Images

Nine images were obtained from various magazines and websites depicting men with broad shoulders, large muscles, toned physiques, and lean stomachs. These images were taken from such magazines as *Men's Health*, *Fitness*, and *Abercrombie and Fitch*. Images of celebrities and commercials or advertisements depicting muscular men were also used. Thirteen other images of various neutral objects were also used and randomly placed in the series of images shown (see Appendix C). An attempt was made to keep these images somewhat related but still remain neutral. For example, a picture of a muscled actor on a surfboard in the water was preceded and followed by images of things related to the water or beach.

Body Satisfaction

The Body Assessment (BA) (Lorenzen, Grieve, & Thomas, 2004), was used in this study. The assessment is a 25-item survey that assesses participant's attitudes towards various parts or aspects of their body. Examples of these items include weight, face, biceps, and abdominal muscles. The items are scored on a 5-point scale ranging from 1, (strongly negative) to 5, (strongly positive) (Lorenzen et al. 2004). The internal consistency of the measure ranged from .94 on the pretest to .95 on the administration of the posttest (Lorenzen et al. 2004). The BA was designed to measure overall body satisfaction. A high score on the BA indicates increased body satisfaction (Lorenzen, et al 2004) (see Appendix B).

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Drive For Muscularity

The Drive for Muscularity Scale (DMS) (McCreary & Sasse, 2000) is a 15 item self-report questionnaire that measures attitudes and behaviors associated with the desire to be more muscular (Mills & D'Alfonso, 2007). The participants were asked to read each question and circle the response that best applied to him/her. The response scale ranged from 1 (always), to 6 (never). Examples of the 15 questions in the scale are: "I wish that I were more muscular" and "I think my arms are not muscular enough" (McCreary & Sasse, 2000). Internal consistency was measured to show reliability. (McCreary, Sasse, Saucier, & Dorsch, 2004). This scale has been shown to possess good internal validity, convergent, and discriminative validity (Mills & D'Alfonso, 2007) (see Appendix D).

Hypermasculinity

The Auburn Differential Masculinity Inventory (ADMI) is a 60 item self-report measure used to assess a variety of characteristics associated with the construct of hypermasculinity (Burk, Burkhart, & Sikorski, 2004). The ADMI measure incorporates five scales. The internal consistency of the measure has been shown to be strong. (Burk et al. 2004). The ADMI has high internal reliability and good content and construct validity (Burk et al. 2004). A high score on the ADMI indicated increased hypermasculinity (Burk et al. 2004) (see Appendix E).

Procedure

All student participants were provided extra credit in their respective classes to participate in the study. Multiple time slots were available for participants to choose from. These time slots were randomly assigned to either be shown the slideshow depicting various images of muscular men or no slideshow. Informed consent was obtained from all participants. Informed consent forms were kept

separate from all data collected to protect confidentiality. The time slots (groups) shown the slideshow viewed the slideshow immediately following completion of the informed consent forms. The slideshow was shown via overhead projector. A total of twenty-two images were shown, nine images of muscular men and thirteen neutral images. These neutral images were included in the slideshow to attempt to control for demand characteristics. Each image was shown for exactly ten seconds. The slideshow in its entirety took three minutes and thirty seconds. Following completion of the slideshow each participant was given a packet containing a demographics questionnaire, the BA, the DMS, and the ADMI measures. These measures were randomly assorted within each packet. All participants were asked to fill out the measures completely. Groups that did not view the slideshow were given the packet of measures and simply asked to complete the measures fully. Participants were allowed to leave the testing room upon completion of the packet. The entire process took approximately fifteen minutes to complete.

The purpose of the Body Assessment was to determine male body dissatisfaction in two conditions; viewing no images and immediately following exposure to media depicting idealistic images of the male body. Responses to the 25 items were summed to produce a total score for body satisfaction. The highest possible score on the BA is 125 with a high score indicating increased body satisfaction. The purpose of the Drive for Muscularity Scale is to determine a desire to be more muscular. The highest possible score for the DMS is 90 with a low score indicating a increased drive for muscularity. All responses to the 15 item DMS were summed to calculate a total score. The ADMI was used to examine the degree of hypermasculinity among participants. Participants were grouped based on low, medium, or high hypermasculinity and this was determined using the 25/75 percentile calculation. It was

determined that participants with a hypermasculinity score of 0-71 were low in hypermasculinity, those with a score of 71-120 were medium in hypermasculinity, and those with a score of 120 or higher had a high degree of hypermasculinity.

Results

Two, two-way ANOVAs were conducted to analyze the data. The outcome measures being examined were the Body Assessment and the Drive for Muscularity Scale for each two-way ANOVA respectively. An analysis of the Body Assessment measure was conducted. In examining our main effect for slideshow, the mean BA score for viewed slideshow was 88.29 (SD = 12.92); the mean BA score for no slideshow was 88.27 (SD = 19.17). With alpha set .05, this difference was not statistically significant, $F(1, 37) = .068, p > .05$.

In examining our main effect for hypermasculinity, the mean BA score for low hypermasculinity was 84 (SD = 10.63); the mean BA score for medium hypermasculinity was 86.17 (SD = 16.29); and the mean BA score for high hypermasculinity was 96.18 (SD = 18.32). With alpha set at .05 this difference was not statistically significant, $F(2, 37) = 2.072, p > .05$.

The applicability of the main effect results in this study are not limited by the nature of the interaction effect observed. In short, a significant interaction effect was not observed, $F(2, 37) = .421, p > .05$.

An analysis of the Drive for Muscularity Scale was also conducted. In examining our main effect for slideshow, the mean DMS score for viewed slideshow was 58.81 (SD = 12.25); and the mean DMS score for no slideshow was 60.59 (SD = 14.67). With alpha set at .05, this difference was not statistically significant, $F(1, 37) = 1.134, p > .05$.

In examining our main effect for hypermasculinity, the mean DMS scores for low hypermasculinity was 68.11 (SD = 10.28); the mean DMS scores for medium hypermasculinity was 60.61 (SD = 12.37); and the mean DMS scores for high hypermasculinity was 51 (SD = 13.62). With alpha set at .05, this difference was statistically significant, $F(2, 37) = 4.693, p < .02$. The effect size based on eta squared was .202. Tukey post hoc testing revealed that those with low or medium hypermasculinity obtained a significantly higher drive for muscularity score than those with high hypermasculinity. Additionally, those with low hypermasculinity revealed a significantly higher drive for muscularity than those with medium hypermasculinity.

The applicability of main effect results in this study are not limited by the nature of the interaction effect observed. In short, a significant interaction effect was not observed, $F(2, 37) = .084, p > .05$.

A Pearson Product-Moment Correlation Coefficient was computed to assess the relationship between hypermasculinity, drive for muscularity and body assessment. One significant correlation was discovered between

Table 1

Hypermasculinity, Body Assessment, and Drive for Muscularity: Pearson Product Moment Correlations (N=43)

Measures	1	2	3
1. Hypermasculinity	-	.267	-.442**
2. Body Assessment	.267	-	.009
3. Muscularity	-.442**	.009	-

**p < .01

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ADMI scores and DMS scores (see Table 1). There was a negative correlation between the two variables, $r(41) = -.44, p < .004$. Overall there was a moderately strong negative correlation between hypermasculinity and a drive for muscularity. Those with high levels of hypermasculinity displayed less of a desire to be muscular.

Discussion

The purpose of this study was two fold. The first set of hypotheses focused on the drive for muscularity and if this construct is affected by the degree of hypermasculinity and/or viewing images that depict the muscular ideal male body common in today's society. The second set of hypotheses focused on body dissatisfaction and if it is affected by degree of hypermasculinity and/or viewing images that depict the same muscular male body. Analysis of the data reveals that neither a drive for muscularity nor body satisfaction is affected by simple viewing of images of muscular men. However, the data does show a relationship between hypermasculinity and a drive to be more muscular. It appears that individuals with a low or medium degree of hypermasculinity have a much stronger desire to be more muscular than individuals with a high degree of hypermasculinity. This supports existing research on this topic. Hypermasculinity is partially characterized by the traditional male role being emphasized (Burk, Burkhart, & Sikorski, 2004). It also includes a heavy dominance on interpersonal issues leading to a possible lack of valid self-judgments (Burk et al. 2004). These characteristics of the hypermasculine man could lead to inaccurate positive self-evaluations, and contribute to a much weaker desire to be more muscular than the individual is at present. Conversely, an individual with low hypermasculinity may be more honest about his own assessment of the body, contributing to a much stronger desire to be more muscular. Of course, the most obvious explanation for the cause of this phenomenon is that men with

higher degrees of hypermasculinity put more emphasis on physical attractiveness and typically male oriented activities than those with mid or low levels of hypermasculinity. This may lead to these individuals engaging in more sport like activities, such as weight lifting, therefore contributing to a more muscled body in general. In short, individuals high in hypermasculinity do not have a strong drive to be more muscular because these individuals have already achieved a muscular physique and are satisfied with their bodies in their present condition. However, this explanation seems unlikely since correlation analysis revealed no significant relationship between ADMI scores and BA scores. This result seems to suggest that hypermasculinity is a more cognitive phenomenon and has less to do with physical characteristics. Men with high levels of hypermasculinity may inherently think differently than the rest of the male population. Hypermasculinity may have less to do with factors relating to physical appearance. After all, it may be that the most 'macho' of men are the most disinterested in tailoring their physical appearance as they may interpret these types of acts to be characteristics associated with femininity. Research suggests that hypermasculine men tend to avoid that which they perceive as feminine (Blashill & Powlishta, 2009). This may also help to explain why men typically identified as hypermasculine drastically vary in physical appearance. Popular icons like John Wayne, Kid Rock, and Arnold Schwarzenegger may all be considered hypermasculine; however, all vary considerably in physical appearance. Future research should focus more on environmental factors that contribute to a hypermasculine cognitive set.

There are number of limitations to the present study. The most glaring is the size of the sample. With only forty-three viable participants, the study was very limited in its ability to get a representative sample and therefore be able to generalize to the whole population.

This small sample size also increases the possibility that intact groups are being tested. Participants chose the time from the various time slots offered. Therefore, all participants that sign up for certain time periods may have something in common, making random sampling impossible in this study. A larger sample needs to be examined to increase external validity. The small sample size may have contributed to a lack of statistically significant findings on the Body Assessment measure. Previous research has shown that body dissatisfaction does increase immediately following exposure to images of muscular men (Baird & Grieve, 2006). Although the descriptive statistics of this study support this, the difference between groups was not significant enough to say with any certainty that the current study supports that previous investigation. The use of a college population is also a severe limitation. The majority of participants were under the age of twenty. The ages represented in the sample do not represent the much broader age ranges that exist in the United States population currently.

Numerous steps were taken to control for demand characteristics. The order of the measures contained in each packet provided to participants was randomly determined, reducing the possibility that individuals would surmise the true intentions of the measures. Also, the muscular images the participants viewed via slideshow were mixed with neutral images so the intent of the slideshow would not be so blatant. An attempt was made to keep the neutral images somewhat related following and preceding images of muscular men. Future research should aim to ensure that neutral images are more closely related, or have a singular category. Despite steps taken to control for demand characteristics, it is unknown whether these disruption effects took place and effected final results.

In summary, previous research has shown that being dissatisfied with one's body and de-

siring a different body shape is no longer a problem reserved for women. As the body dissatisfaction in men continues to increase, one could predict that rates of muscle dysmorphia and other disorders related to body image will increase accordingly. However, currently the pressures on women to achieve the ideal body seem to still be greater than the pressures on men. There is still more variety of body sizes and shapes, large and small, in media as it pertains to men. Many current TV programs still depict and average or overweight lead male character with a very slim woman (Schooler & Ward, 2006). This implies that men do not need to be fit, muscular, and handsome to be with a woman who may fit the slender ideal body image of the female in our society. Whether this is at all a representation of reality is unknown and may be a moot point. However, this may allow men the opportunity to make positive social comparisons with figures in the media that do not depict the ideal male body image. Therefore, this makes body shape and size a less important characteristic of comparison (Schooler & Ward, 2006).

In this study the construct of hypermasculinity was shown to be a factor in one's desire to be more muscular. Previous research has studied hypermasculinity on various issues relating to sexual aggression, views on women, and violence (Burk et al. 2004). It appears that this construct will continue to be examined and be a contributing factor in male perceptions and behavior. The current study indicates that there is a relationship between hypermasculinity and a desire to be more muscular. The value of this research reveals the need for further exploring the relationship that exists, using multiple measures across varying contexts.

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Appendix A

Demographic Questionnaire

What is your age in years? _____

What is your biological sex?

a) Male _____

b) Female _____

What is your ethnicity?

a) European American

b) African American

c) Latino American

d) Asian American

e) Biracial American

f) Other

What is your class standing?

a) Freshman

b) Sophomore

c) Junior

d) Senior

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Appendix B

Slideshow Images

- 1) Scenic photograph of rolling New England hills in mid summer.
- 2) Photograph of sailboats in the ocean on a sun filled day.
- 3) Photograph of a popular actor on a surfboard in the ocean. He is shirtless with a muscled physique.
- 4) Photograph of the sun setting over the ocean. Taken from an ocean bay during the summer months in Massachusetts.
- 5) Close up photograph of old water buoys.
- 6) Photograph of a shirtless man with a toned and muscled upper body. Dog tags hang from around his neck and he holds headphones in one hand. He is wearing jeans and the photograph is taken from approximately the knee up.
- 7) Advertisement for Levis jeans. Image of five individual's lower half, from the belt down, all wearing jeans.
- 8) A photo used in a popular clothing store advertisement in the United States. This image is of a shirtless man with a very toned and muscled physique. The image is cut off at the head and again at the waste, only showing the midsection of the body and a very small portion of the jeans he is wearing. The advertisement is for the jeans.
- 9) Photograph of a crowded New York City street. The photo is taken at street level at night.
- 10) Photograph of three pairs of men's boxer brief underwear. They are placed in a triangular pattern with each slightly touching each other. This was used as an advertisement for the underwear.
- 11) Photograph of a man in only his brief underwear. The man has a very muscled and toned physique. The photograph is an advertisement for Calvin Klein underwear.
- 12) Photograph of many pairs of boxer style underwear laid out on the floor. The underwear are of different brands and colors.
- 13) Split image of a well-known actor in the popular Batman movies. On one side of the image is a photograph of the actor with his shirt off in a tanning bed. He is muscled and toned. The other side of the image is the actor in his Batman suit, standing atop a crumbling building.
- 14) The cover page of Fine Woodworking magazine. There is a cabinet with the drawers pulled out on the cover.
- 15) The cover of Rolling Stone magazine from December 1998. The cover is of a popular actor with his shirt open, revealing a toned and muscle chest.
- 16) The cover of Sport Illustrated Kid's Edition magazine. The cover is of the popular video game Mario Brothers, with Mario catching a baseball.
- 17) An advertisement for a popular clothing store in the United States. The image is of a young man with a long sleeve shirt on. The shirt is unbuttoned and completely open. The man's chest and stomach are toned and very muscular. He wears a beaded necklace around his neck.
- 18) Photograph of a new Audi automobile. The car is navy blue and located in a showroom.
- 19) Poster of the 2009 movie GI Joe Rise of Cobra. It is a photograph of the main character holding a gun and wearing skin-tight body armor. He is very muscular and the image is in black and white.
- 20) Photograph of the Diamond Exchange sign in New York City. Photograph taken at night with the sign lit up in red and orange color.
- 21) The cover of Muscle and Fitness magazine. The cover image is of an overly muscular man with his shirt off holding an egg.
- 22) Photograph of a rock structure on the shore of New England. The words "Keep Out" are written with white spray paint on the brown colored rock formation. The words can barely be read and are partially rubbed off.

Appendix C

Body Assessment

Please rate the following areas on a scale of 1 (strongly negative) to 5 (strongly positive).

- 1) Weight _____
- 2) Face _____
- 3) Body shape _____
- 4) Thighs _____
- 5) Upper body strength _____
- 6) Waist _____
- 7) Reflexes _____
- 8) Health _____
- 9) Shoulders _____
- 10) Physical stamina _____
- 11) Agility _____
- 12) Biceps _____
- 13) Lower body strength _____
- 14) Chest _____
- 15) Chin _____
- 16) Energy Level _____
- 17) Body build _____
- 18) Physical coordination _____
- 19) Buttocks _____
- 20) Calves _____
- 21) Stomach _____
- 22) Physical condition _____
- 23) Triceps _____
- 24) Abdominal muscles _____
- 25) Legs _____

Hypermascularity, Muscularity & the Male

Appendix D

Drive for Muscularity Scale

Please read each item carefully then, for each one, circle the number that best applies to you.

	1	2	3	4	5	6
	Always	Very often	Often	Sometimes	Rarely	Never
1) I wish I were more muscular.						1 2 3 4 5 6
2) I lift weights to build muscle.						1 2 3 4 5 6
3) I use protein or energy supplements.						1 2 3 4 5 6
4) I drink weight gain or protein shakes.						1 2 3 4 5 6
5) I try to consume as many calories as I can in a day.						1 2 3 4 5 6
6) I feel guilty if I miss a weight training session.						1 2 3 4 5 6
7) I think I would feel more confident if I had more muscle mass.						1 2 3 4 5 6
8) Other people think I work out with weights too often.						1 2 3 4 5 6
9) I think that I would look better if I gained 10 pounds in bulk.						1 2 3 4 5 6
10) I think about taking anabolic steroids.						1 2 3 4 5 6
11) I think that I would feel stronger if I gained a little more muscle mass.						1 2 3 4 5 6
12) I think that my weight training schedule interferes with other aspects of my life.						1 2 3 4 5 6
13) I think my arms are not muscular enough.						1 2 3 4 5 6
14) I think that my chest is not muscular enough.						1 2 3 4 5 6
15) I think that my legs are not muscular enough.						1 2 3 4 5 6

Appendix E

Hypermasculinity Scale

1	2	3	4	5
Very much like me	Like me	A little like me	Not much like me	Not at all like me

The following statements describe certain beliefs. Please read each item carefully and decide how well it describes you. Rate each on the scale shown above.

- 1) If another man made a pass at my girlfriend/wife, I would tell him off. _____
- 2) I believe sometimes you've got to fight or people will walk all over you. _____
- 3) I think women should date one man. _____
- 4) I think men who show their emotions frequently are sissies. _____
- 5) I think men who show they are afraid are weak. _____
- 6) I think men who cry are weak. _____
- 7) I don't get mad, I get even. _____
- 8) Even if I was afraid, I would never admit it. _____
- 9) I consider men superior to women in intellect. _____
- 10) I think women who say they are feminists are just trying to be like men. _____
- 11) I think women who are too independent need to be knocked down a peg or two. _____
- 12) I don't feel guilty for long when I cheat on my girlfriend/wife. _____
- 13) I know feminists want to be like men because men are better than women. _____
- 14) Women, generally, are not as smart as men. _____
- 15) My attitude regarding casual sex is "the more the better." _____
- 16) I would never forgive my wife if she was unfaithful. _____
- 17) There are two kinds of women: the kind I date and the kind I would marry. _____
- 18) I like to tell stories of my sexual experiences to my male friends. _____
- 19) I think it's okay for men to be a little rough during sex. _____
- 20) If a women struggles while we are having sex, it makes me feel strong _____
- 21) I am my own master; no one tells me what to do. _____
- 22) I try to avoid physical conflict. _____
- 23) If someone challenges me, I let him see my anger. _____
- 24) I wouldn't have sex with a women who had been drinking. _____
- 25) Sometimes I have to threaten people to make them do what they should. _____
- 26) Many men are not as tough as me. _____
- 27) I value power over other people. _____

Hypermasculinity, Muscularity & the Male

Appendix E (cont.)

- 28) If a women puts up a fight while we are having sex, it make the sex more exciting. _____
- 29) I don't mind using verbal or physical threats to get what I want. _____
- 30) I think it is worse for a women to be sexually unfaithful than for a man to be unfaithful. _____
- 31) I think it's okay for teenage boys to have sex. _____
- 32) I like to be in control of social situations. _____
- 33) I prefer to watch contact sports like football or boxing. _____
- 34) If I had a son I'd be sure to show him what a real man should do. _____
- 35) If a woman thinks she's better than me, I'll show her. _____
- 36) I notice women most for their physical characteristics like their breasts or body shape _____
- 37) I think it's okay for men to date more than one woman. _____
- 38) I sometimes feel afraid. _____
- 39) I think men who stay home to take care of their children are just as weak as women. _____
- 40) I'd rather stay home and watch a movie than go our to a bar. _____
- 41) I like to brag about my sexual conquests to my friends. _____
- 42) When something bad happens to me I feel sad. _____
- 43) I can date many women at the same time without commitment. _____
- 44) I don't mind using physical violence to defend what I have. _____
- 45) I think men should be generally aggressive in their behavior. _____
- 46) I would initiate a fight if someone threatened me. _____
- 47) Women need men to help them make up their minds. _____
- 48) If some guy tries to make me look like a fool, I'll get him back. _____
- 49) I consider myself quite superior to most other men. _____
- 45) I get mad when something bad happens to me. _____
- 51) I want the woman I marry to be pure. _____
- 52) I like to be the boss. _____
- 53) I like to think about the men I've beaten in physical fights. _____
- 54) I would fight to defend myself if the other person threw the first punch. _____
- 55) If another man made a pass at my girlfriend/wife, I would want to beat him up. _____
- 56) Sometimes I have to threaten people to make them do what I want. _____
- 57) I think it's okay to have sex with a woman who is drunk. _____
- 58) If I exercise, I play a real sport like football or weight lifting. _____
- 59) I feel it is unfair for a woman to start something sexual but refuse to go through with it. _____
- 60) I often get mad. _____

Are We Killing Creativity in the College Undergraduate Student?

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Abstract—*The present study investigated whether there is a need for more creative thinking within the college undergraduate's courses as well as whether creativity is being suppressed throughout an undergraduate's college experience. Specifically, 339 students from the University of North Carolina at Charlotte consisting of freshmen, sophomores, juniors, and seniors who also met the criteria of being in the arts, education, the sciences, or business concentrations, were tested for creative thinking via a questionnaire and the Abbreviated Torrance Test for Adults (ATTA) (Goff & Torrance, 2002). The present study compared later year students (i.e. juniors and seniors) scores on the ATTA to earlier year students (i.e. freshmen and sophomores) to evaluate whether creative thinking decreases throughout the undergraduates' college experience. Results showed that juniors and seniors actually scored higher than freshmen and sophomores. Furthermore, the present study also examined whether the business and science concentrations when compared to the education and art concentrations would yield results consistent with previous research findings that both the business and science concentrations typically score lower on creativity tests than education and art concentrations. Results were inconclusive on whether business and science concentrations score any lower than education and art concentrations on the ATTA.*

Creativity appears to be a very muddled concept when defining its parameters in research. However, regardless of its definition in the research world, humans appear to utilize creativity in a variety of ways and it also seems to be an advantageous tool for our own advancement in the real world that we live in. From technology to Education, Business to the Sciences, and even from math to the Arts, creativity creeps into our lives and allows us to expand on the simplest yet also the most complex areas of our human existence.

With creativity seen as such an important human factor, it is no wonder why it has been studied and researched for centuries. Over the last few decades, there appears to have been a boost in the research and studies on how to integrate creativity into the academic world. One of the leading advocates for this push was renowned creativity expert Ellis Paul Torrance. He believed that, "creative thinking and learning involve[s] such abilities as evaluation (especially the ability to sense problems, inconsistencies, and missing elements); divergent production (e.g., fluency, flexibility, originality, and elaboration); and redefinition", which all seem to be crucial elements for the creative individual (Torrance & Goff, 1999, p. 1).

Although Torrance advocated for a push in both researching creativity and integrating creativity within the academic world, research-

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ers and educators still believe that adults, teachers, and school systems alike are “killing” or suppressing creativity within the student by the way of standardized testing and offering few courses that actually promote creative thought. The majority of these researchers and educators have primarily focused their beliefs on students in elementary school, middle school, and high school (Baer, 1996; Fasko, 2001; Kaila, 2005). But what about the college undergraduate student? Is this “creativity killing” phenomenon also occurring in the undergraduate college realm?

Due to the reality that most college undergraduates are either a step away from entering graduate school or the job market, one could almost argue that an undergraduate student would need to possess creative thinking as much or more than other skills. Sir Ken Robinson (2006) a creativity expert and creativity advocate, picks up this argument by explaining that the value of academic skills is on a decline, which is placing many companies into a recruiting bind. Robinson elaborates on this problem by explaining that creative thinking is not being taught enough within the classrooms, which in return produces college graduates that cannot communicate, work in teams or think creatively. Furthermore, Robinson claims that the educational systems were not built around the promotion of creativity but rather for conformity, which is one of the reasons why classrooms currently lack a high level of stimulating creative thought. Due to this reasoning, Robinson calls for a drastic change in the structure of the educational systems and advocates for more integration of creativity through both teaching and courses that provoke and implement creative thinking within the student psyche.

The student-creativity relationship has been examined through various research studies; however, many of these studies do not focus on the question at hand: ‘Does such a drastic change really need to occur within the col-

lege undergraduate realm?’. Most of the past student-creativity research has centered around gender and creativity correlations (Keller, Lavish & Brown, 2007; Abra, 1991; Kaufman, 2006), intelligence and creativity correlations (Schlicht et al, 1968; Zdep, 1966; Doherty & Carsini, 1976), and comparisons of specific academic majors and creativity (Eisenman, 1969; Webster and Walker, 1981; Cheung, Rudowicz, Yue, & Kwan, 2003; Charyton and Snelbecker, 2007). In all, very few studies have investigated whether or not creativity declines or strengthens during the course of an undergraduate’s college experience (Cheung et al, 2003). The present study examined whether this phenomenon of a decline in creative thinking is actually occurring byway of a comparison and analysis of creativity scores among students from four different years and four different concentrations within the undergraduate college school system.

A study by Eisenman (1969) examined and compared creativity scores of two different majors: Business versus English majors. In addition, the researcher of this study went a step further by proposing that particular majors themselves may attract a certain kind of student. In the case of this study, the researchers proposed that those majors found within the english domain would attract students that would normally score higher on creativity tests while those majors within the Business domain will attract students who would normally score lower on creativity tests (Eisenman, 1969). The researcher measured creativity scores from English and Business majors at Temple University, with two different creativity tests (Eisenman, 1969). The first test asked students to come up with unusual uses for common objects while the second was a “30-item paper-and-pencil personality measure of creativity” (Eisenman, 1969, p. 393). The results of the study concluded that the English majors were more creatively inclined than the Business students. Then the researcher compared

the 48 students to a previous normative sample of 229 undergraduate students (Eisenman, 1969). Results of this study concluded that the 20 English majors still had higher creativity scores than the 229 while the Business majors displayed creativity scores lower than the 229 sampled (Eisenman, 1969). With this second comparison, the researcher added more strength to the proposed idea that particular majors may attract more creative students. The Eisenman (1969) study has been considered for the proposed research study due to this idea that particular majors may act like a creativity magnet, pulling in those students who are already inclined to think creatively.

Another group of researchers, Charyton and Snelbecker (2007), compared creativity scores of students in two different majors, engineering and music majors. This study is significant because the researchers used different kinds of creativity tests to examine how music and engineering students think creatively. The researchers tested one hundred music and 105 engineering students with three different kinds of creativity tests, which included the Creative personality scale (CPS), the Creative temperament scale (CT), the Cognitive risk tolerance survey (CRT), the Harmonic improvisation readiness record (HIRR), and Purdue creativity test (Charyton & Snelbecker, 2007). The first batch of tests, the CPS, the CT, and the CRT, measured the 205 students overall general creativity, a second set of tests, the HIRR, measured for the participants music creativity, and finally the third group of tests, the Purdue creativity test measured for the students engineering creativity. Results concluded that musicians scored higher in both general and artistic creativity yet had no significant differences in the scientific creativity tests. The results of this study demonstrated that creativity tests may cater to a particular major thus one should use caution when choosing creativity tests when testing students from different majors. The present study has taken this into consid-

eration by finding a more universally general and major-neutral creativity test.

Cheung, Rudowicz, Yue, and Kwan's (2003) examined how the field and year of study impacted the creativity scores of the university student. This study and the present study coincide in the way that the researchers are testing how the undergraduate student from different majors and years score on creativity tests. However, the present study differs from the Cheung et al (2003) study in many ways. The Cheung et al (2003) study used a series of surveys and a combination of general creative tests and self-made creative tests to assess and analyze a student's measure of creativity, academic achievement, educational characteristics (i.e., years, field, & level of study), background characteristics, and situational factors (i.e., motivation) (Cheung et al, 2003). The researchers measured creativity through three areas: verbal divergent production, a creative personality traits list, and self-reported creative products (Cheung et al, 2003). The researchers' verbal divergent production test included five measures of divergent thinking: verbal fluency, flexibility, novelty, innovativeness, and originality (Cheung et al, 2003). The creative personality traits list and the self-reported creative products task were both developed by the researchers and evidence for reliability and validity were not provided.

Unfortunately the concern for the validity in the tests and other choices of data collection did not stop at these self-made creativity tests. To measure the participants overall situational factors, the researchers asked the single following question, "How highly motivated were you to complete this questionnaire?" to which participants were then given a five point scale rating to choose from (Cheung et al, 2003). It would seem that question at the most could measure only how motivated a student may be to take the particular test that the researchers gave and not the students' "situational factors". The results from the

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Cheung et al (2003) study concluded that they have support for lower creativity for third year students but upon further analysis of their data, third years did not score the highest but second years did on one of the measures and first years on another (Cheung et al, 2003). This is not strong support for their hypothesis and they seemed to not have looked at the possible interaction effects between year and type of field or major.

Overall the Cheung et al (2003) study was weak in their use of measurements and data collection as well as in reporting their results. With this study and the aforementioned research studies in mind, the following study examined Sir Ken Robinson's concern to whether or not creativity is being "killed off" within the college school system. To test this concern, the present study compared student's creativity scores from freshman, sophomore, junior, and senior years. In addition, this study compared student's creativity test scores from the following four academic concentrations: Business, the Sciences, the Arts and Education. On the basis of very limited prior work (Eisenman, 1969; Charyton & Snelbecker, 2007; Cheung, Rudowicz, Yue, & Kwan, 2003), it is expected that, earlier year college

undergraduate students (i.e. freshmen and sophomores) will score higher on creativity tests than latter year students (i.e. juniors and seniors) and that Education and the Arts majors will score higher on creativity tests than the Sciences and Business majors.

Method

Participants

Data was collected from 339 undergraduate students at the University of North Carolina at Charlotte. Out of the 339 students tested, 27.14 percent ($N = 92$) were males and 72.86 percent ($N = 247$) were females. See Table 1 for a complete break down of the number of students by the four different concentrations and years in school. Gender was not examined any further due to a lack of a main effect or significant interactions for creativity index scores, $F < 1$. Out of 339 students, 337 students gave their age. Of those 337, the mean age was 21 (range 18 – 44). Yet there were no significant correlations for age and creativity index scores ($r(336) = .036, p = .51$).

Type of school was not examined because of the overwhelming number of students were from public schools: out of the 339 students tested, 86.4 percent ($N = 293$) students

Table 1

*Concentration * Year in school Crosstabulation*

Concentrations	Years in school				Overall
	Freshmen	Sophomores	Juniors	Seniors	
Business	10	21	5	7	43
Arts	13	8	7	13	41
Science	57	45	41	66	209
Education	16	6	20	4	46
Overall	96	80	73	90	339

Note. This is the breakdown of undergraduate student participants by years in school and concentrations where each value represents the number of students tested.

had attended a public high school, 0.3 percent ($N = 1$) attended a charter school, 1.5 percent ($N = 5$) attended a magnet school, 0.3 percent ($N = 1$) attended an independent school, 7.7 percent ($N = 26$) attended a parochial school, and 3.8 percent ($N = 13$) checked the box for other. Participants took part in the study either voluntarily or for research credit. All student participants had to meet specific criteria such as being over the age of 18, must be a University of North Carolina at Charlotte student, were either a freshman, sophomore, junior or senior, and taking a major that fell into one of the four concentrations: the Sciences, the Arts, Business, or Education. Please see Table 2 for further qualifications to which academic majors at the University of North Carolina at Charlotte fall into these four concentrations.

Materials

Participants were given a questionnaire that asked for their gender, age, type of high school they had attended, current year in school, major, number of years within major, number of courses taken within major, and finally a section to list all the courses that they have taken within their major. Following the questionnaire, participants were given the Abbreviated Torrance Test for Adults (ATTA) to obtain the participant's creativity score (Goff, K., & Torrance, E.P, 2002). This test is a condensed version of the Torrance Test of Creative Thinking (TTCT), which has been widely analyzed and researched and has proven both in its reliability and validity as a tool for creativity measurement (Cheung, P., Chau, P., & Au, A., 2008).

The ATTA consists of three three-minute activities which assesses four norm-referenced abilities: fluency (i.e. "the ability to produce quantities of ideas which are relevant to the task instruction"), originality (i.e. "the ability to produce uncommon ideas or ideas that are totally new or unique"), elaboration (i.e. "the ability to embellish ideas with de-

tails", flexibility (i.e. "the ability to process information or objects in different ways, given the same stimulus"); and fifteen criterion-referenced creativity indicators split by two categories: verbal responses (i.e. "richness and colorfulness of imagery, emotions/feelings, future orientation, humor: conceptual incongruity, and provocative questions") and figural responses (i.e. "openness: resistance to premature closure, unusual visualization/different perspective, movement and/or sound, richness and/or colorfulness of imagery, abstractness of titles, context: environment for object/articulateness in telling story, combination/synthesis of two or more figures, internal visual perspective, expressions of feelings and emotions, and fantasy") to reach a holistic and cohesive creativity index score of one's creative thinking abilities (Goff, K., & Torrance, E.P, 2002).

For further reliability and validity of this test, Cheung, Chau, & Au used the ATTA in a study on knowledge and creativity and found that the test was both valid and reliable when assessing one's creative thinking (Cheung, P., Chau, P., & Au, A., 2008). Additional studies by Horng, 1981, Townsend, Torrance, & Wu, 1981, and Torrance & Safter, 1999, confirm the tests validity in its earliest stages.

Procedure

Participants were given a consent form, which informed them of the nature of the study. After reading the consent form, the researcher orally pointed out specific details about the study. Afterwards, participants were given the chance to ask any questions before starting the questionnaire or the ATTA and were also given the chance to ask any questions if they may arise during the course of the testing phase. Subsequently, participants were then given the questionnaire and asked to wait patiently to continue to the creativity test until all fellow participants had also finished the questionnaire. After all of the participants were done with the questionnaire, the researcher ad-

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Table 2

The University of North Carolina at Charlotte's Academic Undergraduate Majors Broken Down by Art, Science, Business, and Education Concentrations

Concentrations	Art	Science	Business	Education
Major	Architecture	Anthropology	Accounting	Art Education
	Africana Studies	Biology	Business Administration	Chemistry Education
	Art	Biology, Medical Technology	Economics	Dance Education (K-12)
	Art History	Chemistry	Finance	Child & Family Development
	Communication Studies	Chemistry, Medical Technology	Industrial & Operations Management	Child & Family Development, (B-K) Teacher Licensure
	Dance	Criminal Justice	International Business	Elementary Education
	English	Earth Science	Management	English Education
	French	Geography	Management Information Systems	French Education (K-12)
	German	Geology	Marketing	German Education
	History	Mathematics	Mathematics for Business	History Education
	International Studies	Meteorology		Mathematics Education
	Latin American Studies	Physics		Middle Grades Education
	Music	Political Science		Music Education (K-12)
	Music Performance	Psychology		Spanish Education (K-12)
	Philosophy	Sociology		Special Education
	Religious Studies	Computer Science		Theatre Education (K-12)
	Spanish	Software & Information Systems		
	Theatre	Engineering		
		Engineering Technology		
		Athletic Training		
		Exercise Science		
		Public Health		
		Respiratory Therapy		
	Social Work			
	Nursing			

Note. This is a breakdown of the different majors offered at the University of North Carolina at Charlotte into the four different concentrations (i.e. Arts, Science, Business, Education) for the current study.

ministered the Abbreviated Torrance Test for Adults. At the end of the test, both the test and questionnaire were collected; participants were thanked for their time and contribution to the project.

Results

An alpha level of .05 was used for all statistical tests unless otherwise stated. A 4 (year in school: freshmen, sophomores, juniors, seniors) x 4 (concentration: Business, Arts, Science, Education) between-subjects analysis of variance was performed on overall creativity scores on the Abbreviated Torrance Test for Adults (ATTA). Additional analyses were performed on the ATTA subtests of fluency, flexibility, originality, elaboration, verbal responses, and figural responses.

For overall creativity scores, a marginally significant main effect was found for year, $F(3, 323) = 2.42, p = .07$, no main effect of concentration, $F < 2$, and no interaction between year and concentration, $F < 2$. Creativity scores were highest for juniors ($M = 75.11, SD = 9.01$), followed by seniors ($M = 73.17, SD = 10.17$) followed by sophomores ($M = 72.38, SD = 10.63$) followed by freshmen ($M = 71.42, SD = 11.67$). Comparing the last two years (i.e., junior and senior) to the first two years showed significantly higher performance for

those in their last two years, $F(1, 335) = 6.38, p = .01$. This is exactly the opposite from the result predicted by Hypothesis 1.

Additional analyses on subtest scores showed no main effects or interactions for fluency or flexibility.

Results for the originality subtest showed no main effects for year, $F < 1$, a significant main effect for concentration, $F(3, 323) = 2.78, p = .04$, and no interaction of year and concentration, $F < 2$. For concentration, Education had the highest score for originality ($M = 15.43, SD = 2.23$), the Art concentration was second highest ($M = 14.76, SD = 3.44$), the Business concentration was third ($M = 14.21, SD = 2.22$), and finally the Science concentration had the lowest score ($M = 14.18, SD = 2.06$). This result offers partial support for Hypothesis 2.

Results from the elaboration subtest showed a significant main effect for year, $F(3, 323) = 2.827, p = .04$, a significant main effect for concentration, $F(3, 323) = 4.01, p = .01$, and a significant interaction of year and concentration, $F(9, 323) = 2.53, p = .01$. These means and standard deviations are shown in Table 3. Again, higher scores were found for juniors and seniors compared to freshmen and sophomores. Across concentration, the highest

Table 3

Means (Standard Deviations) on Elaboration Subtest Scores for Year and Concentration

Year	Concentration				
	Art	Business	Education	Science	Overall
Freshman	11.31 (5.39)	14.60 (2.12)	16.44 (2.00)	15.12 (2.05)	14.77 (3.07)
Sophomore	13.25 (5.68)	14.48 (3.93)	14.17 (3.13)	15.44 (2.05)	14.87 (3.20)
Junior	16.57 (1.40)	14.20 (1.79)	16.10 (1.65)	15.78 (1.65)	15.84 (1.75)
Senior	14.77 (2.09)	15.00 (1.92)	16.50 (3.11)	15.00 (2.70)	15.03 (2.57)
Overall	13.68 (4.44)	14.56 (3.03)	16.00 (2.18)	15.28 (2.23)	

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score was in Education while the lowest was in Art. Hypothesis 2 is not supported. In examining the interaction one sees very little difference across the four years for Business and Science majors while Education majors score particularly low during the sophomore year and Art majors score particularly high during the junior year.

Results from the verbal subtest showed significant main effects for year, $F(3, 323) = 5.51, p = .00$, concentration, $F(3, 323) = 3.75, p = .01$, and the interaction of year and concentration, $F(9, 323) = 2.74, p = .00$. Table 4 shows means and standard deviations of verbal scores for the 16 groups. The highest verbal

scores were for students in their sophomore year while freshmen were the lowest. For concentration, Education and Science students scored higher than Art and Business students. Examining the interaction one sees a complex interplay between year and concentration with a general trend toward improved performance across the four years but surprisingly low performance for junior Art majors and surprisingly high for sophomores in Education.

Student's figural subtest scores showed a significant main effect of year, $F(3, 323) = 4.06, p = .00$, and a significant interaction between year and concentration, $F(9, 323) = 2.10, p = .03$, but no main effect of concentra-

Table 4
Means (Standard Deviations) on Verbal Subtest Scores for Year and Concentration

Year	Concentration				
	Art	Business	Education	Science	Overall
Freshman	3.08 (1.94)	2.40 (1.78)	4.19 (1.33)	4.04 (1.39)	3.76 (1.59)
Sophomore	3.88 (1.64)	4.33 (1.56)	5.50 (1.38)	4.13 (1.38)	4.26 (1.51)
Junior	2.86 (1.77)	3.80 (1.64)	4.30 (1.78)	4.34 (1.53)	4.15 (1.66)
Senior	4.62 (1.94)	4.57 (1.90)	5.25 (2.50)	3.67 (1.47)	3.94 (1.67)
Overall	3.68 (1.93)	3.86 (1.82)	4.50 (1.67)	4.00 (1.46)	

Table 5
Means (Standard Deviations) on Figural Subtest Scores for Year and Concentration

Year	Concentration				
	Art	Business	Education	Science	Overall
Freshman	5.62 (5.08)	8.60 (5.02)	11.06 (3.38)	10.21 (3.23)	9.56 (4.06)
Sophomore	9.50 (3.34)	8.86 (3.97)	10.50 (5.79)	10.47 (4.14)	9.95 (4.14)
Junior	12.43 (3.56)	12.00 (4.00)	10.65 (3.60)	11.24 (2.97)	11.25 (3.25)
Senior	10.54 (3.05)	11.14 (3.98)	10.25 (4.92)	9.77 (4.32)	10.01 (4.12)
Overall	9.10 (4.58)	9.53 (4.27)	10.74 (3.83)	10.33 (3.77)	

tion, $F < 1$, Table 5 shows means and standard deviations for this subtest for the 16 groups. As with several other measures, students' figural scores were higher in the junior and senior years compared to freshmen and sophomore years. All of these findings with respect to year in college argue against the hypothesis that creativity declines over the college years and, in fact, appears to increase. In examining the interaction, one clearly sees this increase in Art and Business majors while senior Science majors show a slightly lower score (junior Science majors, however, have the highest score). Education majors show very little difference in scores across the four years.

Discussion

The researcher examined two hypotheses: (1) early year college undergraduate students (e.g. freshmen and sophomores) will score higher on creativity tests than latter years (e.g. junior and seniors); (2) Education and the Arts majors will score higher on creativity tests than the Sciences and Business majors. The positive trend by year (freshmen and sophomores grouped together, juniors and seniors grouped together) for the holistic scores of students' creativity (e.g. the creativity index score) suggests that undergraduate students at the University of North Carolina at Charlotte may well be receiving creativity stimulating courses over time, which in return increases their creative thinking abilities. The present results certainly show no decline over the college years.

Upon further analysis of the data, results from the scores for elaboration, a sub-measure of the holistic creativity index score of the ATTA which specifically tests for one's creative "ability to embellish ideas with details", generated a consistent pattern as was seen with the overall creativity index scores: freshmen and sophomores scored lower on the ATTA than juniors and seniors, thus showing an opposite trend than was predicted for Hy-

pothesis 1 (Goff, & Torrance, 2002).

When separating out the subdivided scores that comprise of the total creativity score (e.g. the creativity index), results showed that originality, elaboration, and verbal sub-measures signify mixed findings than what was predicted for Hypothesis 2. Over all three of these subdivided scores, the Education concentration sat at the top with the highest scores, while the Art concentration was a runner-up in only one subdivided creativity category: originality. These findings offer partial support for Hypothesis 2 in that both the Science and Business concentrations had lower scores for originality when compared to the Education and Art majors. One general speculative theory for this phenomenon runs along the idea that Science and Business students work in a standardized paradigm, which may be stripping them of their potential to tap into new ideas. It would be interesting to do future testing to see how students who work, learn, and interact in a more standardized and homogeneous construct compared to those who work in a more abstract, free-flowing and open construct score on creativity tests.

Furthermore, Hypothesis 2 (e.g. the Arts and Education concentrations would score higher than the Science and Business concentrations) was not entirely supported for the elaboration sub-measure. In further detail, the highest elaboration score from the four concentrations was found in the Education concentration, while the Science concentration followed in second highest, then the Business concentrations, and finally the Arts concentrations had the lowest score for elaboration. These findings suggest that compared with other concentrations, Art majors do not embellish their thoughts or ideas as much. Charyton and Snelbecker's 2007 paper alludes to a possible idea that perhaps specific tests may cater towards certain majors. In the case of Art students, it is possible the ATTA did not cater to the Art students in respect to this idea of an

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elaboration creativity measure. Future creativity testing on Art students' ability to elaborate could abate the findings in this study.

For Education majors, further speculation to why they scored so high on the elaboration sub-measure may be explained through the Eisenman's 1969 study. Eisenman's study found that particular majors might actually draw in more students who already would have higher creative thoughts and ideas (1969). Additionally, perhaps certain majors also attract a larger number of students who have the potential to foster creativity easier than those of other majors. With Eisenman's theory in mind, it is possible that the Education concentration happens to attract more students who elaborate on their ideas than those of the other concentrations. Additional future testing similar to that of Eisenman's 1969 study could help strengthen the support for this axiom.

Results from the verbal creativity scores, which lumped students creative abilities for "richness and colorfulness of imagery, emotions/feelings, future orientation, humor: conceptual incongruity, and provocative questions" into this one category, had interesting results that did not fully support but rather partially supported Hypothesis 1 and Hypothesis 2 (Goff & Torrance, 2002). For year, freshmen and seniors had the lowest overall verbal scores while sophomores and juniors had the highest scores, thus partially supporting Hypothesis 1. For concentration, Education and Science students scored higher than Business and Art students, thus partially supporting Hypothesis 2. Examining the interaction of the year and the concentration, one can see a complex yet interesting interplay with a general trend toward improved performance across the four years but surprisingly low performance for junior Art concentrations and surprisingly high scores for sophomores in Education. These results may suggest that students are being stimulated for verbal creativity growth.

Results from the figural creativity scores, which combined students creative abilities for "openness: resistance to premature closure; unusual visualization, different perspective; movement and/or sound; richness and/or colorfulness of images; abstractness of titles; context: environment for object, articulateness in telling story; combination/synthesis of two or more figures; internal visual perspective; expressions of feelings and emotions; and fantasy" into this one category, painted a similar picture with that of the holistic creativity results (Goff & Torrance, 2002). Students' figural scores were higher in the junior and senior years when compared to freshmen and sophomore years. When looking at the interaction of concentration and year for students' figural scores, the Art and Business concentrations clearly show an increase in scores while the senior Science concentration show a slightly lower score where the junior Science concentration had the highest score. The Education concentration showed very little difference in scores across the four years. Perhaps the increase for the Arts and Business concentrations could be the result of a surge in descriptive, perceptual, expressive, and abstract learning paradigms as students progress from their freshmen year to their senior year. However, because this was not a longitudinal study but rather a cross-sectional sample study, these interactions may not paint an accurate picture and thus using a longitudinal paradigm for future tests, one may be able to paint a clearer picture of how figural creativity, as well as overall creativity, evolves overtime for the university student.

Limitations

The current study was very broad in nature and did not focus on particular majors but rather on concentrations involving a vast array of majors. This may have caused varying results because students may learn contrastive creative thinking strategies depending on which major they are in, thus causing a differ-

ence in creativity scores. This also brings up the concern of creativity testing. Just as there are often two camps struggling to rightfully define intelligence (e.g. a general intelligence camp and a specific intelligence camp), one can argue for this concern for creativity testing and that perhaps there is a similar paradigm occurring.

The testing explored in this study used a more general and broad form of creativity testing (the ATTA), which allowed for all years and majors to have an equal chance of showing their true creativity. However, future studies may investigate other kinds of valid creativity tests, which could evaluate the different concentrations and years of creative thinking better than the test used for this particular study. As aforementioned, the Charyton and Snelbecker (2007) study used a similar investigative technique, which involved a diverse set of creativity tests to measure the creativity of two different majors. One creativity test was geared towards one particular major, while another was geared towards the other major, and then finally a third creativity test measured the students' overall general creativity. The results of their study concluded that certain tests may cater towards certain majors, however, the validity and general creativity of the test used for this study are such that there is no significant concerns that the Abbreviated Torrance Test for Adults favors one particular major or not.

One other limitation for this study lies within the number of students tested within each concentration. There were proportionally a higher number of students tested within the Science concentration (N = 209) than in any other concentration (e.g. Business (N = 43), Arts (N = 41), and Education (N = 46)). For year, student participation was relatively spread out (e.g. freshmen (N = 96), sophomores (N = 80), juniors (N = 73), seniors (N = 90)).

A further limitation for this study was that it was not a longitudinal study but rather a cross-sectional sample study. Ideally, it would be best to follow students from year to year to receive an accurate depiction of how creativity is affected. Instead, the researcher chose a less time consuming paradigm, which may inaccurately convey a need (or lack there of) for more creativity courses. Future studies should use a longitudinal study for a more accurate answer.

A final limitation for this study involves the representation of each concentration and year. The participants were tested at a southeastern university in the United States of America. It would be interesting to conduct this test around the nation as well as the globe to see if there are specific cultural, ethnic, and environmental influences to creativity.

Conclusion

When looking at a picture, one can see it differently based off of various factors, such as eye sight, how close or far one is standing to the picture, whether or not the person is looking at one portion of the picture or viewing it as a whole, and so forth. The results of this study paint a picture of how creativity at the University of North Carolina at Charlotte is being learned and used for undergraduate students. Although this picture is only a fraction of the whole picture, it does not completely echo Sir Ken Robinson's call for more creativity in the classroom, however future testing may prove otherwise. Sir Ken Robinson once wrote, "It's often said that education is the key to the future. It is. But a key can be turned in two directions. Turn it one way and you lock resources away: turn it the other and you release them." (Robinson, n.d.). Which way are we turning the key on creativity?

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The Effect of Video Game Character and Human Player Gender on Game Play

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Abstract—*Video games, which are a popular form of entertainment, are more likely to be played by males than females. This literature review examines the aspects of video games, video game characters, and human players in order to determine why females are less likely to play video games and what can be done to encourage them to play. It reveals that game characters tend to reflect gender stereotypes and that male and female players prefer different playing elements in games. It also explores the notion that the gender of a game character may affect the playing experience of a human player and proposes a model of explanation that incorporates elements of both evolutionary and social psychology.*

(Cassell & Jenkins, 1998; The Entertainment Software Association, 2009).

This recent influx may be attributed to the increasing availability of “casual games”, games which require no specific skills or long-term commitment to play (Casual Games Association, 2007). The increase of female players greatly benefits the game industry, for women account for the majority of players who are willing to download and pay for casual games. The increased interest in video games also benefits the players themselves. Comfort with computer and video games creates a bridge for computer literacy, a skill needed for various educational and career environments (Dickey, 2006; Kiesler, Sproull, & Eccles, 1985). It is for these reasons that game developers, educators, and psychologists alike have posed the same question: what makes girls play games?

Americans in aggregate spend billions of dollars every year on video games (The Entertainment Software Association, 2009). This is partly due to the sheer number of game players: as of 2009, sixty-eight percent of American households included people who played either computer or video games. Historically, most of these players have been men (Cassell & Jenkins, 1998). However, a recent influx of female players has leveled the playing field. The percentage of female players has increased from twenty-five percent to forty percent of all players in a matter of 11 years

A wealth of psychological research has explored what women like and want in games (Brunner, Bennett, & Honey, 1998; Subrahmanyam & Greenfield, 1998; Wood, Griffiths, Chappell, & Davies, 2004); perhaps even more literature has explored what women dislike about video games (Kiesler, Sproull, & Eccles, 1985; Tafalla, 2007; Wood et. al., 2004). The majority of studies examine either the traits of male and female players themselves or the traits of male and female characters in the

games. These studies often refer to evolutionary psychology as an explanation for the traits of human players. For instance, some studies reason that more boys than girls prefer violent games over non-violent games because of the inherently aggressive nature of boys (Neppl, 1997; Vorder & Bryant, 2006). Studies that focus on the traits of game characters often view the characters through a social perspective. Game characters serve as male idealizations of the sexes, which simply don't appeal to women (Dill & Thill, 2007; Ivory, 2006). It is for these reasons, the literature concludes, that women tend to shy away from playing video games.

Though these studies and models provide a foundation for understanding why men are more inclined than women to play video games, the direct relationship and interaction between the gender of a human player and the gender of game characters has yet to be determined. Only a scant amount of research has examined this relationship (Eastin, 2006). Many questions remain: how does a player react to playing a character of the same or opposite sex? How do players react to the representations of their sexes in games? Do these reactions affect their willingness to play? This literature review makes two propositions: first, that further research is needed to explore the relationship between human player and game character gender, and second, that the traits of human players, game characters, and the relationship between the two should be examined through a model that incorporates both evolutionary and social perspectives. This will provide further insight into what draws or repels people from playing video games.

Video Games

For the purposes of this review, "video games" will refer to both computer games and games played on a console. Though there has been a push for the use of video games in education (Squire, 2003), the primary purpose of

video games is to entertain the user by providing challenges for the user to overcome through a graphical, interactive interface (Squire, 2006). These challenges differ between genres: a first person shooter may require its players to assassinate an opponent without being shot themselves, whereas a platformer may require its players to reach a destination within a limited span of time. The reward for completion of the challenges also differs between genres: casual games tend to keep track of a player's numerical score, which motivates the player to achieve the highest score possible, whereas role playing games reward the player for completing quests by providing the player with the next section of the game's plot.

This review will primarily refer to three genres of video games: first person shooters, role playing games, and casual games. These genres are currently among the top best sellers per game unit sold (The Entertainment Software Association, 2009). Perhaps the most notorious genre of the three is the first person shooter. A first person shooter (FPS) centers around weapon-based combat; the user experiences the game world through the eyes of the protagonist from a first person perspective. The players, armed with whatever weapons are provided to them, must achieve a specific goal while destroying enemies that impede their progress. For instance, the players may have to reach a certain destination, kill a certain enemy, or keep a certain non-playable character (NPC) alive. Well-known games in this genre include the *Halo* series, the *Grand Theft Auto* series, and the *Call of Duty* series.

Role playing games (RPGs) also provide players with specific goals to achieve. However, these goals, or "side quests", are only smaller sections of an overall quest (the main goal the player aims to achieve.) The players must complete side quests in order to progress through the plot of the game and are often provided NPC "party members" to aid

them in this process. Side quests often include obtaining a certain object, solving a certain puzzle, or defeating a certain number of enemies (combat differs from FPSs in that the player selects an [often magical] attack from a number of choices rather than slaying enemies with weapons.) The reward for completing these quests, continuation of the game's plotline, is often focused on the development of the characters in the game. Popular games in this genre include the *Final Fantasy* series, the *Pokemon* series, and the *Kingdom Hearts* series.

The third genre of interest is the casual game. Casual games, as aforementioned, are games that require little skill or time commitment to play. The player normally progresses through levels that steadily increase in difficulty; the game keeps track of how many points the player has earned. Challenges vary game to game: some games have the player find sets of matching images whereas others have the player spell out words using adjacent word tiles. Most of these games include little to no violent content and do not feature any sort of main character. The popular games in this genre include *Bejeweled*, *Peggle*, and *Bookworm*.

Game Characters

Video game players need a vehicle through which they can explore their virtual worlds. These vehicles most often take the form of playable game characters. Gamers use these characters to explore and interact with the game world and NPCs. How the character can interact with the world and other characters depends on the genre. In an FPS, the playable character (also known as a "protagonist" or "main character") may very well be able to shoot friendly NPCs and otherwise destroy objects in the environment, whereas in an RPG, the playable character may be able to barter for items or engage in an interactive conversation with NPCs.

Video games, like other forms of entertainment, may play a role in the process of determining which behaviors are appropriately masculine and feminine (Beasley & Standley, 2002). Because human players are so prone to identifying with their main characters (Lewis, Weber, & Bowman, 2008; McDonald & Kim, 2001), it seems likely that the way the main character is portrayed and interacts with male and female NPCs influences this gender socialization. Although there currently are not any studies that examine this specific relationship, several studies have examined how game characters portray gender roles and expectations in general (Beasley & Standley, 2002; Dill & Thill, 2007; Ivory, 2006). The way male and female characters are portrayed in video games appears to be relatively consistent across genres.

Male Characters

Content analyses of video games and their reviews indicate that the majority of video game characters are male. A content analysis of 33 games by Dietz (1998) of old consoles, the Super Nintendo and the Sega Genesis, revealed that 51 percent of the games had only male characters. A more recent content analysis performed by Beasley and Standley analyzed 47 randomly selected games for the Nintendo 64 and Sony PlayStation consoles (2002). Of the 597 characters identified in the games, 515 (about 86 percent) were male. In a content analysis of 100 video game reviews, Ivory (2006) found that even though 54 percent of the game reviews did not indicate the main character's gender, 76 percent of those that did had male protagonists. Male characters that were of great importance to the game or plot were mentioned in 75 percent of the reviews. Though some of these studies are dated by time standards of the video game community, they demonstrate the historical bias toward the inclusion of male characters in video games.

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Studies have also examined the traits of the male characters. In a content analysis of 49 video game articles from magazines, Miller and Summers found that male characters were most often portrayed to have more weapons, have more abilities, and be more muscular and powerful than their female companions (2007). Another content analysis of magazine articles by Dill and Thill found male characters to be portrayed as aggressive in 83 percent of the images depicting male characters (2007). Bulky, aggressive male characters are often found in FPSs, many of which contain solely male characters (which may be attributed to the games' historic war themes.)

Female Characters

As one can infer from the results of the studies in the previous section, most research has found that female characters are much less common in video games, especially as main characters (Beasley & Standley, 2002; Dietz, 1998; Ivory, 2006). However, a study done by Jansz and Martis indicated that there was a shift toward the inclusion of female protagonists in modern video games (2007). The researchers selected 12 popular titles based on the gender and racial diversity of the characters and a strong focus on plot within the games. Two coders viewed the introductory videos of the games and noted the number of characters in the videos and their traits (which included gender, race, role and position, and appearance.) They found that although male characters (70 percent of all characters) still outnumbered female characters overall, the distribution of male and female protagonists was equal.

Although it is true that some recent hits have included female protagonists (e.g. *Portal* and *Mirror's Edge*), to say that the inclusion of female protagonists is a developing trend would be premature. Jansz and Martis stated this themselves (2007, p. 146). The coders only viewed a small sample of the games that

were popular at the time on the basis that they included a diverse set of characters and a storyline important to game play. These two criteria excluded a multitude of games that were popular at the time (particularly most FPSs), and thus made the sample not fully representative of (then) modern video games. The coders also did not actually play the games: they gathered their data by watching the introductory videos of the 12 games. As the authors indicated, it would be extremely difficult to extract data by fully playing through all 12 games, as games very often have 30 or more hours of game play. However, merely watching an introductory video does not allow the player to get a sense of how the main character overcomes the challenges presented in the game. It is possible that a female protagonist would require the assistance of a male character to obtain her objective, which would weaken her strength as a lead.

Jansz's and Martis's study did indicate that the female characters typically wore what they deemed "sexy" attire and had thin, muscular bodies (2007). Most other studies that have examined the traits of female characters found similar results. Dill and Thill's study (2007) found that female characters were much more like to be portrayed as hypersexualized (60 percent of female characters as opposed to 1 percent of male characters) and scantily clad (39 percent of female characters versus 1 percent of male characters) than male characters in images in video game magazine articles. Miller and Summers found that female characters in video game magazine articles were more attractive, sexy, and innocent than their male companions (2007). Though other media sources (e.g. television shows, movies, women's magazines) also depict overtly sexualized women, women may perceive sexualized depictions in video games to be merely "eye candy" for male players, whereas depictions in other female-focused media sources may be perceived as ideals of sexual liberation.

Thus, these depictions of females in video games may be a contributing factor to women's unwillingness to play video games.

Players

Perhaps the most important aspect of the video game community is its players. Psychologists have tracked certain individual gaming tendencies within the context of the player's gender. This has been done primarily to understand why the majority of video game players have been men, and what can be done to encourage (or stop the discouragement of) women to play video games. Women's apparent lack of interest in video games seems to be related to a lack of involvement in the fields of technology and mathematics, fields which are also pushing for more female involvement (Brunner, 2008; Temple & Lips, 1989).

Male Players

Males currently account for the majority of video game players (The Entertainment Software Association, 2009). Though research has aimed to determine what women like and dislike in games, it has also explored what men like and look for in games. An online survey by Wood, Griffiths, Chappell, and Davies (2004) asked 382 participants to rate the importance of various aspects of video games, which included sound, graphics, background and setting, duration of game play, rate of play, advancement rate, use of humor, control options, game dynamics, winning and losing features, character development, and multiplayer features on a five point scale. Significantly more males than females regarded the inclusion of full motion video, having realistic settings, having a long duration time, being able to customize the game, having multiplayer settings, being able to beat other players, being able to shoot things, and having to survive against the odds as important.

Not surprisingly, these are the characteristics of many FPSs. A survey by Jansz and

Tanis indicated that, indeed, the majority of FPS players were young men (2007). FPSs are often set in the context of a historical war (e.g. *Medal of Honor*, *Call of Duty*, *Commandos: Strike Force*), include 40 or more hours of game play, allow players to customize aspects of the game (e.g. *Fall Out 3*, *Halo 3*, *Gears of War*), and incorporate online and local area network multiplayer modes. Multiplayer modes often include versus modes (killing the other players the most number of times) and survival modes (levels in which hordes of enemies continually attack the players in waves; the players play to see how long they can keep their characters alive.) Whether male players prefer these game play elements before playing FPSs (and would therefore have a predisposition toward liking them) or grow to prefer these elements after they play FPSs (and would have grown to prefer games with similar elements) has yet to be determined.

Female Players

Male and female players are similar in many respects. A study by Malone and Lepper (as cited in Kafai, 1998) found common features in games that motivated males and females to play, which included challenge, curiosity, control, fantasy, cooperation, competition, and recognition. Studies have gone beyond merely finding similarities between players: researchers have also found instances in which there are no significant differences between the players. Although the notion that men are inherently more skilled at spatial tasks and are thus more likely to enjoy playing video games persists, several studies have indicated that this is not the case. Subrahmanyam and Greenfield measured the spatial ability of ten year olds before and after playing video games (1997). They found that the spatial ability of the children improved significantly, regardless of gender. Pépin and Dorval conducted a similar study using college students and found the same effect (1988). These studies suggest that men may not be more inclined to play games

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due to supposedly having superior innate spatial skills.

Studies seem to indicate that differences do exist between female gamers and their male counterparts. The study by Wood et al (2004) found that significantly more female gamers than male gamers regarded having cartoon styled graphics, fantasy settings, humor, a short game duration, and a rapid rate of advancement as important features of video games. Female players also preferred games that included puzzles, finding and collecting objects, and scoring points. Brunner, Bennett, and Honey (1998) identified many of the same characteristics in their study: they posited that female players value technological sophistication, personal triumphs (as opposed to beating another player), persuasion (as opposed to conquest), humor, rescue missions, puzzles, writing, design, and mysteries. These two studies identified traits that are common elements of RPGs and casual games, two genres that are popular among female players. RPGs often include cartoon graphics (e.g. the *Pokemon*, *Harvest Moon*, and *Kingdom Hearts* series), fantasy settings (e.g. the *Final Fantasy* series), humor, and rescue missions (e.g. the *Persona* series), whereas casual games, by definition, are short, fast paced games that keep track of players' scores.

Some have suggested that the violence in video games male players condone may actually repel women from playing. In Tafalla's (2007) study of cardiovascular reactivity to game play and outside stressors, he found that male participants who listened to a soundtrack while playing *Doom* experienced an increase in heart rate, which indicated arousal, whereas female participants experienced an increase in systolic and diastolic blood pressures, which indicated stress. He concluded that women may avoid violent video games because they act as negative stressors. Studies of educational games by Cooper, Hall, and Huff, Malone, and Greenfield (as cited in Cassell &

Jenkins, 1998) also described how the violent nature in games makes girls experience stress and alienates them as players, which makes them less likely to play.

Although these studies draw reasonable inferences, they fail to clearly define what type of violence disturbs female players. *The Sims*, a game series cited as "female friendly" (Carr, 2005), gives its players the option to slap, shove, and fistfight other characters. The *Pokemon* series, another game series that appeals to female players (Ito, 2008), focuses on using creatures with special abilities to fight and knock out opponents' creatures. Various other RPGs, many of which have a large female fan base, regularly incorporate battles and *turn-based* combat (as opposed to *real time* combat) into game play. Perhaps, then, it is not the mere presence of violent content that turns women away from games. Perhaps it is the way in which the violent content is presented: it may very well be that women don't necessarily mind killing opponents, as they do in RPGs, but that they do mind the accompanying blood and gore that result from killing them in FPSs. Further research should aim to distinguish the types of violent content in video games and then proceed to record human responses to the content.

Player-Game Character Interaction

The studies of video game characters and human players have not been mutually exclusive. Descriptive studies have examined whether players believe video game characters represent gender stereotypes. After performing a content analysis of video game characters in magazine articles, Dill and Thill (2007) proceeded to survey teenagers about their beliefs about the portrayal of game characters. They found that teenagers believed that male characters were stereotypically portrayed as aggressive and that female characters were sexually objectified. Ogletree and Drake's survey results also indicated that their participants

viewed female characters as more sexually provocative and helpless and less strong and aggressive than male characters.

Some researchers have gone farther and investigated the impact the portrayal of video game characters has on players. A study by Bartlett and Harris measured the body esteem of 51 college males and 32 college females (2008). The first group played a game that displayed extremely muscular characters for 15 minutes; the second group played a game that displayed extremely thin characters for the same amount of time. Both groups then completed another body esteem scale. Bartlett and Harris found that both groups experienced a significant decrease in body esteem after playing the video games, regardless of gender. A different study by Dill, Brown, and Collins (2008) examined the effect of showing stereotypical video game characters on sexual harassment judgments and found that men who were exposed to the images of game characters, as opposed to the control (images of business men and women,) were more likely to make judgments that were more tolerant of sexual harassment.

Direct Gender Interaction

Though these studies provide interesting information, they do not directly address how the gender of a playable video game character affects the playing experience of the gamer. Since female gamers bemoan the lack of female protagonists in video games (Kafai, 1996), it would not be a stretch to say that playing as a male character affects their overall gaming experience. Conversely, one may speculate whether the lack of female protagonists stems from a fear from game developers that their largely male audience would react negatively to playing as a woman. It is also likely that game designers, most of whom are male (The Art Institutes, 2009), simply design games based on their own male-oriented preferences, which may include playing as a male

character. Although research has not determined whether players prefer to play characters of the same gender, Eastin (2006) posits that playing as a character of the same gender causes the player to experience in-group association with the character, which makes it easier for the player to identify with the perceived thoughts and feelings of that character.

Eastin's study examined the effect of protagonists' and opponents' genders on presence (how situated a player feels in a virtual environment) and aggressive thoughts in female gamers. The women played a customized game map of *Unreal Tournament: Game of the Year Edition*, an FPS. They were randomly assigned to play as a male or female character; the gender of their opponents was randomly assigned as well. The map incorporated mirrored columns as a way to make the gender of the main character known to the players. After the participants played the game for 20 minutes, they were asked to identify the genders of their characters and the opponents as a manipulation check. Only the participants who correctly identified the genders of the protagonist and opponent were included in the analyses. After finishing the manipulation check, the participants completed a word completion task, which served as a measure of aggressive thoughts, and a presence questionnaire, which measured presence by asking the participants to indicate the responsiveness of the environment, how engaged they were in the game, how realistic the game was, and the amount of distractions they experienced while playing on a 7-point scale.

The results of the study indicated that the participants who played as a female character experienced significantly more presence compared to the participants who played as a male character. The gender of the opponent had no bearing on presence. Participants who played as a female character had more aggressive thoughts than those who played as a male. Opponent gender lead to an interesting interac-

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tion: overall, male opponents evoked more aggressive thoughts than female opponents. Participants in the female protagonist, male opponent condition experienced the greatest number of aggressive thoughts. This greatly contrasts the participants in the male protagonist, female opponent condition, who experienced relatively low number of aggressive thoughts.

An effective FPS is one that provokes aggression in its players. The women who participated in this study experienced aggressive thoughts when playing as a female character, one with whom the participants could more readily identify. Perhaps women shy away from video games not only because they dislike the portrayal of women or violent content in games, but because games simply lack female leads that enhance the playing experience for them. This may also be why women make up the majority of casual game players. Casual games, for the most part, entirely lack characters. The female player does not have to experience the game world through a character who is a member of an out-group. Because Eastin's study only examined the reactions of female players, future research should aim to find whether the playing experience of male players is also enhanced by playing a character of the same gender and, more generally, whether the gender of a main character affects players' willingness to play a game.

Models of Game Play

Different psychological models have been used to explain why male and female players differ in their behaviors. Two models that are prominent in psychological video game literature are evolutionary and social psychology. Evolutionary psychology is a field of psychology that aims to explain human thought and behavior through the context of natural selection and adaptation (Buss, 1995). According to this theory, behaviors and thought patterns that are beneficial to survival and reproduction---for instance, being wary of

predators---are found in the animals that successfully reproduce. Their offspring then possess the beneficial traits and pass them on to their own children. Animals with maladaptive mutations or behaviors are less likely to live long enough to reproduce; thus, these mutations and behaviors are less likely to persist in the general population of animals.

Some researchers have explored evolutionary psychology as an explanation for why the majority of video game players are men (Vorder & Bryant, 2006). The evolutionary theory suggests that women, who are typically the primary caretakers of children and benefit from having mates with complementary traits, are more discriminating in mate selection than men are; therefore, men need to be more competitive with members of the same sex than women. This predisposes men to engage in more aggressive and competitive behavior than women. This aggressive and competitive behavior increases the likelihood of being selected for reproduction, and is therefore adaptive. These behaviors have been observed in childhood play (Neppel, 1997) as well as video game play. Aggression and competition are key aspects of a wide spectrum of video games, and, more specifically, FPSs. This may be why the majority of FPS players are male. More generally, this may also be why games that focus on competition and domination seem to appeal less to women: historically, being competitive and aggressive provided them no evolutionary advantage, so they never developed a predisposition to those types of behaviors.

Other researchers have viewed the behavior of game players through a social psychology perspective. Social psychology is a field of psychology that examines how the thoughts, feelings, and behaviors of an individual are influenced by the presence (or perceived presence) of others (Abrams & Hogg, 1990). Concepts explored in the context of this field include intergroup relations, social

stereotyping, social influence and conformity, and self-esteem. Intergroup relations pertains to how people distinguish who is a part of their group (known as an “in-group”) and who isn’t (an “out-group”) and how their behavior is influenced by people in both types of groups. Social stereotyping pertains to how people categorize information about others based on their memberships in other groups, and how the categorization affects people’s attitudes and beliefs about the other groups. Social influence and conformity pertain to how people alter their attitudes and behaviors to mimic the norms of their in-group. Finally, self-esteem pertains to how people evaluate how they seem themselves: when applied to a specific aspect of themselves, their bodies, this is called body esteem.

These concepts in social psychology have been used to explain the behavior of video game players. Eastin’s study (2006) indicated that female players may regard male protagonists as a part of an out-group, and thus are less likely to experience the game in the same sense a member of the in-group, a male player, would. Jenkins proposed that boys act and play aggressively as a way to prove to their peers that they are self-reliant, and that they shift that behavior from the playground to the virtual realm as they enter adolescence (1998). The video game community conforms into what is considered a part of “boy culture”, which discourages female involvement. Other research has indicated that gamers believe that video games tend to portray male and female characters in stereotypical ways (Dill & Thill, 2007), and that exaggerated body features make players feel worse about their own bodies (Bartlett & Harris, 2008). The decrease in body esteem, which is a negative experience, may turn female players away from games.

These models are sensible, but incomplete. Female players can be prompted into aggressive play with the proper priming. If female players are deterred by the hypersex-

ualization of female characters, why aren’t male players deterred by the hypermasculinization of male characters? Why would female players be disturbed by some sorts of violence but not by other sorts of violence? A more eclectic model needs to be developed in order to address these holes in explanation. Perhaps men have a slight evolutionary inclination for aggressive and competitive play, but are also socialized to demonstrate the inclination through the use of video games. Perhaps women, who reflect fertility through physical appearance, negatively view sexy, scantily clad female game characters as “competition” and refuse to include them in their in-group.

A model that incorporates aspects of both evolutionary and social psychology would be a model that identifies predispositions to behaviors along with the factors that exacerbate them. Aspects of evolutionary psychology could identify potential predispositions to certain gaming tendencies in men and women, such as gaming preferences and levels of aggression and competition experienced when playing. However, this would not serve as an end-all explanation. Aspects of social psychology could identify factors in the social environment that enhance inherent inclinations to certain behaviors. For example, group conformity may enhance a boy’s natural tendency to prefer more violent video games, which would result in him choosing to play violent video games with his friends. In this model, neither evolutionary nor social psychology serve as primary explanations of gaming behavior: aspects the social environment would enhance evolutionary predispositions.

Conclusion

The study of video games, their characters, their players, and the interactions that occur between the characters and players is multifaceted. Male and female characters differ in how and how often they are portrayed and how often they are protagonists; male players gen-

erally prefer more violent and competitive games than female players; and players may experience an in-group association with a game character of the same gender, which may enhance the game play experience. Because these variables are so complexly intertwined, this field of literature requires more research into in-group associations between players and characters, player reactions to different types of violence, and video games as a source of gender socialization in order to further understand the interaction between human player and game character gender and a model of explanation that incorporates both evolutionary and social psychology. This will provide insight into what can be done to motivate people to play video games.

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The Relation Between Academic Discounting and Delay Discounting

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Abstract--*The purpose of this study was to establish a measure of academic discounting and correlate it with an accepted analogue of delay discounting. Discounting is demonstrated when an organism devalues a reinforcer due to an increased delay (known as delay discounting) or effort requirement (effort discounting) until reinforcer delivery. Academic discounting is defined as the decrease in the subjective value of academic rewards based on the number of hours of effort required to obtain a certain grade. In this study, 33 participants (26 females) completed two discounting tasks: one academic-discounting task and one delay discounting task. Area under the curve (AUC), a quantitative measure of discounting was calculated for each task. Results suggest that a correlation between these two constructs was not significant ($df=29$, $r=0.09$, $p>.05$). This research attempted to provide an applicable use of the effort-discounting paradigm in order to increase the generality of this construct. Revisions to the methodology are necessary in replication, and this experiment serves as a pilot study. After validating this measure, several avenues of research are available and are discussed in this paper.*

An organism behaves impulsively if it chooses a smaller, more immediate reinforcer

over a larger reinforcer delivered after some delay. The organism practices self-control by choosing the larger, more delayed reward instead (cf. Grossbard & Mazur, 1986). Discounting is defined as the decrease in an organism's subjective value of reinforcers as a function of delay (known as delay or temporal discounting; Green & Myerson, 2004) or the amount of effort required until receipt of reward (effort discounting; Grossbard & Mazur, 1986; Sugiwaka & Okouchi, 2004). A large body of literature exists concerning the investigation of delay discounting, with a limited body of research on effort discounting.

Discounting Methods and Research

Ainslie (1974) established a method of teaching self-control to pigeons. In this study, subjects could either peck a key correlated with the delivery of a small, immediate reinforcer (2 s of grain access), or peck an alternative key for a larger, delayed reinforcer (4 s of grain access). The smaller reward was available after pecking the key. Access to the larger, delayed reinforcer was contingent upon a delay in pecking the key for 15 s. Three of the ten pigeons learned to respond to this self-controlled option, providing evidence that self-control is a learned process. Studies such as these provided a foundational basis for studying impulsive choice in later investigations.

Rachlin, Raineri and Cross (1991) laid out a framework for measuring the rate of discounting using human populations. In these experiments, college students were asked to communicate their preference between two amounts of hypothetical money. The smaller amount was to be delivered immediately, and the larger amount was delivered at systematically varied delays. Rachlin and his colleagues used a monetary range from \$1 to \$1000, and delays ranging from one month to 50 years.

Participants were tested on an individual basis, and pairs of cards were presented to participants during the choice procedure. One deck of cards presented amounts of money delivered immediately, and the second deck presented amounts of money delivered after a delay. Participants were instructed to communicate preference between the two hypothetical rewards. The delayed \$1000 card remained showing while the smaller; more immediate reward was systematically varied in magnitude. After the smaller, immediate reward presentation was cycled through in both ascending and descending order, the delay to the presentation of the \$1000 reward systematically increased. The presentation of rewards was counterbalanced in terms of ascending and descending order. The researchers considered a participant to have switched from an immediate to a delayed reward delivery after choosing the delayed reward twice in a row. The two amounts of money were used to find an indifference point, one amount from the ascending presentation, and the other amount from the descending presentation. Indifference points were calculated by taking the average of these two amounts. Using these data, the rate of discounting was calculated by fitting the hyperbolic equation. This study provided the methodological framework for studying discounting by human participants.

Mazur (1987) tested mathematical equations to find the best fit for the discounting data. The two equations that are routinely

discussed in the literature are the exponential equation and the hyperbolic equation. In these two equations, variable V represents subjective value, 'd' represents delay before reward delivery, 'a' represents the magnitude of the reward (amount), and 'k' functions as a free parameter. The exponential equation attempts to describe discounting based on economic theory:

$$(1) \quad V = Ae^{-kD}$$

and the hyperbolic equation in which the parameters are analogous to the first equation:

$$(2) \quad V = A (1+kD)$$

Mazur's findings suggested that the hyperbolic equation provides a better fit for the discounting data. Green and Myerson (2004) reviewed the delay discounting and probability discounting literature, and found that the hyperbolic function is the best fit for describing the rate of discounting. Essentially, the hyperbolic equation captures the rate of discounting across all parameters (delay, effort, probability). The study by Rachlin and colleagues (1991) also supported Mazur's findings.

One issue in the discounting methodology regards the use of real and hypothetical rewards. Specifically, should researchers offer real rewards to participants, or rely on imaginary rewards? The first methodologically sound study to examine this issue (Johnson & Bickel, 2002), provided evidence to suggest that the use of hypothetical rewards provide a valid measure of discounting. Later studies by Madden and his colleagues also examined this issue (Madden, Begotka, Raiff & Kastern, 2003; Madden et al., 2004). In these two studies, the researchers did not find significant differences between the rates of discounting when using real and hypothetical rewards. Green and Myerson (2004) reviewed the literature in which real and hypothetical rewards were used, and rates of discounting were similar across reinforcer type. In the present study, hypothetical rewards will be used.

Academic and Delay Discounting

Drug Effects

Recent studies have focused on how individuals discount monetary and psychopharmacological rewards. Participants are typically either drug users or drug abstainers, and comparisons are drawn between groups. First, the investigator examines how these two groups differ in discounting rates of monetary reinforcement. Second, the researchers examine how money and drugs are discounted by the drug-dependent group. Results of these studies indicate that drug-dependent participants discount monetary reinforcement at a higher rate than non-drug-using participants, and that the drug of choice is discounted at a higher rate than monetary reinforcement.

The rate of discounting increases as a function of chronic opioid use (cf. Giordano, Bickel, Loewenstein, Jacobs, Marsch, & Badger, 2002; Kirby, Petry, & Bickel, 1999; Madden, Bickel, & Jacobs, 1999; Madden, Petry, Badger, & Bickel, 1997), chronic nicotine use (cf., Bickel, Odum, & Madden, 1999; Mitchell, 1999; Odum, Madden, & Bickel, 2002), chronic stimulant use (cf., Anderson & Woolverton, 2003; Diller, Saunders & Anderson, 2008), and chronic alcohol use (cf. Odum & Rainaud, 2003; Petry, 2001; Vuchinich & Simpson, 1998). Monetary reinforcement was discounted at a higher rate by drug-using participants in studies of discounting and opioids (Giordano, et al., 2002; Madden et al., 1999; Madden, et al., 1997) and nicotine (Bickel, et al., 1999).

The pharmacological studies primarily examine two key aspects of discounting. The first aspect focuses on the effect of drugs on the rate of discounting. The second aspect focuses on the rate of discounting between different reward types. The present study focuses on the latter, examining the rate of discounting between two secondary reinforcers: academic grades and monetary rewards.

Effort Discounting

Compared to the temporal discounting literature, the effort discounting literature is relatively limited. Two studies looked at how rewards are discounted in delay discounting tasks and effort-discounting tasks (cf., Mitchell, 2004; Sugiwaka & Okouchi, 2004). Two other studies looked at effort discounting from a neurological perspective (cf., Bardgett, Depenbrock, Downs, Points, & Green, 2009; Ghods-Sharifi, St. Onge, & Floresco, 2009). Effort discounting is related to delay discounting; the value of a reinforcer decreases as a function of either delay or effort (cf. Mitchell, 2004; Sugiwaka & Okouchi, 2004).

Two studies examined the rate of discounting in both a delay-discounting task and an effort-discounting task. In a pharmacology study, Mitchell (2004) found that abstinence from repeated nicotine use increased impulsive choice in 11 smokers. Participants chose between cigarettes available immediately and a delayed \$10. The maximum number of cigarettes in this scale was equal to \$10 at the time of the study. This discounting task was compared to a validated task, where a smaller amount of money was available immediately and a larger amount of money was available after a delay. The rate of discounting for these two reinforcers was found in a delay-discounting condition and an effort-discounting condition. Participants had to squeeze a hand dynamometer in the effort-discounting condition. A titrated scale specified the percentage of effort required to receive rewards. Mitchell (2004) found that abstinence from nicotine increases the reinforcing value of cigarette consumption.

A second study compared patterns of effort and delay discounting (Sugiwaka & Okouchi, 2004). Participants completed a personality questionnaire on self-control. Three groups were created from scores on this measure: 10 high self-control participants, 10 me-

dium self-control participants, and 12 low self-control participants. Each group experienced one delay-discounting and one effort-discounting task using hypothetical rewards. In the effort-discounting condition, the larger reward was contingent upon cleaning a *furo*, a room with a bathtub and sink. Delays ranged from three days to 30 years, and the amount of effort was measured by the number of times the *furo* would be cleaned. Rewards ranged from 100 to 100,000 yen. Results suggested that low self-control participants discounted effort at a higher rate than high self-control participants.

The effort-discounting construct was also examined in two studies regarding brain structure and neurotransmitter activity. These studies used rats as subjects. Ghods-Sharifi and colleagues (2009) investigated the role of the basolateral amygdala (BLA) on effort-based discounting. Lesions on the BLA decrease preference for larger effort-based rewards in both rats and humans. Rats were trained in an operant chamber; pressing one lever yielded a small reward (one or two pellets), and pressing the second lever multiple times yielded a large reward (four pellets). The high-effort reward choice ranged from a variable-ratio 2 (VR-2) schedule to a VR-20 reward delivery schedule. The baseline phase required rats to maintain preference for the higher reward on 80% of trials. Afterwards, the BLA in each rat was inactivated by an infusion of GABA agonists, and subjects completed four more trial blocks. The results suggest that when the BLA is infused with GABA agonists, discounting of larger, more effortful rewards is increased.

Bardgett and colleagues (2009) examined the role of dopamine receptors in effort discounting. Subjects were trained to run in a T-maze; one arm allowed access to two pellets of food, the other arm required subjects to run over a 30 cm barrier to reach eight pellets of food. When the rat chose the arm with the larger reward, the number of pellets in that arm

decreased by one in the subsequent trial. After the baseline phase, subjects were injected with either a dopamine (DA) agonist or DA antagonist and moved on to the next trial. It was found that DA agonists decreased discounting, and DA antagonists increased discounting.

Mazur (1996) combined both discounting constructs into a study on procrastination in pigeons. The indifference points were calculated using a smaller fixed-ratio (FR) requirement after a shorter delay and a larger variable ratio (VR) requirement after a longer delay. For example, in experiment two, a peck on one key resulted in a delay of 2 s, followed by an FR-8 effort requirement, followed by a 15-s delay, and finally a 4 s of access to mixed grain. A peck on the other key followed the same sequence, except the delay was 15 s at the beginning instead of 2 s. In the third experiment, the ratio of responses increased as the delay before the requirement of these responses also increased. These experiments suggested evidence for procrastination in pigeons, where subjects chose the more delayed and more effortful task more than the alternative. Thus, reinforcement value is highest when delivery is immediate, or, in this case, when the required effort is low.

Current Study

A student may value academic achievement differently than his or her peers. Achievement may be defined through graduating with honors, earning induction into an honors society in his or her major, earning admission into a graduate program, or by maintaining a GPA sufficient to stay on a team. On the other hand, some students may value the college degree and consider college GPA as irrelevant. These cumulative achievements are the product of consistent academic effort and demonstrating mastery of the material presented during each semester. The discounting construct was used in this study to capture the value of one course based on effort. The aca-

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demic discounting construct was compared to a validated delay discounting procedure because effort is a product both energy and time.

The purpose of this study was to expand upon the previous discounting literature. It was hypothesized that the academic discounting measure would highly and positively correlate with the validated delay discounting task. To date, this is the only research to be conducted on the academic discounting construct.

Method

Participants. A total of 33 participants were included in the study. Information from three participants was excluded, as it was clear that participants did not understand the directions. These three participants failed to communicate consistent preference of reward. For example, one participant chose an A- over the A when both grades were contingent upon the same effort; another participant chose the immediate reward in each pairing, except when the \$500 available immediately was paired with the alternative. These participants were excluded from data analysis.

Participants were recruited through the Eastern Connecticut State University (ECSU) Experimentrix website (an online subject pool management system), fliers posted around campus, and convenience sampling. Of the 33 participants, there were 24 females and 23 were Caucasian. The age range was 18-36, with a mean of 20.66 years. Eleven participants were freshmen, six were sophomores, five were juniors and another 11 were seniors.

General Procedure. All procedures were approved by the Committee on the Use of Human Subjects in Research at ECSU. Participants completed the experiment individually in a small study room in the campus library. Participants first filled out consent and demographics forms. Participants experienced two tasks, one delay discounting task and one aca-

demic-discounting task (described below). The order of these tasks was counterbalanced across participants. Before each task began, the investigator read the instructions pertaining to each task (see below). The investigator asked each participant if he or she had any questions prior to each task, and if the instructions were clear.

Rewards were printed on 3x5" index cards, analogous to previous research (Bickel, et al., 1999; Madden et al., 1999; Odum, et al., 2002; Odum & Rainaud, 2003). Pairs of rewards were presented concurrently. One reward was available immediately, and the alternative was available after a specified delay. Participants were instructed to communicate their preference between the two. After the participant communicated his or her preference between rewards, the investigator recorded each preference, and changed the reward values. Rewards were presented in both ascending and descending order, and the order of presentation was counterbalanced across participants. After both tasks were completed, participants received a debriefing form, which included information to turn into his or her professor for experimental credit. Each experimental session lasted approximately 45 minutes, and participants received two research credits as compensation. Each task is described below in further detail.

Delay Discounting Task. Before this task began, the investigator read the following instructions:

I am going to present you with two monetary rewards. You will decide which reward you prefer. These rewards are written on these cards. One reward is available immediately, and the other reward is available after a specified delay. I will record your preferences. Although these rewards are imaginary, I want you to make your decisions as if you were receiving one

of these two rewards. You should select the reward that you really want, and not the reward that you think I want you to select. There are no wrong answers here. I might ask you to choose your preference between \$1000 immediately and \$1000 in 25 years. It is up to you to choose and communicate your preference.

The monetary rewards were presented in both ascending and descending order. The scales for this task were similar to the scales developed by Rachlin et al. (1991). The rewards in this task are as follows: \$1, \$5, \$10, \$20, \$40, \$60, \$80, \$100, \$150, \$200, \$250, \$300, \$350, \$400, \$450, \$500, \$550, \$600, \$650, \$700, \$750, \$800, \$850, \$920, \$960, and \$990. The time delays in this task are as follows: one week, two weeks, one month, six months, one year, five years, and 25 years.

Academic Discounting task. Before this task began, the investigator read the following instructions:

I am going to present you with two imaginary academic rewards, represented as grades in a course. You will decide which reward you prefer. Rewards are written on these cards. One reward would be available after one hour of academic effort, and the second reward is contingent upon more effort. Academic effort is defined as the amount of time you spend studying, spending time in class, writing papers, or any other time you spend towards earning a grade in your class. I will record your preferences. Although these academic rewards are imaginary, I want you to make your decisions as if you were receiving one of these two rewards. You should select the reward that you really want, and not the reward that you think I want you to select. There are no wrong answers here.

I will ask you what your preferences are between two rewards based on amounts of time. Remember that these amounts of time represent academic effort, which is contingent upon receiving such rewards. For example, I might ask you to choose your preference between 1 hour of academic effort for an 'A' and 120 hours of academic effort for an 'A'. It is up to you to choose and communicate your preference.

The rewards scale for this task are as follows: A, A-, B+, B, B-, C+, C, C-, D+, D, D-. A letter grade of F was excluded because it was assumed that participants would prefer to pass his or her class, regardless of the amount of work involved. The amounts of effort, measured in hours, are as follows: 1, 2, 4, 6, 8, 12, 16, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 85, 95, 105, and 120.

Data Analysis. The data were analyzed using area under the curve (AUC; Myerson, Green & Warusawitharana, 2001), which is a quantitative measure of discounting. To calculate AUC, indifference points for each participant were calculated by first recording the first preference reversal during the ascending and descending presentation of rewards. The average of these values is the indifference point. An indifference point was found for each delay value. Using these indifference points, vertical lines can be drawn from the data point to the x-axis, forming trapezoids. The area of the trapezoids can be calculated, and summed. This sum is then divided by the total area of the graph (i.e., the product of the maximum values on the x- and y-axis), which provides the AUC value.

For each participant, the AUC for both discounting tasks was calculated. Spearman's Rho was calculated to determine if there was a correlation between delay discounting and academic discounting.

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Results

A total of 33 participants took part in this study. Data from 30 participants were used when calculating statistics, with rationale described in the methods section.

Participants were asked to report their studying habits, and indicated that they studied an average of 4.12 days a week (range: 2-7 days per week), studying an average of 11.57 hours per week (range: 2-35).

Table 1 illustrates the relation between delay discounting and academic discounting.

Table 1.		
<i>Statistics Between Measures</i>		
	Delay Discounting	Academic Discounting
Mean	0.26	0.58
SD	0.22	0.25
Minimum	0.01	0.16
Maximum	0.96	0.96
Median	0.21	0.62

Participants discounted monetary rewards at a steeper rate than academic rewards. The academic-discounting AUC ($M = 0.58$, $SD = 0.25$) was higher than the delay-discounting AUC ($M = 0.26$, $SD = 0.23$) suggesting that monetary rewards were discounted at a steeper rate than academic rewards. The majority of participants discounted monetary rewards more than academic rewards (24 participants, 80% of sample). Figure 1 illustrates the distribution of AUC scores between both measures, with monetary rewards discounted more than academic rewards.

Spearman's Rho was used to calculate all correlations. The correlation between the delay discounting and academic discounting measures was not significant $r(29) = 0.09$, $p > .05$.

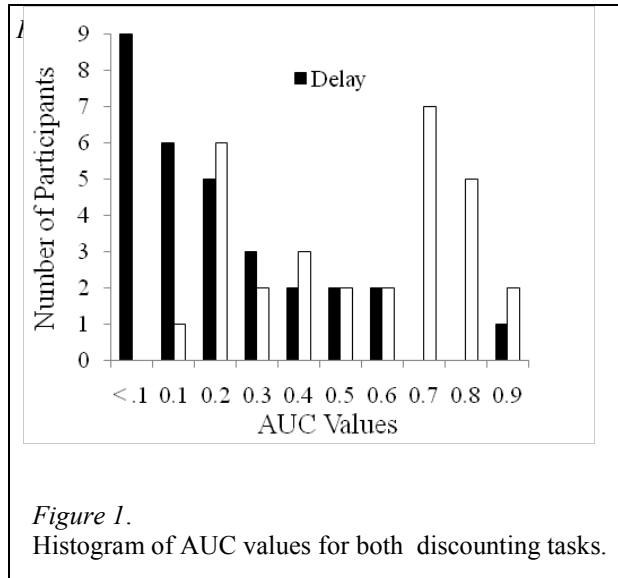


Figure 1. Histogram of AUC values for both discounting tasks.

Figures 2 and 3 illustrate the rate of delay and academic discounting, respectively. The general hyperbolic curves suggest that participants discounted both monetary and academic reinforcement.

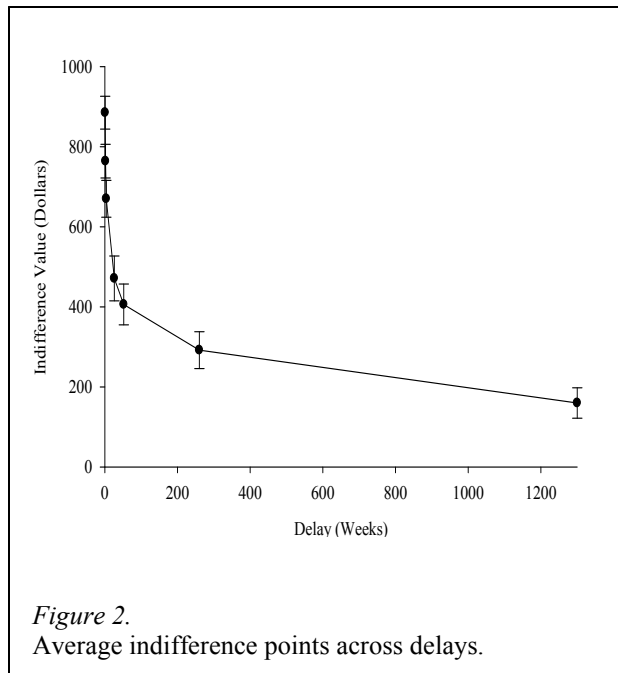
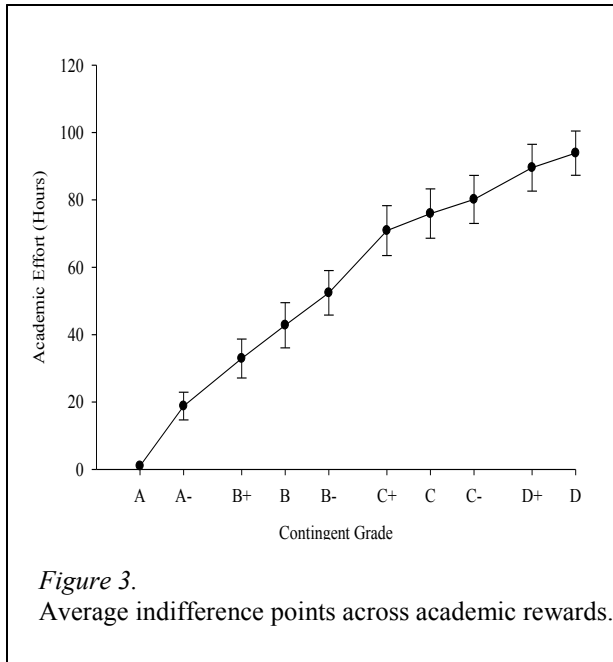


Figure 2. Average indifference points across delays.

Two types of participants emerged: those who discounted both reward types consistently, and those who discounted monetary reinforcement at a substantially faster rate than



academic reinforcement. Twenty-two participants were found to be “inconsistent” in discounting rates; the absolute value between monetary and academic AUC values was larger than 0.10. The number of “inconsistent” participants is substantial, considering a difference of 0.10 is substantial in itself. All but one “inconsistent” participant discounted monetary rewards at a steeper rate than academic rewards. There were eight “consistent” participants; the absolute value between delay-discounting and academic-discounting AUC values was less than 0.10. Half of these “consistent” participants had absolute differences of less than 0.03. Five of these “consistent” participants discounted academic reinforcement faster than monetary reinforcement.

Discussion

Participants experienced two discounting tasks: one delay-discounting task and one academic-discounting task. A correlation between these two measures was computed and was not significant. Generally, participants discounted monetary rewards at a steeper rate than academic rewards. The academic discounting scale was not derived from the vali-

dated delay discounting scale, and the magnitude of an A could have been much higher than \$1000. Several studies examining the relation between drug use and delay discounting have derived the scale of drug rewards based on monetary rewards (nicotine, cf. Bickel, et al., 1999; Mitchell, 2004; heroin, cf. Giordano, et al., 2002; Madden, et al., 1999; Madden, et al., 1997; alcohol, cf. Odum & Rainaud, 2003). In these studies, the researchers figure out how much of the drug can be purchased using the monetary high-end point. The rest of the scale is derived in this fashion. In this study, the academic-discounting procedure was not derived from the validated delay-discounting procedure. The number of hours of academic effort and the academic reinforcer scale were not derived from the validated discounting task in which it was compared. It appears that Sugiwaka & Okouchi (2004) ran into the same methodological issue. The authors did not specifically say that the effort discounting task, cleaning a *furo* a specific number of times, was derived from the delay discounting scale.

An improvement in the methodology is required in order to compare delay-discounting rates and effort-discounting rates. In order to derive the effort-discounting scale in the Sugiwaka & Okouchi study (2004), the researchers could have used the same delay scale (3 days, 1 week, 1 month, 3 months, 6 months, 1 year, 3 years, 5 years, 7 years, 10 years, 20 years, 30 years) and communicated that participants must clean the *furo* a certain number of times each day. After the time period expired, monetary reinforcement would be delivered.

In the academic-discounting methodology, a simple task could be used to find the indifference point between an A after 120 hours and a variable monetary reward. This indifference point would be used to find the monetary high-end point. The rest of the monetary scale would be derived from this computation. In this study, a high-end point of \$1,000 was used. If this task reveals an indif-

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ference point of say, \$10,000, the complete monetary scale would be multiplied by ten. The reason for doing so is backed by variations in the discounting methodology. In different studies, different maximum reinforcer values have been used (\$10.00; Mitchell, 2004; \$10.50; Mitchell, 1999; \$100; Odum & Rainaud, 2003; \$1000; Bickel, Odum, & Madden 1999; Madden, et al., 1997; Madden, et al., 1999; Petry, 2001; Rachlin, et al., 1991; Vuchinich & Simpson, 1998). Research suggests that smaller reinforcer magnitudes are discounted at a higher rate than larger reinforcer magnitudes (cf., Estle, Green, Myerson, & Holt, 2007; Giordano, et al., 2002). Therefore, perhaps the reason why the AUC values for these tasks were so different was because an A was valued higher than \$1000.

The study had several strengths. This study increased the generality of the effort discounting paradigm. The effort discounting literature is limited in both studies of human neurophysiology and behavioral pharmacology, and also limited in the application of the construct. This research was the first to investigate academic discounting by providing data to document how students value time and grades in relation to potential immediate monetary rewards.

The methodology of the study also had a few weaknesses, which are important to document. Most importantly, the ceiling of the academic-discounting measure may have been too low, which may have inflated academic AUC values. The 120 hour maximum was derived by multiplying the amount of lecture time spent in a three-credit course per week (two and a half hours) by three, equaling seven and a half hours. This is in accordance with advice commonly given to undergrads stating that students should spend three hours studying per every one hour spent in class. This figure was multiplied by 16, the number of weeks in a semester.

In the current scale, participants had to exert academic effort for 7.5 hours each week to receive an A grade. More than two-thirds of participants preferred working 120 hours for an A instead of working one hour for a D-. The academic-discounting scale should be constructed in such a way that the number of hours of academic effort would systematically become too high for the majority of participants to choose the A.

Secondly, some participants reported discounting academic effort as if the amount of time was limited to completion within one week. Perhaps if students assumed one semester to complete the work, respective AUC values could have been higher.

Third, some students work towards an A without regard to academic workload. A number of participants reported during experimental sessions that some grades were not acceptable. For example, one participant preferred 120 hours of work for an A versus 1 hour of work for a B+, because a grade of B+ was not acceptable.

Finally, participants did not have to decide which type of course was being discounted. There is a greater amount of effort required in a psychology writing or statistics course than a 1-credit gym course. In the future, the class type should be specified.

There are a few steps required to improve the methodology. First, the academic discounting scale must be adjusted with a high ceiling in place. The validated delay discounting scale had a ceiling of 25 years, influencing all participants to choose an immediate reward at some point versus waiting 25 years for the \$1000. A similar ceiling would be required in the academic discounting scale. Likewise, as previously discussed, the maximum monetary reinforcement value should be properly measured by deriving this from a pilot study. Here, the indifference point between an A and a

monetary reinforcer would be calculated. Additionally, participants must understand that the amount of academic effort must be completed before the end of a semester. This was not clearly communicated during experimental trials.

It may also be helpful to use a validated discounting procedure in the future as a training tool before engaging in the discounting process. Some participants reported that it took some time to get acclimated to the procedure. This could have affected the data, especially when the academic discounting procedure, which has yet to be validated, preceded the delay discounting procedure.

The findings of this study allow research in academic discounting in relation to behavioral pharmacology. Further research can be conducted comparing students who drink alcohol, smoke cigarettes or drink caffeinated beverages and how these students value academic effort. Discounting studies have examined both delay-discounting and effort-discounting paradigms (Mitchell, 2004; Sugiwaka & Okouchi, 2004) These studies were based on physical effort, specifically squeezing a hand-dynamometer (Mitchell, 2004) and cleaning a *furo* several times (Sugiwaka & Okouchi, 2004) to gain access to reinforcement. These two studies use physical effort, whereas the study of academic discounting uses cognitive effort. The effort discounting literature could be expanded by comparing these two types of effort.

Samples from Ivy League schools, community colleges and high schools can be compared to further expand the generality of results. Further investigations could look at the effects of extra-curricular activities, such as mentoring or holding a job. For example, comparisons could be drawn between student athletes, students in a health or gym course, and a control group. Student athletes are often required to maintain a high GPA. While athletics

does come with a time commitment, exercise can relieve stress and therefore have a positive effect on academics in general.

Conclusions

The primary purpose of this study was to investigate the relation between delay discounting and academic discounting. This experiment expands the scope of the discounting literature. Discounting studies are traditionally concerned with the relation between impulsive behavior and drug use. Investigators measure how participants discount the value of monetary and drug reinforcement. There is little research regarding how other reinforcers are discounted as a function of time or effort.

Two types of participants emerged: the first who consistently discounted monetary and academic rewards, and the second who discounted monetary rewards at a much steeper rate than academic rewards. In conclusion, revisions to the academic discounting scale and overall methodology are required in further developing the validity of this scale.

This study provides an underdeveloped application of the effort discounting paradigm in the form of academic discounting. Further development of this construct is recommended to better understand how and why academic reinforcement is discounted by students.

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