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CONTENTS

Motivations of Play and Pathological Use of Massively Multiplayer Online Roleplaying Games

Michael R. Burson

University of North Carolina at Charlotte

Abstract --Recent research on massively multiplayer online role playing games (MMORPGs), games involving role-playing in virtual environments, interaction among many players, and ongoing, continuously evolving play has focused mainly on the potential problematic and pathological outcomes that may result from their play. These outcomes may result from specific motivations related to avoidance of offline environments (escapism) or excessive pursuit of rewards in online environments (immersion). Other motivations such as pursuit of relationships or achievements may be associated with health benefits but these relationships are little studied. By examining which motivations are associated with problematic use, or alternatively, health benefits such as improved self-esteem, social support, and life satisfaction, a better understanding of the connection between motivations and health outcomes may be reached. The current study examined relationships between motivations to play MMORPGs and possible positive and negative health outcomes that may result from their play. Unique associations were assessed between five motivations, including achievement, relationship, immersion, escapism, and manipulation motivations and negative outcomes (Problematic Internet Use, or PIU) as well as a range of specific positive outcomes hypothesized to be related to MMPORG play, including self-esteem, perceived social support, and life satisfaction. Findings showed that achievement and relationship motivations were related to hours of play and PIU, and manipulation was related to PIU. Contrary to expectations, escapism and immersion did now show anticipated relationships to PIU. Findings also did not demonstrate anticipated relationships with positive health outcomes. Implications for future research on motivations for MMPORG play and health outcomes are discussed. .

Internet use is an area of study that is gaining more attention in health research as the Internet becomes increasingly integrated into everyday life (Brian & Wiemer-Hastings, 2005; Caplan, 2002; Caplan 2005; Caplan, 2007; Ceyhan & Ceyhan, 2008; Deniz, 2010; Griffiths & Meredith 2010; Grüsser, Thalemann, & Griffiths, 2007). Internet activities have become accessible to a widening population of users, and provide many potential benefits to health and well being, including increased self-esteem and increased social support (Caplan, 2002). However, some individuals invest a great deal of time and money into online activities, suggesting potential for excessive use and health effects, including possible development of problems related to use, referred to as Pathological Internet Use (PIU; Davis, 2001). Certain types of games involving role-playing in virtual environments, interaction among many players, and ongoing, continuously evolving play, referred to as massively multiplayer online role-playing games (MMORPGs), have raised particular concerns in this regard. Specifically, the capacity of these environments to provide immediate rewards that may be lacking from users' "real" lives or an outlet for escape from aversive life circumstances may compel some vulnerable individuals to use MMORPGs in a pathological way. Recent research on these and other, potentially more posi-

tive motivations for using MMORPGs (Yee, 2006) may provide a basis for better understanding positive and negative effects of MMPORG use, through examining which motivations are associated with PIU, or alternatively, health benefits such as improved self-esteem, social support, and life satisfaction.

The aim of the present study is to contribute to the emerging literature on PIU by examining how motivations to play MMORPGs are associated with negative or positive health outcomes. Specifically, the study will examine which of five motivations for play identified in prior research, including immersion, escapism, achievement, relationship, and manipulation (Yee, 2006) are associated with: 1) increased MMORPG use; 2) PIU; and 3) positive health outcomes, including improved self-esteem, social support, and life satisfaction. In the remaining sections of this literature review, PIU as it is described in existing research will be discussed along with existing theory regarding its causes; then, ways in which the five motivations– particularly immersion and escapism – may contribute to further development of this theory will be proposed.

Internet Usage and PIU

Though not currently a formal diagnosis in the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV; American Psychiatric Association, 2000) criteria for PIU have been suggested, including alienation from the real world, hampering of interpersonal relationships, reduced academic performance, and loss of sense of time (Hsu, Wen & Wu, 2009). Caplan (2002) defines PIU as "the use of the Internet that creates psychological, social, school, and/or work difficulties in a person's life," a definition which highly resembles criteria used to establish substance abuse in the DSM-IV. Caplan further proposes that PIU can involve psychological dependence, characterized by increased investment of resources in Internet related activities, unpleasant feelings like anxiety or depression when off-line, development of "tolerance" to the effects of being online, and denial of problematic behaviors. Caplan proposes that the symptoms of PIU often develop in the context of pre-existing psychopathology, particularly mood disorders, or in circumstances in which the user is socially isolated.

Measurement of PIU

Time using the Internet is one commonly used measure of PIU (Brian & Weimer-Hastings, 2005; Caplan, Williams & Yee, 2009; Deniz, 2010; Hsu, Wen & Wu, 2009). However, as a single measure, time using the Internet has important limitations. Some users can play for only a few hours a day and still be considered to have problematic behavior, whereas others may play for hours and never experience harmful effects or compulsion to play (Caplan, 2002). Thus, while time spent playing online games can be useful, it does not necessarily capture problems related to use, and there are other measures that need to be considered. PIU has been empirically measured by Caplan (2002) using a Generalized Problematic Internet Use Scale (GPIUS). This measure, using a model of "generalized" pathological use proposed by Davis (2001) assesses problematic cognitions, behaviors, and negative outcomes related to online experiences of any type (e.g., in addition to MMPORGs, gambling, viewing of pornographic material). For example, cognitions associated with PIU are "I feel worthless when offline, but I feel like somebody online" (Caplan, 2002). Behavioral associations include "I have missed important appointments because I was online" and negative outcomes include "I have gotten in trouble with my employer or school because of being online." In addition to direct measures, PIU is sometimes assessed using measures of self-esteem, depression, and perceived social support scales in order to provide a better understanding of how PIU may relate to psychological or social functioning (Caplan, 2002).

Massively Multiplayer Online Role Playing Games (MMORPGs)

Research on MMORPGs provides ample basis for concerns regarding possible pathological qualities of these games (Colwell & Rhaiti, 1995; Griffiths & Meredith, 2009; Grüsser, Thalemann & Griffiths, 2007; Hsu, Wen & Wu, 2009; Brian & Wiemer-Hastings, 2005; Stetina

et al, 2011, Yee, 2006). MMORPGs are some of the most popular games on the market and include titles such as World of Warcraft, EverQuest, Warhammer, and Lord of the Rings Online (Yee, 2006). MMORPGs are played by many people at once, are ongoing, with different sets of players participating over time, and constantly evolve due to contributions of these changing sets of players to situations or "plot" associated with the game (Yee, 2006). Unlike other computer and online games, MMORPGs do not have a linear beginning and end. The virtual "world" is unpredictable, with the virtual environment or narrative of the game unfolding as determined by the players within certain broad constraints. Designers also change games on an ongoing basis. For example, World of Warcraft consistently releases new software upgrades that add new aspects to the game-play, changing the constraints within which players operate (Blizzard Entertainment, 2011). The highly motivating nature of these appealing features potentially contributes to use. More specifically, these games may contribute to problems among individuals because their rewarding nature provides outlets for players motivated by desires for immersion in virtual environments or "escape" from real environments.

MMORPG Immersiveness

Games are intentionally designed to be "immersive," and one of the reasons MMORPGs have been so successful is due to this fact (Calleja, 2010). Immersive games allow users to feel that they are part of the game or are "someone else" (Stetina et al, 2010; Yee, 2006). Several characteristics of MMORPGs are thought to contribute to their immersive qualities. First, MMORPGs typically do not "end" in the same manner as other games, so that players can participate on an ongoing basis, without interruption, continually developing their characters' stories and accessing new and exciting opportunities (Stetina et al, 2010). MMORPGs are also designed to encourage a sense of obligation among players to participate frequently and consistently.

For example, in most MMORPGs, if a player wishes to access more difficult and therefore more rewarding aspects of the game, it becomes necessary to join a "guild", a formally organized group of gamers who communicate with each other and combine their individual abilities and talents together online. Guild members depend on each other for active and consistent participation and because of this social and competitive aspect of the game, some gamers may begin to feel that dedication to a guild is mandatory (Brain &Weimer-Hastings, 2005). Players driven by immersion motivations seek to discover things about the game that others do not know, exploring and finding hidden lore and items (Yee, 2006b). Immersive players might also deeply enjoy customizing their avatar, or in-game character, with special clothes, accessories, styles, and weapons. This motive could show that some gamers are drawn to MMORPGs because they, the users, can make their avatar appear in ways they wish to in real life, making them more physically attractive and strong and dress them in fanciful clothing that is unavailable in the real world (Bessiere, Seay, & Kiesler 2007). One recent study found that players with lower self-esteem are more likely to make an "ideal" avatar instead of a realistic one, suggesting that people with lower self-esteem are more prone to immersive behavior (Stetina et al, 2011).

Escapism and MMORPGs

In addition to the highly immersive aspects of MMORPGs, problems can occur when players begin to use the game as a form of escape. Escapist behavior is characterized by using the game to escape from reality or to avoid problems (Stetina et al, 2010). Calleja (2010) argues that because games are the newest and most exciting technologies available they are the best examples of "unreality" and therefore highly attractive to those wishing to escape. Calleja uses the term "magic circle" to illustrate how the digital world can be seen as separated and protected from the harshness of the real world, a special place gamers can go to get away from their problems. Everything within the "magic circle" follows special rules, separate and beyond the real world. Courtrooms, card tables, and computer screens can all be inside these magic circles and

follow their own social rules independent of the world around them. Players who lead hectic lives may find the predictability and controllability provided by magic circles comforting. Other players may seek to escape from the predictability of their lives and involve themselves in something out of the routine (Calleja, 2010). These motivations are particularly telling when considering the effects of PIU and motivations to play MMORPGs (Calleja, 2010). Where immersive factors of game play could be considered positive reinforcement, escapist factors can be considered negative reinforcement, as escape into the world of the game effectively removes problems users may experience in their offline lives, at least for a short time. Individuals suffering from significant forms of psychopathology such as mood or anxiety disorders may be particularly vulnerable to this type of reinforcement mechanism (Davis, 2001).

Other Motivations for MMORPG Use

In addition to immersion and escapism motivations thought to contribute to PIU of MMPORGs, several other motivations for MMORPG play have been described. Yee (2006) has empirically developed a five-factor model of user motivations for online games, including the two potentially pathogenic motivations of immersion and escapism described above as well as three other motivations: *achievement*, *relationship*, and *manipulation*. To identify these factors, Yee conducted an exploratory factor analysis of items, which were generated from review of existing literature and qualitative data gathered from participants in preliminary research for the study (Yee, 2006). *Achievement* motivations are associated with desire to enhance oneself in the context of the virtual world through the completion of goals (Yee, 2006). MMORPGs provide opportunities to be successful at a personally meaningful activity, contributing to self-actualization, as well as opportunities to exercise leadership (e.g., through guilds). *Relationship* motivated gamers play to have social interaction with other players, forming friendships that in some cases might be more intimate than those experienced in the real world. In MMORPGs there is a strong emphasis on the need to communicate and cooperate with other players. The social connections that may be forged as a result may be necessary to achievement in the game, but they also provide a potential secondary benefit of increasing users' social support. This could be beneficial to health, particularly if relationships established online are further pursued in off-line contexts, an outcome that existing literature suggests regularly occurs among MMPORG users (Yee, 2006).

Where achievement and relationship have several positive aspects, they also have potential negative health outcomes. If carried to an extreme, achievers may be driven so deeply by the need to succeed or they may obsess about the next adventure, it may be possible that they will be unable to cut back on game play. Relationship driven players may come to rely too much on online friends and neglect their real world relations of friends, family, spouses, or even children (Yee, 2006). *Manipulation* is the final motivation described by Yee (2006). Players pursuing manipulation objectives taunt, agitate, and mislead others to further their own goals. It is unclear whether this motivation would be associated with PIU, as engaging in online manipulation does not necessarily require as great of an investment of time and energy as might be needed for other objectives, such as those associated with relationship or achievement motivations. The nature of escapism and immersion – avoidance of offline reality, or "losing oneself" in online reality – similarly implies potential excessive use in a manner manipulation does not.

Present Study

PIU is still a new topic in the literature and relatively few studies examine factors contributing to it versus healthy Internet use such as the motivations developed by Yee (2006). In order to examine how motivations are associated with problematic play or healthy outcomes, the present study will examine relationships between Yee's five factors and: 1) time spent on MMORPG use; 2) extent of pathological use, as operationalized using a previously validated measure of PIU (Davis, 2001); and 3) positive health outcomes, more specifically, self-esteem, which may be particularly enhanced as a func-

tion of play for achievement motivations, social support, which may benefit from play for relationship motivations, and life satisfaction, which might be expected to be enhanced by either achievement or relationship motivations. Based on the literature summarized above, the following relationships between MMORPG motivations and outcomes were hypothesized: 1) all five types of motivations will be associated with time of MMORPG use, consistent with their hypothesized roles in encouraging MMPORG play; 2) negative health outcomes as operationalized by PIU will be associated with immersion and escapism; 3) positive health outcomes will be associated with achievement and relationship motivations. Yee (2006) speculated that achievement and relationship motivation might be related to PIU as well; however, we anticipate that this would occur only to the extent that achievement and relationship rewards are not similarly accessible offline, as might be expected among users motivated by escapism and immersion. Consequently, we anticipate in addition to our first three hypotheses that 4) achievement and relationship motives will relate to PIU levels bivariately, but not if levels of escapism and immersion are controlled. No hypotheses are offered related to associations between manipulation and PIU, as little consideration of the role of manipulation in PIU has previously occurred in the relevant literature.

Method

Participant Recruitment and Selection

Participants were recruited through advertisements posted to on-line gaming forums that cater to MMORPG gamers. No incentives were given for these participants. Participants were also recruited through the University of North Carolina at Charlotte's student research volunteer recruitment system. These students received standard extra credit awarded for participation through the sona system (i.e., credit for one half hour of participation, the estimated time required for completing the survey for the study). To be included, participants were required to consent to participate by indicating agreement with a statement of consent in an online form,

and had to indicate that they are users of MMORPGs, which for purposes of this study was operationalized as "online games involving role-playing in virtual environments, interaction among many players, and ongoing, continuously evolving play." Participants were asked to list up to three MMORPGs that they most frequently play to allow for objective verification of their self-report of MMORPG participation. To provide information on the extent of their MMPORG use, participants were asked to indicate how many hours they played MMPORGs in a given week, and if they had ever played an MMORPG for 10 hours or more continuously.

Measures

Generalized Problematic Internet Use Scale. The *Generalized Problematic Internet Use Scale* (GPIUS; Davis, 2001) measures participants' cognitions, behaviors, and outcomes associated with Davis's theoretical construct of PIU. The GPIUS consists of 29 items using a 4-point Likert-style scale, with higher scores indicating higher agreement with statements regarding problematic outcomes of use (*Strongly Disagree* = 1, *Strongly Agree* = 4). Sample items include "I seek others online when I feel isolated" and "I have gotten into trouble at work or school because of being online."

Yee's Motivations for MMORPG Game Play Scale. The *Motivations for MMORPG Game Play Scale* (Yee, 2006) consists of 34 items assessing the five motivations to play MMORPGs in Yee's (2006) five-factor model. Six items were removed from the original measure as they were designed to assess motivations for MMORPG play that were not ultimately included in Yee's model. Each item is answered on a 4-point Likert-style scale, with higher scores indicating stronger agreement with statements regarding the five motivations for play (*Strongly Disagree* = 1, *Strongly Agree* = 4). Sample items include "I make up stories or histories for my character" and "Playing the game helps me to forget some of the real-life problems I have". Unit weighted composites of items contributing to each of the five factors (i.e., immersion, escapism, achievement, relationship, and manipulation) were used as predictors in the

analyses.

Social Provisions Scale. Participants' perceived social support was assessed using the 24-item Social Provisions Scale (SPS; Cutrona & Russell, 1984). Each item on the SPS is answered on a 4-point Likert-type scale with higher scores indicating higher agreement with the statements describing perceptions of being supported by one's social network. Sample items include "There are people I can depend on for help if I really need it" and "I feel part of a group of people who share my attitudes and beliefs."

Rosenberg's Self-Esteem Scale. Participants' self-esteem was assessed using the 10-item *Rosenberg Self-Esteem Scale* (1965). Each item is answered on a 4-point Likert scale with higher scores indicating higher self-esteem (*Strongly Disagree* = 1, *Strongly Agree=4*). Sample items include ''I feel that I have a number of good qualities" and ''I am able to do things as well as most other people."

Life Satisfaction Scale. Participants' satisfaction with their lives was assessed using a 5-item Life Satisfaction Scale (Diener, 1985). Each item is answered on a 6-point Likert scale with higher scores indicating higher life satisfaction (*Strongly Disagree=1, Strongly Agree=6*). Sample items include, "In most ways my life is close to ideal" and "The conditions of my life are excellent."

Analyses

Bivariate Analyses. Bivariate correlations between scores for motivations on the Motivations for MMORPG Game Play scale and outcome measures were examined to determine which motivations were bivariately associated with PIU and other positive and negative health outcomes.

Regression Analyses. Motivations for MMORPGs were expected to correlate. Thus, simultaneous multiple regression was used to determine whether motivations were uniquely associated with hours of use, PIU, and positive health outcomes (i.e., social support, self-esteem, and life satisfaction), controlling for the other motivations assessed by Yee's scale. Scores for the five motivations from Yee's scale, including the two motivations thought to be pathogenic (i.e., escapism and immersion) and the remaining three motivations (achievement, relationship, and manipulation) were used in five multiple regressions, one for each outcome variable. For all analyses, significance was evaluated at the .05 level.

Results

Description of Sample

117 participants were recruited for this study. This sample size is slightly higher than *N*=91 participants required for detecting significance at the *p*<.05 level of predictors with a

Table 1. *Sample Descriptives*

Descriptive	Categories	Frequency (N=117)	%
Gender	Male	63	53.8%
	Female	54	46.2%
Occupation	Work full time	8	6.8%
	Full-time student	93	79.5%
	Work part-time and/or part-time student	12	10.3%
	Stay-at-home mom/dad	1	0.9%
	Unemployed	3	2.6%
	Retired	0	0.0%
Marital Status	Single/unmarried	106	90.6%
	Engaged/Married	11	9.4%
Children	Yes	10	8.5%
	No	107	91.5%
10+ Hours	Yes	44	37.6%
	No	73	62.4%

† $p < .10$ * $p < .05$ ** $p < .01$

"medium" effect size (f²=.15), according to an algorithm devised by Soper (2011). Table 1 shows descriptive statistics for the sample. The mean age of the sample was 21. 53.8% of participants were male, and a large majority (79.5%) were full time students, single (90.6%) and did not have children (91.5%). These sample characteristics are typical for students at a 4-year degree granting institution and also resemble those of MMPORG gamers (Yee, 2006). The mean of hours played in a week was 9.66 hours (*SD*=9.097). About a third (37%) of participants said that they had at one point played continuously for 10 hours or more. Participants were asked to list one to three MMORPGs that they have played in order to define them as gamers familiar with the specific type of games being included in this study. World of Warcraft was the most common response. Other games that were frequently listed were Everquest, Star Wars: The Old Republic, Lord of the Rings Online, and Runescape. These games all meet criteria for being an MMORPG as operationalized by this study (i.e. online games involving role-playing in virtual environments, interaction among many players, and ongoing, continuously evolving play).

Based on these data, it appears that at least some study participants played quite frequently, spending large amounts of time on average each week playing MMORPGs, many having played for many hours continuously on at least one occasion. Games reported included the most popular titles but a broad variety of other games as well. .

Game Playing Motivations

As seen in Table 2, participants tended to agree with most of the motivations for use examined, including both those hypothesized to be related to negative outcomes, immersion and escapism motivations (*M* = 2.57, *SD* = .53; *M* = 2.91, *SD* = .62, respectively) and one of those hypothesized to be related to positive outcomes, achievement motivation (*M* = 3.03, *SD* =.45). There was a slight tendency of users to disagree with statements describing relationship motiva-

Table 2. Means, Standard Deviations, and Correlations of Study Variables

Variable	M	SD	1	2	3	4	5	6	7	8	9	10	11
1 Relationship	2.29	.72	-										
2 Manipulation	1.90	.72	.08	-									
3 Immersion	2.57	.53	.14	-.09	-								
4 Escapism	2.91	.62	.27**	-.01	.21*	-							
5 Achievement	3.03	.45	.22*	.10	.06	.35**	-						
6 Problematic Use	2.06	.51	.40**	.04**	.14	.32**	.35**	-					
7 Self-Esteem	3.11	.52	-.08	-.17†	-.13	-.20	.03	-.50**	-				
8 Social Support	3.22	.47	-.06	-.31**	-.07	-.12	.03	-.54**	.73**	-			
9 Life Satisfaction	4.24	1.08	-.06	-.04	.02	-.12	-.08	-.32**	.63**	.53**	-		
10 Age	21	4.29	.06	.09	-.06	.02	-.11	.01	-.12	-.05	-.07	-	
11 Gender	.46	.50	-.16	-.07	-.03	-.13	-28**	-.01	-.12	-.01	-.06	-.19*	-
12 Time Played	9.66	9.91	.37**	-.12	.12	.18†	.37**	.33**	-.11	-.02	-.25*	-.11	-.23*

† *p* < .10* *p* < .05** *p* < .01

tions for use ($M = 2.29$, $SD = .72$). Only one motivation showed a strong tendency to elicit disagreement from participants, manipulation ($M = 1.90$, $SD = .72$). Table 2 also shows correlations between study variables. Time of use was related to problematic use ($r = .33$, $p < .01$), confirming expectations that greater time spent with the game would result in greater likelihood of problems related to use. Time spent playing MMORPGs was related to relationship and achievement motivations ($r = .37$, $p < .01$; $r = .37$, $p < .01$, respectively), but not the remaining motivations, immersion, escapism, and manipulation ($r = .12$, *ns*; $r = .18$, *ns*; $r = -.12$, *ns*, respectively). Correlations were shown between the hypothesized negative motivation of escapism and PIU ($r = .32$, $p < .001$) but not between the hypothesized negative motivation of immersion and PIU ($r = .14$, *ns*). As expected (i.e., in the absence of controlling for escapism and immersion), achievement and relationship motivations strongly related to PIU ($r = .35$, $p < .001$; $r = .40$, $p < .001$, respectively). Manipulation was also strongly related to PIU ($r = .34$, $p < .001$).

Regression Results

Table 3 shows results of simultaneous regressions of the five motivations on the five outcomes. The first hypothesis posited that all five motivations would be associated with hours of MMORPGs played per week. Significant relationships were found between relationship and achievement motivations and hours played ($\beta = 4.05$, $p < .01$; $\beta = 5.01$, $p < .01$, respectively). Escapism, immersion, and manipulation did not show statistically significant relationships with hours played at the $p < .05$ level, though a trend was shown for manipulation to be *inversely* related to hours played ($\beta = -.03$, *ns*; $\beta = .03$, *ns*; $\beta = -.18$, *ns*, respectively).

The second hypothesis posited that the motivations of escapism and immersion would be related to negative health outcomes. Contrary to this hypothesis, relationships between these motivations and outcomes were not significant ($\beta = .15$, *ns*; $\beta = .09$, *ns*, respectively); however, the other motivations of achievement, relationship, and manipulation were related to PIU, ($\beta = .24$, $p < .01$; $\beta = .27$, $p < .01$; $\beta = .30$, $p < .01$, respectively).

Table 3. Unique Relationships between Motivations and Outcomes

	Hours Played	Problematic Internet Use	Self-Esteem	Social Support	Life Satisfaction
Variable	β	β	β	β	β
Step 1					
Gender	-.13	.05	-.16	-.03	-.16
Age	-.11	.01	-.13	-.01	-.09
Step 2					
Relationship	.29**	.27**	-.02	.01	-.03
Manipulation	-.18†	.30**	-.17†	-.33**	-.12
Immersion	.03	.09	-.12	-.08	.04
Escapism	-.03	.15†	-.21*	-.15	-.12
Achievement	.28**	.24**	.07	.10	-.07
R^2	.27**	.35**	.12†	.13*	.04

† $p < .10$ * $p < .05$ ** $p < .01$

The third hypothesis was that achievement and relationship motivations would be related to positive outcomes. Findings did not support this hypothesis, as achievement and relationship motivations were not significantly related to self-esteem ($\beta = .07. ns$; $\beta = -.02, ns$), perceived social support ($\beta = .10. ns$; $\beta = .01, ns$), or life satisfaction ($\beta = -.07. ns$; $\beta = -.03, ns$). However, inverse relationships were found between escapism and self-esteem ($\beta = -.21, p < .04$) as well as between manipulation and social support ($\beta = -.33, p < .01$). Our fourth hypothesis was that achievement and relationship motivations would relate to PIU bivariately, but not if escapism and immersion motivations were controlled. Results described above indicated that this hypothesis was not supported; specifically, achievement and relationship motivations remained related to PIU when entered with escapism and immersion motives in the simultaneous regression for PIU ($\beta = .27, p < .01$; $\beta = .29, p < .001$, respectively).

Discussion

The purpose of this study was to examine relationships between motivations for MMORPGs and possible positive and negative health outcomes of play. It was anticipated that all motivations would be related to hours of play, that certain motivations thought to be pathogenic – immersion and escapism – would be related to negative outcomes (PIU), and that motivations thought to be associated with positive effects – achievement and relationship motivations – would be related to positive outcomes, and further, would not be related to negative outcomes if pathogenic motives were controlled.

Findings showed that motivations were related to outcomes, but not in the anticipated ways. Contrary to expectations, though escapism (not immersion) showed a relationship to PIU in the bivariate analyses, these motivations were not related to PIU when levels of other motivations were controlled. Also contrary to expectations, achievement and relationship motivations were related to hours of play and PIU, whether or not escapism and immersion were controlled. Furthermore, these motivations did not show anticipated positive relationships with variables related to well-being, including self-esteem, social support, and life satisfaction. Escapism showed a negative relationship to self-esteem. It would seem that a pre-existing feeling of low self-esteem may cause a user to play MMORPGs, as these games provide an opportunity to create an alternative identity in order to escape from poor sense of self (Yee, 2006). However, study findings do not support the notion that this process in turn relates to PIU, as escapism and PIU were unrelated in the present study, despite past research suggesting a relationship between escapism and PIU (Caplan, 2009). Manipulation, while negatively related to hours of use, related to increased PIU. Thus, the relationship between manipulation and PIU was an atypical one, not conforming to expectations for development of abusive or dependent patterns of activity use, given the fact that such problematic patterns generally result from excessive engagement in the related activity.

Implications of findings for understanding relationships between motivations and PIU

These findings suggest that rather than being determined exclusively by pathogenic motivations, PIU appears to be predicted by motivations that would generally be considered to have positive ramifications (i.e., achievement and relationship motivations). Thus, individuals who develop PIU may be motivated to play games for reasons that in other types of contexts would be thought to be positive and promote well-being. This pattern suggests the possibility that the role of motivation in development of PIU may be that MMORPGs promote pursuit of rewards online that would be better pursued offline. This explanation would be consistent with suggestions by Yee that even positive motivations could be problematic for MMPORG users if taken to the extreme, such that pursuit of these objectives online displaces their pursuit offline. It should be noted that escapism did relate to PIU bivariately; however, this relationship was not a unique one, as it disappeared when other motives were controlled. One possible explanation of this pattern is that escapism is of secondary importance in the process of developing PIU, such that escapist use (and any associated problems) tends

to occur only among users who begin to seek achievement and relationship rewards online, possibly displacing pursuit of such motives in offline settings.

An exception to this pattern of ostensibly "positive" motivations being associated with PIU was the relationship between PIU and manipulation. This was an unanticipated relationship. It is likely that different types of processes would explain the association between manipulation and negative outcomes than those that were thought to underlie the hypothesized relationships between these outcomes and escapism and immersion, both of which were considered potential reinforcers (negative, and positive, respectively). Manipulation, though associated with PIU, was not related to hours of use. In fact, a trend was shown for manipulation to be negatively related to use. It is possible that manipulation may limit hours of play due to its potential to limit access to games, as users engaging in manipulation may be more likely to violate mores of MMORPGs and thus be ejected from games by administrators. Regardless of the reason for the negative relationship, results are clearly not consistent with the explanation that manipulation plays a causal role in PIU, as least insofar as the emergence of PIU is explicable through patterns of reinforcement, since manipulation was not associated with increased use. Thus, it is more likely that increased desire to use MMORPGs for manipulative motivations and PIU were due to their common association with other variables. A possible candidate for this role would be social support, as both manipulation and PIU related to social support (inversely) in the study, with both correlations exceeding the $r = .3$ level, a moderate to large effect size. Theory related to bullying (MacDonald & Roberts-Pittman, 2010; Hemphill et al, 2012) and emerging anecdotal accounts of "trolls" (Morris, 2012) may be helpful in explaining these phenomena. As manipulation was a strong predictor of PIU in the current sample (despite its lack of relationship to hours of play) this relationship is clearly worthy of further study.

Implications for future research and interventions to address PIU

This study has shown that the connections between motivations for MMPORG play as described by Yee (2006) and health outcomes are quite different from those hypothesized. The findings that relationship and achievement motivations were related to PIU and unrelated to positive outcomes suggest that generally, when gamers play in order to fulfill social and achievement needs, these tendencies are problematic to their health, despite any possible compensatory tendencies previously discussed (possible enhancement of "real" social networks through relationships initially begun in virtual ones). Conversely, findings suggest that the more explicitly pathogenic motivations of immersion and escapism do not play significant roles in PIU development. Further research could shed further light on this issue and help to reconcile study findings with contrasting findings in earlier research, which did suggest that escapism and PIU were associated (Caplan, 2009).

Some possible alternative explanations for findings of the present study could be advanced (i.e., other than the most straightforward, that achievement and relationship motives are more important than overly negative ones in determining PIU). First, the sample for the current study was mostly composed of college age participants, and gaining a wider and more diverse set of data could show somewhat different findings more closely mirroring prior results in research using an older population (Caplan, 2009). With a more diverse sample, differences in relationships between motivations and PIU could be examined based on life situation and age (e.g., being an "emerging" or younger adult or student, versus being an older adult with more demanding commitments to family and work). It is also possible that lack of relationships shown between "pathogenic" motivations and PIU related to greater willingness by users to acknowledge more socially desirable relationship and achievement motivations – which one would expect to be related to escapism and immersion, if MMORPGs were used to fulfill these needs in place of aversive offline contexts. However, this explanation is relatively less likely than others, given the means on scales for "positive" versus

"negative" motivations; specifically, users tended to agree with statements describing immersive and escapist motives.

MMORPGs are a great source of fun and entertainment for many users all over the world. They give people opportunities to fulfill needs for social interaction and achievement that might be lacking or missing in their real lives. However, when using games becomes a source of fulfilling these needs that takes primacy over "real world" contexts for relationship formation and achievement, it may become problematic to one's health. The present study suggests the possibility that such a process of displacement of offline motivational activities to online social contexts may play a role in the development of PIU. In addition to replicating this unanticipated finding, future research should examine potential moderators determining whether "positive" or "negative" motivations are more dominant in determining PIU, such as demand characteristics of positively versus negatively framed motivational statements, or characteristics of samples such as age or level of adult role commitment.

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Appendix A. Yee's Motivations of Play Scale

1) I find myself having meaningful conversations with others within the game.
2) I usually don't chat much with group members.
3) I have made some good friends in the game.
4) I find myself soloing a lot.
5) I like to say funny things in group/guild chat.
6) I talk to my friends in the game about personal issues.
7) Friends in the game have offered me support when I had a real life problem or crisis.
8) I like to feel powerful in the game.
9) Doing massive amounts of damage is very satisfying.
10) I constantly try to set and reach goals.
11) I can't stand those people who only care about leveling.
12) It's very important to me to get the best gear available.
13) I try to optimize my XP gain as much as possible.
14) I'm fascinated by the game mechanics, and love charts and tables.
15) I research everything about a class before starting a character.
16) Class-balancing or realm-balancing issues do not interest me.
17) These games are too complicated.
18) I like wandering and exploring the world.
19) I would make maps if they weren't available.
20) I have learned things about myself from playing the game.
21) I understand real-life group dynamics much more after playing the game.
22) I like the escapism aspect of the game.
23) I like to be immersed in a fantasy world.
24) Playing the game lets me vent and relieve stress from the day.
25) Playing the game lets for forget some of the real life problems I have.
26) I like to try out new roles and personalities with my characters.
27) The way I am in the game is the way I am in real life.
28) People who role-play exclusively bother me.
29) I like the feeling of being part of a story.
30) I make up stories and histories for my character(s).
31) I like to manipulate other people so they do what I want them to.
32) I like to dominate other characters/players.
33) I like to taunt or annoy other players.
34) I scam other people out of their money or equipment.
35) I beg for money or items in the game.
36) It's important to me to achieve things with as little help from other people as possible.
37) It's just a game.
38) I am uninterested in player killing.

Appendix B. Caplan's Problematic Internet Use Scale

1) I use MMORPGs to talk to others when I feel isolated.
2) I use MMORPGs to make myself feel better when I'm down.
3) I feel that I am treated better in the game than in face-to-face relationships.
4) I feel safer relating to others in the game rather than in face-to-face relationships.
5) I feel more confident socializing in the game than in the real world.
6) I feel more comfortable with computers than with real people.
7) I have gotten into trouble at work or school because of playing MMORPGs.
8) I have missed class or work because of playing MMORPGs.
9) I feel worthless in the real world, but I am someone in the game.
10) I have missed social events because of playing MMORPGs.
11) I have had unsuccessful attempts to control my MMORPG use.
12) I have been unable to reduce the amount of time I spend playing MMORPGs.
13) I have had guilt about the amount of time I spend playing MMORPGs.
14) I have tried to stop playing MMORPGs for long periods of time.
15) I have lost track of time while in the game.
16) I play MMORPGs for longer times than I intended to.
17) I spend a good deal of time playing MMORPGs.
18) I feel preoccupied with the game if I can't log on for an extended period of time.
19) I miss playing MMORPGs if I can't get on.
20) When I am not playing MMORPGs, I wonder about what is happening in the game.
21) I feel lost if I can't play MMORPGs.
22) I find it hard to stop thinking about what is waiting for me in the game.
23) I don't worry about how I look in the real world when I socialize in the game.
24) I don't worry about relationship commitment when socializing in the game.
25) I feel that I have power over how others perceive me when I socialize in the game.

Appendix C. Rosenberg's Self-Esteem Measure

1) On the whole, I am satisfied with myself.
2) At times, I think I am no good at all.*
3) I feel that I have a number of good qualities.
4) I am able to do things as well as most other people.
5) I feel I do not have much to be proud of.*
6) I certainly feel useless at times.*
7) I feel that I'm a person of worth, a least on an equal plane with others.
8) I wish I could have more respect for myself.*
9) All in all, I am inclined to feel that I am a failure.*
10) I take a positive attitude toward myself.

   *Indicates item should be reverse scored before computing scale total.

Appendix D. Social Provisions Scale

1) There are people I can depend on to help me if I really need it.

2) I feel that I do not have close personal relationships with other people.*

3) There is no one I can turn to for guidance in times of stress.*

4) There are people who depend on me for help.

5) There are people who enjoy the same social activities I do.

6) Other people do not view me as competent.*

7) I feel personally responsible for the well-being of another person.

8) I feel part of a group of people who share my attitudes and beliefs.

9) I do not think other people respect my skills and abilities.*

10) If something went wrong, no one would come to my assistance.*

11) I have close relationships that provide me with a sense of emotional security and well-being.

12) There is someone I could talk to about important decisions in my life.

13) I have relationships where my competence and skill are recognized.

14) There is no one who shares my interests and concerns.*

15) There is no one who really relies on me for their well-being.*

16) There is a trustworthy person I could turn to for advice if I were having problems.

17) I feel a strong emotional bond with at least one other person.

18) There is no one I can depend on for aid if I really need it.*

19) There is no one I feel comfortable talking about problems with.*

20) There are people who admire my talents and abilities.

21) I lack a feeling of intimacy with another person.*

22) There is no one who likes to do the things I do.*

23) There are people I can count on in an emergency.

24) No one needs me to care for them.*

Appendix E. Life Satisfaction Scale

1) My life is going well.
2) My life is just right.
3) I would like to change many things in my life.*
4) I wish I had a different kind of life.*
5) I have a good life.
6) I have what I want in life.

   *Indicates item should be reverse scored before computing scale total.

Social Influence on Eating Behavior and Using Serving Size Information as a Mitigating Factor

Joseph Currin

Washburn University

Abstract--There is a lot of attention today given to eating behaviors and patterns that lead to overeating. One factor that leads to overeating is eating as a social function. This study investigated whether there was an effect of the number of people eating together on the amount consumed by each person, and if the effect can be mitigated by making people aware of proper portion size before they eat. The first hypothesis was the triads will eat more individually than the dyads, or those eating alone. The second hypothesis was if participants were made aware of proper portion size before their meals, they would eat less than those that were not made aware of proper portion size. Women (N = 99) received a pre-weighed meal of pasta that weighed on average 710.4 grams (SD = 131.6). Before the meal, half of the participants were informed of the proper serving size via a questionnaire. After the meal concluded, the amount not eaten per person was weighed to determine the amount consumed and the duration of the meal was recorded. The results partially confirmed the hypotheses. Individuals in dyads did eat more than those eating alone, however individuals in triads ate less than those in dyads. Serving size information had no effect on the amounts the individuals ate in any group.

One of the largest health issues facing America today is obesity. In 2008, 35.5% of women and 32.2% of men were obese (Flegal, Carroll, Ogden, & Curtin, 2010). The cost of obesity and obesity related illnesses as reported by the Insurance Status and Data Source was over 78 billion dollars (Centers for Disease Control and Prevention, 2011). With the large economic burden obesity carries and one-third of the American population being obese, the magnitude of the obesity problem is alarming. Many medical and dietary programs focus on controlling hunger and caloric intake to help individuals lose weight. However, eating behavior is influenced by more than just hunger. The amount that individuals eat is also affected by social facilitation. Social facilitation is when the environment enables, demonstrates, or encourages a person to engage in a specific behavior or group of behaviors (Bond & Titus, 1983).

Weight loss programs are not addressing the issue of social facilitation on eating behaviors. Weight Watchers is a weight loss program that helps an individual make correct food choices and help educate how food and exercise lead to a healthy lifestyle. The program promotes attendance at group meetings and tips on choices a person can make in social settings, but the program does not address the impact other can have on eating behaviors. Nutrisystem and Jenny Craig are weight loss programs that require customers to purchase premade meals. While both help with food choices and developing a healthy lifestyle through proper diet and exercise, they do not address the impact of social facilitation on eating behavior (Jenny Craig, 2011; Liebert, 2008; Nutrisystem, 2011; Weight Watchers, 2011).

Social facilitation can impact an individual in one of two ways: either by distracting the

individual from the task at hand or by the influence of others behaviors on the person. Social facilitation can work to distract a person from concentrating on eating when a person eats with others. Hetherington, Anderson, Norton, and Newson (2006) had a women dine alone, dine with their friends, and dine alone while watching television. The experimenters found when women ate with two friends they ate 18% more than when eating alone, and ate 14% more than when they ate alone while watching television. When the participants dined alone with no distractions, the participant looked at the food she consumed more than anything else. When dining with individuals, she looked at those individuals more than the food she consumed, and when dining while watching television she looked at the television more than the food she consumed. The distraction of conversation and television diverted the participants' attention away from the meal (Hetherington et al., 2006).

How familiar a person is with those he/she eats with at any given meal may influence the amount of food a person consumes. Salvy, Jarrin, Paluch, Irfan, and Pliner (2007) looked at the effect of familiarity of eating partners and how it influences the amount a woman eats. In their experiment, they had women eat with either a same sex friend, an opposite sex friend, a romantic partner, a same sex stranger, and an opposite sex stranger. Their research concluded that the more familiar a person is with his/her eating partner, the more he/she will eat. They speculated that this was due to not worrying about the familiar eating partner judging their eating behavior negatively (Salvy, et al., 2007). Koh and Pliner (2009) reached the same conclusion by looking at the familiarity of same sex dyads sharing food. In their study, the more familiar the dyads were with each other, the more food they consumed and shared (Koh & Pliner, 2009).

In a naturalistic study, researchers observed 469 college students selecting food to eat in the cafeteria (Young, Mizzau, Mai, Sirisegaram, & Wilson, 2009). The researchers found that women eating with three or more other women selected more food to consume than women who were eating either with one other woman or if a man was present in the group. Researchers proposed that one reason the women selected more food in the larger groups is that the women were distracted while making food choices (Young, et al., 2009).

While social facilitation can influence a person to consume more food in social situations, a way to counteract the effect of social facilitation on eating behaviors is to be mindful while eating (Ergstrom, 2007). Ergstrom worked with a bariatric patient who had not lost the desired amount of weight from her Roux en Y Gastric Bypass surgery. Ergstrom taught the bariatric patient how to eat mindfully. The patient was not allowed to read, watch television, or use the computer while eating. The patient was also initially instructed to eat alone. Ergstrom directed the bariatric patient to focus on the taste, texture, and smell of the food she ate and to eat at the same times every day. By removing all potential distractions and instructing the bariatric patient to focus all of her attention on her eating, her negative eating behaviors subsided and Ergstrom was able to help her lose an additional 47 pounds. By eating mindfully, the patient was able to focus on how her body responded to the food she was eating, paying attention to the textures, flavors, and her own satiation. This focus led to her subsequent weight loss. It is important to note that being mindful while eating is not trying to suppress thoughts about food. Barnes and Tantliff (2010) found that those who participated actively in food thought suppression were more likely to experience food cravings and participate in binge eating.

Unlike women, social facilitation does not influence men to eat as much as another individual unless the man is hungry. Hermans, Herman, Larsen, and Engels (2010) had a male confederate eat a certain amount of snack food. Participants reported their hunger level, and then watched a program with the male confederate. Men who reported they were hungry did eat as much snack food as the male confederate, subsequently those men that did not report being hun-

gry did not eat as much as the male confederate (Hermans, Herman, Larsen, and Engels, 2010).

However, the impact of group size on eating behaviors is not well understood. The literature has focused primarily on those eating in dyads (Hetherington et al., 2006; Koh & Pliner, 2009; Salvy et al., 2007) or it has examined naturalistic observations of large groups (Young et al., 2009). The current study aimed to determine whether women eating alone, in dyads, or in triads differed in the amount eaten individually. Furthermore, this study investigated whether providing women information about proper portion sizes mitigated the social facilitation of eating in the dyads and triads. The first hypothesis tested proposed that the members of the triads would eat more individually than the members of the dyads or when eating alone. The other hypothesis tested stated that the groups informed of proper portion size would eat less than the groups that are not informed of proper portion size.

Method

Participants

Participants included 89 women taking introductory psychology courses at a small Midwestern university. They received course credit for their participation in the experiment. There were also 10 female volunteers who were friends/family of the enrolled students. Only women participated in this study because research shows that women are more influenced by social facilitation (Hermans, Herman, Larsen, & Engels, 2010; Salvy et al., 2007, Young et al., 2009). The mean age for all participants was 21.85 years (*SD* = 8.23). The mean BMI for all participants was 26.36 (*SD* = 7.75). The racial makeup of the participants was 4% Asian, 14% African American, 6% Hispanic, and 75% Caucasian. Two participants withdrew before the end of the experiment. Participants were treated in accordance with the *Ethical Principles of Psychologists and Code of Conduct* (APA, 2002).

Materials and Procedures

All trials of the experiment took place in the university dining facility on campus. Participants volunteered for the experiment either alone, with one other female friend (familiar dyad), or with two other female friends (familiar triad). They were told the experiment was a study on the effects of pasta and friendship on memory. Upon arriving for the experiment, participants completed a brief demographic survey to gather data about age, ethnicity, BMI, and the last time they ate. Participants also rated their hunger level on a Likert scale of 1 to 10 where 1 was *not hungry at all* and 10 was *extremely hungry*. Participants in dyads and triads reported the length of friendship for each of the other participants in the group.

All participants also completed a food intake survey. The survey was developed by the researcher and the only purpose of the survey was to introduce the information about proper serving size. The results of the survey were not analyzed for this study. Proper portion size information was retrieved from the USDA's food pyramid website (2010). This survey asked general questions about food behaviors including eating balanced meals, shopping habits, food preparation habits, and whether or not participants read nutritional labels on food. Three questions of the food intake survey asked specific questions about participants' eating habits by asking the participants to report the number of servings per week they ate of meat/protein, pasta & grains, and fruits & vegetables (one question for each category). An example of the first three questions is, "Approximately how many servings of pasta, rice, and/or grains do you have in one week?" Half of the participants' surveys also included information on how to visualize serving size information. An example of one of the three statements that followed the questions about serving size information was, "For example, one serving of pasta is about the size of two tennis balls." This statement was designed to make participants mindful of the amount of food they should eat. The other half of the participants did not receive any serving size information. In addition, to facilitate the expectation that the experiment was a study about memory, participants

responded to a question about what they believed was brain food as well as to indicate whether or not they typically ate before a major exam in a course.

After completing the demographic and food intake surveys, participants received a brief memory test. The participants looked at a sheet of paper with 20 various clip art images on it. Examples of images included on the sheet of paper were a rainbow, house plant, airplane, butterfly, house, and a light bulb. After 30 seconds, the sheet with images was removed, and the participants received a blank piece of paper and given one minute to write down as many of the images that they could recall. The experimenter told the participants that after their meals, they would be tested again. The memory exercise helped continue the expectation that the experiment was about memory.

Meals of pasta were prepared by a private caterer (Chartwells , http://chartwells-usa.com) contracted to run the dining facility on the university campus. Meals consisted of pasta (rigatoni, spaghetti, or bow tie), marinara sauce (tomato puree, tomato paste, extra virgin olive oil, salt, onions, lemon juice, and corn syrup), parmesan cheese, and a bread stick. Each meal consisted of a minimum of one-and-a-half times the suggested serving size of pasta (United States Department of Agriculture, 2010). The weight of the meal varied (710.4g, $SD = 131.4$g) according to type of pasta served that day by the private caterer. A small food scale, manufactured by Taylor and sold under the brand name Biggest Loser, weighed the meals. All measurements were recorded in grams.

Before the meals, the experimenter weighed the meals. Then participants each received a served meal and began to eat. When the participants received their meals, the start time of the meal was recorded. The participants were told they did not have to eat all of the food provided if they did not want. The experimenter instructed the participants to let him know when they were done eating and he excused himself from the area for two to three minutes and sat at a nearby table appearing to be working on his laptop. While all participants initiated conversation on their own, several conversation starters were prepared in case they were needed. The meal was marked as ended when the participants called the experimenter back to the table. Then, the experimenter debriefed the participants and the remaining food was weighed and recorded along with the completion time of the meal.

Results

Researchers measured the amount of pasta eaten (in grams) by each participant. The length of the meal was also recorded. The amounts eaten by each individual when dining alone, in a same sex dyad, or triad for the mindful of serving size condition were $M=307.53$g ($SD=118.93$g), $M=379.67$g ($SD=160.96$g), and $M=335.44$g ($SD=133.26$g), respectively; and for the condition where participants were not mindful of serving size the amount eaten was $M=312.47$g ($SD=97.47$g), $M=438.19$g ($SD=158.88$g), and $M=360.53$g ($SD=103.62$g), respectively. Figure 1 shows the mean amount eaten by each member in the triads, dyads, and those eating alone. The lengths of meal for each group (in minutes) when dining alone, in a same sex dyad, or in a triad for the mindful of serving size condition, was $M=9.93$ ($SD=2.43$), $M=13.11$ ($SD=1.91$), and $M=13.00$ ($SD=4.60$), respectively; and for the condition where participants were not mindful of serving size were $M=8.73$ ($SD=2.55$), $M=15.44$ ($SD=3.14$) and $M=11.60$ ($SD=1.06$), respectively. Figure 2 shows the mean amount of time taken to eat the meal by each member in the triads, dyads, and those eating alone. Finally, the duration of friendship among member of the dyads and triads were also recorded. The mean lengths of friendship (in years) between the participants (and standard deviation) in each group for the same sex dyad and the same sex triads in the mindful of serving size condition in years were $M=6.49$ ($SD=6.07$) and $M=1.94$ ($SD=2.57$), respectively; and in the not mindful of serving size condition were $M=9.30$ ($SD=10.91$) and $M=3.85$ ($SD=7.33$), respectively.

A 2 (mindful condition) X 3 (group size) between groups analysis of variance (ANOVA) was performed on the average amount eaten by each individual. There was a significant main effect for group size $F(2,91)=4.55$, $p=0.01$, $d=0.21$ demonstrating that the amounts eaten were significantly different by group. Post hoc test using Tukey's HSD tests ($p<0.01$) showed the amount eaten individually by participants in dyads was larger than the amount eaten individually by members of participants eating alone. However, there was no difference in the amount eaten between participants eating alone and participants eating in triads, or between participants eating in dyads and participants eating in triads. There also was no significant effect for the condition to make participants mindful of serving size, $F(1,91)=1.19$, $p=0.28$, and there was also no significant interaction between group size and mindful condition $F(2,91)=0.34$, $p=0.72$.

A 2 (mindful condition) X 3 (group size) between groups ANOVA was also performed on the average length of meal by group. There was a significant effect for group size $F(2,91)=23.45$, $p<0.01$, $d=0.04$ showing a difference in the length of time between each group. Post hoc test using Tukey's HSD tests ($p<0.01$) showed that all three groups were different, with the dyad group taking longer than the triad group, and the triad group taking longer than those dining alone.

Due to the fact that the triads individually did not eat more than the dyads and that their meal length was not longer than the dyads, the experimenter decided to run a 2 (mindful condition) X 2 (group size) between groups ANOVA on the length of time the participants within each group were friends. There was a significant effect for the length of friendship $F(1,65)=8.09$, $p<0.01$, $d=0.32$ showing that the participants in the dyads were friends significantly longer than the participants in the triads.

Discussion

The hypothesis stating that those eating in triads would eat more individually than dyads, and that those eating in dyads would eat more than those dining alone, was partially supported by the results. Members of the familiar dyads did eat more than those dining alone, which was expected. However, members of the dyads also ate more than the members of the triads, which was not expected.

The experimenters speculated members of the dyads ate more than those dining alone because as research suggests, members of the dyads concentrated on the conversation and not on the amounts they were eating (Hetherington, et al., 2006). Another factor that could have influenced the amount eaten was the length of the meal. Participants in the dyads ate significantly longer than those who dined alone. The longer the duration of a meal, the more opportunity exists for someone to eat (Herman, Roth, & Polivy, 2003).

However, members in the triads did not eat more than members in the dyads. Furthermore the length of the meal for triads was shorter than the length of the meal for dyads. Research shows the longer you have known someone, the less likely you are to be concerned with making a good impression on them (Salvy, Jarrin, Paluch, Irfan, & Pliner, 2007; Koh & Pliner, 2009). The length of friendship of the dyads was significantly longer than the length of friendship in triads (see Figure 3). In this study, during debriefing, the members of the triads stated that two of the members of the triad knew each other well, and the two members recruited a third, albeit less familiar, member. Therefore, we speculated that the reason the triads did not eat more or longer than the dyads can be explained by the lack of familiarity among all three members of the triad, which is supported by social comparison theory.

Social comparison is a behavior in which an individual compares one's own behaviors, attributes, and/or traits to others in a group and adapts to that group. When a person is not familiar with everyone in a group in which they are eating, they will monitor the amount of food that is consumed by each member of the group and ensure her behavior matches that of the group (Herman & Polivy, 2005; Koh & Pliner 2009).

Often time, we are not even aware that we are participating in social comparison (Vartanian, Herman, & Wansick, 2008)

Pliner and Mann (2004) demonstrated how powerful social comparison can be even without another individual present in the area. The researchers had individual women eat cookies under the ruse that each person was participating in a taste test. As the participant entered the room, a paper was left on the desk next to the cookies reporting the supposed amount of cookies eaten by the previous participant. Even without the other individual present, participants ate only as much as the supposed other participant, based on the paper next to the cookie tray (Pliner and Mann, 2004). Most of the participants were engaged in this behavior without realizing it.

Therefore, participants in triads who did not know the other group members as well may have been more influenced by social comparison than by social facilitation. The fact that one participant in the triad did not know the other participants in the same triad as well could explain why the amount eaten by each individual in the triad and the meal duration of the triads were less than the amount eaten by each individual in the dyad and the meal duration of the dyad. In order for social facilitation to take place, all members of the group must be familiar with each other, and in this study, all triad members were not as familiar with each other as the members of the dyads were, thus leading to only partial support of the first hypothesis.

The second hypothesis, that the groups informed of proper portion size would eat less than the groups who were not informed of proper portion size, was not supported. There was no significant difference in the amount of food eaten between the groups that were exposed to the correct serving size information and groups that were not exposed to the correct serving size information ate. After the experiment and during the debriefing, the experimenter asked participants if they noticed and understood the serving size information on the food intake survey. All of the participants exposed to the serving size information acknowledged they did notice and understand the information. However, the participants all stated they did not utilize the information to alter their behavior. Thus, the information was not impactful in mitigating social facilitation. Failure to find differences between the groups mindful of serving size and the groups not mindful of serving size might be due to the method used to make participants aware of serving size information and was a limitation of the study. For future research, a more effective method of educating participants about serving size information should be utilized to look into whether just making individuals aware of proper serving size information can mitigate social influence.

Another limitation was the type of pasta served in the experiment was not consistent. The study was dependent on the type of pasta the university's contracted food preparation service prepared for that day. Ideally, all participants should have been presented with the same type of pasta. However, in this study on some days participants were given spaghetti, on other days they received bow tie pasta, and yet on other days rigatoni. This is a limitation because participants might have eaten more or less food depending on the type of pasta that was served. Serving the same type of pasta to all participants would eliminate that variable in this study.

Participants' length of friendship was also a limitation due to the large difference between the length of friendship in dyads and the length of friendship in triads. The group members in dyads did not have a problem in finding a long term friend with whom they could dine. However, the members of the triads were not able to find two long term friends with whom to dine and recruited less familiar classmates to make up their triad. This seemed to impact meal duration and likely exerted a different influence on the participants. For future research, participants in a triad group would need to be recruited for friendship length. Furthermore, length of friendship could be manipulated to juxtapose social facilitation with social comparison to see the difference.

A final limitation of this study was that only women participated. Due to limited funds that supported this study, only one population could be included. Women were selected because social facilitation, and for that matter social comparison, are much more impactful on women than men (Hermans, Herman, Larsen, & Engels, 2010; Salvy et al., 2007, Young et al., 2009). Sex is a worthy variable to pursue because oftentimes people dine with members of the opposite sex.

Research in obesity has far reaching application for today's society. Understanding the obesity epidemic and its underlying causes can help improve the health of individuals struggling with obesity. Understanding what influences a person to eat, or how one eats, can help a person to alter behaviors and situations to reduce negative eating behaviors and patterns. While many programs are focus on portion size and calories consumed, they leave out the effect that our social environment can have on how much we eat. By focusing on the social influences on eating behaviors and learning to mitigate them, people could alter their eating behaviors to help them lose weight.

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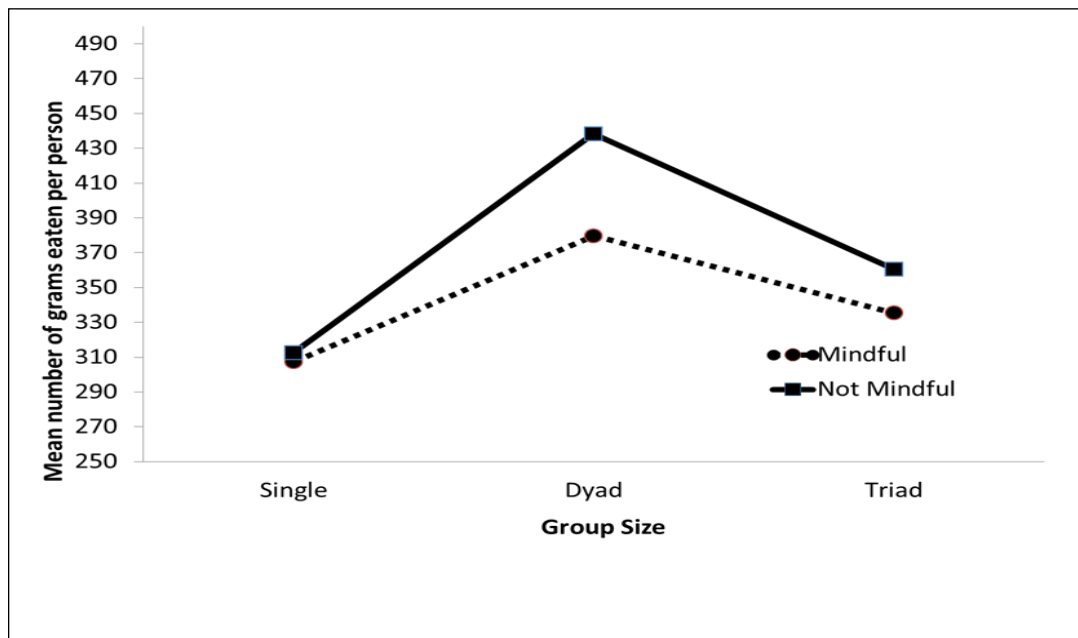
Figure 1. Actual amount of pasta (in grams) eaten per person based on the size of the experiment group. The mindful condition represents participants who took the survey with serving size information. The not mindful condition represents participants who took the survey that omitted serving size information.
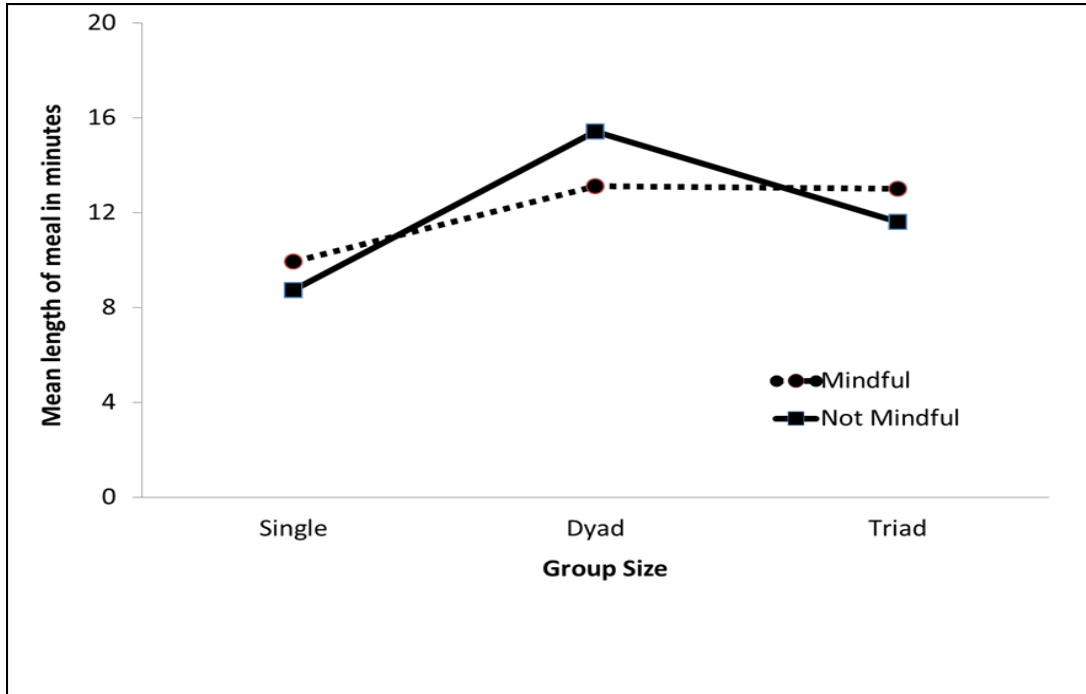
Figure 2. Actual length of meal (in minutes) based on the size of the experiment group. The mindful condition represents participants who took the survey with serving size information. The not mindful condition represents participants who took the survey that omitted serving size information.

Figure 3. Actual length of reported friendship (in years) based on the size of the experiment group. The mindful condition represents participants who took the survey with serving size information. The not mindful condition represents participants who took the survey that omitted serving size information
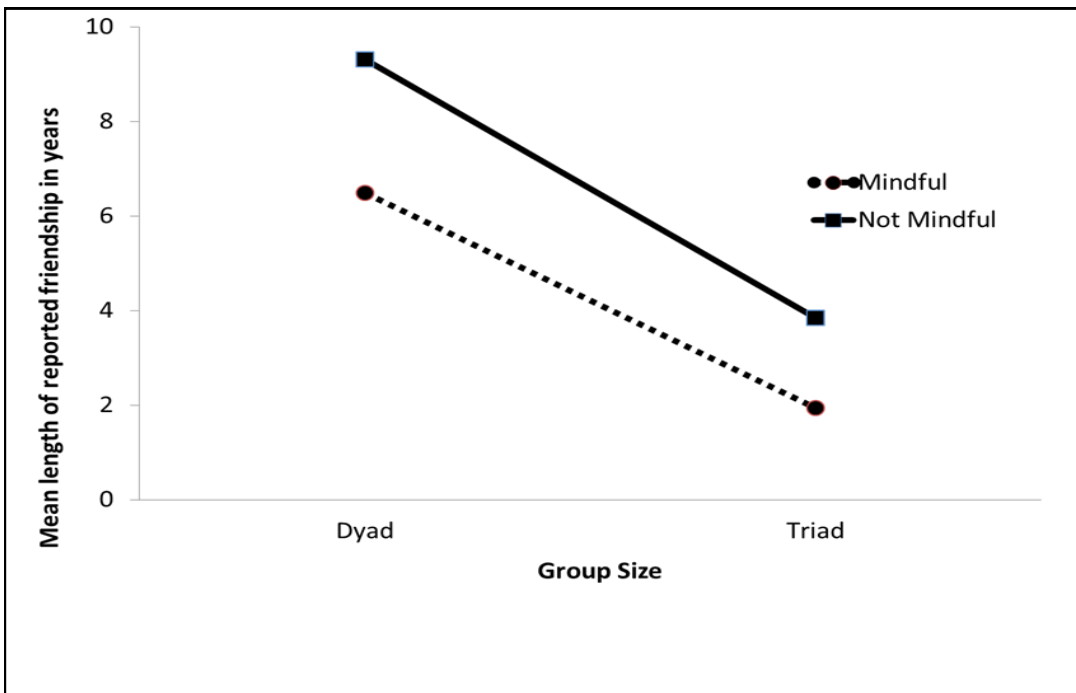
Re-examining the Apparent Career Success of the Model Minority

Angela Yoo

University of North Carolina at Charlotte

Abstract--In the past half century, Asian Americans have attained a status as the "model minority," placing them above other minorities in an artificial racial hierarchy. Due to this elevated status, there is a common misconception of lesser or non-existent discrimination existing against Asian Americans. However, the concept of the "model minority" is steeped in fundamentally racist ideology, and the perception of little differential treatment of Asian Americans dismisses the disparity evident in hiring, wages, and promotions, even in occupations considered to play to inherent strengths and abilities of Asians. There is still hope of progress in advancing efforts for equality through the Equal Employment Opportunity Commission and through the efforts of individuals and organizations.

Kim Parker[1] is the Executive Director of a Charlotte-area nonprofit (personal communication, December 2, 2011). This statement may seem rather mundane unless one learns that Kim Parker is an Asian woman. Outside of ethnic and cultural organizations, there are no other nonprofits in the Charlotte Metro area with an Asian-American executive. She was selected by an almost all-white Board of Directors, who was impressed by her 20-year career in healthcare, almost half of it spent in senior management. Her resume lists work experience in health insurance, a large hospital system, a family clinic, and human service nonprofit. When asked how she was able to navigate her career and land an executive position in a field where

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[1] Name of subject has been changed for confidentiality reasons.

Asians are largely absent, particularly in Charlotte, Kim attests that confidence has been the key to her accomplishments.

Although anecdotal, Kim's story would probably be considered common among Asian American workers. Kim is a classic example of the "model minority" – well-educated, intelligent, hard-working, successful. She appears to be proof that Asian Americans are not subjected to discrimination as other minority groups, and even if they are subject, their work ethic and intelligence begets success despite the obstacles. Aggregate data regarding such areas as income and educational attainment corroborates as much. Diversity Inc. reports Asian Americans have the highest median household income of the three largest minority groups in the U.S. (as cited in Jones, Ni, & Wilson, 2009). Asian Americans also have higher rates of degree attainment, nearly triple and quadruple the rates of African Americans and Latinos.

Some researchers have even determined empirically that there are less negative attitudes and, therefore, less discrimination toward Asian Americans. In one study, white male participants judged resumes from Asian applicants as belonging to the most suitable candidate compared to resumes belonging to black and Hispanic applicants. (King, Madera, Hebl, Knight, & Mendoza, 2006). Researchers have also claimed that the idea of the "model minority" for Asian Americans has only meant positive regard in the workplace (McGowan & Lindgren, 2006). Over a third of the participants in a study by McGowan and Lindgren thought of Asians as harder work-

ing than Caucasians, and 20% thought they were more intelligent as well. There are even findings that Asian Americans themselves report feeling no more discrimination than Caucasians (Jones et al., 2009).

With such attitudes being common in the United States, the research has been sparse on the actual discrimination that does happen, particularly in the workplace (Woo, 2000). In the course of finding articles for this paper in the electronic journal databases PsycINFO and Business Source Premier, most of the search parameters would result in three to five times the articles if "black" or "Hispanic" was a keyword, instead of "Asian." The research that does exist, however, points to growing criticism of the concept of the "model minority." Seemingly positive and benign stereotypes of Asian Americans are in fact detrimental by concealing the reality of prejudice and discrimination. The denial of the negative consequences is not unassailable proof of their absence. These stereotypes hinder occupational success of Asian Americans, even in stereotypically "Asian" careers, in which they are seen as attaining high levels of success.

The concept of the "model minority" perpetuates inaccurate stereotypes and impedes any dialogue on the prejudices faced by Asian Americans. In 1966 in the height of the Civil Rights Movement and the midst of the Cold War, a *New York Times* magazine article coined the phrase "model minority" when describing the progress of hard-working, resourceful Japanese-Americans (Kawai, 2005). Asians, who had until this point been exploited, marginalized, derided, and caricaturized, were suddenly praised and lauded (Lee, Vue, Seklaski, & Ma, 2007). Asians were so "admired" for their perseverance that a 1971 *Newsweek* article described their feat as "Outwhiting the Whites" (cited in Kawai, 2005). According to Yuko Kawai, this turn in white American sentiment served a two-fold purpose. First, by lifting up a "model minority," white Americans were sending a subtle but clear message to "problem minorities," who were causing chaos and lawlessness with their civil rights protests. Not only was the message relevant for domestic matters, but it also played well to interna-

tional concerns. The "model minority" message asserted solidarity of sorts with Japan in hopes of resisting the encroaching Communist forces from China.

Understanding its origins illustrates that, even in inception, the concept of the "model minority" has merely been a way for the majority culture to control and maintain its dominance (Kawai, 2005). In essence, this positive stereotype is the passive-aggressive counterpart to the negative stereotypes of Asian Americans. Perceptions of Asian Americans as working tirelessly without complaint and being poor communicators was noted in a report to the EEOC(U.S. Equal Employment Opportunity Commission, 2008). Further, Asians are perceived to be intelligent and technically skilled but socially deficient. The positive version operates when suggesting Asians are superior to other minorities, but the negative stereotypes seem to become more relevant when being compared to Caucasians (Lee et al, 2007). Either situation results in a less than desirable effect, whether by divisively pitting one minority group against the others or by perpetuating the status quo of a white dominant culture.

Certainly, there may be many Asian Americans who deny experiencing any differential treatment, as reported by Jones, Ni, and Wilson (2009). To them, the "model minority myth" has only facilitated their success. Woo (2000) points to possible patterns among Asian Americans of attributing career challenges to personal deficiencies. However, for non-Asians to fault Asian Americans' personal shortcomings – such as not projecting sufficient leadership qualities – in the lack of their upward career movement without acknowledging systemic problems – such as performance evaluation criteria that place subjective judgments on "leadership" based on dominant cultural values – is to make the fundamental attribution error. Those who make such errors may also hold a self-serving bias because they only credit their own personal accomplishments and fail to acknowledge how such dominant cultural systems have given them an advantage in the workplace.

As in Kim Parker's experience, her belief

that a personal trait of confidence is what leads to career success does not address other aspects of her life that may have given her an advantage over other Asian Americans. Kim was adopted at age of 3 by Caucasian parents (personal communication, December 2, 2011). She states that, because of her adoptive parents and because of the predominantly white neighborhoods in her hometown in Minnesota, she is culturally white. Being raised as "white" allows Kim to unconsciously learn the rules of navigating social networks that are often seen as an impediment to most Asian Americans in the workplace. Both her American-sounding maiden and married names have meant that employers are always surprised when she arrives for interviews. The employers admit as much and laugh that her ethnicity is an added bonus for the company's diversity. Furthermore, rather than rising through traditional ranks to senior management, Kim has managerial experience from starting a private clinic with a colleague, in essence becoming a self-employed entrepreneur. It is this experience that qualified her for higher level positions once she entered the non-profit sector.

An internalized racism that embraces the fundamental attribution error and a self-serving bias of mainstream groups are not the only psychological and cultural processes that cause Asian Americans to perpetuate stereotypes themselves and deny discrimination. Sun and Starosta (2006) posit that this denial is a way to "save face" and identify themselves more closely to dominant groups. Sun and Starosta also suggest that everyday, low-level prejudice and discrimination has been in the background, and some Asian Americans may not have experienced a major sensitizing incident that would have rendered disparity issues more salient. Furthermore, traditional Asian cultures emphasize self-censorship and de-emphasize individual feelings.

Despite the claims of a few studies that discrimination against Asian Americans is less prevalent, there is increasing evidence to quite the contrary. In some instances the pervasive view that discrimination is non-existent is used as an excuse for differential treatment of Asian Americans. One leader of an Asian American/ Pacific Islander affinity group in the federal government said that he was forced to use his own personal leave time to meet with the chair of the EEOC or other members of his affinity group in order to discuss challenges faced by Asian Americans in the federal government (EEOC, 2008). There is a general sentiment that federal agencies fail to provide the same level of support to Asian American and Pacific Islander affinity groups as affinity groups for other minorities. Weathers and Trujillo (2008) determined that Caucasians do not feel that Asian Americans are underrepresented or are penalized from employment testing and thus should not benefit from affirmative action initiatives.

Fortunately for those interested in advancing equal rights to Asian Americans, there is a growing number of Asian Americans taking notice of the disparity that exists for many of them. The Equal Employment Opportunity Commission (2008) found that, according to one Gallup Poll, 31% of Asian American respondents say they feel they have experienced discrimination in the workplace – more than any other racial group, including the 26% of African Americans who felt discrimination. However, only 2% of formally filed complaints in the private sector are filed by Asian Americans. Interestingly, as previously stated, Jones et al. used the same Gallup Poll to draw very different conclusions than the EEOC. The Jones study focused on a small portion of the survey completed by a self-selected subsection of the total number of respondents, leading to contrary findings from the EEOC.

The perceived discrimination has many repercussions in the workplace. A new report released by the Center for Work-Life Policy (2011) captures much of the frustration felt by Asian American employees today. Sixty-three percent of Asian men and 44% of Asian women feel that they have stalled in their careers. Compared to over 40% of African Americans, Hispanics, and Caucasians, only 28% of Asian Americans say they feel comfortable "being themselves" at work. Almost half of the Asian American respondents in the report also have concerns regarding expectations to conform to

currently established models of leadership by looking, acting, and sounding like their supervisors. Due to the perceived bias, Asian Americans are three times more likely than other groups to disengage from work by reducing number of hours, lowering ambitions, and contemplating quitting.

Deeper examination of statistical data validates the feelings of Asian Americans, who perceive differential treatment in their careers. The high incomes reported for Asian Americans, long touted as a sign of their success, actually are not equivalent to the incomes for non-Hispanic white Americans when education and skill level are taken into consideration (Woo, 2000). Part of the disparity has been credited to the language barriers of recently immigrated Asian Americans. However, even when comparing native English-speaking Asian Americans to non-native, immigrant whites, Asian Americans are penalized despite better mastery of the language (Woo, 2000).

Lower promotion rates are another documented obstacle for Asian Americans (EEOC, 2008). The same stereotypes of Asian Americans as accommodating, industrious, and quietly persevering have also characterized them as passive, docile, and unsuitable for leadership. Even though the Center for Work-Life Policy study found Asian Americans to be just as likely as other ethnicities to directly ask for promotions, many persistently generalize Asian Americans to be too passive and, therefore, their own cause of inhibited advancement. These misperceptions of passivity paradoxically coexist with fears of Asian dominance in global markets (Lee et al., 2007); popularity of high-grossing testosterone-filled movies like *Crouching Tiger, Hidden Dragon*; and controversies surrounding Amy Chua's book *Battle Hymn of the Tiger Mother*, criticized for promoting overly harsh parenting (Center for Work-Life Policy, 2011). Apparently, stereotypes would have Asian assertiveness – even aggression – as the stuff of martial arts films and international takeovers but misplaced in an American office environment.

Perhaps, if one examines the information regarding underrepresentation of Asian Ameri-cans in executive positions by various industries, the data would reveal a different trend. Since Asian Americans are supposed to be more highly skilled in math, science, and technical trades, there would be greater benefits in those occupations. Tashiro and Conrad (2009) hypothesized that, because of the positive stereotype of Asian Americans being more technically proficient, Asian Americans would have higher wages than Caucasians for occupations involving greater computer use. The findings revealed that for Asian American men there was no difference in wages despite a greater amount of time spent on technical applications versus general computer use than Caucasian men. In contrast, Asian American women did not fare as well. Compared to Caucasian women, the salary of Asian American women was approximately 10% less.

The EEOC (2008) and the Glass Ceiling Commission (Woo, 2000) detail the general dearth of Asian Americans in managerial positions. Inclusive of fields with high concentrations of Asian Americans, senior levels are glaringly missing an Asian presence. In the 1990's when nearly a quarter of Silicon Valley employees were Asian Americans, there were no Asians in senior management (Woo, 2000). A decade and a half later, Asian Americans were still being excluded from the upper echelons of organizations (EEOC, 2008). Asian Americans are also less likely than African Americans or Hispanics to hold managerial positions, even in occupational fields with greater overall numbers of Asian Americans. These employees experience "sticky floors" – trapped in particular low level positions for prolonged periods (EEOC, 2008) or tracked into positions with less opportunity for advancement (Woo, 2000). Workplace equality advocates have referred to this overrepresentation in lower levels as the "white collar sweatshop" (Le, 2006) and the Asian American workers as the "high-tech coolie" (Woo, 2000), referring to the indentured servitude of the first wave of Chinese immigrants in the building of the transcontinental railroad in the 1800's (Kawai, 2005).

Perceptions that Asian Americans only tend to be engineers, computer scientists, or accountants also obscure other issues. While East-

ern Asians, such as ones with cultural roots in China or Japan, become engineers and scientists in proportionately greater numbers, Southeastern Asians and Pacific Islanders tend to hold positions in blue-collar or service industry jobs (EEOC, 2008). Overlooking this fact also means that the general public ignores Southeast Asians' and Pacific Islanders' higher poverty rates and lower educational attainment that is on par with African American statistics.

Secondly, the higher numbers of Asian Americans in science and technology fields may not necessarily be indicative of self-selection. In vocations outside of what is considered "Asian" jobs, occupational stereotyping may prevent success or even entry into the field (Leong & Hayes, 1990). Just as a "pattern of occupational segregation for women" has traditionally limited women to certain career paths, the same may be said about Asian Americans. In Leong and Hayes' research, participants ranked Asian Americans as more capable of being successful in several of the stereotypically Asian jobs – accounting, engineering, and computer science – but less capable of competence in non-stereotypical Asian jobs, such as insurance sales. Though this is a single limited study, the implications are concerning, particularly with more and more U.S.-born Asian Americans choosing fields outside of the math and sciences (Woo, 1994). Not surprisingly, I was unable to find additional literature regarding the role of occupational stereotypes in non-traditional careers for Asians beyond the Leong and Hayes study and the U.S. Glass Ceiling Commission report.

One final area, in which Asian Americans appear to be gaining strides, is entrepreneurship. Asian Americans constitute a disproportionately greater number of small business owners (Le, 2006). Initially, this may seem to be positive news, but experts fear that the number of small Asian-owned businesses is rather an indicator of discrimination in typical work settings. By becoming their own boss, Asian Americans have been able to find alternatives to underemployment and exclusion from managerial positions (Woo, 2000). They are able to bypass the standard path to leadership roles, in which many

"glass ceiling mechanisms" operate, but they are opening businesses in areas of the market with a high risk of failure (Le, 2006). Asian-owned businesses have even been the target of hate crimes. Accusations of unfair pricing practices heightened tensions between non-Asian minorities and Korean-American storeowners, which led to the 1992 race riots in Los Angeles (Le, 2006).

Many of the seemingly positive gains and successes of Asian Americans serve to mask underlying problems. Sun and Starosta (2006) capture the essence of the Asian American employee's experience:

> "'Invisibility' denies the existence of racial concerns by consciously or unconsciously, deliberately or non-deliberately downplaying, ignoring, or oversimplifying them. It manifests itself as colorblindness, claims of reverse discrimination, the belief in a model minority, and exaggerated/negative/purposeful racial displays by those of the mainstream." (p.119)

When American culture suddenly praised Asian Americans by dubbing them the "model minority" in the 1960's, it was not symbolic of the end of prejudice and discrimination. Rather, it was the precise moment when the overt racism plaguing Asian Americans transitioned into the subtle, more insidious modern racism that exists today. This new racism is evident in the denial of the Asian American experience, even in the face of unequal hiring, wages, and promotion.

To counteract these injustices, there have been calls to action for the Asian American community to become more vocal, more politically active, and more participatory in coalition building (Sun & Starosta, 2006). The federal government through the EEOC also continues to contribute to awareness of cultural issues and diversity initiatives in the American workplace. Then there are the ones who have managed to prevail despite circumstances. Kim Parker is grateful for her position at her agency and in her community (personal communication, December 2, 2011). Adding more diversity to her agency's Board of Directors has become a per-

sonal mission of hers. Her acceptance as a culturally "white" person and a third "other" race in a very black-and-white South enable her to facilitate discussions around diversity, bias, and cultural sensitivity without accusations of being overly sensitive. She can not only be a champion for greater awareness and acceptance for Asian Americans but an advocate for other minorities as well.

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The Relation Between Executive Functioning and Musical Production/Creativity in Undergraduate Students

Dina Khaimova, Katherine E. Eskine, and Laura A. Rabin

Brooklyn College, CUNY

Abstract--Executive functioning can be defined as various self-regulatory cognitive processes that enable individuals to create novel solutions to problems, adapt their behavior in response to new information, plan and create strategies for complex actions, and override competing responses in order to engage in goal-directed behavior (Williams, Suchy, & Rau, 2009). There is reason to believe that executive functioning is conceptually linked with creativity. For example, research has found that having a low level of attentional inhibition plays a role in creativity because it leads to looser associations in thinking (Martindale, 1995). Others have found that focused mental efforts are necessary for higher levels of creativity, particularly in the refinement stages of the creative process (Osburn & Mumford, 2006). Research has also demonstrated the roles of mood and intelligence in the creative process (Baas, de Dreu, & Nijstad, 2008; Carlsson, 2010; Okebukola, 1986). The current study investigated if aspects of executive functioning were related to musical creativity in 92 undergraduate students, after controlling for mood and intelligence. Responses to a widely-used self report inventory of executive functioning (BRIEF-A) as well as performance on a standardized test of executive functioning (D-KEFS Design Fluency) were correlated with performance on a novel creativity task (Musical Production). Only a few significant correlations emerged – a negative correlation between the working memory subscale of the BRIEF-A and Musical Production (for males and females) and a positive correlation between a Design Fluency subscale and Musical Production (but only when the musical pieces were rated by male raters). We discuss these results in terms of the possible role of executive functioning in the creative process and explore various directions for future research.

Creativity has been defined as the generation of ideas that are both novel and useful (James, Clark, & Cropanzano, 1999). Creative acts come about in different ways. Galenson (2001) divided people into *finders* and *seekers*. Seekers work and think by trial and error, and experiment by making changes in their techniques; they inspect and change their images and gradually arrive at a final product. Seekers are pragmatic and exhibit a fair amount of mental control throughout the creative process. Finders, on the other hand, make distinct leaps in their work and create new innovations via new ideas; they think through their work in advance and implement their ideas accordingly. Finders arrive at creative ideas through mental freedom, often described as 'aha' moments.

Executive functioning (EF) refers to a series of self-regulatory neurocognitive processes that enable individuals to create novel solutions to problems, adapt their behavior in response to new information, and plan and create strategies for complex actions (Williams, Suchy, & Rau, 2009). The construct of executive functioning encompasses meta-cognitive fields commonly viewed as psychological control processes that facilitate self-control, includ-

ing planning, cognitive flexibility, and working memory and may be important for the creative process (Denckla, 1996; Lezak 1995; Pennington and Ozonoff, 1996). Specifically, cognitive control – persistence and the ability to resist distraction – may be necessary for maintaining creative feats (Feist, 1999; Zabelina & Robinson, 2010). For example, people who are under-controlled are spontaneous but may lack control to sustain their creative efforts (i.e. finders), whereas those who are controlled may have more persistence (i.e., seekers) (Zabelina, Robinson, & Anicha, 2007).

Research has yielded conflicting results as to whether cognitive control and cognitive flexibility are vehicles for creative endeavors. On the one hand, focused mental efforts are necessary for higher levels of creativity (Groborz & Nȩcka, 2003). Conversely, defocused attention, or having no attentional inhibition, plays a role in creativity because it leads to looser associations in thinking (Martindale, 1995). Additionally, highly creative individuals have been shown to manifest higher levels of flexible cognitive control, an ability to switch between times of cognitive control and cognitive flexibility (Zabelina & Robinson). Individuals such as Vincent van Gogh and John Nash, who showed symptoms of schizophrenia, were widely considered to be among the most creative people in history (Abraham, Windmann, McKenna, & Güntürkün, 2007). Is it possible that decreased executive function enables creativity in some cases? Abraham's (2007) study on patients with schizophrenia showed that performance on creativity tasks of fluency (number of generated ideas) and relevance was mediated by executive functioning, but this did not hold true for a measure of originality. Abraham evaluated participants with schizophrenia relative to matched control participants on various components of creative cognition and tests of executive control. His findings indicated that executive functions may have an effect on the number of generated ideas, but not the quality of those ideas. Therefore executive functions may not be necessary when generating ideas, but may be essential when forming ideas into highly creative ones.

Research has investigated specific aspects of executive functions, with results indicating that planning is an essential feature of creative thought (Osburn & Mumford, 2006). For instance, planning is needed to refine new ideas because new ideas tend to be poorly structured (Osburn & Mumford). Planning also inspires the development of ideas through convergent and divergent thinking; i.e., when novel ideas are created to overcome expected problems (Osburn & Mumford). Caughron and Mumford (2008) found that individuals displayed higher levels of creativity in the components of originality, quality, and elegance when they were told to think about events that could get in the way of their goal as opposed to when they were not directed to use a particular planning technique.

With disorders such as schizophrenia possibly playing a mediatory role in the creative process, several studies have been conducted to explore the roles of other possible factors, such as mood and intelligence. A meta-analytic study found that creativity was enhanced by positive mood states that activate motivation and promote focus, such as happiness, while negative mood states, such as fear and anxiety, were associated with lower levels of creativity (Baas, de Dreu, & Nijstad, 2008). Research has also determined that positive moods lead to more creativity when tasks are framed as intrinsically rewarding and enjoyable, whereas extrinsically rewarding and serious framing enhanced creativity in negative moods (Baas, de Dreu, & Nijstad).

With regard to depression, males with high verbal creativity displayed more depressive symptoms, whilst females with high verbal creativity displayed lower levels of depression (Post, 1996; DeMoss, Milich, & DeMers, 1993). Research on anxiety, however, demonstrates inconsistent findings. On the one hand, individuals with higher levels of creativity were shown to have more anxiety than those with lower creativity levels (Carlsson, 2010). On the other hand, negative correlations were observed between anxiety and creativity (Okebukola, 1986). Intelligence, also a factor researchers believe to be related to creativity has been studied in depth. One of the main theories postulates that intelligence

and creativity are correlated up until a certain point (IQ = 120), after which there is great variance (Sternberg, 2005).

With all of this contradictory research, it may be difficult to determine whether, and what aspects of, executive functioning are associated with creativity. Executive functioning seems to both strengthen and weaken the ability to create novel ideas. The current study investigated the role of executive functioning in the production of creative piece of music. Responses on two types of executive function tasks (i.e., BRIEF-A Self-Report Inventory, Roth, Isquith, & Gioia, 2005; and D-KEFS Design Fluency, a performance-based test, Delis, Kaplan, & Kramer, 2001) were correlated with performance on a novel creativity task (i.e., ratings on a Musical Production task). Based on research described above, we hypothesized that higher levels of executive functioning would be associated with lower levels of creativity. Specifically, the planning and organization aspects of executive functioning were hypothesized to lead to lower creative levels. We also hypothesized that cognitive flexibility would not correlate with quality of creative output, as cognitive control seems to be the main factor. Although our measures were used to study the quality of creative output (ratings on a Musical Production task), no measures were available to study the quantity of creative output. Finally, intelligence, anxiety, and depression may play a mediatory role in the creative process, strengthening the relationship between executive functioning and creativity.

Method

Materials and Design

The Design Fluency Test from the Delis-Kaplan Executive Function System (D-KEFS) measures facets of executive functioning including response inhibition, cognitive flexibility, and novel output via the production of novel designs (Delis et al., 2001). There are three task conditions. The first condition tests design fluency by providing participants with 60 seconds to draw as many different designs as they are able to within set guidelines, such as adhering to four lines to create the designs. The second condition

tests response inhibition by providing participants with 60 seconds to draw as many different designs as they are able to by connecting only the empty dots and ignoring the filled dots. The third condition tests cognitive flexibility by providing participants with 60 seconds to draw as many different designs as they are able to by alternating between empty and filled dots.

The Behavior Rating Inventory of Executive Function-Adult Version (BRIEF-A) measures self-reported executive functioning and contains 75 items with three response choices – i.e. *Never*, *Sometimes*, *Often* (Roth et al., 2005). The BRI (Behavioral Regulation Index) and MI (Metacognition Index) are the composite scores of the BRIEF-A. The BRI consists of four clinical scales: Inhibit, Shift, Control, and Self-Monitor (Roth, Isquith, & Gioia, 2005). The BRI is thought to express a person's ability to maintain appropriate regulatory control of his/her own behavior and emotional responses. This control relates to appropriately inhibiting thoughts and actions, having flexibility in a shifting problem-solving set, modulating one's emotional responses, and monitoring one's own actions. The five clinical scales included within the MI are: Initiate, Working Memory, Plan/Organize, Task Monitor, and Organization of Materials (Roth et al., 2005). The MI reflects a person's ability to solve problems by means of planning and organization, while at the same time keeping these task-completion efforts active in working memory. The MI may also be viewed as an assessment of a person's ability to mentally manage attention and problem-solving. Standardized instructions and scoring criteria are provided in the test manual.

To assess the validity of the data provided by the participant on the BRIEF-A, the negativity, infrequency, and inconsistency scales are used. The negativity scale measures the level of responses that were answered in a negative fashion, i.e. responding with *Often* on Negativity items. The infrequency scale measures the extent to which the items were responded to in an unusual manner; i.e. responding to Item 10 ("I forget my name") as *Often* is atypical. The inconsistency scale measures the level of inconsistent

responses by participants; i.e. responding to Item 33 ("Overreacts to small problems") with *Never* while simultaneously responding to Item 72 ("Gets upset quickly or easily over little things") with *Often*. No participant in the current sample had a clinically elevated score on these validity measures.

The Musical Production Task (Eskine, 2011) measures creative ability via the participant's completion of a novel piece of music on a wooden xylophone, within a span of four minutes. This task asked participants to "create a song on this xylophone… You will have 4 minutes to create a novel and interesting piece of music. Once the 4 minutes have lapsed, we will record you using this microphone". Participants then recorded a piece of music lasting 30 seconds on the software application GarageBand.

The Beck Anxiety Inventory assesses anxiety by means of 21 questions measuring symptoms of anxiety such as numbness, feelings of dread, and hot and cold sweats (BAI, Beck & Steer, 1990). The BAI reliably differentiates between anxiety and depression, and provides convergent validity between them (Beck & Steer). The Beck Depression Inventory, Second Edition (BDI-II, Beck, Steer, & Brown, 1996) assesses depression via a self-report form consisting of 21 multiple choice questions. The BDI-II measures symptoms of depression such as irritability and hopelessness, cognitions of depression such as guilt, and physical symptoms of depression such as fatigue. Standardized scoring criteria are provided in the manuals of these self-report measures.

The Raven's Standard Progressive Matrices (Raven's) was used to estimate intelligence. The Raven's test includes a total of 60 questions, with five sets of 12 questions each. Each question contains a pattern with a missing piece, with the participant's goal being to identify the missing piece from the options provided. It is a validated measure of general cognitive ability (g) identified by Spearman in 1923 (Raven, 2000; Spearman, 1927).

Participants and Procedure

As part of the first phase of a larger experiment, 92 undergraduate students at an urban,

public college were briefly introduced to the experiment and were asked to read and sign a consent form. Participants varied with respect to their major, educational level, and ethnicity. Their ages ranged from 18-30 (see Table 1).

Table 1

Descriptive Statistics for Participants in Phase I

Variables	Mean	%
Age (years)	22.01 (2.66)	
Gender		
Male		48.91
Female		51.09
Ethnicity		
African American		29.30
Caucasian		48.90
Hispanic/Latino		6.50
Asian American		7.60
Other		7.60
Grade Point Average	3.27/4.00 (0.49)	
Years of Education	15.30 (1.20)	

Participation was voluntary and confidential and all data were collected as part of an IRB-approved protocol. All participants provided written informed consent and the study took approximately 75 minutes to complete. Data collection took place in a psychology laboratory. For their participation, students received credit in partial fulfillment of an introductory psychology class requirement or extra credit from their course instructors.

Participants were first asked to complete the BRIEF-A, BAI, and BDI-II, and report their demographic information. They then completed the Musical Production Task. Participants were subsequently asked to complete the D-KEFS Design Fluency Test, which was administered to the participants by an experimenter. Appendix A shows the order of tasks to be completed by the participant, and various tasks were performed in a soundproof chamber to ensure silence during task completion.

In the second phase of the study, 82 un-

dergraduate students at an urban, public college rated all pieces of music via Qualtrics, an online-based survey system which randomizes the order of the pieces. A demonstration was available before the participants commenced rating. Pieces were rated on a scale of 1 to 8 in the domains of quality, appealingness, expressiveness, imaginativeness, rhythm, and melody; as demonstrated on Appendix B. Descriptive statistics for the raters may be found in Table 2.

Table 2

Descriptive Statistics on Raters in Phase II

Variables	Mean (SD)	%
Age (years)	20.86 (4.17)	
Gender		
Male		28.05
Female		71.95
Grade Point Average	3.22/4.00 (0.48)	
Years of Education	13.72 (0.45)	

To fully examine the relationship between executive functioning and creativity, we took into account certain variables that are associated with both executive functioning and creativity (i.e., mood, intelligence). Research has shown that men and women judge musical pieces using different criteria (Millar, 2008). To address this finding, three variables were created to quantify the Musical Production ratings. Our first variable combined all the ratings across the 7 variables into one score. The second variable combined the ratings made by females, and the third variable combined the ratings made by males. Therefore, each participant had three scores, an average rating by all raters, an average rating by females only, and an average rating by males only.

Results

Our measures of creativity included an overall composite rating, male composite rating, and female composite rating of musical pieces. Male participants' ratings of musical pieces were slightly lower than female ratings. For the D-KEFS Design Fluency task, total design scores for each of the three conditions were computed (DF1, DF2 and DF3). Participants generated "average" total raw scores (i.e., number of correct responses) for the first, second and third conditions. In addition, the number of errors for each condition was recorded. Participants made

Table 3

Descriptive Statistics for Measures Taken by Participants in Phase I

Variables	Mean (SD)	Possible Ranges
Musical Ratings		
Quality	3.75 (0.87)	0-9
Appealing	3.60 (0.93)	0-9
Expressive	3.80 (0.96)	0-9
Imaginative	3.80 (0.95)	0-9
Complex	3.62 (0.89)	0-9
Rhythmic	3.76 (1.04)	0-9
Melodic	3.62 (1.02)	0-9
Composite Total	3.73 (0.94)	0-9
Composite Male	3.46 (0.94)	0-9
Composite Female	3.84 (0.97)	0-9
Design Fluency		
Task 1 Responses	10.58 (3.32)	0-20
Task 1 Repetitions	0.97 (1.34)	0-19
Task 2 Responses	11.54 (3.31)	0-21
Task 2 Repetitions	1.84 (2.00)	0-20
Task 3 Responses	9.55 (2.34)	0-16
Task 3 Repetitions	1.04 (1.45)	0-15
Behavior Rating Inventory of Executive Function-Adult		
Initiate	12.28 (3.17)	0-24
Working Memory	11.70 (2.98)	0-24
Plan/Organize	14.24 (3.54)	0-30
Task Monitor	9.66 (2.24)	0-18
Organization of Materials	12.05 (3.30)	0-24
Raven's Matrices		
Raw Score	44.25 (7.17)	0-72
Percentage	27.44 (20.94)	0-100
Beck Anxiety Inventory	8.26 (7.10)	0-63
Beck Depression Inventory-II	8.80 (6.67)	0-63

more errors in the second condition than they did in the first and third conditions. As a measure of self reported executive functioning, the five clinical scales of the BRIEF-A Metacognition Index (MI) were included in our analysis: Initiate, Working Memory, Plan/Organize, Task Monitor, and Organization of Materials. The Behavior Regulation Index (BRI) of the BRIEF-A did not yield significant results and these findings are therefore not included. Descriptive statistics for all of these variables may be found in Table 3.

The average score for the participants was in the "normal" range for the BAI and the BDI-II. Additionally, participants showed variability in their scores on the Raven's Standard Progressive Matrices. Further descriptive statistics may be found in Table 3.

To determine the extent of any significant relationships, performance on two types of executive function tasks (i.e., BRIEF-A Self-Report Inventory and D-KEFS Design Fluency, a performance-based test) were correlated with male and female performances on the novel creativity task (i.e., ratings on the Musical Production task). The Working Memory (WM) subscale of the BRIEF-A was significantly correlated with the female composite ratings ($r = -0.208$, $p = .047$) while the other four subscales of the BRIEF-A MI did not reach significance. Additionally, male composite scores were significantly correlated with number of repetitions on the Design Fluency test ($r = -0.218$, $p = .037$). The zero-order correlation coefficients, along with their p-values, may be found in Table 4.

To investigate if variables known to affect executive functioning could account for our findings, we computed semi-partial correlations. This allowed us to control for the variance in intelligence (i.e., Raven's scores), BAI, and BDI-II while the criterion variables (executive functioning scores and Musical Production ratings) re-

Table 4

Zero-order Correlations between Composite Scores and Performance on Tests of Executive

	Composite Musical Ratings	Male Composite Ratings	Female Composite Ratings	BRIEF-A Working Memory	Design Fluency Total	Design Fluency Repetitions	Design Fluency Set-Loss
Composite Musical Ratings	1	0.965**	0.995**	-0.204	-0.009	0.153	-0.063
Male Composite Ratings	0.965**	1	0.938**	-0.175	-0.026	0.218*	-0.095
Female Composite Ratings	0.995**	0.938**	1	-0.208*	-0.004	0.130	-0.050
BRIEF-A Working Memory	-0.204	-0.175	-.208*	1	0.157	-0.041	-0.038
Design Fluency Total	-0.009	-0.026	-0.004	0.157	1	0.242*	-0.073
Design Fluency Repetitions	0.153	0.218*	0.130	-0.041	0.242*	1	-0.017
Design Fluency Set -Loss	-0.063	-0.095	-0.050	-0.038	-0.073	-0.017	1

Note. *p<.05   **p<.01

mained unaltered. When intelligence, BAI, and BDI-II were entered as predictors, a positive correlation between the Design Fluency test and Musical Production reached significance in males ($r = 0.219$, $p = .041$). Thus, our hypothesis that cognitive flexibility has no bearing on creative output seems to be unfounded. In addition, we found significant negative correlations between the WM subscale of the BRIEF-A and Musical Production for the female composite ratings ($r = -0.239$, $p = .025$), male composite ratings ($r = -0.228$, $p = .033$) and overall composite ratings ($r = -0.241$, $p = .024$). This lends credence to our hypothesis that planning leads to lower levels of creativity, with intelligence and mood strengthening the relationship. The corre-

female composite, and the male composite and WM when we controlled for BAI and BDI-II. The correlation coefficients and p-values may be found on Table 6.

Discussion

In the current study, we investigated whether self-reported and performance-based measures of executive functioning were related to musical creativity in a sample of undergraduate students. Generally, we found that ratings did not correlate with aspects of executive functioning. People's judgments were uniform for musical pieces created by individuals with high and low scores on objective and subjective executive function measures. Of the nine clinical subscales of the BRIEF-A, only one was significantly cor-

Table 5

Semi-Partial Correlations between Composite Scores and Performance on Tests of Executive Functioning When Controlling for Raven's, BAI, and BDI-II

	BRIEF-A Working Memory	Design Fluency Repetitions
Male Composite	-0.228*	0.219*
Female Composite	-0.239*	0.132
Overall Composite	-0.241*	0.155

Note. *p<.05

lation coefficients and p-values may be found on Table 5.

To explore the individual contribution of mood we ran semi-partial correlations only controlling for anxiety and depression. In this case the modest significant correlation between the composite rating by males and the number of repetitions on the first condition of the Design Fluency Test remained. Significant correlations were found between the overall composite, the

related with ratings on creative performance. Design Fluency was subject to the same effect, of the many subscales (Total correct for Conditions 1-3, total set-loss deigns, and total repeated designs) only one was significantly correlated with ratings on creative performance.

Specifically, all three musical ratings were significantly negatively correlated with self reported Working Memory (WM) when the contributions of intelligence and mood were con-

Table 6

Semi-Partial Correlations between Composite Scores and Performance on Tests of Executive Functioning When Controlling for BAI and BDI-II

	BRIEF-A Working Memory	Design Fluency Repetitions
Male Composite	-0.227*	0.219*
Female Composite	-0.239*	0.132
Overall Composite	-0.241*	0.156

related to decreased creativity is because of decreases in cognitive flexibility and cognitive persistence (i.e., the level of attention paid to probing alternatives). Conversely, anxiety may have been a result of the unearthing of unconscious material from the creative process (Rothenberg, 1990). As novel ideas were created, the buried subconscious may have been brought to the individual's conscious attention, and the information uncovered caused the individual anxiety. Additionally, studies have observed a positive correlation between the levels of depression and creativity in males (Post, 1996). According to these studies, one may infer that depressed individuals made no effort to search for alternative and novel ideas. Thus, these individuals may have been the "finders" described earlier (Galenson, 2001) in the paper; they did not actively search for ideas and yet produced highly creative works. However, this is not in line with the observed results of our study. Further research is necessary to assess the extent to which mood plays a role in the creative process.

Overall, the current findings suggest that practically no relationship exists between executive functioning and creativity (as measured via our limited study tasks). Of all the subscales that could be correlated to the creative process, only two reached significance. One reason we may not be finding many significant associations is because the musical production task was too short and did not extend to all stages of the creative process (i.e., from the generation of ideas to their refinement and execution). An increased generation of creative ideas is associated with a decreased latent inhibition, which enables an increased amount of information to enter consciousness (Carson, Peterson, & Higgins, 2003; Kaufman, 2009; Carson, 2011). Latent inhibition, or the subconscious ability to filter out irrelevant stimuli, refers to the brain's preconscious inhibitory ability to protect an individual's current attentional focus from stimuli formerly viewed as irrelevant (Lubow, 1989; Peterson, Smith, & Carson, 2002). Kaufman (2009) suggests that decreased latent inhibition may make an individual more open to experience and more likely to observe and make connections that are

not viewed by others and may lead to the most potent levels of creative achievement when combined with a high level of executive functioning. Additionally, increased WM capacity allows individuals to mentally manipulate and process more information without being overwhelmed (Carson, 2011). It is likely that the musical production task lies between the preconscious focused attention and the refinement process that relies on working memory, thus leading to an absence of correlations.

For future studies, more time should be given to participants during the musical production task. Additionally, as latent inhibition is known to be related to creativity, a study similar to the one conducted by Kaufman (2009) may be carried out to explore this theory, relating latent inhibition, executive functioning, and creativity. The correlations may become stronger if latent inhibition is included in the equation. The same may be true for any variable that influences creativity, executive function, or the interplay between them. Another reason for the lack of findings may be due to the fact that defocused part of the creative process is preconscious and thus not tapped by our current measures.

It is important to mention our study limitations. Most raters were female, which may have caused a bias in the composite musical rating (see Millar, 2008). Additionally, the raters were all undergraduate students, with a large percentage majoring in psychology. Perhaps a more diverse group of individuals would have approached the ratings differently or may have had different ideas about what makes music appealing, expressive, rhythmic, etc. It is also possible that the nature of the Design Fluency Task did not translate well to the Musical Production Task. In other words, it is possible that we did not select the ideal performance-based measure of executive functioning to investigate our research question. For future studies, researchers should make use of a more diverse set of neuropsychological measures, especially those requiring more complex responses (e.g., Tower Test, Category Test, etc.) and ideally auditory responses.

In addition, our participants were healthy

undergraduate students who did not report many problems with executive functioning on the BRIEF-A (limiting our range of scores). It would certainly be instructive to carry out future work with individuals who manifest a range of executive function abilities. Another consideration is statistical power and a larger sample would certainly be desirable. Finally, this study was correlational and cross-sectional, and we therefore cannot draw conclusions pertaining to directionality or the predictive value of executive function difficulties to creativity.

In sum, the relation between creativity and important aspects of cognition such as executive functioning is not well understood. This relation should be studied in order to decipher the pathways involved in creating novel ideas. Such research may enable researchers to isolate the cognitive components that underlie the processes used by creative thinkers, enhancing our understanding of the creative process and possibly even its evolutionary origins. For example, do creative thinkers exercise mental control, or do they give their minds free reign? Are there fundamental differences between highly creative and modestly creative individuals? Can we train people to become more creative? Our finding that executive functioning was not related to the creation of a 4-minute piece of music highlights the importance of timing in studies examining creativity. Time course, as well as the extent of the roles of intelligence, mood, and presence of mental illness, should be a consideration as we enhance our understanding of the relationship between the complex processes of executive functioning and creativity.

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Time Effects on Approach and Avoidance Conflict Resolution

Michael D. Heeney, Alex Livermore, Keyonna Miller and Brandy Wright

University of North Carolina at Charlotte

Abstract--Conflict arising from a personal choice is not only dependent on the alternatives themselves, but on whether they are evaluated as something to be gained or something to be lost. Previous research has formalized the distinction between pleasant (approach-approach) choice alternatives and unpleasant (avoidance-avoidance) choice alternatives, and has demonstrated that the latter is more difficult to resolve. Our experiment explored potential changes in this disparity by presenting student volunteers with a series of approach and avoidance decision choices under either timed or untimed conditions. Participants provided evaluations of relative difficulty, satisfaction and confidence in their approach choices versus their avoidance choices, and the likelihood of changing their approach choices versus avoidance choices if they were presented with them again. We also asked participants to return after the initial experiment to respond a second time to the same evaluation questions. We found that avoidance choices produce a higher degree of conflict, but did not detect a significant difference between responses under the timed versus untimed conditions. A significant difference between the initial and follow up survey responses was found for only one of the four measures of conflict.

This study attempts to expand upon previous research conducted by Arkoff (1957) and Terry (2010), who through the application of controlled experiments, identified differential levels of conflict between favorable choice alter- natives (approach-approach conflicts, or com- monly referred to as simply "approach" choices), and unfavorable choice alternatives (avoidance- avoidance conflicts, or referred to more simply as "avoidance" choices). Here, we attempt to ex- plore this distinction further through a replication of these previous experiments under both timed and untimed conditions.

Decision making under the approach and avoidance framework was first formalized by Lewin (1935), who adapted the term "valence" to describe the attraction to (positive valence) or repulsion from (negative valence) a given choice alternative. The strength and direction of these valences, according to Lewin, establish the foun- dation for what motivates us and drives our deci- sions.

Even though Lewin first developed the approach and avoidance concepts, the terms "approach-approach" and "avoidance- avoidance" were first devised by Hovland and Sears (1938). Here, they framed approach deci- sions to reference choices between desirable al- ternatives, such as a child's choice between candy and a kitten. Conversely, avoidance deci- sions refer to choices between undesirable alter- natives, such as a child's choice between receiv- ing a punishment and performing an unpleasant chore.

Several studies (Arkoff, 1957; Barker, 1946; Houston, Sherman, & Baker, 1991; Terry, 2010) have established that avoidance decisions are more difficult to resolve than similar ap- proach decisions. Supporting theory is derived

from the notion that preferences are biased towards avoiding losses over acquiring gains of equal measure. Ashraf, Camerer and Loewenstein (2005) trace the first discussion of this asymmetry in preferences to the founder of classical economics, Adam Smith, in *The Theory of Moral Sentiments* (Smith, 1759). It took an additional 200 years for Tversky and Kahneman (1979) to crystallize the concept of loss aversion into what has become a landmark study in the fields of both decision theory and behavioral economics. Consistent with this theory and subsequent empirical research, we attempt to reaffirm that decisions involving avoidance alternatives will be both more difficult to make, and will generate a higher degree of conflict.

Several studies (Arkoff, 1957; Barker, 1946; Houston, Sherman, & Baker, 1991; Hendrick, Mills & Kiesler, 1968; Kiesler, 1966; Terry, 2010) have measured time as a dependent variable in order to demonstrate that avoidance decisions take longer to make. In contrast, time-pressure studies generally specify time as an independent variable relative to some other construct, such as task performance (Goodie, & Crooks, 2004; Payne, Bettman & Johnson, 1993) and decision confidence (Bockenholt, & Kroeger, 1993; Smith, 1982; Zakay, 1985). This presents an opportunity to test the established approach and avoidance specification under both timed and untimed response conditions. This experiment tests the hypothesis that time constraints serve to magnify any measured differences in conflict between the approach versus avoidance decision variants.

Research on the stability of post-choice evaluations over time, in the context of approach and avoidance decision-making, appears to be absent from the published literature. This leads one to question whether any initial approach and avoidance distinctions could diminish, disappear, or even reverse following a subsequent evaluation.

Differentiation Consolidation theory may lead to the expectation that variation in subsequent approach and avoidance evaluations will be minimal. Svenson (1992) asserted that follow-ing a decision, a consolidation process occurs in the mind of the decision maker that further supports the chosen alternative. The current study explores this question by taking a second set of measurements two to seven days following the initial experiment.

Method

Participants

Thirty undergraduate students from UNC Charlotte participated in the study, of which 19 were female and 11 were male. No effort was made to assign conditions by sex as Arkoff (1957) found no significant differences in the mean ratings of decision difficulties across that dimension.

Participants were randomly assigned, in groups, to either the timed or the untimed condition. Each experiment session contained three or fewer participants. Six participants were excluded from the study because they failed to return for the follow-up survey.

Materials and Procedure

Both the timed and untimed conditions used identical materials that were previously established by Terry (2010). In his work, Terry developed 20 self-referent decision alternatives selected from trait adjectives originally published by Anderson (1968). Each decision alternative was phrased as both an approach and an avoidance variant to create 40 questions in total. These pairs of approach and avoidance questions were separated and counterbalanced within the total list of questions. An example of a set of alternatives with both an approach and an avoidance variant is:

"Would you rather be more attractive than you are now or more intelligent?"

"Would you rather be less attractive than you are now or less intelligent?"

The questions were presented on PowerPoint slides that were projected on an overhead screen. In the timed group, slides were only visible for five seconds; in the untimed group, participants were subject to no time limitation. Participants answered each of the 40 questions on an

assigned answer sheet.

Following the collection of the initial responses, participants were asked to provide general ratings of the approach versus avoidance questions across four representations of difficulty and conflict. The questions for each of the four measures were:

"Were the 'would you rather be less....less...' decisions easier or more difficult to make than the 'more...more' decisions?"

"Comparing the 'less...less' versus the 'more...more' questions, how confident are you that you made the right choices?"

"How satisfied were you with the choices you made?"

"If you were to make these same choices again, how likely do you think you would change you selections in the 'less...less' versus 'more...more' choices?"

The four evaluation questions provided answer choices with values ranging from one to five. Two of the evaluation questions assigned a value of five to represent much greater conflict resulting from the approach choices, and a value of one to represent much greater conflict resulting from the avoidance choices. The other two evaluation questions reverse-ordered the values assigned to the response choices, with a value of five to represent much greater conflict resulting from the avoidance choices, and a value of one to represent much greater conflict resulting from the approach choices. For all four evaluation-questions, a value of three represented an equal level of conflict experienced between the approach and avoidance variants, and the values of two and four represented moderate levels of relative conflict in line with the established direction of each scale.

Participants responded to the evaluation survey during their initial visit, and returned to complete an identical follow up survey within two to seven days.

The Institutional Review Board approved the materials and procedure in this experiment.

Results

A twofold approach was taken in the analysis of the evaluation responses. In the first component, one-tailed t-tests were applied to the initial and follow up responses to support (or refute) the previous findings that avoidance choices are more difficult to make. The second component explored both the impact of time constraints and the stability of responses from the initial to the follow-up evaluations using a between-within factorial design.

The direction and significance of the t-test results support previous findings that avoidance choices are indeed more difficult. These findings were consistent across the timed and untimed conditions, the initial and follow-up evaluations and across all four evaluation measures. The results of this analysis are presented in the appendix in Table 1.

A review of the evaluation-response data provides additional evidence. Of the 240 total responses collected (30 respondents x 4 dependent variables x 2 surveys), 85% identified avoidance choices as creating "more" or "much more" conflict relative to approach choices. When the neutral evaluations of three are included, this percentage moves to over 94%, leaving less than 6% of the total responses ranking in direct contradiction to our expected result.

There was no support for the hypothesis that time constraints magnify the established differences between the approach and avoidance decision variants. The between-subjects results generated F-values < 1 for all four response measures.

The comparison of the initial and follow-up evaluation surveys provided somewhat mixed results. For the dependent variable "Likelihood to Change", the results demonstrated a significant reduction in the mean evaluated difference between approach and avoidance decision conflict from the initial (M = 1.97) to the follow-up (M = 2.30) survey, (F(1, 28) = 5.00, p = .03). This demonstrates that during the initial evaluation, participants, on average,

Table 1

One-tailed t-test of Approach vs. Avoidance Decision Conflict

| Dependent Variable | Initial Evaluation | | | | | |
| | Untimed | | | Timed | | |
	Mean	S.D.	t	Mean	S.D.	t
Difficulty	2.13	0.92	-3.67***	1.87	0.83	-5.26***
Satisfaction	3.87	1.06	3.17**	3.67	0.90	2.87**
Confidence	4.00	0.76	5.12***	3.80	0.86	3.59***
Likelihood to Change	1.93	0.70	-5.87***	2.00	0.76	-5.12***
	Follow-up Evaluation					
	Untimed			Timed		
	Mean	S.D.	t	Mean	S.D.	t
Difficulty	1.73	0.59	-8.26***	1.93	0.88	-4.67***
Satisfaction	3.93	0.46	7.9***	3.60	0.99	2.36*
Confidence	4.00	0.85	4.58***	3.87	0.99	3.39***
Likelihood to Change	2.27	0.46	-6.20***	2.33	0.72	-3.57***

Note: Mean represents responses for each survey question. For "Satisfaction" and "Confidence", mean values > 3 indicate greater conflict for avoidance questions. For "Difficulty" and "Likelihood to Change", mean < 3 indicate greater conflict for avoidance questions. *p<.01, **p<.05, *p<.1

reported that they would be more likely to change their responses to the avoidance questions, but during the follow-up evaluation, the distinction between the likelihood of changing avoidance over approach responses diminished significantly. For the remaining three dependent variables (Difficulty, Confidence and Satisfaction), there were no significant differences between the initial and follow-up responses. The within-subjects results generated F-values < 1 for these three response measures.

No significant interaction effects were identified between the timed/untimed and the initial/follow-up survey results. The results of the between-within component of the analysis are presented in the appendix in Table 2.

Discussion

The results of this study consistently support the findings of Arkoff (1957) and Terry (2010) who found that avoidance choices are more difficult than approach choices when comparing similar decision alternatives. Our attempt to expand this framework to explore the effect of time constraints and follow-up evaluations was, however, inconclusive at best.

Despite the absence of statistical significance, the average evaluation ratings for the timed conditions yielded diminished differences between the approach and avoidance ratings in three dependent variables in the initial survey, and in all four dependent variables in the follow-up survey. These results are directionally opposite of our hypothesis that timed conditions would magnify reported differences between approach and avoidance decision-difficulty. This may suggest that, by limiting the duration of the decision process, the timed condition instead relieves conflict for both the approach and avoidance decision variants, which may in turn diminish the differences between them. A deeper exploration of these relationships would present a worthwhile research opportunity.

The statistically significant increase in the dependent variable "Likelihood to Change"

Table 2

Statistical Output: Factorial Between-Within Analysis

Between Subjects: Independent Variable (Timed vs. Untimed)			
Dependent Variable	df	F	p
Difficulty	28	0.02	0.88
Satisfaction	28	0.74	0.40
Confidence	28	0.34	0.57
Likelihood to Change	28	0.12	0.73
Within Subjects: Independent Variable (Initial vs. Follow-up Evaluation			
Dependent Variable	df	F	p
Difficulty	28	0.64	0.43
Satisfaction	28	0.04	0.84
Confidence	28	0.06	0.80
Likelihood to Change	28	5.00	0.03
Within Subjects: Independent Variable (Initial vs. Follow-up Evaluation)			
Dependent Variable	df	F	p
Difficulty	28	1.25	0.27
Satisfaction	28	0.37	0.55
Confidence	28	0.06	0.80
Likelihood to Change	28	0.00	1.00

from the initial to the follow-up survey suggests that the differentiation between approach and avoidance decision conflict may diminish with the passage of time. This is contrary to the findings by Svenson (1992), who stated that a consolidation process tends to provide consistency between choices made during an initial and a subsequent evaluation process. Despite this result, the absence of a significant change for the other three dependent variables provides some evidence in support of the hypothesized relationships.

There were potential confounding elements in the structure of the experiment itself. The broad allowable timeframe of two to seven days between the initial and follow up evaluations may have created an additional source of variation in our results. Data regarding the elapsed number of days for each participant were not retained, which may have otherwise impacted the relationships between the evaluation survey results and the number of days between the initial and follow-up survey. One solution may be to conduct the experiment in a classroom setting, which would facilitate strict control over the amount of elapsed time between the initial and follow-up evaluations.

We also learned that from a practical standpoint, the additional effort required by a subsequent visit might limit participation (and therefore the number of observations) in a repeated-measure experiment. Additional participation may have revealed clearer patterns in the context of the timed and untimed conditions.

The manner in which the untimed experiments were conducted may have also hindered our efforts to obtain precise measurements. By using an overhead projector and multiple questions on each slide under the untimed condition, participants may have experienced difficulty truly operating at their own individual pace. The faster participants may have subtly influenced the pace of the slower participants, which may have inadvertently created a de facto timed condition within the component of the experiment that was intended to be untimed.

One solution may be to eliminate the overhead projector and conduct the experiment using a computer program that operates the timed condition on the defined interval, and the untimed condition on a pace specified by each individual participant.

In summary, we were able to support previous research that highlights distinctions between relative levels of approach and avoidance decision conflict, but were not able to surface firm conclusions regarding the impact of time constraints, or changes in the relative levels of approach and avoidance decision conflict following the passage of time. Research supported by a larger sample may reveal results

that lead to a broader understanding of the established relationship.

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Action Research on Student Health: Who Cares about What?

Christina Browett

Keele University, UK

Abstract--Communities need multidisciplinary collaboration to identify and reduce their health concerns. University students (stereotypically) have poor health, but few studies look into their health concerns and take steps to reduce them. This project aimed to explore the health concerns of Keele University students, compare them with perceived concerns of healthcare professionals (HcPs), and collaborate with the health centre and student support services to design and implement an intervention to reduce those concerns. A World-Café with 8 students indicated shared concerns about university stress and poor, convenience diets. Three themes emerged: disparities between HcPs and students on health concerns, disengagement of HcPs and students, and centralising sociability of student lives. Students expressed that they avoided visiting General Practitioners (GPs) and financial concern influenced their health. In the footsteps of the Healthy Campus Program, the Centre for Learning and Student Support (CLASS) used these findings to help with drawing plans for improving the student support and development services. It is hoped these findings will set an example for other universities and communities to use collaborative approaches and approach students directly regarding their concerns.

Health is an issue in every country worldwide, whether it be vaccinating populations to prevent disease or encouraging and teaching them how to live a healthy lifestyle. Though the critical issues are different between countries, it can be argued that the most important factors for future health in the western-world are the beliefs held and the choices made by the younger generation. Indeed, Nutbeam (1997) claimed that health promotion is naturally political and constantly needs to find ways of becoming more effective as advocates for young people.

Youngblade and Curry (2006) found that just knowing resources are available is enough to increase health-promoting behaviour in adolescents. However, Fletcher et al (2007) found that, despite this knowledge, students did not tend to use these resources. They suggested that universities should be more active in promoting their health services, but it is not enough to explain health-related behaviours. Luszczynska et al (2004) showed that self-efficacy, social comparison orientation, and perceived peer behaviours predicted health behaviours. They placed social interaction at the centre of determining health-promoting behaviours. This leads to the prospect of creating socially-acceptable interventions to improve health-related behaviours. However, they may have underestimated the influence of self-efficacy. Similarly, Wrigley et al (2005) found that perception of stigmas was more likely to influence attitudes to health-promoting behaviour than the degree of ill-symptoms. Together, these studies suggest that individual differences in cognitions play a significant part in health behaviours, but that they can be influenced by others and over time.

Attitudes are powerful cognitions that strongly influence behaviour. A study looking into the changes in attitudes towards doctors by general populations found alarming evidence that

Canadians thought doctors cared less, made more errors, and did not acknowledge mistakes as readily as 10 years earlier (Gillis, Belluz and Dehaas 2010). Doctors were also ranked lower than nurses for honesty and ethical standards. This was about trust, not respect, as most still held doctors in high esteem. This could contribute to resistance towards visiting doctors when ill and impede population health. Gillis et al explained that these perceptions were more likely to be because of a lack of access to services or long waits for healthcare. Additionally, increased medical error disclosure in the press could be incorrectly interpreted as more mistakes being made. Recently, new guidelines were put in place to prevent doctors behaving like 'House MD' – perhaps in response to such findings. This suggests that attitudes and beliefs towards Healthcare Professionals (HcPs) could support or prevent health in populations but may be manipulated. Conroy et al (2002) can elaborate with the idea that different HcPs will have different attitudes towards them. Antenatal patients expressed more positive attitudes to doctors and medicine than GP patients. More positive ratings were given to family and antenatal clinic doctors. Conroy et al suggested that attitudes depend on general stereotypes or particular experiences. In a younger population, it is more likely that health concerns are based on stereotypes as opposed to previous experiences with ill-health.

Jessops, Herbert and Soloman (2005) found alarming evidence that financial concern in university students correlated with poor mental and physical health. This could indicate that their (unavoidable) financial situation needs to be handled carefully to prevent it affecting their health. In turn, this would require more information for students about healthy living and budgeting. However, it is important not to tar everyone in a population with the same brush as not every student will experience the same problems. Despite the stereotypical image of students consuming excessive amounts of alcohol throughout university – more if they live in halls accommodation (Zamboanga et al 2009) – Bewick et al (2008) showed that consumption generally decreased over time. Piacentini and Banister (2006) found that though students view binge-drinking as normal, many felt uncomfortable about this and did not engage in it themselves. Bewick et al also found students consuming more alcohol felt it had more negative impacts on their studies, finances and health. Despite the social and cultural aspects of drinking, it could indicate that students are concerned about their lifestyle and perhaps health centres need to provide information to help reduce these concerns. Dunne and Somerset (2004) went on to investigate students' health needs and views on health promotion. They found issues relating to university adjustment, health-related lifestyle behaviours and support service provision. Views on health promotion were positive, but recommendations were made to improve efficacy and include complementary interventions.

So far, it is clear that there are a lot of factors influencing health, but they may interact. Hendricks, Herbold and Fung (2004) concluded from their study that health-promoting (or health-limiting) behaviours occur together, so reducing even one barrier may be the butterfly-effect start to improving health. One study supports this notion. Cooper and Guthrie (2007) found that more positive family, peer, and neighbourhood factors were associated with less health-limiting and increased health-promoting behaviours in African-American girls. Negative surroundings could therefore become a barrier not easily changed without collective support. It is difficult to accept that contextual influences (that cannot be controlled by an individual easily) will have such an effect as it questions the point of even attempting to make lifestyle changes. However, research indicates that environmental differences only *contribute* to health-promoting behaviours. Cooper and Guthrie indicate that communities and populations need to address health concerns together in order to change their environment to benefit their health. This is another characteristic required for health interventions.

Clearly, it is important to conduct a thorough and comprehensive study before embarking on a large-scale intervention to improve population health. It is also important to find out the

health concerns of a population so as to not make any assumptions about them. Ferrara (2009) reviewed interventions in college students and concluded that interventions are, indeed, vital, with comprehensive studies having increased efficacy. However, information is sometimes gathered from the wrong population. This is highlighted by Sobal et al. (1988) who found teachers had inaccurate beliefs about their student's health concerns. They significantly underestimated overall concern and were inaccurate about the topics. As teachers spend lots of time with students, they are more likely to be approached about their concerns, but they may inadvertently mislead people. This shows that researchers, and those in a position to help/advise, need to listen to the concerns of populations directly.

One comprehensive study showed that 'hands-on' approaches with a student population can be successful in improving health-promoting behaviour. Students gain weight during their first year at university, attributable to poor diet, increased alcohol consumption (Wane, van Uffelen and Brown 2010) and decreased exercise (Butler et al 2004). With this in mind, Ince (2008) carried out a 12-week exercise intervention on university students based on the Social Cognitive Theory – focussing on various weight-gain aspects. Self-reports showed improvement in nutrition, health responsibility, social support, exercise, stress management, and overall health. However, Saksvig et al.'s 2005 study (similar to Ince's) did not go as well and highlighted the importance of designing a population-appropriate intervention. Their study was followed by an intervention that improved the health self-efficacy and healthy-living habits of school children. Despite this, there was no reduction in obesity levels. It is possible that lack of collaboration with the participants reduced its efficacy because children and their parents (being mostly in control of the children's eating habits) were not put in a position to tailor components to their own needs.

Collaboration is evidently important, and Mundt (1996) concluded students need to have an influence on the design and delivery of health services, and health centres need to continually gather data on student's health status and service use. Smaller universities may find this easier due to the sheer number of students they would have to obtain information from to be representative. Keele is one such university – nicknamed the "bubble" – that should use the collaborative method of Action Research to implement effective health interventions. Action research (AR) is based on the principles that action produces useful knowledge and that research is confined and defined by the power balance of researchers and participants (a.k.a. context). AR has the power to make real-life changes to people's lives by combining living experience with engagement. Lewin's 1947 model of this research describes cycles of action and reflection. Though AR demands a lot of the researchers and community – as collaboration is essential for the process to work – when this is achieved, the results can be far reaching. Community and population interventions should strive to use such methods to obtain the best possible results. There are many methods used in AR, from diagramming and story-telling to photovoice and world-cafés. World-Cafés in particular began with Juanita Brown (2002) who described them as 'evocative metaphors'. They use conversational enquiry with large numbers of participants to discover shared intelligence, meanings and future desires. AR could therefore be used to tailor the introduction of the Healthy Campus program as a solution to addressing the health concerns at Keele University.

Healthy Campus is an initiative of Health Promotion Programs from St. George Campus, informed by the Ottawa Charter on Health Promotion. The basis of this program (AKA intervention) is to encourage complete collaboration between students and departmental staff in order to promote health and wellbeing of the students.

> **"***The concept of the health-promoting university means much more than conducting health education and health promotion for students and staff. It means integrating health into the culture, processes and policies of the university. It*

*means understanding and dealing with health in a different way and developing an action framework that blends such factors as empowerment, dialogue, choice and participation with goals for equity, sustainability and health-conducive living, working and learning environments.***"** (Tsouros et al. 1998, pg 11)

Much of what drives Healthy Campus is the use of Participatory Action Research (PAR) to allow information, guidance and evaluation to be freely available and shared amongst all those involved. This form of research has become increasingly popular in recent years due to the widespread, positive impacts associated with it. PAR is similar to AR as it is about encouraging change and growth in a community-based project, utilising communication and collaboration to make the improvements required for that area/ community (McIntyre 2008).

So far, the Healthy Campus program has been successful in Universities across the world, mostly in America, but the UK is only just starting to grasp the concept. Sheffield and Newcastle Universities have both embraced the process and boast of the positive results on their websites. The most significant hurdle for the program is obtaining agreement from the relevant parties to collaborate and make changes.

The project described here aimed to use Action Research (by conducting a world-café, interviews and meetings) in order to explore the health concerns, attitudes and beliefs of the student and HcP population on Keele University campus. It attempted to collaboratively design and implement a health communication intervention, based on the issues raised, alongside various members of staff across the university departments, in a similar way that the Healthy Campus Program is implemented.

Methods

This was an Action Research project with multiple methods of data collection prior to action steps based on the findings. It used the AR structure with 3 main methods (see Table 1). A world-café [1] was held as it would provide more perspective and in-depth views of the students than a questionnaire or survey would. Students were recruited for the world-café by word-of-mouth, posters put up around campus, and an email sent to all student university emails. There were also structured interviews [2] with the HcPs [3] in Keele health centre. Subsequently, the researcher arranged a meeting with the manager of the Centre for Learning and Student Support (CLASS), which is a department of the university aimed at supporting the learning and personal development of students, as well as sup-

Table 1

Methods, participants and aims employed for this project

Method	Participants	Aim
World-café	A self-selected sample of 8 current University students (1 Male, 7 Female) mean age = 19.5 yrs (SD = 1.069)	To explore their health concerns, the relationship they have with HcPs and investigate the suggestions they have for a health intervention in Keele
Structured interviews	Three out of the four on-campus HcPs (one refused to participate)	To explore their views on student health concerns
Meeting	The manager for CLASS	To discuss the findings from the world-café and interviews, and explore their views on this topic

porting them through any hardships they may encounter.

The World-Café was organised into three themes of conversation:

1. Health motivators and barriers

2. Effectiveness of NHS campaigns

3. Student health concerns

Data collected by dictaphone in the world-café, and the data from the interviews underwent thematic analysis following the guidelines as outlined by Braun and Clarke (2006).

1. After typing up the transcript (from audio file) into a word document, the initial ideas about the findings began to be formulated.

2. Comments were made on key points that were said by participants. These were the basis of the initial codes that were given a possible theme name. Codes were considered important points or facts that emerged from the transcript. Possible themes related to the broadest area/field they could be related to.

3. The codes were then grouped together by similarity.

Further reading of the codes and transcript allowed for concrete establishment of the themes and also for links to be made between the themes.

1. The themes and their links were developed into an integrated diagram.

2. Themes were then compared with the responses of HcPs in their interviews and linked together into super-ordinate themes according to a common idea or finding.

3. Final reading of all the data finalised the specifics of each theme and super-theme. Then writing up of the results and evaluating them in the discussion was implemented.

[1] Unfortunately, due to the poor turn-out of students to the event, the world-café became more like a focus group. However, for the purposes of this project, it will continue to be referred to as a world-café to prevent confusion with the aims of this project. Additionally, it could still be considered as a mini-world-café due to its unstructured nature and relaxed atmosphere.

[2] Though face-to-face, semi-structured interviews were hoped to be conducted, the interviews (out of convenience) had to be structured and conducted via dictaphone or paper because this reduced the amount of time the HcPs had to spend on the project.

[3] Unfortunately, a student advisor from the student's union could not fully participate in the project due to a busy schedule that was reducing communication.

Results

There were three super-ordinate themes discovered, which were:

1. Disparities between HcPs and Students on health concerns

   a. Disparities in Health Concerns

   b. Disparities in Barriers to Health

   c. Disparities in Health Information

2. Disengagement and attitudes of HcPs and Students

3. Centralising sociability of students

As these super-ordinate themes are the basis of the findings of this project, they will now be discussed in more detail.

1-Disparities between HcPs and students on health concerns

These related to health concerns, barriers to health and health information.

1a. Disparities in Health Concerns:

It was found, from the three interviews, that HcPs felt students most commonly visited the GPs for minor ailments (coughs/cold/sore

throats), contraception and tiredness. They also mentioned skin complaints, aches and pains, chronic diseases and respiratory infection. They believed that students were most concerned about mainly minor ailments and contraception. However, it appears the HcPs were inaccurate in these beliefs. Students were, in fact, concerned mostly about *stress*, followed by *diet* – with explicit statement that contraception was of no concern to them.

> *"Stress especially because I think that's like a big problem with students..."*

University stress cannot be taken away from students. However, the fact that they seem to know what works to reduce that stress for the majority of them, and that they still believe it to be a problem, indicates that there is a need for more communication between students and the university to develop ways in which this concern can be reduced.

Diet was a close second to stress as a health concern for students, making it very clear that they felt the university was not providing them with enough help to eat better. Though diet is stereotypically poor in students, it does not seem to prevent them feeling concerned and that they should have more information to help them through their time at university. Indeed, they expressed this desire for more when discussing the topic. Students seemed enthusiastic about suggesting the university should provide them with information on basic recipes and setting up a cooking society or cookery classes. Some students felt that a lack of education prior to university was a big determinant of what becomes the student diet.

> *"...if the parents can't cook either and they have nothing to learn from."*

Despite seemingly concerned about their dietary intake, students overlooked bad eating habits and were not concerned at all by their alcohol consumption. It could be interpreted that students not being concerned about many of the health issues advertised by the GPs, and nationally by NHS campaigns, means the advertising that is already prevalent is reducing their concerns by providing information students feel they would have otherwise needed to find. This could - in part - explain why students were concerned about stress and diet, as a brief visit to the health centre brought to light that there appeared to be little information freely available to students relating to these issues. However, there was information on reducing stress provided by the Centre for Learning and Student Support (CLASS)

Despite the discrepancies, students did not visit the health centre with their concerns about diet and stress, so it is understandable that the HcPs would not know about their health concerns.

*1b. Disparities in Barriers to health:*

The biggest barriers to health that the HcPs thought the students had were *convenience* (time and money relating to food and the gym) and potentially peer pressure (a.k.a. *appearance/image*), though they did not acknowledge that *financial concerns* may play a role too.

> *"Oh yeah - it's all about convenience."*

Convenience was deemed an important factor for determining engagement of health-promoting behaviours. A need for convenience was described for donating blood, their daily meals, taking health tests, and visiting GPs. Keele is a campus university with very little in the way of near-by shops - leaving the students to travel by bus or car (both costing them valuable money) to do a weekly supermarket shop. Some students, as mentioned before, get around this by getting weekly food deliveries and/or cooking large meals and freezing portions for quick meals later. Students also find that they need convenient, quick meals because their kitchens are too small for the number of users, therefore healthy eating is not easy to co-ordinate. Indeed, laziness was admitted towards healthy eating and exercise. This could be due to a number of factors such as having left a home where they have not experienced putting the effort in to cooking a meal before, or wanting to spend as much time as possible working or socialising.

Figure 1.

Diagram showing the themes found from the world-café and their links. Bold text denotes the issues of most concern to students; social awareness and interaction was core.
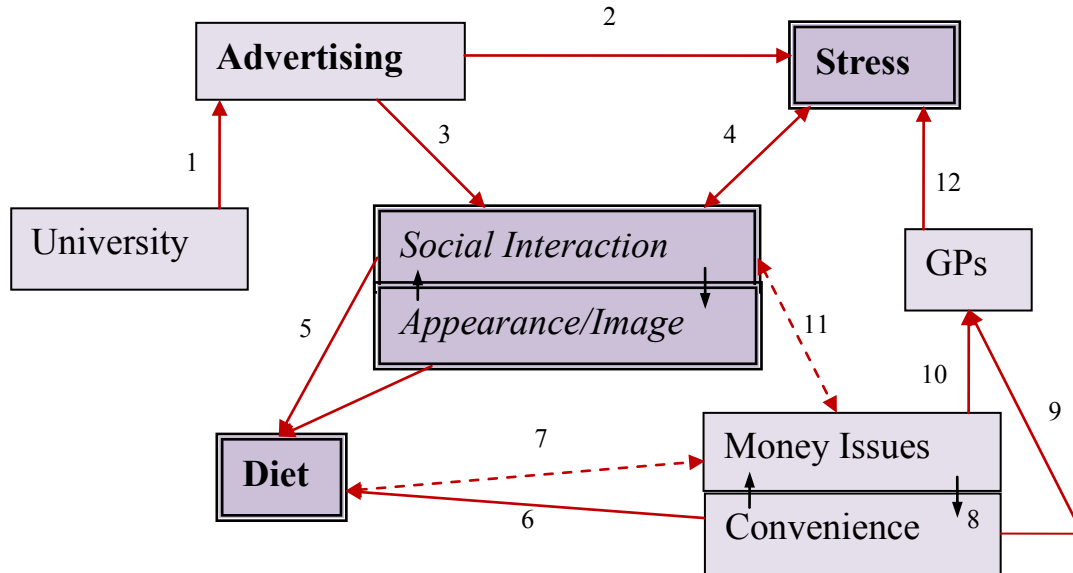
1. The University controls what advertising is put around campus.

2. Advertisement of events that may reduce stress was deemed important.

3. Good advertising and advertisement of social events can promote social interaction.

4. Stress influenced student's decision to undertake social events and social interaction influenced the experience of stress.

5. Social interaction could influence diet by sharing recipes or influencing to buy take-aways.

6. Students emphasise the need for meals to be convenient.

7. Common sense denotes that the type of diet a student has will affect their finances and financial concern will influence the choice of foods students will consume.

8. Forms to help reduce the cost of living were deemed inconvenient.

9. Students felt that convenience affected their decision to visit the GPs.

10. Money worries affected decisions to attend GPs or purchase the prescriptions that they were given by the GPs.Social interaction can be assumed to influence the amount of money students have and vice versa.

11. Students gave the impression that going to the GPs can cause them stress, though presumably not going to the doctors about their health may cause some stress in itself.

HcPs were right in believing that peer pressure (which can also be termed Image/appearance) was an important motivator for students, as this applied even to hygiene for some. One particular issue included in this was not being overweight and eating healthily. Students felt that image/appearance can be a factor in preventing undertaking free exercise. This was because they acknowledged the small scale of Keele and the importance of appearance when they are surrounded by the same few people constantly. Students mentioning the importance of their appearance, how being overweight is socially undesirable, and eating healthy is important could imply that they compare themselves with one another and pass judgment on each other. This judgment may then explain why the students felt they could not engage in free exercise (by running around campus) in-case they were judged negatively by someone who saw them. This then becomes a barrier for students and therefore needs to be handled tactfully in order to prevent health-limiting behaviours.

However, HcPs did not notice that students also thought of money worries as a barrier to their health. Due to the financial limitations most students have, it was no surprise to find that they are concerned about money. The effect money has on their health became clear as students explained the cost of the gym, prescriptions and one-person meals as huge barriers to maintaining and improving their health. Some students mentioned that, shockingly, they would not collect their prescriptions even when they were important because of the cost involved (with the exception of free contraception). This also translated into students feeling saving money was more important than healthy living. It could be implied that this issue could prevent students from even visiting the GPs in the first place. Additionally, despite the option of free exercise by running outside, they do not undertake it – perhaps due to the social implications as outlined earlier. Though the financial situation students endure cannot be taken away completely, it can be eased with some guidance. The fact that HcPs were not aware of this barrier indicates that they are not fully communicating with the students or not taking context into account. This should be addressed so that students can obtain more rounded and relevant support.

1c. Disparities in Health Information:

The HcPs thought that the most effective way of giving information was verbally and on the internet, but leaflets may also be useful. When asked if they had students come in asking about information already freely available to them, they said it does not happen often, but when it did, it was for 'burning health issues'. This seems to be in slight contrast with students as they gave the impression that in Keele, posters and (more generally) TV adverts were the most effective advertising media.

Advertising was considered a great tool for raising health awareness and even for getting them to donate blood. Sponsorship of TV programmes by NHS campaigns was thought to help, but students feel that they may seem contradictory if inappropriately placed, and that only unhealthy products will undertake sponsorship. The interesting thing to note here is that the Student's Union in Keele is sponsored by Domino's, which, when informed about, the students felt was a bad idea. This might suggest that students are inadvertently prompted to eat unhealthy food when they see the label of a fast-food brand, which would impact on their health over time, and so they feel it should be replaced with a label from a healthier-food brand. Therefore, it could indicate the need for the health centre to step in and request a company of healthier associations to sponsor the union instead in the interest of student health.

Students suggested that advertising for important health issues (such as exam stress) should be placed in waiting areas of doctor's surgeries and bus stops around campus.

"It's good to have the signs in places where people are gonna be sitting and like bored and looking around. So obviously waiting rooms are like a quite a good one and bus stops are a good one."

In terms of their health, students felt it was

important for good advertising of new events that may be beneficial for their health. They suggested that advertising for stress-reducing events needs to be constant and not just during the exam periods or in the short run-up to them.

2- Disengagement and attitudes of HcPs and students

Unfortunately, one of the four HcPs in the health centre refused to take part in this project. Though one could speculate as to why this was, it does indicate to some extent that there is a degree of disengagement of HcPs. The poor attendance to the world-café equally shows a degree of disengagement of students. Additionally, the disparities between HcPs and students on health concerns imply a deeper level of disengagement between them too.

Students felt that doctors can upset them if they don't seem confident with the conclusions about their health. There was alarming consensus amongst the students that they felt judged or embarrassed when going to the doctors. When asked about whether these opinions applied to students only, they believed it applied to anyone of any age and status – also confirming it just applied to GPs.

"GPs just think they are approachable but they are not. I'd rather go to A&E, I'd rather wait for it to get worse and go to A&E than go to my GP."

As a result, students admitted to only visiting the doctors if their illness was preventing them from doing what they wanted, but still preferred walk-in centres instead of GPs. Yet having said this, students felt that they did not trust health tests that were not given to them by GPs.

Indeed, visiting the doctors was thought to be inconvenient and time-consuming, something also applied to having to phone up for test results (especially when they felt there was not enough staff to answer phones in the health centre).

Doctors can be a source of information to help relieve stress and so presumably, by not visiting the GPs, students will not have a professional to discuss their health concerns with and may become stressed as a result.

The fact that students did not visit doctors often, even avoiding them, could be exacerbated in Keele because there are a small number of HcPs, so if one is not liked by enough students, circulating rumours or comments could prevent many more students from visiting. Part of the issue could be resolved by the health centre advertising the friendliness of their staff and the efficiency of their services to encourage students to use their resources. Additionally, it implies the importance of endorsing and, in effect, 'advertising' health-promoting behaviours.

3- Centralising sociability of students

Students seemed to place social interaction at the very centre of their university lives. Every theme that they discussed related, at some point or another, to their social engagement. The fact that social interaction is linked with many other themes can be seen in Fig. 1.

However, social interaction could also become a barrier as they felt some health-promoting societies - sports in particular - were not "open" to newcomers.

Students felt that overall, appearance/ image - which corresponds to peer pressure – was an important factor in influencing the way that students live their lives. They can be prevented from exercising, pressured to stay hygienic and encouraged not to be overweight by their student peers. Despite this apparent negativity from their peers, friendships and social events were felt to help significantly reduce stress so that they could share their experiences. Other studies have shown this.

Students went so far as to say that they felt advertising was good if it promoted discussion but also that social interaction could be used as a tool for advertising to reach more people – raising awareness of campaigns and increasing knowledge about events such as blood donation. This could also be translated into endorsing health-promoting behaviours by making them seem more 'socially acceptable'.

Centre for Learning and Student Support (CLASS)

A meeting to discuss the findings of this project with the manager of CLASS provided an opportunity to ask if they would distribute their resources for support on stress (and other aspects of university life) more frequently and make them more widely available to students via their website. They were also asked if they would consider getting into contact and collaborating with the health centre in order to develop a synergistic operation for student support, development and health. It was discovered that there were already movements towards plans to adopt the Healthy Campus program into Keele University. They were in talks to enhance communication between various departments – from volunteering experience to counselling and careers service. A copy of the transcript and key points from the world-café were even taken as information to help initiate changes.

The fact that CLASS wants to develop the healthy campus programme in Keele is a great step in the direction of developing strategies to incorporate so that the university can more effectively engage with the student population to reduce their health concerns. It would hopefully build an integrated service to the students and provide a one-stop place for them to discuss concerns and get advice.

Discussion

As seen in Jessops, Herbert and Soloman's (2005), financial concern can translate to health concern so by providing a means of financial 'relief', the students may become less concerned about their health. This would be enhanced, of course, by the fact that being able to live healthy on their budget inevitably improves health anyway. Other studies have shown this.

The finding that social interaction can influence behaviours in diet and exercise (both being health-promoting behaviours) concurs with findings from Luszczynska et al (2004) and Youngblade and Curry (2006).

Whereas Luszczynska et al described that perception of, and comparison with, peer lifestyles influences the decision to engage in healthy behaviour, this project additionally describes how healthy (or unhealthy) behaviours can become a social event. As mentioned, this could indicate the benefit of using social marketing to endorse the health-promoting behaviours in socially 'acceptable' ways.

The fact that students did not visit doctors often – even avoiding them – supports findings from Fletcher et al (2007) that students do not use the health facilities despite knowing about them. Their negative attitudes towards the GPs mirrors general public attitudes towards doctors, with variations between different HcPs also found previously (eg Gillis, Belluz and Dehaas, 2010 and Conroy et al., 2002) which could explain their avoidance. Of course, the implications of not visiting GPs can be quite serious. It is therefore vital the health centres build and maintain good rapport with their student population base in order to ensure their good health.

From what the students described in the world-café, it seems that, alarmingly, student's health-related behaviours consist of mostly health-limiting ones: Eating poor-nutritional foods (concurring with Wane, van Uffelen and Brown, 2010) out of convenience and to 'save money'; avoiding the gym out of cost and free exercise out of social pride; and avoiding doctors out of convenience and their negative attitudes towards them. This indicates that an intervention is needed to prevent detrimental cycles of poor-health in students. The fact that the HcPs were inaccurate in their beliefs about student health concerns mimics what Sobal et al (1988) said when they highlighted the importance of obtaining information about a population's concerns from them directly.

Taking all of the information above, the following changes or additions could be put in place to address the student health concerns raised. Note that some of these points are similar to the aims of the Healthy Campus programme, hopefully implemented in the near future.

Addition of a website for the health centre

to include information on the most common health concerns (as defined by the students in Keele).

Distribution of leaflets providing information on basic, convenient, but healthy meals to students on campus, with information on how to do this in a cost-effective way [6].

Introduction of more leaflets/posters in the health centre endorsing socially acceptable diet, exercise and healthy lifestyle choices.

Constant advertising of social, stress-reducing events that occur on campus.

Collaboration between various departments in Keele to work synergistically to reduce health concerns and enhance student support and development.

Providing links to trustworthy websites that provide health information specifically for students (such as www.nhs.uk/livewell/studenthealth) either on the university, health centre or CLASS websites.

The outcomes of this project mainly revolve around the plans CLASS were making: intending to organise and carry out the necessary changes to incorporate the 'Healthy Campus' programme into Keele. At the time of writing, discussion with various departments were seeking to initiate these movements, taking the world-café transcript and interview data as evidence to support their arguments because it clearly demonstrates that collaboration with students is key to succeeding at reducing health concerns. The fact that CLASS had already begun to acknowledge the need for some changes highlights some underlying issues relating to the infrastructure at Keele University. It also answers the question whether any staff members recognised problems with the current format of student support. The actions planned indicate that it may indeed be possible to make changes to reduce student health concerns and create a healthy campus. Future research should follow the progress of incorporating the Healthy Campus onto university campuses like Keele to assess the changes in student attitudes, concerns and suggestions in relation to health – in both quantitative and qualitative methods.

The lack of participants may make the findings of this study less generalisable. Another study is recommended that includes a larger proportion of the population at Keele, though others studies in other universities need to address the participant recruitment issues encountered by this project by using extensive advertising (such as posters, radio announcements, announcements in lectures and leaflet drops) and using more incentives (such as free food/drink, prize draws or money vouchers). Initially it will be difficult to get students interested in health, as the lack of participants in this project shows, but hopefully implementing the changes suggested here and advertising health promotion will sway the disinterest and negative attitudes.

Another limitation of this study is that the demographics of the participants were not assessed in detail. For example, the students who attended the world-café may have all studied a science or sport-related subject which could bias their opinions. Also, they may have been interested in health and/or psychology more so than other students even within the same subject area. Future research should include a question about subject area studied and how much they are interested in health/psychology to assess this.

The participants from the health centre may also not be representative of HcPs across the country. There were only a small number of them and they work in a very small part of the country. A city-based HcP, or an HcP based in a hospital, may have completely different views on student health concerns. Additionally, the students that the HcPs see may not be representative of students across the campus or across the country which means they may inadvertently obtain the wrong image of student health and health concerns. Future research could utilise this to compare and contrast the attitudes and beliefs of HcPs on campus, in hospitals and in local GPs.

Conclusion

In conclusion, this project aimed to explore the health concerns of students and HcPs on a small university campus, with the intention to provide information towards a health intervention. It adds to previous findings that health concerns can be misinterpreted and collaboration can effectively reduce concerns in the student population. A lot of disparities and significant disengagement were found between student and HcP beliefs, whilst students centred sociability in influencing their health. The university was already on the path to adopting a Healthy Campus program and this project played a part in supporting those movements as well as showing that the campaign could be beneficial. However, having such small numbers of participants could increase the likelihood of bias in the findings of this research, so future studies should include a larger participant base. Also, using a self-selected sample of participants may reduce the generalisability of the findings as those students who are more interested in health and/or psychology may be more likely to decide to participate, and they might also be more careful with their health, thus their concerns may differ from other students. Subsequent research should incorporate means of obtaining more of a variety of participants in their recruitment to prevent such bias. Using a more thorough participant recruitment method could also provide another area to look into; comparing the health concerns of students studying health-related subjects, or that take a specific interest in health, with those who are not. It is important to consider that the students that attend the health centre might not be representative of the concerns of the majority of students. This may affect the ability of all HcPs to accurately gauge the concerns of students and, indeed, individual populations. Additionally, future research could explore or quantify the changes in student health-promoting behaviours, health concerns, and attitudes to HcPs (particularly GPs) due to the transition from a traditional campus university to a more collaborative, 'healthy campus' university.

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