

# Journal of Multidisciplinary Research

# Journal of Multidisciplinary Research

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## Mission Statement

The mission of the *Journal of Multidisciplinary Research* is to promote excellence in leadership practice by providing a venue for academics, students, and practitioners to publish current and significant empirical and conceptual research in the arts; humanities; applied, natural, and social sciences; and other areas that tests, extends, or builds leadership theory.

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# Journal of Multidisciplinary Research

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## Editorial

A warm welcome to the fall edition of the *Journal of Multidisciplinary Research*.

In a continuous effort to deliver cross cutting research from a large array of disciplines, the current edition of the *Journal* features articles from the psychology of sport and exercise, cross cultural marketing and management, sport administration, and environmental sciences.

The fundamental goal of the *Journal* remaining the promotion of distinction in the dissemination of scientific knowledge, this issue too provides a unique multidisciplinary venue of empirical and conceptual research.

Claude Bernard once said, “It is what we think we know that keeps us from learning.” As the guest editor of the present issue, I hope this edition of the *Journal of Multidisciplinary Research* will humble the readers in appreciating what there may be left to learn.

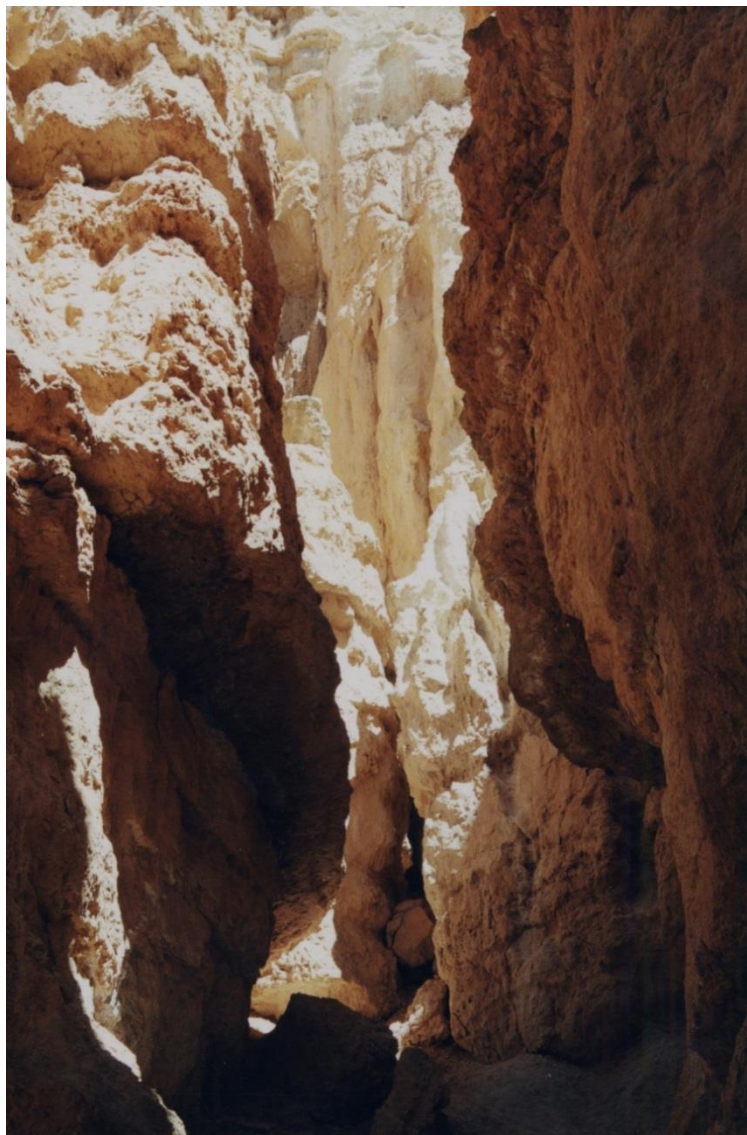
Best,

Selen Razon, Ph.D.

*Guest Editor*

**Susan S. Buzzi**, artist, educator, and longtime environmental advocate

The photographs in this issue include selected works from the “National Parks” series, which profiles distinct geographic locations and celebrates their diversity and integrity. Through the techniques of artistic and documentary photography, this ongoing project explores the fragility and wonder around us.



**Crevice** (Lake Powell, Utah)

Photograph by Susan S. Buzzi

Lake Powell is a reservoir on the Colorado River that straddles Utah and Arizona. The unique erosion and carved canyons are the result of ancient inland sea and sand movements, thus making it a popular film and vacation destination. Trekking amidst this geological phenomenon and the layers of primeval wonderment was truly an opportunity of a lifetime.

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# **The Effects of Collegiate Head Coaches' Knowledge and Attitudes Toward Alcohol Consumption by Student-Athletes**

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## Abstract

A host of studies have documented the consumption of alcohol, to a degree that is dangerous to health and well-being, among college students (Brenner, Metz, & Brenner, 2009; Harris et al., 2010; Leichter et al., 1998; Martens, O'Connor, & Paient, 2006). Other studies indicate college athletes indulge in a higher level of alcohol consumption than their non-athletic peers (NCAA, 2006; Williams, Jr. et al., 2008). There is a continuing culture of *excessive* consumption of alcohol among college athletes. When reading headlines about a collegiate athlete who dies because of misusing alcohol, one might ask how the issue continues to be such a problem, and what people can do about it. Data from this study indicate that part of this issue may be due to lack of self-efficacy on the part of collegiate head coaches to address and intervene on behalf of athletes who misuse alcohol. This article presents data that quantify the knowledge, attitudes, and beliefs of collegiate head coaches with regard to the alcohol consumption of their athletes. Additional data from this study indicate that head coaches do not feel confident in their ability to identify the signs and symptoms of athletes who drink and indicate that they are not efficacious in their ability to help, or if they know how to help.

**Keywords:** alcohol, head coach, self-efficacy, duty of care, motivational interviewing, intervention

## **Introduction**

Many studies have documented the consumption of alcohol, to a degree that is dangerous to health and well-being, among college students (Brenner, Metz, & Brenner, 2009; Harris et al., 2010; Leichter et al., 1998; Martens, O'Connor, & Paient, 2006). Other studies indicate that college athletes indulge in a higher level of alcohol consumption than their non-athletic peers (NCAA, 2006; Williams, Jr. et al., 2008). There is a culture of *excessive* consumption of alcohol among college athletes. When reading headlines about a collegiate athlete dying as a result of misusing alcohol, one might ask how the issue continues to be such a problem, and what people can do about it.

Noticeably absent from this information is data that captures what collegiate head coaches know about alcohol consumption among their athletes, what coaches' attitudes are toward alcohol consumption, and how empowered coaches feel about being able, or willing, to address alcohol consumption. To explore this, a literature review of the characteristics of an effective coach will inform the larger discussion of head coaches' ability to intervene on behalf of athletes who drink. Such characteristics include, among other things, being adept at teaching values, character, morals, and life skills, in addition to the skills to perform in their chosen sport (Walinga, 2012). In a qualitative analysis of leadership characteristics among Korean coaches performed by Park and Lyle (2013), emergent characteristics of successful coaches included eight dimensions, *attitude and philosophy* among them. In this context, attitude and philosophy entail a concern for athletes, role modeling, credibility, and responsibility, in addition to a love of sport. To some degree, concern for athletes also includes management of athletes' private lives. Park and Lyle (2013) also note that pedagogy necessitates "a leadership role in managing the necessary intervention to bring about improvements in performance" (p. 84). A focus on the process of coaching, as in sound practice, rather than the outcomes, embraces a higher meaning to athletes.

In a study of athletes' perceptions of coaching effectiveness, Boardley, Kavussanu, and Ring (2008) describe effective coaches as those who, through their own behaviors, produce positive outcomes in their athletes. This study operationalized the coaching self-efficacy model, as a study by Corcoran and Feltz (1993) present, which was based upon the Self-Efficacy theory of health behavior Bandura (1977) developed. Self-efficacy, as Bandura (1977) describes, is one's *belief* in one's ability to perform a skill or desired action. The results of the study by Boardley et al. (2008) indicate there is a direct relationship between athletes' positive perceptions of their coaches' effectiveness in such areas as motivation and sportsmanlike behavior. Boardley et al. (2008) suggest coaches' behaviors exert some influence on athletes through the perceptions of athletes. This study also suggests that "athletes who perceived their coach as effective in technique were more likely to report being more confident in executing key [rugby] skills" (p. 283). This could be helpful in informing the discussion on athletes' perceptions of head coaches' attitudes toward athlete alcohol consumption. However, this may not be true when it relates to alcohol consumption, as a study by Williams, Jr., Perko, Usdan, Leeper, Belcher, and Leaver-Dunn (2008) reports, which indicates the alcohol rules of coaches had no impact on athletes' alcohol behaviors.

Williams, Jr. et al. (2008) applied the Social Ecological model of health behavior, which suggests there are multiple levels of environmental influence that affect an individual's health behaviors, including not only self but also friends and family, community, workplace, and policy. All of these are potential sources of influence that can lead an individual to engage in pro-social or anti-social behaviors. Results from the Williams, Jr. et al. (2008) study show influence on athletes' alcohol consumption results from the athletes themselves (intrapersonal level of influence) as well as their teammates' attitudes toward drinking (interpersonal level of influence), rather than from their coaches' influence.

Regardless of the contradiction present in the literature regarding whether head coaches influence their athletes' personal behavior, the fact remains that the very essence of being a coach, especially a collegiate head coach, comes with the *duty of care* toward the well-being of those for whom they are responsible. Assuming, for the purpose of this article, that all collegiate head coaches show care and concern for their athletes, whether star player or benchwarmer, there is also the legal obligation known as "duty of care" that coaches have toward their athletes. *Duty of care* is all the reasonable steps a coach must take to prevent injury to athletes, "including ensuring participants are prepared for all aspects of the activity by means of progressive instruction" (Grossman, 2009, p. 13). Many of the head coaches who participated in the survey for this article indicate they enforce an implied policy called the 48-hour rule of drinking. Drew Potthoff (1996), a football coach at Syracuse High School, in Illinois, posed several questions that may be applicable here: Do these rules really work, or are they "window dressing" for administration, or parents, or both? Do athletes consider these rules a joke and believe no one is really interested in them? Do coaches look the other way when their athletes are at risk (Coach & Athletic Director, 1996)?

This 48-hour rule is not sanctioned by most institutions nationwide, nor the NCAA, and implicitly states that an athlete should not consume any alcohol within 48 hours leading up to a practice or game. While the intent of this article is not to discuss this rule per se, it is intended to indicate that, by permitting, whether expressly or implicitly, athletes to engage in activity while alcohol is still present in the blood, it demonstrates a violation of the duty of care mentioned above and places the coach at legal risk. More importantly, athletes who drink prior to the 48 hours leading up to a practice or game expose themselves to serious injury, which can be deleterious to long-term well-being. Many believe that starting in sports at a young age is not only a fun and positive use of time for young people, including children, but that it is also associated with psychological well-being, social development, and higher academic scores. Part of this positive development rests in the duty of care that coaches owe to their athletes. The duty of care expected is from a "reasonable, confident and careful coach acting in similar circumstances" (Grossman, 2009, p. 13).

Given the most recent, high profile, adverse events involving collegiate head coaches, there is increased concern regarding the risks that pose a threat to the safety and well-being of college athletes who agree to participate in episodic, excessive drinking, and then attempt to participate in a sporting event. Clearly, the existing institutional and, perhaps in some cases, departmental policies fail to deal adequately with the problems associated with athlete alcohol consumption and additional measures are required to ensure the safety and protection of college athletes. This responsibility may, in whole or at least in part, rest with the head coach, whom the athletes may perceive as fostering an environment that implicitly encourages alcohol consumption. It is worth noting that, while this research does not specifically investigate

institutional alcohol policies, it is unclear if the policies themselves fail to address this issue, as much as the lack of awareness and enforcement of these policies by coaches, or team staff, or both.

In an evaluation of chemical health education for high school athletic coaches, Corcoran and Feltz (1993) showed high school coaches need to be educated regarding “critical chemical information and methods for developing intervention skills so that they may adequately, and intelligently, and successfully discourage their [young] athletes from engaging in unhealthy behavior” (p. 299). The research question for the present study is very similar in nature to that of Corcoran and Feltz (1993): To what extent do collegiate head coaches’ knowledge of the signs and symptoms of alcohol use, and their skills to intervene, prevent them from actually doing so. One of the reasons behind the current culture of alcohol consumption may be in part because collegiate head coaches do not feel confident in their ability to intervene on behalf of an athlete who drinks. Therefore, this study seeks to establish a relationship between collegiate head coaches’ current knowledge and attitudes toward athlete alcohol consumption, and the current culture of drinking within the world of collegiate athletics. While the first part of this research question has an answer in the current survey responses, the second part, that of the culture of drinking, may not have an answer until after the implementation and evaluation of a new intervention.

## **Methods**

### **Participants**

This study received Institutional Review Board approval on July 30, 2012. Recruitment began in August 2012 by way of an e-mail introduction to head coaches through the researcher’s professional contacts. In addition to this, a separate spreadsheet, identifying head coaches through a random internet selection of institution websites, provided additional recruitment avenues. The present researchers sent one hundred eighty-nine (189) e-mails requesting participation to head coaches based on this spreadsheet. These request for participation e-mails included an introduction to the survey, including a declaration of informed consent, and an active link to the survey. Additionally, the researchers posted the same active survey link to a listserv containing 2,000 e-mail addresses. The researchers do not know if any of the listserv participants forwarded this link to others. Recruitment also took place through attendance at the NCAA APPLE conference, which is dedicated to substance abuse prevention and health promotion for student athletes and athletics department administrators, in January 2013 at the University of Virginia. Once they received an introduction to the study, attendees voluntarily signed up to receive the same introductory e-mail, declaration of informed consent, and active survey link. The survey remained active until February 1, 2013.

The sample for this study consists of 62 collegiate ( $N = 62$ ) head coaches who responded to the survey through networking at professional conferences and, as a convenience sample, through presence on two Pennsylvania college campuses (Temple University in Philadelphia, Pennsylvania, and West Chester University in West Chester, Pennsylvania). There were three criteria that respondents had to meet in order to be able to participate in this survey: The participant had to be over the age of 18, the participant had to hold the position of head coach at a college or university, and the institution had to be part of a Division of the NCAA.

Mean age of the respondents was 41.5 (SD = 10.515). The age range of respondents was 18-68. Forty-five respondents indicated their gender, with 53.3% male and 46.7% female. Forty-four respondents indicated their NCAA Division as the following: 45.5% Division I, 27.3% Division II, and 27.3% Division III. Of 43 respondents to the question of ethnicity, 100% indicated they were Caucasian. Table 1 itemizes the sports represented as part of this study. The number of respondents per sport, however, is greater than the survey's population (N=62) because some head coaches coach more than one sport.

Table 1  
*Sports Represented in this Study*

Sport	# of Respondents (N=62)	% of those Responding
Baseball	2	4.1%
Women's Basketball	4	8.2%
Men's Basketball	2	4.1%
Women's Cross Country	7	14.3%
Men's Cross Country	6	12.2%
Field Hockey	2	4.1%
Football	2	4.1%
Women's Golf	2	4.1%
Men's Golf	4	8.2%
Women's Gymnastics	2	4.1%
Women's Ice Hockey	1	2.0%
Women's Lacrosse	1	2.0%
Women's Rowing	1	2.0%
Men's Rowing	1	2.0%
Women's Soccer	2	4.1%
Softball	7	14.3%
Women's Tennis	4	8.2%
Men's Tennis	1	2.0%
Women's Track & Field Indoor	8	16.3%
Men's Track & Field Indoor	7	14.3%
Women's Volleyball	2	4.1%
Women's Water Polo	1	2.0%
Men's Wrestling	2	4.1%
Other	6	12.2%

## **Instrumentation**

A review of the literature yielded no existing measure for determining the knowledge of head coaches in recognizing the signs and symptoms of alcohol use, or self-efficacy, to intervene on behalf of athletes who drink. This study used a newly developed survey instrument, which

quantifies head coaches' knowledge and attitudes toward athletes who drink (Nolt, 2012). This 33-item survey measures the following: coaches' confidence and knowledge of the signs and symptoms of alcohol consumption by an athlete; alcohol's effect on athletic performance; past training on alcohol use as well as perceived effectiveness of the training; knowledge and enforcement of institutional and departmental alcohol use policies; and self-efficacy with respect to intervening on behalf of an athlete with an alcohol use problem. Items derived from the author's review of the literature on substance abuse education as well as professional experience. Twenty-five questions were single answer, multiple choice response questions, and eight questions asked respondents to elaborate on their answers to previous questions. This instrument is available upon request from the author. Colleagues who are knowledgeable in the subject area of head coaching and substance abuse education reviewed the instrument for logical validity with respect to the construct of coaches' self-efficacy to intervene on behalf of an athlete who drinks. Testing of logical validity also occurred through head coach and athletic trainer review, thereby confirming that the instrument would measure what it was purported to measure.

## Results

All 62 respondents did not answer all questions. Survey questions to the respondents probed if they felt confident in their ability to identify signs and symptoms of alcohol use among their student-athletes. Respondents (58.6%) indicated they are only *somewhat*, or *not at all*, confident that they can recognize the signs and symptoms of athlete alcohol consumption. Additionally, 19.5 % of respondents stated they feel *only somewhat confident* or *not at all confident*, that they have the ability to intervene beyond a referral to a professional or someone else on campus. Furthermore, 51.2% of 41 respondents indicated they are only *somewhat*, *if at all*, familiar with their own institution's policies regarding alcohol consumption. Thirty-nine percent of the 41 respondents further indicated that, even if they did confirm alcohol use by a student-athlete, they do not feel confident that they know what to say to help.

All of the respondents indicated that alcohol can affect athletic performance. The qualitative, elaborate, responses to the question of *how* alcohol can affect performance include: It is a depressant that slows down cognizant and physical abilities; affects one's ability to train at higher levels; decreases focus and concentration; creates a lack of stability; decreases muscle; creates lack of motivation, fatigue, and stamina; and takes athletes longer to recover from workouts, practices, and races. Forty-one coaches indicated they *do not* speak to their athletes regularly about the consequences of alcohol consumption. Thirty-eight respondents indicated they are *only somewhat confident* or *not at all confident* their athletes would seek them out to discuss alcohol use if necessary.

Of the 45 respondents who answered the question of whether they have received training on alcohol use at any time, 28.9% indicated they had received *no training at all*, 20% indicated they had taken a course *while in college*, and 40% indicated they had received training at their institution or through their department. When asked if this training was effective in raising their ability to recognize signs and symptoms of alcohol use by athletes, 15.8% indicated that their training *was not effective*. When added to the 28.9% of respondents who received no training at all, results showed that approximately 44.7 % of respondents might not be able to identify the signs and symptoms of athletes who drink.

Of the 41 respondents who answered the question about their team rules regarding alcohol consumption, 61% stated they have their own rules, and 39% indicated they do not. Of the 24 respondents who elaborated on their response on team rules, 13 (54%) indicated they enforce a 24-48-hour rule. One respondent indicated the team rule is that “there is no alcohol if wearing articles of clothing that identify you as a team athlete.” Respondents also indicated rules regarding alcohol use are enforced more strictly during in-season than during the off-season (56.4%), and 41% indicated the team rules regarding alcohol use are enforced equally in-season and during the off-season (2.6% indicated rules are enforced more strictly during the off-season).

## **Discussion**

The current study uses a newly developed instrument (Nolt, 2012) to ascertain collegiate head coaches' knowledge and attitudes toward their student-athletes' alcohol consumption. This study sought to explore the self-efficacy of collegiate head coaches with respect to their ability to intervene on behalf of student-athletes who consume alcohol and, thereby, place themselves at a greater risk of an alcohol-related injury. Respondents to this survey did indicate they do not feel confident in their ability to intervene, which is indicative of either a lack of skill to do so, or the confidence to intervene, or both. Respondents also indicate they do not believe athletes will seek them out, as their head coach, if they need to discuss their alcohol problems. If this is in fact true then, as indicated in Boardley et al. (2008), when it comes to alcohol, athletes may perceive their head coaches as ineffective in intervening, based on technique or skill, and, therefore, are not confident that their coaches can help. It is also possible athletes may perceive their coaches as being put-upon when discussing this topic, or not interested in pursuing or enforcing rules regarding their drinking as long as they can perform effectively within their sport, as Potthoff (1996) suggests.

Some head coaches did indicate they enforce an implied, as in not sanctioned, unwritten rule called the 48-hour rule. This means if athletes are going to drink, they should refrain from doing so within the 48 hours immediately prior to a practice, workout, or game, lest it affect their performance and, thereby, their outcomes. The suggestion is that, should performance be lacking, enforcement begins. Enforcement, according to respondents, may be sanctions, such as sitting out games, no dressing, warnings, and possible suspensions. Half of the respondents skipped the overall response to a question regarding enforcement of rules (32 skipped this question), and among the respondents who did elaborate, they did so without any commitment to a specific enforcement modality. The answers were general in nature and, mostly, indicated it depended on the impact of the violation, and whether it took place in or out of season; sometimes, the coach relied upon trust. In many cases, these responses did suggest Athletic Directors set policies, but the responses did not seem to provide specifics as to enforcement.

With respect to enforcement of rules during the in-season versus the off-season, respondents were nearly equal in their enforcement of rules for alcohol consumption, where the majority still enforced rules more strictly during the season. According to Martens, Dams-O'Connor, and Duffy-Paiement (2006), athletes did positively alter their drinking behaviors during the competitive season; however, their drinking behaviors during the off-season were such that the consequences still could result in injury, whether physical or not, that could affect athletic performance negatively. These might include “serious academic, social, and health related problems as a result of such drinking” (p. 508). Martens et al. (2006) further suggest that

“off-season increases in alcohol use would almost certainly negatively impact an athlete’s training and subsequent athletic performance” (p. 508). Regardless of the true nature of this piece of the athlete alcohol consumption puzzle, head coaches (as do all coaches) should uphold a duty of care toward their student-athletes. By failing to establish concrete, vocalized (and often), boundaries regarding alcohol consumption, coaches leave themselves and, potentially, their institutions open to legal action, and their athletes open to a potentially serious injury.

Duty of care is a legal obligation on the part of a coach to ensure athletes are completely ready to participate in a practice, workout, or game through progressive instruction. If part of the program fails to instruct on alcohol consumption and its related consequences, whether in-season or not, could the coach then be partly liable for injuries sustained by an athlete? According to Grossman (2009), a similar question came up in the courtrooms in the United Kingdom on three separate occasions. In two of these cases, the courts ruled against the coach(es); in the third case, there were contributory circumstances, but the coach still was found partly negligent. Palamer (2011) suggests that what makes a claim of negligence successful is there must be “a duty of care owed; a breach of the duty of care, and foreseeability and causation of injury” (p. 8).

Underpinning this legal risk, however, are the leadership characteristics indicative of a good and effective coach, such as those Park and Lyle (2013) describe, which include serving as positive role models and demonstrating credibility, responsibility, and a true sense of caring for their athletes’ well-being as much as for their sport and related outcomes. Head coaches who participated in the present study indicated they are lacking in the skills and confidence to address alcohol consumption by their student-athletes. They also indicated they are unaware of, and therefore cannot enforce, their institution’s alcohol policies and can only refer athletes out of their control to others for help. This, then, establishes a need to provide an intervention for head coaches that will increase skill and confidence to intervene on behalf of athletes who drink and, thereby, increase the likelihood head coaches can demonstrate their care and concern for their athletes with regard to alcohol consumption.

To this end, the researchers have implemented a newly developed intervention that empowers collegiate head coaches to identify signs and symptoms of alcohol consumption by athletes; instructs them on the use of motivational interviewing techniques to conduct brief interventions for athletes; and heightens awareness of institutional policies on alcohol consumption to affect change in the culture of enforcement of established policies (Nolt, 2013). Future research should include effectiveness and outcome related study.

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#### Discussion Questions

1. How critical an issue is alcohol consumption for student-athletes? Explore and discuss.
2. How knowledgeable should coaches be about alcohol and the effects of alcohol on performance? Explore and discuss.
3. What is “duty of care,” and why is it important for coaches and student-athletes? Explore and discuss.

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# **Flow in Sport, Exercise, and Performance: A Review with Implications for Future Research**

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## Abstract

The broad definition of flow is a person's sense of joy, creativity and an experience of total involvement in life. Such an experience fosters the development of a conscious state where optimal human functioning flourishes (Csikszentmihalyi, 1990). Qualitative and quantitative research on the topic has led to a definition of flow that includes nine sub-experiences that constitute the conscious state of flow. While based on the nine components of flow, often flow reflects a diverse experience based on the person's level of ability (expert vs. amateur), activity, and cultural background. Research within the area of flow and its applications is still young. Several areas within flow research need further exploration. This systematic review provides an in depth discussion of the theoretical foundations of flow, current research, and recommendations for expanding flow theory and research.

*Keywords:* Mihalyi Csikszentmihalyi, engagement, flow theory, sport psychology

## **Introduction**

Mihaly Csikszentmihalyi developed the construct of flow from his early work on the effects of anxiety and boredom on task absorption. He describes flow as a concept that defines the full ranges of optimal human functioning. The broad definition of flow is a person's sense of joy, creativity, and an experience of total involvement in life. Such an experience fosters the development of a conscious state where optimal human functioning flourishes (Csikszentmihalyi, 1990). This concept has served as a beginning point for a body of research on flow and has fostered a more in depth understanding of flow achievement, and the individual experiential factors present when a person is experiencing flow.

### **Early Perspectives on Flow**

The study of flow began in the early 1970s at the University of Chicago with the work of Mihaly Csikszentmihalyi. His work began the process of investigating optimal human functioning by examining participants' descriptive narrative of the experience. Csikszentmihalyi sought to understand the specific aspects of the human experience most commonly expressed among people who displayed adept skills and abilities in their field in order to better understand the specific domains of high performance (Csikszentmihalyi, 1990). From in-depth interviews, Csikszentmihalyi developed the nine domains of flow with findings published in his 1990 work titled, *Flow*. Susan Jackson elaborated on these nine domains in her doctoral studies and early work in which she studied elite athletes' experience of flow and performed qualitative content analysis on their descriptions. Since her early work, Jackson has dedicated her career to studying flow in elite athletes. Jackson points out the nine domains of flow "Together...represent the optimal psychological state of flow; singly they signify conceptual elements of this state" (Jackson & Eklund, 2002, p. 134). Important to the concept of flow is that at no time are we able to truly measure flow; instead, we are able to measure only the psychological experiences indicative of (and correlated to) the flow state. The following descriptions of the flow domains (see below) are from Csikszentmihalyi's 1990 work, *Flow* (Csikszentmihalyi, 1990), and Jackson and Csikszentmihalyi's combined undertaking, *Flow in Sports* (Jackson & Csikszentmihalyi, 1999).

### **Defining Flow**

Mihaly Csikszentmihalyi first coined flow, colloquially known as one's ability to "get into the zone." Specifically, flow is athletes' full engagement in their athletic performance that involves an ideal balance among focus, enjoyment, the challenges of the competitive situation, and the athlete's skills. Athletes attempt to find this harmonious balance during competitive performance whereby the athlete or performer's mind and body are engaging the competitive event with seemingly automatic, correct, and autotelic response.

According to Csikszentmihalyi (1990), flow is a cognitive state that involves athletes enjoying and focusing on their athletic performance (Jackson & Csikszentmihalyi, 1999). Athletes being fully absorbed in their activity characterizes focus (Jackson & Csikszentmihalyi, 1999). Focused athletes are ones who can mute irrelevant external as well as internal distractions, allowing them to concentrate on the competitive task. According to Yerkes and

Dodson (1908), the components of flow mediating the achievement of optimal levels of arousal and attention as well as an athlete's emotional state during competition characterizes such focus.

Athletes who focus during their competitive performance are ones who are fully concentrating on the physical and mental tasks required to perform at their best. Such focus is necessary for optimal performance. In comparison, a "harmonious experience" (Jackson & Csikszentmihalyi, 1999) that results in an athlete who reports a positive, euphoric, and intrinsically motivating experience characterizes enjoyment. Anyone engaged in a performance situation can experience flow; however, according to flow theory, sport provides individuals more positive experiences, thus, more opportunities to achieve flow (Jackson & Csikszentmihalyi, 1999).

Flow involves nine components: challenge-skills balance, merging of action-awareness, clear goals, feedback, concentration, sense of control, loss of self-consciousness, transformation of time, and autotelic experience. Optimizing all nine components during a single activity can create an optimal state of arousal (Yerkes & Dodson, 1908), thus positively affecting performance.

*Challenge-skills balance* refers to the need for individuals to have a balance between their current competitive situation and perceived skill level; this 'balance' is where the challenges of the situation match the skills of the athletes for whom these challenges and skills are at a personally high level (Williams, 2009), positively affecting performance. Moreover, challenges are the situational demands of the event that provide an opportunity for action, with skills being people's perceived level of confidence and belief in their ability (Jackson & Csikszentmihalyi, 1999). In order to reach a balance between challenges and skills, one's challenges and skills must be well-matched, relatively high, and go beyond the person's average skill levels (Jackson & Csikszentmihalyi, 1999).

Furthermore, this component is essential to experiencing flow as athletes must feel their current skill level matches the competitive demands (Jackson & Csikszentmihalyi, 1999), or such negative moods as boredom (having high skills and low challenge), anxiety (having low skills and high challenge), or apathy (having low skill and low challenge) could arise. Moreover, an athlete's perceived skills are necessary to match the presenting challenges of the competitive event, possibly before the latter eight components can be maximized. Understanding the role of challenge skills balance is important in considering an athlete's ability to access and maintain a flow state. If individuals do not sense a balance between the foreseeable challenge and their perceived skills, the inequality will generate anxiety within the athletes, prohibiting them from fully utilizing the eight remaining components of flow. A second component of flow, the *merging of action-awareness*, refers to the merging of one's actions and awareness during performance; such integration of conscious action and awareness of that athlete's action causes the individual's movements to feel effortless.

*Action-awareness merging* is the fusion of effort and awareness of that effort during an activity, thus creating a moment whereby the 'feeling' of doing is lost and the feeling of automatic response takes place. The athlete is no longer thinking of the "hows" of performing and just doing.

*Clear goals* refers to having a clear set of strategies, instructions, or goals when engaging in the activity. Clear goals allow athletes to evaluate the progress of their actions through the automatic assessment of their progress toward their specific goals.

*Unambiguous feedback* refers to the automatic receipt of information from various sources during the activity that positively affects performance. This information or feedback allows the participants to make any necessary adjustments to their form or performance through automatic response (not self-conscious or forced). *Unambiguous feedback* describes a performer needing to receive accurate feedback during the event, promotes skill development. Sources of feedback are the coach, team, competitive situation, opposing team as well as the individual (i.e., feeling the movement of the body); these forms of feedback assist the athlete in gauging their performance and making appropriate adjustments during the competitive event (Jackson & Csikszentmihalyi, 1999).

*Concentration* refers to complete concentration on the task or event. A lack of concentration can cause poor decisions, distraction, and focus on irrelevant situational variables that will not assist in achieving flow or produce a desirable competitive outcome. When optimizing this component the athletes mute irrelevant stimuli and distractions and are fully focused on their course of action.

*Sense of control* is a paradoxical notion that refers to the athlete feeling in control, but not consumed by the evaluation of it (Stavrou, Jackson, Zervas, & Karteroliotis, 2007). *Sense of Control* suggests that athletes relinquish control of their skill in order to feel in control; when athletes are hyper-vigilant during competition this may cause the athletes to over-analyze their performance, affecting the achievement of flow. However, the athlete's performance becomes automatic when athletes assume their skills are stable, effective, and reflexive, allowing their skill to match the challenge naturally. Further, a sense of control is the feeling of effortlessness that occurs during the merging of action and awareness (Jackson & Csikszentmihalyi, 1999).

*Loss of self-consciousness* is focusing on the skill but not its evaluation (Jackson & Csikszentmihalyi, 1999). In order to optimize performance, self-conscious thoughts (over evaluation of one's actions) regarding the nature of the performance must be eliminated, resulting in a performer who is fully absorbed, yet freely engaged in the activity. The performers release feelings of the ego (e.g., "is this movement correct" or "am I doing a good job") and come to understand what their role is in the activity. Gayle Privette (1983) describes this feeling of self-awareness as "clarity of role."

*Transformation of time* refers to the feeling during the activity that time has transformed beyond physical awareness. Athletes report the feeling that time has either sped up or slowed down. When in this state, athletes have reported that, as their behaviors felt slowed, the overall course of the event seemed to speed by.

*Autotelic experience* refers to experiencing intrinsic reward and pleasure during a flow state; when an individual has experienced flow, he or she feels enjoyment and intrinsic reward from participating in the activity (Jackson & Csikszentmihalyi, 1999).

## **Measuring Flow**

Much of the early assessment of flow focused on the use of semi-structured interviews to investigate what specific aspects of flow people commonly experienced, regardless of the activity they were performing or their cultural background (Csikszentmihalyi, 1975). This approach was refined into the Experience Sampling Method (ESM), which Csikszentmihalyi and others used to gain a snapshot of people's experience of flow while they were experiencing it over the course of a

week in their daily work or athletic activities. When a pager cued them, participants would document their experience of flow.

The present research found ESM to be not only a valuable tool for gaining insight into an individual's inner experiences but also a valid tool for comparing the psychological experiences that comprise flow among groups of people (Csikszentmihalyi & Larson, 1987). The development of the ESM shed a great deal of light onto the nature of flow and how individuals experience it across a wide range of activities. Later, Jackson and colleagues addressed the issue of developing an empirically valid measure for flow and developed the Flow State Scale (FSS) and the Dispositional Flow Scale (DFS) (Jackson & Marsh, 1996).

### **The Flow States Scales**

The flow scales are a series of scales that assess the extent to which situational or dispositional factors influence individual flow achievement during activity. Susan Jackson developed the Dispositional Flow Scale (DFS), which tests the trait component to flow (Jackson & Eklund, 2004) through examining dispositional factors that influence individual flow during competition. In comparison, the Flow States Scale (FSS), which Susan Jackson developed, tests the state component to flow (Jackson & Eklund, 2004) through examining situational factors that influence individual levels of flow during competition.

The long versions of both the FSS-2 and DFS-2 have 36 items and measure state and trait flow along nine subscales based on the nine components of flow (i.e., challenge-skill balance, action-awareness, clear goals, unambiguous feedback, sense of control, loss of self-consciousness, concentration on the task at hand, transformation of time, and autotelic experience).

Stavrou et al. (2007) found the FSS had reasonable reliability regarding its correlations between flow subscales, the orthogonal model of flow, and assessment of challenge and skills in athletes. Additionally, Jackson and Marsh found considerable reliability and validity with both the Flow States Scale-2 (FSS-2) and Dispositional Flow Scale-2 (DFS-2). Jackson and Eklund (2004) further support this in their publication of the flow manual. According to Jackson and Eklund (2004), the FSS-2 and the DFS-2 use a five point Likert Scale. They designed the FSS-2 for researchers to administer them to participants (e.g., exercisers, athletes, hobbyists, and performers) soon after completing an athletic event or non-athletic task to assess a participant's just-completed experience, while Jackson and Eklund designed the DFS-2 for researchers to administer it to participants at any time and for sport and exercise psychology professionals (e.g., researchers and practitioners) to use to identify one's propensity to experience flow in a more or less stable way while engaging in a particular activity (Jackson & Eklund, 2004).

Jackson (2009a, 2009b) developed more recent versions of the FSS-2 and DFS-2, and these are short forms of each scale. The Short Flow States Scale-2 (Short FSS-2; Jackson, 2009b) is a nine-item questionnaire assessing the state component of flow on a five-point Likert scale with response items from 1 "strongly disagree" to 5 "strongly agree."

Though one's cultural origin, one's chosen discipline, and linguistic factors could affect one's description of the flow state, researchers have found flow is a highly cross culturally sound concept and the theoretical foundation of flow as an altered conscious state appears to be accepted across a wide range of cultures. Research has confirmed the flow measures are cross-culturally valid tools to assess the construct of flow, and revisions from the first to second versions of the scales have increased the conceptual coherence to Csikszentmihalyi's original

nine-factor conceptualization of flow while being tested on participants with expertise in a large range of sports and sporting activities (Jackson & Eklund, 2002). Jackson and colleagues, as well as a large and growing body of flow researchers, have used these scales in the assessment of athletes who play a wide range of sports, as well as non-athletes. Some of the activities the flow scales assess include the following: gymnastics, track and field, distance running, triathlon, rugby, rowing, white water rafting, cycling, swimming, hockey, figure skating, sailing, rowing, gaming, motorcycle riding, dancing, farming, hiking, horseback riding, fishing, piano playing, singing, writing, web browsing, and military combat (Chen, 2000; Freer, 2009; Harari, 2008; Hefferon & Ollis, 2006; Kiili, 2006; Levine, 2006; Manzano, Theorell, Harmat, & Ullen, 2010; Whitmore, 2005). Additionally, the flow scales have assessed the experience of flow in a range of nations and cultures including the following: Australia, many European countries, Japan, Korea, North America, China, and Thailand (Csikszentmihalyi, 1990; Csikszentmihalyi & Csikszentmihalyi, 1988; Kawabata, Mallett, & Jackson, 2008; Yuan, Hu, & Wang, 2009).

### **Translations of the Flow States Scales**

Translations of the flow scales have also emerged as highly cross-culturally valid measures when translated into other languages. The flow scales have also been found to maintain their sound psychometric properties when successfully translated into other languages, including: Greek, French, Japanese, and Chinese (Fournier, Gaudreau, Demontrond-Behr, Visioli, Forest, & Jackson, 2007; Kawabata et al., 2008; Stavrou & Zervas, 2004; Yuan, Hu, & Wang, 2009). Some translations of the flow scales have found small discrepancies with construct validity. But, further research into both the cultural validity of the flow state as a human experience, as well as the internal consistency of the flow measures, have found flow to be both a cross-culturally valid concept. This cross-cultural research has confirmed the flow instruments accurately measure the psychological states associated with the flow experience (Jackson & Eklund, 2002).

Seemingly, the only caveat to findings suggesting flow is a cross-culturally valid concept, and empirically valid in cross-lingual translations findings Doganis, Iosifidou, and Vlachopoulos (2000) mentioned findings in investigating the Greek translations of the flow scales. This work found the original versions of the flow scales to lack significant levels of internal consistency on certain scales (Doganis, Iosifidou, & Vlachopoulos, 2000). Those scales were the “action-awareness merging” and “concentration on the task at hand” domains of flow. Based on these findings, the authors suggested Jackson and colleagues further clarify the conceptual underpinnings of those domains, which likely would aid in their translation to other languages.

### **Cultural Variations in Measuring Flow**

Doganis et al. (2000) reiterated the warnings of Jackson and Marsh (1996) in using the flow scales to assess a particular population because of issues related to linguistic translation and nuances of dialectical expression. Additionally, the authors suggested there could be variances in responding when using the FSS to assess an athlete after a competitive experience because of the effect winning and losing can have on flow reporting. But Doganis et al. (2000) went on to suggest variance due to competitive outcome is likely nominal and an inherent part of the competitive experience given that all athletes experience both winning and losing in some ratio relative to their skills and experience of success in competition. Their research also discussed

possible issues with the flow scales related to using them with a particular population of athletes who may characterize their flow experiences in a particular vernacular that is specific to their sport and does not fit with the nomenclature of the flow scales (Doganis et al., 2000). Jackson and colleagues addressed these issues in their 2002 work by increasing the conceptual coherence of the flow scales to the original conceptual underpinning of Dr. Csikszentmihalyi (1990) when redesigning the flow scales into the FSS-2 and DFS-2.

### **Flow, Peak Experience, and Peak Performance**

Peak experience is a transcendental, spontaneous, and joyful event that absorbs the individual into its moment. Abraham Maslow (1968) suggested that peak experiences are vital elements in an individual's quest for self-actualization; such a moment provides an optimal state of consciousness as well as experience. Privette (1983) suggests that the 'self' is more passive due to the spontaneous nature of a peak experience and this passive 'self' allows the 'self' to be absorbed in the moment, rather than in the pursuit of any action (during the moment). Individuals that experience this peak moment tend to report feelings of completion or closure as the experience may redefine, finalize, or reframe certain feelings of progress or stagnation.

Peak performance is the experience of superior performance during an activity (Privette, 1983). Peak performance is maximizing one's ability; thus, feelings of progress and superiority are felt. Peak performance differs from peak experience in that peak performance tends to be more focused, intentional (not spontaneous), and responsive to the activity. Meaning, athletes are responding to the demands of the competitive event with their skills, instead of passively experiencing the competition without action. There is a strong sense of self and self-understanding during this moment, as the participants understand their ability, motivations for participation, and are often seeking to optimize performance for a personal or extrinsic outcome.

In comparison, Csikszentmihalyi (1990) defines flow as an intrinsically motivating and joyful experience. According to Privette (1983), often flow is the subject of discussion in relation to peak performance, whereby such a pairing suggests that the experience of flow is contingent on a peak performance (or vice versa). This assumption is often the subject of debate within the area of sport psychology: Peak performance is superior or best ability that is not exclusively comprised of intrinsic motivation and joy (as a product). An athlete could have experienced a peak performance without the feelings of deep enjoyment or intrinsic motivation. In comparison, experiencing flow is not dependent on athletes feeling as though they are maximizing their current ability. Regarding the self during flow, the self experiences a loss of ego and role clarity; negative emotions associated with the over-evaluation of performance (i.e., anxiety or frustration) are suppressed. This suppression of self-conscious thought permits the performers to come to a sense of deep awareness regarding their placement and function within the activity. Moreover, an understanding of the process becomes more fluid to which once experienced (flow) the participant feels motivated to continue.

Personal interactions play a vital role in the flow experience. When considering the components of challenge-skills balance, feedback, and clear goals, it is evident that interactions with others could directly affect the optimization of these components. Feedback, as previously defined, provides the participant with an unobstructed understanding of the need to alter or engage certain skills. Feedback can come from multiple sources such as coaches, teammates, spectators, as well as the athlete's own body (e.g., kinesthetic feedback). Appropriate forms of

information that guide the athlete during performance (thus eliminating self-conscious thought) certainly would open the door to the flow experience. However, such negative sources of feedback such as negative comments, behaviors, or remarks from spectators, lack of communication on the team or with the coach, can hinder athletes' ability to make adequate adjustments to their play, thus hindering flow achievement.

Second is the element of challenge-skills balance, which is the athlete feeling that his or her skills are well-matched for the competitive event. Stavrou et al. (2007) explored the role of challenge-skills balance and the orthogonal model of flow on its relationship to flow achievement. The researchers found that persons who scored high on the flow scales also scored high on the 'skills' subscale in the challenge measure. Such a finding suggests that athletes must feel able to engage a competitive setting at their current skill level (or possess the ability to increase their skills) in order to achieve flow. Such findings do not discount the notion of 'challenges,' as challenge is an essential component in minimizing feelings of boredom or apathy in order to achieve flow but do highlight the importance of athletes' subjective evaluation of their current ability.

Interestingly, this study expands the theory of flow in that not only are the perceptions of skills possibly slightly more important than the challenge of the event, but research highlighting skill perception can be explored. Moreover, good training and communication within the team regarding what the athletes can offer to the competition are variables that affect the athletes' subjective measure of their performance.

Last, the flow component of clear goals refers to the participants having structured goals regarding their participation in the performance. Coaches, teammates, or parents affect the maintenance and development of clear goals. Having clear goals when entering the activity allows athletes to enter the competition focused on only the necessary actions pertaining to that activity. Unfortunately, a team, coach, or parent who does not clearly communicate goals to the athlete may create feelings of confusion or self-consciousness regarding the athletes' ability to effectively monitor their behaviors and actions during the event as well as perform at their peak.

### **Implications: Future Directions for Flow Research**

Research within the area of flow and its applications is still young. There are several areas within flow research that researchers can explore and develop.

### **The Autotelic Experience**

New findings (River, 2011) would seem to support the findings of Schüler (2010), which suggested the motivational structure of the autotelic experience is more complex than previously considered. In her work, Schüler (2010) questioned the classical model of flow theory as it pertains to the motivational structure of the autotelic experience. Schüler's work suggested the sequencing of extrinsic and intrinsic motivational structures is a key aspect of the autotelic experience. It would appear that further work is necessary to elaborate on the importance of reconsidering a reordering of motivational structures in the autotelic experience as it pertains to high performance.

Schüler's work (2010) pointed to a reordering of the intrinsic and extrinsic motivational structures in such a way that still favors intrinsic experiences in the flow state, but only slightly.

Her findings pointed to an increased importance of extrinsic experiences than previously considered in theoretical models of flow and the autotelic experience. Schüler's research suggested a shift in emphasis onto extrinsic motivational structures that are present-based. These present-based extrinsic motivational structures serve to highlight important environmental cues that aid in fully appraising and utilizing competitive opportunities as they appear moment to moment. River's (2011) findings suggest the autotelic experience is actually a primarily extrinsically motivated construct among higher performing squash athletes, with intrinsic motivational rewards existing in a secondary relationship. This switching of motivational emphases fosters a new view of the autotelic experience.

Important in this new conceptualization is the defining of extrinsic goals that are primarily present-oriented and not outcome oriented. From this perspective, engaging in present based extrinsic rewards is significantly more motivating for higher performing athletes because of the opportunity it presents to enact micro-competitive behaviors from moment to moment that permit athletes to actively cultivate victory.

### **Music and Flow**

Pates, Karageorghis, Fryer, & Maynard (2003) suggested that music and flow can have a positive relationship on performance with Karageorghis and Deeth (2002) finding that asynchronous motivational music correlated to higher flow states within study participants. As Pates et al. (2003) found, participants suggested that the asynchronous music assisted in increasing concentration and relaxation as well as participants experienced more positive emotions.

### **Flow, Peak Experience, and Peak Performance**

Flow is not synonymous with peak experience (Privette, 1983) whereby researching the similar, potentially parallel experiences of flow and peak experiences in athletes would be of considerable interest. Also, research exploring the intersection of flow, peak performance, and peak experience or the potential triggering of one experience to another (Jackson & Roberts, 1992; Privette, 1983; Privette & Bundrick, 1997) is still to be examined.

### **Flow and Work**

The experience of flow within work, leisure, and interpersonal settings has vast implications. In essence, flow is a fluid intersection of enjoyment (Moneta & Csikszentmihalyi, 1996), absorption (Chen, 2006, Csikszentmihalyi, 1975; Sanchez et al., 2011), and intrinsic experience (Moneta & Csikszentmihalyi, 1996). Researching the relationship among these three constructs within the domains of physical activity, interpersonal relationships, and work would add to the current understanding of flow. Sanchez et al. (2011) found that flow was least experienced in non-healthy (burnt out) individuals, postulating that the cause of this is that burnout contradicts the inherent experience of engagement necessary to achieving flow. Further research exploring the experience of flow in physically and mentally 'healthy' versus non-healthy adults (Sanchez et al., 2011) would provide more insight into (1) the fluid experience of flow, (2) the intersection of emotions and flow, and (3) assist in further operationalizing the flow model.

## **Flow in Combat**

Harari (2008) postulated that the experience of flow within combat situations involves a loss of reflective awareness, necessity to focus on the present as a means of survival, and such present focus results in an increased awareness of living; Harari suggested that the flight response activated during wartime or combat situations optimizes all flow components out of necessity. Certainly for the soldier in a wartime situation, elements of danger, threat, and risk would only increase the likelihood of a flow response due to naturally narrowed attention, thoughts limited to survival (e.g., fight or flight) with little room for outside self-consciousness thinking, and the individual's response being automatic, reinforcing the present focus and deep absorption characteristic of a flow state.

## **Pleasure**

The flow construct is still the subject of research and expansion. Research concerning flow and pleasure (Csikszentmihalyi, 1990) in order to expand current knowledge on enjoyment and individual potentiation as partially caused by eudemonic pleasure would be interesting. Also, research exploring the differences between hedonic and eudemonic pleasure responses as related to flow would provide additional insight into the experience of flow within work, activity, and living.

## **Flow and Creativity**

Pelaprat and Cole (2011) defined creativity as “literally a form of making, the making of “the whole world of culture” based on the products of imagination” (p. 399), with Vygotsky characterizing creativity as a process that arises from imagination (Pelaprat & Cole, 2011); through the process of resolving and connecting through abstraction, the individuals create a solid image, object, or situation that reflects their world. Through the process of resolving and connecting within the imaginations, the experience of creativity as a product of successful, connecting the abstract to develop a concrete solution, results in the feeling of one being more deeply integrated into the world (Pelaprat & Cole, 2011).

Research has only scratched the surface regarding the experience of flow during an imaginative or creative process. While flow has been the subject of research within artists (Csikszentmihalyi & Csikszentmihalyi, 1988), it has not been explored deeply as a fluid process within creativity and imagination. The implications of conducting such research would be the applications of flow within the learning process (see Rieber, 2001), and the elements of flow applicable to facilitate learning and motivation to learn. According to Getzels and Csikszentmihalyi (1964, 1976), mental imagery and spatial abilities have been positively correlated to creative behavior; thus, future research examining how science, technology, engineering, and math (STEM) are taught and developing an educational environment that utilizes the components of flow with course content has profound implications for learning.

## **Real-Time Tracking of the Runner, Flow States, and Mood**

Future research within the area of flow should utilize the Experience-Sampling Method (ESM) which requires individuals to respond to a short questionnaire (or experience-sampling form) whenever notified via an electronic beeper or alarm during random times during the day (and typically over the course of a week). This assessment method allows for the examination of the fluid experience of flow throughout the day, within multiple settings (Rodriguez-Sanchez, Schaufeli, Salanova, Cifre, & Sonnenschein, 2011), and, if paired with mood or emotion assessments, evaluates the experience of daily positive and negative emotions on flow. Sanchez et al. suggested that due to the “affective component (enjoyment)” (2001, p. 78) inherent in flow, fluctuations in flow are likely. Exploring the fluctuations of flow and mood throughout a day is of considerable interest. Pates et al. (2003) stated one key limitation to the Flow States Scales was their lack of measuring emotions or mood states.

## **Conclusion**

Qualitative and quantitative research on the topic has led to a definition of flow that includes nine sub-experiences that, taken together, constitute the conscious state of flow. While conceptualized based on the nine components of flow, flow is a diverse experience, based on the person's level of ability (expert vs. amateur), activity, and cultural background.

A recent significant finding was the autotelic experience correlating negatively with performance (River, 2011). This would seem antithetical to the premise of the autotelic experience assisting athletes in performing difficult or painful physical tasks by fostering a motivational structure that allows for enjoyment of the act itself, instead of an anticipated positive future outcome from the action primarily driving motivation (Csikszentmihalyi, 1990).

With greater consideration of the motivational structures of the autotelic experience, this finding seems to support recent research and challenge traditional thinking about the autotelic experience.

Considering a new conceptualization of flow requires examining areas of flow that need further investigation. Included in this investigation involves addressing the following questions:

1. Privette (1983) questioned the possibility of triggers to flow. Research within flow has yet to explore the possibility of triggers to flow achievement. Thus, the question remains, are there triggers to flow? If so, are these triggers external or internal? Or both? Can moods be triggers to a flow state?
2. The vast implications of past and current research on flow warrant a new conceptualization of flow; one that defines extrinsic goals as present-oriented and more motivating for higher performing athletes. Can extrinsic goals facilitate a flow experience? What are the processes of extrinsic motivators on the affective process involved in flow?
3. Researching physically and mentally ‘healthy’ versus non-healthy adults (Sanchez et al., 2011) will expand the current flow model. The implications of additional research in this area expand more intimately into the health behavior research causing the question, “how “healthy” must one be to experience flow?” What does healthy mean

when considering the current and changing model of flow? Can flow be a facilitator to positive health?

4. What are the differences in goals? Can intrinsic and extrinsic motives equally facilitate a flow experience?

The results of the present research warrant an investigation into how future researchers can expand or alter flow theory in the following ways: investigating situational antecedents to experiencing flow; assessing the experience of flow across performance domains (i.e., sport, exercise, work, or life-threatening situations); redefining flow to include the nuanced gradations of psychological performance between athletes in the state; expanding the definition of flow to include an understanding of the emotional and somatic processing that take place in flow (Ceja & Navarro, 2009); and promoting a new emphasis on the importance of present-based extrinsic rewards in the flow state. In addition, it appears important to update the conceptual underpinning of flow to include a depiction of the state as enabling an enhanced ability to process somatic and emotional responses with environmentally based contextual cues.

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### Discussion Questions

1. Considering the present discussion on flow, how do you define flow?
2. List two strengths and two weaknesses of the current flow model.
3. What elements of the flow model would you change?

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**Canyonlands** (Canyonlands National Park, Utah)  
Photograph by Susan S. Buzzi

Surrounded by stunning formations, remarkable mesas and river gorges, and ancient secrets! Outside the sprawling Dixie National Forest.

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# **The Development of Expertise in Performance: The Role of Memory, Knowledge, Learning, and Practice**

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## Abstract

The purpose of this review is to discuss the development of expertise. Initially it was thought experts were born with particular capabilities or giftedness for excellence. However, though some believe our genetic characteristics provide a potential for excellence, the strongest evidence points to the experiences one engages in for determining the potential of developing expertise. This article will provide some historical context for this born-versus-made debate as well as review key research identifying the role of memory, knowledge and its organization, learning, and practice in the development of expert levels of performance.

*Keywords:* expertise, expert, expert performance, learning, knowledge, memory, practice

## Introduction

Are expert performers born or made? Researchers throughout the years have investigated whether we are born with innate abilities that determine our capability of becoming experts or if we can develop potential and expertise. This question has intrigued not only researchers and academics but also the mainstream population. For example, books such as Malcolm Gladwell's *Outliers*, Geoff Colvin's *Talent is Overrated*, David Epstein's *The Sports Gene*, Matthew Syed's *Bounce*, and Daniel Coyle's *The Talent Code* examine and discuss this notion of what expertise is and how it develops. The desire to uncover what it takes to become an expert level performer fuels this debate and the obsession surrounding it

## **The Beginning: Experts are Born, Not Made**

Sir Francis Galton (1869) was one of the first individuals to investigate and comment on expertise. In his examination of Great Britain history, he found prominent individuals were

members of a very small number of families. This led him to the conclusion that innate factors are responsible for outstanding achievement. His belief in the importance of genetics and hereditary contributions was so strong that he began a new field of hereditary improvement (i.e., eugenics), opened a laboratory in which he tested individuals on their mental and physical abilities, and through his work in the laboratory aimed to create a superior population of people (Forrest, 1974). Other researchers have followed suit and come to similar conclusions regarding the importance of what one is born with on their potential for becoming an expert. For example, according to Gardner (2004), talented individuals have a biopsychological potential in a specific domain. Further, Eysenck (1995) was a strong proponent of the importance of a genetic basis as a necessary, but not sufficient, condition for the emergence of giftedness.

Proponents of the innate talent perspective believe that excelling in a given domain is the result of a natural ability (i.e., genetic endowment) that is evident in early childhood (Howe, Davidson, & Sloboda, 1998). Bloom (1985) set out to investigate giftedness and critical factors that contribute to the development of talented performers in many domains (e.g., music, sport, and mathematics). Surprisingly to those who believe in the power of innate talent, his research found no evidence for any particular genetic factors that could have predicted the success of the performers he investigated. He wrote the following.

the study has provided strong evidence that no matter what the initial characteristics (or gifts) of the individuals, unless there is a long and intensive process of encouragement, nurturance, education, and training, the individuals will not attain extreme levels of capability in these particular fields. (Bloom, 1985, p. 3)

His findings challenged the notion that hereditary factors (i.e., innate talent or giftedness) were necessary preconditions for the development of expertise.

Further, Howe and colleagues (1998) provided significant evidence to contradict the theory of innate talent. First, the evidence supporting the notion that talent is visible in early childhood consists mostly of retrospective reports and records from parents. Further, many children identified as gifted or talented receive special opportunities and encouragement either as a result of, or resulting in, this identification. The authors also mentioned the large body of literature in a variety of fields that provides evidence for long periods of practice having a great impact on existing exceptional performance, or on the ability to train individuals to exhibit exceptional performance. For example, though many historians and researchers often identify Wolfgang Amadeus Mozart as a child prodigy, others point to a history of the development of his expertise, which includes, for example, the fact that he began his education in music before he was even five years old as well as having a father who was a skilled composer and famous music teacher (Ericsson, Prietula, & Cokely, 2007).

Considering these issues associated with the talent account, many researchers have adopted accounts of expertise and exceptional performance based more on the benefits of experience, namely prolonged and meaningful practice on a given task or in a specific domain. Ericsson and Lehmann (1996) suggested the effects of innate, genetic components are minimal based on the combination of negating evidence for the talent account and supporting evidence for adaptations resulting from extensive practice in a domain. While some researchers (e.g., Tucker & Collins, 2012) still believe innate factors (i.e., genes) provide a potential for the

development of expertise, even they suggest that external factors (such as motivation, coaching, exposure, and practice) play a role in determining elite performance.

### **Experts are Made, Not Born**

Proponents of the “experts are made” viewpoint have based many of their suppositions on evidence from investigations of the memory capabilities and thoughts of experts in a variety of performance domains. De Groot’s (1965) seminal work with chess players examined memory for chess positions. He found that master chess players, when presented with novel board positions, exhibited nearly perfect recall of the positions of the chess pieces, whereas novices were significantly weaker. By examining the players’ thoughts during the chess games, he found that the grandmaster is constantly considering possible options for action and evaluating the potential outcomes of these actions. This research led De Groot to conclude that the grandmaster’s extensive knowledge was the key to his superior performance, which allowed him to immediately identify the problem and begin to generate solutions.

Chase and Simon (1973) also examined chess players to provide complementary support for De Groot’s (1965) findings, and better understand the nature of expertise. They presented participants with trials of both game-like and random board positions. The results indicated that master chess players were far more accurate on the game-like positions than the less experienced players. However, performance on randomized positions was similar across the skill levels, with only two or three pieces placed correctly irrespective of skill level. Based on these findings, Chase and Simon (1973) concluded that the superior performance of chess players was due to their ability to store more information in short-term memory (STM).

To test this idea of the role of memory in expertise, several researchers examined individuals that appeared to exhibit unique capabilities for memorization. For example, Luria’s (1968) subject (S) could accurately recall series (four lists of up to 70 items) of words, numbers, or letters, whether meaningful or nonsense, and either read aloud or written. It was found that S’s mechanism for remembering was to “see” (i.e., synesthesia) the items in the list or convert these items into visual images. Hunt and Love’s (1972) subject (VP) was found giving exhibitions of his ability to play up to seven simultaneous, blindfolded chess matches. They examined him on several tasks finding his recall to be extremely accurate. He explained this by indicating that his recall was based on the functions of the pieces rather than a visualization of the chessboard. VP believed his superior memory was obtained by starting to improve this skill early in childhood, using conscious effort and concentration, and manipulating the situation to his advantage rather than just trying to remember the information.

Gordon, Valentine, and Wilding (1984) were also interested in studying an individual who appeared to have superior memory who made extensive use of advanced mnemonic techniques. Mnemonic devices are complicated procedures that must be learned and practiced for effective use in aiding memory (Belleza, 1981). These aids have been found to facilitate recall by developing a learning strategy that updates new sets of changing information (Belleza, 1982). After several experiments, the researchers concluded that their subject (TE) did not possess superior visual capabilities or memory capability. TE’s illustration of the use of mnemonics to aid in memory suggested that any person with knowledge of and practice with a mnemonic technique could exhibit efficient memory recall ability (Gordon et al., 1984).

To further examine the development of expertise and the notion that it is not a capability certain individuals are born with, attempts were made to produce memory skill experts in an effort to better capture underlying memory processes. In one such study, an undergraduate student (SF) became a memory expert in a digit span task as a result of over 200 hours of practice (Chase & Ericsson, 1981; Ericsson, Chase, & Faloon, 1980). At the beginning of the experiments, SF's ability to memorize and recall the digits was clearly limited by the capacity of STM. Based on his verbal reports, it was evident that SF was relying solely on rehearsing the presented information until he had to recall the list of numbers. After a few days, the researchers began noticing an improvement in SF's recall, and he started reporting using a mnemonic aid in which he grouped and coded the digits as running times, as he was an avid runner. In the beginning, this mnemonic aid was fairly simple, but as the sessions progressed SF strengthened it making it more systematic. By the end of the experiment, he had increased his digit span from seven to 79 digits (Ericsson, Chase, & Faloon, 1980). Based on these experiments, Chase and Ericsson (1981; 1982) concluded that a larger STM capacity was not the underlying cause of expert performance. They argued that an explanation based on storage in STM could not explain superior recall performance. Since STM capacity did not increase with practice, they concluded that long-term memory (LTM) must play a role in skilled memory performance (Chase & Ericsson, 1982).

Skilled memory has also been examined using individuals exhibiting superior memory in their daily lives. For example, Bennett (1983) examined the memory capabilities of cocktail waitresses. Overall, the cocktail waitresses were far more accurate than a group of undergraduate students with 90% and 77% correct recall of drink orders, respectively. The researchers concluded that memory processes other than just STM must be at work in this task. Waitresses reported they had not received any formal training for increasing memory ability, but that they had each developed individual systems, including attentional and mnemonic strategies, for accurate memorization. Similarly, Ericsson and Polson (1988) examined a restaurant waiter (JC) with the skill of memorizing dinner orders for greater than 20 people. With each successive dinner order, JC would use a mnemonic aid to integrate new dinner orders with the previous orders being held in LTM.

Other researchers have provided evidence for the role of LTM in a variety of domains, such as expertise in mental calculation (Chase & Ericsson, 1982), sport (Deakin & Allard, 1991; Eccles, 2006), memory for ballet movements (Smyth & Pendleton, 1994), and taxi driving (Kalakoski & Saarilouma, 2001). It is clear from all of these studies examining memory skill expertise that these individuals do not possess or acquire superior memory abilities nor do they have a larger STM capacity. Further, their advantage over novices is not due to mere perceptual recognition, but rather a deeper level of comprehension (Hodges, Huys, & Starkes, 2007). These individuals have learned to use techniques and strategies, such as mnemonic aids and visual memory, to enhance their memory capability by encoding and storing information in LTM that can later be retrieved for accurate recall and use. Ericsson and Staszewski (1989) stated that "experts acquire not only content knowledge through long hours of practice, they also develop skills that enable them to efficiently apply their knowledge" (p. 237).

## **Developing Expertise**

### **The Role of Knowledge and its Organization**

A major component of the advanced skill of experts that separates them from novices seems to be their acquisition and use of superior cognitive processes in their performance (Ericsson & Lehman, 1996). Previous research has shown that experts possess a vast body of knowledge for their respective domains. This extensive store of knowledge is a major factor in their superior performance compared to novices (Salthouse, 1991). Novices exhibit significant limitations that constrain their performance due to their lack of domain knowledge. For instance, they lack knowledge about expectations for situations, actions that should be taken, and the timing that action should be taken. Further, they have not yet formed relationships among their knowledge and situational factors, nor can they identify and integrate relevant information (Salthouse). As Ericsson and Staszewski (1989) stated, “the fundamental problem in this broad endeavor is to describe what it is that experts know, and how they use their knowledge to achieve performance that most people assume requires extreme or extraordinary ability” (p. 235).

The presence and effects of this knowledge have been examined in a variety of domains. For example, Bryson, Bereiter, Scardamalia, and Joram (1991) examined research on differences between expert and novice writers, and proposed that the difference in the knowledge bases of these two groups impacts their writing performance. While novice writers were able to construct a coherent, imaginative text, their writing was driven by telling what they know about a given topic. Expert writing, however, entailed an extensive recursive planning process involving interaction between the use of their knowledge and consideration of the goals of the writing composition. In an examination of dinosaur knowledge in novice and expert children, Gobbo and Chi (1986) found that expert children tended to focus on deeper level features (e.g., category of dinosaur) of the dinosaurs while novice children focused on surface level features (e.g., size of dinosaur). Further, experts had more structured and cohesive dinosaur knowledge and the superior structure of their knowledge helped them to derive implicit information about unknown dinosaurs.

Coughlin and Patel (1987) found that the more extensive domain knowledge of physicians allowed them to recall more critical information from cases and make fewer inferences to determine critical information compared to medical students. The differences between the physicians and medical students disappeared when the case information was presented in an unstructured manner. However, the physicians were still able to recall more critical information whereas the medical students' recall consisted mainly of dramatic, but noncritical case information. They concluded that the previous knowledge of the physicians enabled them to have a prototype for case information that they used in diagnosis, which was disrupted when information was presented in an unstructured form. In contrast, the medical students' performance did not differ when the case information was presented in the structured versus unstructured forms because they did not yet possess the knowledge to construct these prototypes.

Not only do experts possess this greater body of knowledge in their domains, but the superior organization (i.e., representation in memory) of this knowledge also impacts their performance. Berliner (1994) stated, “what is learned by the expert appears to be linked better to other knowledge that the expert possesses. It also appears that such knowledge is more easily retrievable in appropriate situations and more transferable to new situations” (p. 162). Glaser

(1987) proposed that expert knowledge is structured more effectively, qualitatively different, organized into deeper and richer representations, and more adaptable to varying situations than is novice knowledge. With increasing experience and expertise, knowledge proceeds from a more fact-based, less complex form (i.e., declarative knowledge; knowing what to do) to a more complex and elaborate form (i.e., procedural knowledge) in which the individual knows how, when, and why to use the knowledge in a given situation (Anderson, 1982; Glaser & Bassok, 1989). It is thought that controlled processing governs declarative knowledge which requires more information processing capacity, whereas the use of procedural knowledge involves automatic processing, thereby freeing up cognitive capacity for other tasks (Abernethy, Maxwell, Masters, Van Der Kamp, & Jackson, 2007). These more refined, complex representations enable experts to increase their control over their performances, more effectively prepare for and analyze the available and appropriate courses of action, adapt to the demands of new and evolving situations, and continue to learn and sustain their superior performance (Ericsson, 1998).

The organization of knowledge in LTM is referred to as a mental representation (also called mental models or schemas). These can be thought of as hierarchically organized structures of knowledge that allow for better categorization of information as well as superior decision making regarding how to use that knowledge (Kalyuga, Ayres, Chandler, & Sweller, 2003). The main purpose of these models is to functionally represent this knowledge in order for explanations and predictions to be made (Greca & Moreira, 2000). Further, mental representations are considered recursive in that new knowledge is constantly added to build and update new and existing representations. For example, if one already knows how to solve single digit multiplication problems, the mental representation for that type of mathematical calculation can be used and updated in order to solve double-digit multiplication problems. The solving of a particular problem is affected by the quality of these models, thus impacting performance (Chi, Feltovich, & Glaser, 1981).

Ericsson and Crutcher (1990) stated, “exceptional performance cannot be explained as simply more efficient use of the same processes underlying novice performance” (p. 205). Past research on differences between expert and novice mental representations has supported this notion by consistently finding that experts’ representations tend to consist mainly of abstract conceptualizations of problems whereas novices’ representations are based mainly on surface features (Adelson, 1984; Bradley, Paul, Seeman, 2006; Mayfield, Kardash, & Kivlighan, 1999). For example, Chi et al. (1981) examined differences in expert and novice representations of physics problems, and found that experts extract physics principles from the content of the problems in order to categorize and solve them, whereas novices simply use the content of the problems (i.e., surface features) in their attempts to categorize them and develop problem solutions. Experts initially generate several potential hypotheses based on major physics principles, and then use the meanings of additional information from the problem to narrow down and choose an appropriate hypothesis, whereas novices use the literal components of the problems to lead them to equations that relate those components. Thus, the superior performance of experts is related to the early activation of an appropriate mental representation consisting of extensive physics principle knowledge that is used to restrict the range of possible solutions to the physics problems. Novices, on the other hand, possess substantial declarative knowledge about the problems, but are at a disadvantage due to their lack of abstract, procedural knowledge (Chi et al., 1981).

In an examination of mental representations in counselor's case conceptualization knowledge, Mayfield et al. (1999) found that expert counselors categorized and mapped client statements faster than novices, and exhibited more highly integrated and domain-relevant knowledge structures. Novice counselors exhibited less interrelated and organized schemas, tended to order information based on the time of presentation in the case, and generated more concept categories. Similarly, Eells, Lombart, Kendjelic, Turner, and Lucas (2005) found that expert therapists produced greater quality case formulations than experienced or novice therapists. More specifically, the experts were superior to the other participants in case comprehensiveness, elaboration, complexity, fit of the case to the treatment plan, elaboration of the treatment plan, and use of a systematic strategy across case formulations.

In examinations of the impact of knowledge on teaching in mathematics, Borko and Livingston (1989) and Livingston and Borko (1990) found that expert teachers were better able to integrate students' questions and comments into their pre-planned review lessons than were novices due to their more advanced mathematics schemata. Novices, on the other hand, conducted more procedural lessons and were less able to be responsive to student questions as a result of their lack of sufficient pedagogical knowledge about learning in mathematics and insufficient development of schemata for mathematics and the teaching of mathematics.

Many studies have been conducted on the impact of mental representations on performance in a variety of domains, such as orchestral conducting (Bergee, 2005), air traffic control (Niessen, Eyferth, & Bierwagen, 1999), meteorology (Lowe, 2001), managerial problem solving (Isenberg, 1986), theater acting (Noice, 1991), politics (Jones & Read, 2005), money and banking (Lotto, Rubaltelli, Rumiati, & Savadori, 2006), law enforcement (Harris, Tashman, Ward, Ericsson, Eccles, Williams, Ramrattan, & Lang, 2006; Tashman, Harris, Ramrattan, Ward, Eccles, Ericsson, Williams, Rodrick, & Lang, 2006), and sport (Didierjean & Marmèche, 2005; McPherson, 1999). These studies have consistently found that expert's superior performance is impacted by the richly, highly integrated mental representations of their knowledge in their particular domain of expertise.

Sternberg (1995) proposed that novices and experts differ in three main ways. First, experts have a larger store of domain knowledge that is well-organized in memory. Second, experts are more efficient in their problem solving, related to their developed automaticity for some of their behaviors, enabling them to do more in less time than novices. Their ability to more effectively plan, monitor, and revise their actions also impacts their efficiency. Lastly, experts have more insight into problems that result in more appropriate problem solutions stemming from their creativity in problem solving and their ability to selectively encode (i.e., distinguish between relevant and irrelevant information), combine (i.e., recognition of similarities among information), and compare (i.e., application of information of a similar situation to the current situation) information more efficiently than novices. In support of the impact of their insight into problems, McPherson (2000) proposed the existence of LTM adaptations (i.e., action plan and current event profiles) regarding sport expertise that can be generalized to other domains. Action plan profiles match the conditions of the current situation with the appropriate actions that need to be taken in that situation. For example, in a penalty kick a soccer player will use the mental representation for that type of play in order to determine the most effective courses of action he or she should take in order to attempt to block the shot and not let the opponent score. Current event profiles match past, current, and future events with the relevant information of the current situation. So, in the example of the soccer goalie, he or she might think back to past situations

where this opponent has attempted a penalty kick in order to consider what information is most relevant in this current penalty kick situation. These two adaptations help expert performers to determine what, how, when, and why to use their previous knowledge, determine the most appropriate and relevant information of the current situation, and choose the most effective course of action.

Experts' superior knowledge and organization of that knowledge leads to better performance compared to their novice counterparts. Since these two qualities are evidenced to have a large impact on performance, it is of interest to examine how novices learn domain knowledge to move them along in their path towards developing expertise.

## **The Role of Learning**

Bruer (1993) stated, "learning is the process by which novices become experts" (p. 9). Learning is thought to have an emergent quality, and result from the accumulation of knowledge and the modification of the organization of that knowledge (Glaser & Bassok, 1989; Rumelhart & Norman, 1978). Shuell (1990) stated that, "learning is not merely an additive process – qualitative, as well as quantitative, changes occur, and qualitative differences are evident in both the substance of what is being learned and in the learning processes most appropriate for acquiring additional knowledge" (p. 540).

Bloom (1956) developed a taxonomy of educational objectives that provided a framework for the goals of learning as a result of instruction. The learning categories are ordered from simple to more complex, ranging from knowledge (rote learning of information) to evaluation (making judgments). Krathwol (2002) later revised Bloom's taxonomy by reorganizing the categories into two dimensions (i.e., knowledge and cognitive processes). The knowledge dimension included the main subcategories of factual knowledge (basic components of a domain), conceptual knowledge (interrelationships among the factual knowledge), procedural knowledge (how to complete an action; techniques or methods and when to use procedures), and metacognitive knowledge (awareness of one's own cognition). The cognitive process dimension included the main subcategories of remember (retrieve knowledge from LTM), understand (determine meaning), apply (acting in a given situation), analyze (determine the relationships among individual pieces of information and the whole structure), evaluate (making judgments), and create (creating a new product). The taxonomy of learning objectives is viewed as a cumulative hierarchy in which a learner must first master each simpler category before being able to learn and master a subsequent more complex one (Bloom, 1956).

Rumelhart and Norman (1978) proposed that learning consists of three modes, which includes, (a) the accretion of knowledge in which new information is acquired and matched with appropriate schemata to produce a representation held in LTM, (b) the restructuring of knowledge to impose a new organization that improves the interpretation and accessibility of that knowledge, and (c) the tuning of knowledge in which the categories used for interpreting knowledge are altered to improve accuracy, generalize applicability, specialize applicability, or specify default values or variables in the existing schemata. Similarly, Fitts and Posner (1967) stated that, "skilled performance always involves an organized sequence of activities" (p. 1). They proposed a phase theory of learning in which an individual progresses gradually through a series of three phases (i.e., cognitive, associative, and autonomous). In the cognitive (early) phase, the learner is attempting to understand the nature and demands of a task, and requires instructions

and demonstrations for effective learning. In the associative (intermediate) phase, the knowledge that was acquired in piecemeal during the first phase is combined to form new patterns of knowledge. The length of this phase varies according to the nature and complexity of the skill being learned. The autonomous (final) phase is characterized by a reduction in conscious processing and interference from other conscious processes and potential distractions in the environment. In this final phase, speed and accuracy of problem-solving is increased due to practice (VanLehn, 1996). Thus, new learning can occur, or other perceptual and cognitive activities can be engaged in, while these well-learned skills are being carried out (e.g., thinking about game strategy while running and dribbling a basketball).

Berliner (1988) also believed that learning occurred in stages. He proposed that the beginning stages of learning are marked by individuals abiding by the specific rules of the situation and exhibiting a lack of understanding of what information is important. Then, in the latter stages, learners are able to direct their attention towards important information while disregarding irrelevant information, and are able to predict or anticipate future events. They begin to act in an intuitive manner, but rely mainly on analytical and deliberate decision-making processes. When expertise is reached, individuals act in what Berliner called an “atypical” manner because they do not make decisions in an analytic manner, but rather fluidly and intuitively react to situations. However, when novel situations are encountered, even experts revert to a reliance on analytic, deliberate thinking.

More recently, Alexander (2003) proposed the Model of Domain Learning (MDL) to account for the development of expertise. The MDL consists of three components: knowledge, strategic processing, and interest. Two types of knowledge are included in the model, (1) domain (i.e., the breadth of information an individual knows in the domain), and (2) topic (i.e., the depth of information an individual has about specific topics in the domain). The MDL distinguishes between two types of processing of information including surface-level and deep-processing strategies. Interest is comprised of two forms including individual (i.e., an enduring interest an individual has for the domain) and situational (i.e., a fleeting interest that is tied to a specific situation). The MDL consists of three stages of learning that track an individual’s movement from novice to expert. In the first stage, acclimation, learners have limited knowledge which constrains them to use surface-level processing and rely on situational interest. In the second stage, competence, learners’ knowledge is becoming more cohesive and extensive; they use a mixture of surface-level and deep-processing strategies to solve problems, and begin to develop more individual interest in the domain. In the last stage, proficiency/expertise, learners have a wealth of both domain and topic knowledge, use mainly deep-processing strategies, and have a high level of individual interest in the domain. Regardless of theory, it is clear that expertise develops through a stage process of learning.

### **Quality, Not Quantity: Practicing for Expertise**

Ericsson (1998) stated “very high levels of performance are reached only gradually after many years of engagement in domain-related activities” (p. 81). In an examination of cognition and decision-making in sport expertise, Tenenbaum, Yuval, Elbaz, Bar-Eli, and Weinberg (1993) found that athletes with more experience in a sport exhibited superior decision-making compared to those with less experience. However, it is not the effect of mere accumulated amounts of experience in a domain, but rather the engagement in deliberate practice activities that

contributes to the attainment of exceptional performance (Ericsson, 1998; Ericsson, Krampe, & Tesch-Römer, 1993). Thus, the learning process requires consideration of the quality of the learning.

After reviewing the practice histories of expert performers in a variety of domains (e.g., chess, sport, and music), Ericsson and colleagues (1993) proposed that expertise is attained after ten years or 10,000 hours of deliberate practice. However, they were not referring to mere experience in a domain, but rather to the engagement in effortful, attention-demanding activities aimed at improving one's skill. Further, their contention was that the crucial aspect is not the amount of time one engages in practice that determines the potential for the development of expertise, but rather the quality of the practice one engages in. They proposed three constraints for this framework, including, (a) a resource constraint in which deliberate practice requires time, energy, and the necessary resources (i.e., instructors, facilities, equipment), (b) a motivational constraint in which the motivation to practice comes not necessarily from enjoyment of the activity, but rather from the internal desire to improve, and (c) an effort constraint in which the practice is effortful (i.e., attention demanding) and must be done for a limited amount of time per day with bouts of rest incorporated into the schedule (i.e., in order to avoid losing attentional focus).

Thus, in order to develop expertise and continue to increase one's skill level, individuals must engage in effortful, attention-demanding deliberate practice of their skill(s) in order to build more complex mental representations (Ericsson, 2003). Practice is deemed to be deliberate if it consists of the following: (a) a difficulty level tailored to the individual; (b) the provision of immediate, informative feedback; (c) the opportunity to correct errors and engage in repetition of performance; (d) requires effortful concentration; (e) is aimed at improving skills one already has (i.e., maintaining one's strengths); (f) considerable, specific, and sustained efforts to push the limits of what one can do (i.e., working on one's weaknesses); and (g) is aimed at not only improving one's skill deliberately but also learning how to think deliberately (Ericsson et al., 2007; Guest, Regehr, & Tiberius, 2001).

Focusing on the quantity of practice, supplementing competing/performing for practice, or designing practice in non-deliberate ways may lead to initial improvements in skill and a successful level of performance. Thus, as learners progress through the stages of learning, initial improvements will be attained after some practice and they may even reach the autonomous stage of learning where they can perform their skills automatically without much conscious control (Ericsson et al., 2007). However, with these types of practice activities, an individual may reach a plateau in their performance level in which they are able to perform the desired skills successfully, but will not reach an expert level of performance. For example, suppose an individual wants to learn and become good at tennis in order to start competing in competitions on the weekends. He or she might engage in extensive practice and reach the autonomous stage of learning in order to be a successful competitor. However, once this level of performance is reached the individual no longer practices with the aim of improving, but rather practices repetitively to stay consistent at his or her current competitive level of performance. According to Ericsson and colleagues this individual will not become an expert level performer because his or her practice is no longer deliberate and intentional. Bryan and Harter's (1899) early work on the learning of the telegraphic language provided evidence for this assertion in that initial improvement in the skill was shown after mere repetition, but further improvements were only attained after engagement in more effortful, deliberate practice of the skill.

Evidence supporting the theory of deliberate practice has been shown in a variety of domains, such as academics (Plant, Ericsson, Hill, & Asberg, 2005), medicine (Wayne, Butter, Siddall, Fudala, Wade, Feinglass, & McGaghie, 2006), music (Ericsson et al., 1993), typing (Keith & Ericsson, 2007), and sport (Hodges, Kerr, Starkes, Weir, & Nananidou, 2004). It appears that no matter what the domain, if one wants to develop expertise, engagement in deliberate practice activities will provide the best opportunity to reach such a desired level of performance as well as ensure the ability to sustain and improve upon that one's expertise.

### **Conclusion**

While experts may have been born with certain characteristics that factored into their early performance levels or potential for performance, it is clear that their superior performance is mainly the result of being made into an expert. They not only have learned more knowledge but also make better use of that knowledge due to their superior organization of information in memory. Further, their learning has occurred in stages in which initially they engaged in fact-based learning and then proceeded to being able to perform their skills autonomously and effortlessly at a very high level. Finally, their ability to develop the key mental representations, progress through the stages of learning, and continue to advance their skill level is the result of deliberate, intentional practice. The research and ideas reviewed in this paper can be generalized to an understanding of how to promote and produce effective learning and the development of expertise in any performance domain (e.g., music, medicine, sport, teaching, and counseling). Considering how expertise develops, the impact of knowledge and mental representations on expertise, ideas about the learning process, and the importance of deliberate practice can be used in any domain to understand and develop expert levels of performance.

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### Discussion Questions

1. Are experts born or made? What evidence have proponents of each side of the debate tried to use in order to justify their viewpoint?
2. What are some of the main differences between experts and novices regarding their knowledge, its organization, and how they use that knowledge?
3. What is a mental representation? What effect does it have on expert performance?
4. Based on the discussion regarding the role of learning, describe the stages a learner progresses through.
5. Is quantity or quality of practice more important? Why? What must be included in a practice in order for it to be considered deliberate?

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## **A Cross-Cultural Study of Materialism and Brand Engagement**

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### Abstract

Materialism is overestimating the importance of material goods to human happiness. Researchers have long studied materialism, both for its impact on general human well-being and on many consumer behaviors. The purpose of the present study is to examine cultural differences in materialism by comparing the responses of samples of consumers from the U.S. ( $n = 259$ ) and Korea ( $n = 226$ ), and using two operationalizations of the materialism construct. We present findings using the well-known Richins and Dawson (1992) Material Values Scale, as well as those from a newer scale, the Aspiration Index (Kasser, 2002), in order to provide additional insight into materialism. We also test for cultural differences in a new construct closely related to materialism: brand engagement in self-concept. The results show that the Korean sample scored higher than the U.S. sample on five of the six materialism dimensions, suggesting that materialism might have a stronger impact on the consumption behavior of these consumers than on their U.S. counterparts. In contrast, the U.S. consumers report higher levels of brand engagement in self-concept than the Koreans do, revealing subtle cultural differences of potential importance to marketing strategy.

**Keywords:** materialism, brand engagement in self-concept, personality, motivation, cross-cultural marketing, gender differences

## **Introduction**

Materialism is a concept of preeminent importance in the study of consumer behavior. It is difficult to think of another consumer characteristic linked to both a wide variety of typical marketplace behaviors, like consuming for status (Goldsmith, Flynn, & Clark, 2012a), and pathological behaviors, like hoarding (Cherrier & Ponnor, 2010). Materialism is special in that it is a broad personality characteristic directly linked to specific consumer behaviors. It is also different in that it is demonized and is regularly the subject of studies relating it to negative outcomes, such as overspending (Watson, 2003), consumer indebtedness (Ponchio & Aranha, 2008), and lack of life satisfaction (Wright & Larsen 1993). Recent research shows that income, up to a point, is actually positively related to life evaluation, contrary to traditional ideas that material goods are the root of all evil (Kahneman & Deaton, 2010). Materialism is an important, well-studied construct with broad implications for consumer behavior. To that end, research has produced a wide-ranging body of knowledge about both the antecedents and the consequences of materialistic tendencies.

At the same time, some researchers examine levels of materialism and how these levels differ across cultures. Their goal is to reveal cultural influences on materialism. Although this information is potentially important to understanding both the etiology of materialism and cross-cultural marketing strategy, these studies yield little enlightenment about how exactly this culturally-based phenomenon varies between ethnicities, countries, and cultures. Existing results are contradictory (Ger & Belk, 1996; Kamano, 1999; Kamineni, 2005; Webster & Beatty, 1997). Similarly, some studies report demographic correlates of materialism, but the findings are inconsistent and even contradictory. Such inconsistent findings shed little light on how materialistic tendencies might function differently between different groups, and the limited number of studies provides an insufficient number of data points to permit valid generalizations. Thus, we need further research in order to clarify not only the differences in levels of materialism but also the mechanisms by which materialism exerts its influence between groups.

Moreover, researchers have used different and differentially reliable and valid measures of materialism, usually limiting themselves to one of the versions of the Material Values Scale, or MVS (Richins & Dawson, 1992). This mono-operation bias restricts the depth of insight, but the use of additional operationalizations of the construct can overcome this shortcoming. In addition, prior research emphasizes total materialism scale scores, while the MVS consists of three subscales. This has the effect of obscuring potential cultural differences on the subscales. While the overall level of materialism is important, more diagnostic information comes from studying the separate dimensions. These limitations in the previous research stimulated our study.

The purpose of this study is to examine differences in materialism across demographics in two cultures, the U.S. and South Korea, and with two measures of materialism. We chose these countries because the U.S. is the most widely studied culture in materialism research, so results on the U.S. serve as a de facto standard against which researchers compare other cultures (e.g., Ger & Belk, 1996). We chose South Korea because it is an Asian culture we assume to be quite different from that of the U.S., but which strongly reflects changes sweeping through Asia as these countries become more modern and affluent (*The Economist*, 2011). In addition, no

previous study seems to have used Korean subjects. Finally, to augment what we learn about materialism in these two countries, we supplement the MVS with Kasser's (2002) newer scale, which operationalizes materialism along dimensions different from those of the MVS. We also examine the cross-cultural differences at the factor level. Finally, we include in our study a measure of a construct closely related to materialism, and likely one of the consequences of most interest to marketing practice: Brand Engagement in Self-Construct (Sprott, Czellar, & Spangenberg, 2009). Research has not yet applied this new measure in a cross-cultural setting. We hope to add to the body of knowledge concerning these important aspects of consumer behavior.

## **Literature Review**

### **Materialism**

The concept of materialism has a long history in literature, ranging from economics to abnormal psychology to advertising. Academics and others in particular have criticized the U.S., nearly from its inception (deToqueville, 1835), for an unhealthy preference for material wealth over deeper, more important motivations, such as spirituality and brotherly love. An early review by Richins, McKeage, and Najjar (1992) gives a brief, excellent summary of the history of thought surrounding materialism and its impact on U.S. culture. However, materialism does not stop at the borders of the U.S. Many studies conducted since the 1980s have examined materialistic tendencies in different cultures around the world (cf., Hotstede, 1980; *Chosun Media*, 2010). All sorts of papers report findings comparing and ranking materialistic tendencies by country and culture but show no consistent findings (cf., Flynn, Goldsmith, & Korsenzy, 2011). The lack of reliable findings is a problem that might have to do with measurement issues within the materialism scales, difficulties in translation, or issues of culture and language. In this article, we hope to add to the literature by addressing one of these issues by using two scales and all subscales of each to compare two cultures.

In marketing, materialism has special meaning. From the outside, commentators see marketing as the driver of materialism in developed and developing economies. We do not deal with that here; instead, we are looking at materialism as related to consumer behaviors that are of value to marketing managers. Marketing researchers seek to understand the motivations that give rise to consumer marketplace behavior so marketers can appeal effectively to target consumers. The personal overestimation of the importance of material goods to happiness, materialism, is a motivation social science literature, including marketing research, mentions repeatedly. The wide range of research on materialism has led to something of a blurring of its definition. We choose the above definition for its simplicity and because it gets to the core of its importance. Overestimation of the happiness that material goods provide leads to other behaviors. Research in psychology shows that materialistic values influence compulsive buying and hoarding (Frost et al., 2007), and are related to low levels of happiness and life satisfaction (Millar & Thomas, 2009; Wright & Larsen, 1993). Materialism is important in marketing because it influences important and valuable consumer constructs, such as advertising attitudes (Osmonbekov et al., 2009), shopping motivations (Goldsmith, Flynn & Clark, 2011), and innovativeness, status consumption, and brand engagement with self-concept (Goldsmith, Flynn & Clark, 2012b) among others. Materialistic values also vary with demographics. Materialism

may decline with age (Belk, 1984; Charles, Hurst, & Roussanov, 2009; Pepper, Jackson, & Uzzell, 2009; Richins & Dawson, 1992) and relates to ethnic origin (Albinsson et al., 2010; Kamineni, 2005; Korzenny et al., 2006). We base our hypotheses (see Table 1) on prior research.

Table 1  
*Hypotheses*

---

H1 proposes a negative correlation between materialism and age.

Justification: Rindfleisch (2009), Flynn et al. (2011).

Result: weakly supported, but the finding is stronger for Korean sample and MVS.

H2a proposes male/female differences in materialism, but the direction of differences is unspecified.

Justification: Kamano (1999), Kamineni (2005).

Result: supported; women > men for MVS Centrality.

H2b proposes that women score higher in the AI Attractiveness scale than men.

Justification: Goldsmith, Flynn, and Clark (2011).

Result: supported; women in both U.S. and Korea scored higher than did the men.

H3 proposes U.S./Korean differences in materialism, but the direction of differences is unspecified.

Justification: Ger and Belk (1996), Webster and Beatty (1997), Kamano (1999).

Result: supported; Koreans > U.S. for AI Social, AI Attractiveness, MVS Success, MVS Centrality, and MVS Happiness; but U.S. > Koreans for AI Financial.

H4 proposes that there is no gender difference in BESC (Brand Engagement in Self-Concept).

Justification: Sprott, Czellar, and Spangenberg (2009); Flynn, Goldsmith, and Clark (2011).

Result: supported for both countries.

H5 proposes that the Koreans should score higher on the BESC than the U.S.

Justification: Flynn *et al.* (2011).

Result: counterindicated; the U.S. mean was higher than the Korean mean.

H6 proposes a positive correlation between materialism and BESC.

Justification: Sprott, Czellar, and Spangenberg (2009); Goldsmith, Flynn, and Clark (2002b).

Result: supported for both countries.

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## **Materialism and Age**

Material goods have both instrumental and symbolic value for people (Csikszentmihalyi & Rochberg-Halton, 1981). As people age, however, they tend to value different goods and place more symbolic than instrumental value on these goods (Kamptner, 1991). This situation makes it difficult to hypothesize an unambiguous relationship between materialism and age. Not

surprisingly, studies report contradictory findings regarding the relationship between materialism and age, thus making generalizations difficult. Kamano (1999) reports a significant positive regression coefficient ( $\beta = .0003$ ) for age, with nine items in a study of “national character” measuring materialism, but this relationship was significant only for West Germany, France, and Italy, not for Great Britain, the U.S., Japan, or the Netherlands. Keng, Jung, Jiu, and Wirtz (2000) show a non-monotonic and varying pattern of mean materialism scores derived from seven items of the Richins and Dawson (1992) “success” subscale across five age groups in Singapore. Similarly, Ryan and Dziurawiec (2001) report no correlation between materialism and age in an Australian sample, as does Watson (2003) in a U.S. sample. Rindfleisch, Burroughs, and Wong (2009) report a weak negative correlation ( $r = -.16$ ) among U.S. adults between age and materialism measured by the total Richins (2004) MVS. Lerman and Maxwell (2006) show negative relationships with age for both consumers in the U.S. and emigrant Russians. Ponchio and Aranha (2008) report a correlation ( $-.09$ ) among low income Brazilians. Finally, Flynn, Goldsmith, and Korzenny (2011) also describe a weak, negative, but significant relationship (partial  $\eta^2 = .042$ ) between age and materialism among U.S. adults in a large, national sample. The various conceptualizations and measures of materialism also contribute to a lack of consensus in the findings. We must conclude that age only marginally influences materialism, at best, while other factors, such as relative economic standing, societal influences, and individual psychology, have more influence. However, based on the U.S. findings, we propose that materialism and age are negatively related.

*H1: Materialism is negatively related to age.*

## **Materialism and Gender**

Although researchers have tested the relationship between gender and materialism multiple times, there is no consensus as to whether men or women have stronger materialistic tendencies. Measuring what he sees as the outcomes of materialism, Belk (1984) finds men more envious, but finds no gender differences in a study 12 years later (Ger & Belk, 1996). In contrast, Ryan and Dziurawiec’s (2001) study of Australians shows men are more materialistic than women are, and Keng et al. (2000) and Kaminen (2005) also report the same finding. Men score higher on the Richins and Dawson (1992) scale in at least one other study (Pepper, Jackson & Uzzell, 2009). Some studies find no correlation between gender and materialism (Jusoh, Heaney, & Goldsmith, 2001; Ponchio & Aranha, 2008; Richins & Dawson, 1992; Watson, 2003). Finally, Lerman and Maxwell (2006) find that, in the U.S., women score higher than men do, but among Russian emigrants, there is no difference. Goldsmith et al. (2012b) also report that women score higher than men do. Kamano (1999) reports that across a number of countries, women are more materialistic than men are, but in other countries, the opposite relationship obtains. It seems reasonable given that gender roles vary across cultures, so too might the levels of materialism by gender, with one exception. The Kasser Aspiration Index measures an aspect of materialism that assesses the importance of being attractive. Previous studies (Goldsmith et al., 2011) show that women are more likely to value their own attractiveness than men are. Keep in mind that previous studies do not use consistent definitions or measures of materialism, and that variability further muddies the picture. Given what previous research has shown we hypothesize no specific gender differences in materialism with the exception that women score higher on attractiveness than men in both the U.S. and Korean samples. Our speculation is that if there are consistent

gender differences other than this, they are so small as to be unimportant to the understanding of materialism. That men and women may be *different* in their expression of materialism strikes us as a more important and interesting avenue of research.

*H2a:* There are gender differences in materialism, but these are unspecified because there is no consistent empirical pattern to justify specific differences.

*H2b:* Women score higher than men do on the Attractiveness subscale of the Aspiration Index.

## **Materialism and Ethnicity**

Researchers often report Ethnic differences in materialism (Charles et al., 2009). Research, however, is not so clear on specific variations in materialism by ethnicity or national origin. According to Crispell (1993), African Americans are the most materialistic in their consumption behavior and Asians the least. Korzenny et al. (2006) find non-Hispanic whites in the U.S. to be the least materialistic, followed in order by Hispanics, Asians, and African Americans. In other countries, the findings follow no particular pattern. In eleven countries outside the U.S., Ger and Belk (1996) report a narrow range of scores using their materialism scale and conceptualization. Notably, Swedes score the lowest, though not statistically different from Germany, Turkey, India, France and others. In a study of U.S. and Thai consumers, Webster and Beatty (1997) report Thai consumers score significantly higher on the Richins and Dawson (1992) success subscale of the MVS. Kamano (1999) shows people in the U.S. are the least materialistic, and French and Italian consumers the most when comparing six western European countries. Kamineneni (2005) compares Australians to non-Australians and finds no significant differences. Finally, a Reuters/Ipsos poll (*Chosun Media*, 2010) covering 23 countries reports that Koreans and Chinese consider money the most important sign of success. Therefore, the measures and definitions of materialism are scattered again, making it harder to make good generalizations, but in light of the evidence, we propose:

*H3:* Materialism scores vary between South Korean and U.S. consumers, but there is not enough evidence to support a supposition on which group scores higher.

## **Brand Engagement in Self-Concept**

Although the notion that consumers use brands as a means of self-identity is well accepted, researchers have lacked a valid and reliable means of operationalizing this concept. Sprrott et al. (2009) fill this gap by rigorously defining the concept and developing a measure. They define brand engagement in self-concept (BESC) as “an individual difference measure representing consumers’ propensities to include important brands as a part of how they view themselves” (Sprrott et al., 2009, p. 92). The concept and its measure come from a stream of research showing how people use brands to represent and as extensions of their self-images (c.f. Fournier, 1998). Essentially, consumers use brands not only to express their self-concepts but also to form them. Through advertising and brand experience, consumers form a bond with what then becomes “their brand” (Sprrott et al., 2009). “I am a Harley man,” or “Jif is my peanut butter,” are examples of this phenomenon in action.

Brand engagement in self-concept relates to the general idea of customer engagement, a basis of relationship marketing. It reflects one way that engagement works to create loyalty

behaviors (Hollebeek, 2011). Sprott et al.'s (2009) work represents advancement in that, for the first time, it conceptualizes engagement with brands as a tendency or individual difference among consumers and measures it. The extent to which consumers use brands as badges and embodiments of their self-images is important to companies selling branded merchandise. Sprott et al. designed the brand engagement in self-concept scale in the global domain, meaning that it measures the concept at the broadest level rather than at a specific product category or brand level. Persons with a tendency toward BESC carry this across product categories. Brand engagement with self-concept relates closely to materialism (Sprott et al., 2009). Because the measure of brand engagement in self-concept is relatively new, there is little evidence on how men and women might differ. The original paper (Sprott et al., 2009) reports no gender differences in BESC, but Flynn et al. (2011) show a small difference in favor of men. Thus, in light of the weak evidence for a gender difference:

*H4: BESC scores will not differ by gender in either culture.*

Because BESC is such a new scale, the results are not available on how it might vary across cultures. We can surmise, however, that because Korean consumers are exposed to increasing levels of marketing influence as their economy grows, their new purchasing power and access to branded goods might stimulate increasing use of brands as means of self-identification. Note that Flynn et al. (2011) report that U. S. consumers of Asian descent score the highest on the BESC scale. Thus,

*H5: BESC scores are higher among Korean consumers than among U.S. consumers.*

Finally, because Sprott et al. (2009) and Goldsmith et al. (2012b) present strong evidence for a positive correlation between BESC and materialism, the sixth hypothesis is that these variables are correlated in the present study for both the U.S. and Korean samples. Although the correlations between BESC and materialism reported by Sprott et al. (2009) and by Goldsmith et al. (2012b) are approximately .5, we hypothesize no difference in the size of the correlations in the present study.

*H6: Materialism scores and BESC scores correlate positively in both countries.*

## **Method**

### **Survey Procedures and Samples**

We collected the data via online surveys of both U.S. and South Korean consumers. In both countries, we asked students attending large, public universities to complete surveys for class credit. The data collection yielded two samples of consumers: 260 U.S. and 227 Korean. Two quality check items in the questionnaire (Oppenheimer, Meyvis, & Davidenko, 2009) showed that 1 Korean participant and 1 U.S. participant did not pay attention when responding to the items, and so these two individuals were removed from the study, yielding 259 U.S. and 226 Korean participants ( $n = 485$ ). There were 111 men (43%) and 148 women (57%) in the U.S. sample, and 121 men (54%) and 105 (46%) women in the Korean sample. The ages of the participants ranged from 19 to 53 years for the U.S. participants, and 19 to 55 years for the Koreans, with respective means of 22.1 years ( $SD = 3.5$ ) and 23.8 years ( $SD = 5.3$ ). Independent samples *t*-tests showed no significant difference in mean age between men and women for the U.S. sample; but the Korean men's mean age (24.8,  $SD = 5.2$ ) averaged slightly higher than the Korean women (22.7,  $SD = 5.2$ ) ( $t_{(223)} = 2.9$ ,  $p = .004$ ,  $d = .39$ ). We can

account for this age disparity by the fact that most South Korean men join the military service for two years before going to college.

## Measures

We operationalized the variables using multi-item self-report scales developed by a variety of authors. We chose the Richins and Dawson (1992) Material Values Scale because it has had prior wide use, Kasser's Aspiration Index, because it is newer and provides unique insights into the concept of materialism not provided by existing scales, and the BESC, because it is new and gives a new view of the role of brands in consumer behavior.

Richins and Dawson's Material Values Scale is the most widely used measure of materialistic tendencies in the literature (Goldsmith et al., 2011). Richins (2004) revised the original 18-item scale (2004) and it is available as a psychometrically sound, nine-item version with three factors. The dimension measuring *success* captures the attitude that possessions, rather than social relationships are indicators of success and achievement in life. Acquisition *centrality* measures how strongly a person places gathering possessions at the center of his or her life. The pursuit of *happiness* dimension reflects the feeling that possessions are essential to personal satisfaction and well-being.

Kasser's Aspiration Index (AI) is a 14-item scale measuring the extrinsic goals to which people aspire. These goals are in opposition to intrinsic goals, such as self-acceptance and feelings of community (Kasser & Ahuvia, 2002). Kasser's scale measures materialism somewhat indirectly by asking about aspects of extrinsic success that the subject would like to achieve in the future. The scale consists of three related subscales measuring the importance of *financial* success (four items), *social standing* (five items), and *attractive* physical appearance (five items). Brand engagement in self-concept is an eight-item scale developed by Sprott et al. (2009). It is unidimensional and is not only psychometrically sound, but also generalizable across different ethnic groups and in other languages (Flynn et al., 2011).

Table 2  
*Scale Items*

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### BESC – Brand Engagement in Self-Concept

I often feel a personal connection between my brands and me.  
I consider my favorite brands to be a part of myself.  
My favorite brands are an important indication of who I am.  
I have a special bond with the brands that I like.  
I feel as if I have a close personal connection with the brands I most prefer.  
I can identify with important brands in my life.  
There are links between the brands that I prefer and how I view myself.  
Part of me is defined by important brands in my life.

## AI

*How important is it to you that in the future:*

### Financial

You will have a job that pays well.  
You will be financially successful.  
You will have lots of expensive possessions.  
You will have a job with high social status.

### Social

You will be admired by many people.  
You will be famous.  
Your name will appear frequently in the media.  
Your name will be known to many people.  
You will do something that brings you much recognition.

### Attractive

You will successfully hide the signs of aging.  
You will have people comment about how attractive you look.  
You will keep up with fashions in hair and clothing.  
You will achieve the “look” you’ve been after.  
Your image will be the one others find appealing.

## MVS

### Success

I admire people who own expensive homes, cars, and clothes.  
The things I own say a lot about how well I’m doing in life.  
I like to own things that impress people.

### Centrality

I try to keep my life simple, as far as possessions are concerned.  
Buying things gives me a lot of pleasure.  
I like a lot of luxury in my life.

### Happiness

My life would be better if I owned certain things I don’t have.  
I’d be happier if I could afford to buy more things.  
It sometimes bothers me quite a bit that I can’t afford to buy all the things I’d like.

## Translating the Questionnaire

We translated the questionnaire in two ways. First, the researchers ran the English version through the translation feature provided by Qualtrics. A bilingual colleague also translated the survey manually. Finally, we reconciled the two versions and had the survey back translated by a second colleague.

## Analysis and Results

### Preliminary Analyses

We used exploratory factor analyses to assess the dimensionality of the multi-item scales. We used the nine-item version of the Richins (2004) Material Values scale with three items operationalizing each of the three subscales for both samples. Factor analysis confirmed the three dimensional structure for the U.S. sample, but the Korean sample yielded a two-factor solution, with the success and centrality items forming the first factor, and the happiness items the second factor. We chose to score the Korean data following the prescribed pattern (Richins, 2004), so the results would be comparable to the U.S. sample and other studies. Internal consistency results (coefficient alpha) were acceptable ( $> .7$  with one exception, R and D's Centrality in Korea) and appear in Table 3. Factor analysis for the U.S. sample confirmed the correct three-factor structure for Kasser's Aspiration Index, but this was not the case for the Korean sample. A three-factor solution confirmed the attractiveness factor, but the social and financial factors contained a mixture of items, suggesting that aspirations might differ across the two cultures. With this caveat in mind (and discussed further at the conclusion of the study), we computed the three subscale scores for the AI, as prescribed by Kasser, so that we could meaningfully compare the consumers from the two countries. Internal consistency assessed by Cronbach's alpha was acceptable,  $> .7$  (see Table 3).

Table 3  
*Descriptive Statistics*

Variable	Range	Mean	SD	Skew	Kurtosis	Alpha All	Alpha U.S.	Alpha Korea
Age	19 – 55	22.9	4.5	3.9	18.3			
RandD Success	3 – 15	9.2	2.5	-.252	-.343	.74	.75	.74
RandD Centrality	3 – 15	9.9	2.2	-.162	-.008	.62	.73	.47
RandD Happy	3 – 15	10.4	2.5	-.561	.162	.74	.74	.72
RandD Total	11 – 45	29.5	5.8	-.283	.014			
Kasser Financial	4 – 28	20.8	3.7	-.897	1.765	.77	.78	.76
Kasser Social	5 – 35	20.6	5.6	-.217	-.030	.83	.83	.83
Kasser Attractive	5 – 35	23.7	5.4	-.786	.839	.81	.86	.72
Kasser Total	14 – 96	65.1	11.5	-.637	1.087			
BESC	8 – 39	21.3	6.8	.035	-.619	.93	.94	.91

*Note.* Total sample (n = 485)

For the BESC, the results confirmed unidimensionality. Thus, the evidence suggests that the materialism scales developed in the U.S. seem to have different factor structures in South Korea, but that the BESC scale is unidimensional in both countries. Internal consistency was also high for the scale ( $\alpha = .91$ ).

## Hypotheses Tests

Table 1 summarizes the results of the hypotheses tests. To test the relationship between materialism and age, we correlated scores on the six subscales of the two measures and their total scores with self-reported age (see Table 4). We did the same for the sixth hypothesis. We used MANCOVA to test the remaining hypotheses.

Table 4  
*Correlations for Age and BESC with Materialism*

Variables	AI	AIF	AIS	AIA	MV	MVS	MVC	MVH	BESC
<b>Age</b>									
All participants	-.05	-.11*	.03	-.06	-.15**	-.08	-.14**	-.13**	-.00
U.S. only (n = 259)	-.10	-.10	-.02	-.11	-.11	-.13*	-.09	-.03	-.06
Korean only (n = 225)	-.08	-.07	-.00	-.13	-.25**	-.10	-.26**	-.29**	.13
<b>BESC</b>									
All participants	.29**	.24**	.18**	.27**	.31**	.26**	.27**	.21**	
U.S. only (n = 259)	.40**	.28**	.33**	.35**	.41**	.32**	.36**	.29**	
Korean only (n = 225)	.24**	.12	.12	.32**	.29**	.28**	.24**	.20**	

*Note.* One participant was not included because he did not report his age. Correlations in bold are significantly different from each other at  $p < .05$ .

\* $p < .05$  \*\* $p < .01$

AI = Aspiration Index

AIF = Aspiration Index – Financial

AIS = Aspiration Index – Social

AIA = Aspiration Index – Attractiveness

BESC = Brand Engagement in Self-Concept

MV = Material Values

MVS = Material Values - Success

MVC = Material Values - Centrality

MVH = Material Values - Happiness

The first hypothesis, materialism correlates negatively with age, receives only modest support. All the correlations were negative, but only three of the six subscales were statistically significant. This finding is similar to the weak, negative relationship between materialism and age found in other studies of U.S. college students (e.g., Goldsmith et al., 2012b). It may be that the failure of other researchers to detect a significant relationship between materialism and age is because they only used total scale scores, or part of a total scale. Moreover, the absence of a consistent measure across studies hinders our ability to draw sound conclusions. Materialism and age show weak evidence of negative correlation in this sample, lending modest support to the

hypothesis, but this finding is limited to the MVS. The finding does not hold for the AI. As a global result, then, this finding confirms earlier studies (Rindfleisch et al., 2009; Flynn et al., 2011). However, a closer look at the subscales shows that this relationship might not obtain when using the AI, and that the relationship varies by subscale, suggesting the wisdom of using materialism subscales to reveal more fine-grained results than those provided by total scales. Although the two materialism scales are positively related to each other (Goldsmith et al., 2012a), they measure related but not identical dimensions of materialism. Overall, the findings for materialism and age are slightly more descriptive than what previous research reports and we feel we cannot draw a truly reliable conclusion. The age range of our participants further limits the findings.

To test the hypothesized mean differences between the genders and the two countries, we first conducted a 2 X 2 MANCOVA, with all seven latent variables shown in Table 3 as dependent variables with age as the covariate, control variable owing to its correlations with some aspects of materialism. The multivariate results showed a significant multivariate effect for age, as expected ( $F_{(7,473)} = 3.6, p = .001$ , partial  $\eta^2 = .051$ , Observed Power = .975). The interaction effect ( $F_{(7,473)} = 4.1, p < .0005$ , partial  $\eta^2 = .061$ , Observed Power = .992) was also significant, as were the main effects for both gender ( $F_{(7,473)} = 9.31, p < .0005$ , partial  $\eta^2 = .121$ , Observed Power = 1.0) and country ( $F_{(7,473)} = 37.1, p < .0005$ , partial  $\eta^2 = .354$ , Observed Power = 1.0). Although Box's test of the equality of covariance matrices was significant ( $F = 1.72, p < .0005$ ), inspection of the residual plots did not reveal any violation of the assumption of the ANOVA analyses. There was only one outlier in the data set, the removal of which, followed by reanalysis, did not change the results. The follow-up univariate ANOVAs (see Tables 5 and 6) allow us to inspect the specific ways in which the countries and genders differed on these variables.

Table 5  
*Means for Country and Gender*

	U.S.		Korean		All		All	
	Men	Women	Men	Women	U.S.	Korean	Men	Women
MVS	8.88	9.03	9.59	9.48	8.97 <sup>b</sup>	9.54 <sup>a</sup>	9.25	9.22
MVC	9.03 <sup>b</sup>	10.01 <sup>a</sup>	9.96	10.41	9.59 <sup>b</sup>	10.17 <sup>a</sup>	9.51 <sup>b</sup>	10.17 <sup>a</sup>
MVH	9.76	10.17	10.67	11.10	9.99 <sup>b</sup>	10.87 <sup>a</sup>	10.23	10.55
AIF	20.96	21.74	20.12	20.01	21.41 <sup>a</sup>	20.07 <sup>b</sup>	20.52	21.02
AIS	19.54	19.21	22.11	21.93	19.35 <sup>b</sup>	22.03 <sup>a</sup>	20.88	20.34
AIA	19.82	24.67	24.55	25.59	22.59 <sup>b</sup>	25.03 <sup>a</sup>	22.28 <sup>b</sup>	25.05 <sup>a</sup>
BESC	23.14	22.41	19.46	19.77	22.73 <sup>a</sup>	19.61 <sup>b</sup>	21.22	21.32

Note. Where a > b,  $p < .05$

AIF = Aspiration Index – Financial

AIS = Aspiration Index – Social

AIA = Aspiration Index – Attractiveness

BESC = Brand Engagement in Self-Concept

MVS = Material Values – Success

MVC = Material Values – Centrality

MVH = Material Values – Happiness

Table 6  
ANOVA Results

Effect	Variable	F	p	partial $\eta^2$	Observed Power
Interaction Effect	AIF	1.75	.187	.004	.261
	AIS	.025	.874	.000	.053
	<b>AIA</b>	<b>17.15</b>	<b>&lt; .0005</b>	<b>.034</b>	<b>.985</b>
	MVS	.318	.573	.001	.087
	MVC	1.76	.185	.004	.263
	MVH	.001	.976	.000	.050
	BESC	.723	.395	.002	.136
Main Effect for Gender	AIF	1.0	.317	.002	.170
	AIS	.259	.611	.001	.080
	<b>AIA</b>	<b>41.2</b>	<b>&lt; .0005</b>	<b>.079</b>	<b>1.00</b>
	MVS	.008	.931	.000	.051
	<b>MVC</b>	<b>12.9</b>	<b>&lt; .005</b>	<b>.026</b>	<b>.948</b>
	MVH	3.5	.064	.007	.458
	BESC	.12	.729	.000	.064
Main Effect for Country	<b>AIF</b>	<b>15.0</b>	<b>&lt; .0005</b>	<b>.030</b>	<b>.972</b>
	<b>AIS</b>	<b>28.4</b>	<b>&lt; .0005</b>	<b>.056</b>	<b>1.00</b>
	<b>AIA</b>	<b>37.8</b>	<b>&lt; .0005</b>	<b>.073</b>	<b>1.00</b>
	<b>MVS</b>	<b>6.1</b>	<b>.014</b>	<b>.013</b>	<b>.695</b>
	<b>MVC</b>	<b>11.2</b>	<b>.001</b>	<b>.023</b>	<b>.916</b>
	<b>MVH</b>	<b>16.6</b>	<b>&lt; .0005</b>	<b>.033</b>	<b>.983</b>
	<b>BESC</b>	<b>26.7</b>	<b>&lt; .0005</b>	<b>.053</b>	<b>.999</b>

Note.  $df = 1, 481$  for all tests; BOLD =  $p < .05$

The interaction effect was significant only for one dependent variable, the Attractiveness subscale of the Aspiration Index, which likely accounted for the significant multivariate interaction. Because Levene's test of equal variances was significant ( $F_{(3,480)} = 5.7, p = .001$ ) and there appeared to be one extreme outlying low value, leading to negative skewness ( $-.786$ , std err =  $.111$ ), this variable was first transformed by recoding so that the lowest score became 1.0 and then taking its square root. An ANCOVA on this transformed variable showed that Levene's test was no longer significant, and skewness was no longer significant ( $-.004$ , std err =  $.111$ ). The results of this ANCOVA were almost identical to the original data analysis wherein women in both samples scored higher ( $M = 25.0$ ) on the value of attractiveness than men ( $M = 22.3$ ). This finding is consistent with prior studies and H2b; however, the U.S. men scored significantly lower ( $M = 19.8$ ) than their Korean male counterparts ( $M = 24.6$ ), leading to the significant interaction effect.

For the main effect of gender, there were significant differences in two of the dependent variables, Attractiveness and Centrality. We have already seen the interactions between gender

and country for Attractiveness. The main effect gender difference for the centrality dimension of the Material Values Scale revealed that women scored higher ( $M = 10.2$ ) than men ( $M = 9.8$ ), weakly supporting hypothesis 2a.

The strong main effect for country was striking, supporting H3. There were significant differences between the U.S. and Korean samples for every dependent variable. The U.S. samples scored significantly higher on the finance dimension of the AI scale than did the Koreans, but the Koreans scored significantly higher than the U. S. sample did on all remaining scales.

Hypothesis 4 proposed no gender difference in brand engagement between men and women, and the results supported this supposition for both countries. The proposed difference between Korea and the U.S., hypothesis 5, however, was opposite of the hypothesis. The U.S. mean BESC score (22.7) was significantly higher than the Korean score (19.61).

To test H6, a positive correlation between BESC and materialism, we correlated the scores for both the entire sample and the two countries separately. These results appear in Table 4. These show the two variables correlated in both countries, but slightly more so in the US, even though the size of the correlation (.29) was lower than that reported by Sprcott et al. (2009) and by Goldsmith et al. (2012b).

## Discussion

The purpose of this study is to examine differences in materialism and brand engagement between groups of consumers from two different cultures, the U.S. and South Korea. Although it is important to understand cultural differences in materialism for both theoretical and practical reasons, there is little research on this subject. In addition, most studies measure materialism by using total summed scales, instead of the separate scale factors, and use only the MVS. Few use the Kasser Aspiration Index, which offers newer and different perspectives on materialism. Moreover, no studies address cross-cultural differences in brand engagement on self-concept. We sought to fill these gaps with our study.

The results appear to justify our aims fully. From the methodological perspective, it is interesting to first note that the scales performed well in the translated form. While there is a deficiency in the internal consistency of the MVS centrality subscale, and some differences in factor structure in Korea, the scales seem to translate well and the subjects in South Korea understood the items. However, the failure of the factor analysis to differentiate the success and centrality subscales in the MVS, and between the financial and social subscales in the AI among Korean consumers, suggests the need for further research into materialistic tendencies among non-Western populations. The importance of this result is evidence that materialism is culturally dependent and so materialism measures are culturally dependent too. Examining only mean differences in total scores masks cultural differences. It matters little which group scores higher on the scale when taken as a whole (the differences are very small and erratic). Instead, how cultures view materialistic tendencies and their resulting consequences are the crucial issues scholars need to address. These intricacies are only potentially viewable by examining subscales and learning how they relate to important correlates. In fact, this is probably the case across all the previous cross-cultural studies of materialism, and likely accounts for the lack of consistent results.

Also interesting are the small gender differences in materialism within the two countries. In Korea, men and women show no mean differences on any of the measures. U.S. subjects show

sex differences only for the centrality subscale of the MVS. The difference on the MVS centrality subscale is perplexing. The difference is not large, but women evidence more of a sense that possessions are central to their happiness than do men in the U.S. Again, this difference seems to be limited to one facet of the total scale, supporting our argument that total scale scores are less useful in uncovering relationships than subscale scores. Moreover, differences do not emerge for the Aspiration Index, supporting our contention that multiple operationalizations of materialism are valuable because they reflect the complexities of this construct. Researchers should not treat materialism as a unitary concept because this view ignores the important distinctions it contains.

From the theoretical perspective, the mean differences become very interesting when we compare the two countries. Subjects differ on all seven of our measures. For the AI, South Korean subjects score higher than the U.S. subjects on the attractiveness and the social subscales, but that direction reverses for the financial subscale, where the U.S. subjects have higher mean scores. The fact that the U.S. consumers are more materialistic when it comes to financial success is not very surprising, as U.S. consumers have that reputation worldwide (Ger & Belk, 1999). This sample of primarily young Koreans scored significantly higher than the U.S. sample on aspirations to social success (popularity and fame) and attractiveness. Perhaps in Korea, where there is less disparity in income (*The Economist*, 2011), there is less yearning for more money. This conclusion would fall in line with other research that found that conspicuous consumption increases with income disparity (Charles et al., 2009). Alternatively, perhaps it is a cultural issue, and Koreans considered it gauche to strive for more money.

Turning to the MVS subscales, the South Korean subjects score significantly higher than the U.S. consumers on all three. Centrality of possessions, success, and happiness derived from possessions, are all more important in our South Korean sample. This finding agrees with researchers who have found more materialism in Asian countries (Webster & Beatty, 1997). Since the financial crisis in Korea in 1998, some portion of young South Koreans have become increasingly concerned with their economic futures, thus, motivating them to give increasing importance to materialistic values (compare with the Reuters-Ipsos findings above).

In addition to examining gender and country differences on the subscales of the materialism scales, we looked at how materialism and BESC correlate across the cultures. In our samples, BESC scores were not different between men and women within countries. This finding is consistent with the original paper (Sprott et al., 2009), which found no gender differences for the BESC scale. However, there are large differences between the two countries. Korean consumers score substantially lower on BESC, meaning the Korean sample is less likely to use brands to express their self-image. This is an interesting and contradictory to our hypothesis. Because other studies show BESC to be higher in Asian Americans (Flynn et al., 2011), we expected our Korean sample to score higher on it in this study.

In an atomistic society where individuals are relatively isolated from cohesive cultural reference groups, individuals must look elsewhere for sources of identity. Moreover, a society that values individualism over collectivism gives the individual the freedom and responsibility to shape their own self-identity using whatever resources are available and does not demand an identity derived from the larger group. This could explain our findings of higher BESC scores among US subjects. It is not surprising that an individualistic culture such as the U.S. would score higher in the measure of brand engagement than would a collectivist culture such as Korea. We argue that Flynn et al.'s (2011) finding that Asian Americans score highly reflects their transition from the collectivist culture of their homeland to the individualistic U.S. environment

in which they must construct new self-identities, and that brands may be especially important in doing so.

We can reason that in societies or cultures where individuals gain much of their self-identity from belonging to a well-defined culture, they have little need to derive their identity from commercially manufactured brands. The level of collectivism in Korea is much higher than in the U.S. (Hofstede, 2001; Hofstede, Hofstede, & Minkov, 2010). This difference results in less expression of individuality in South Korea, where there is greater pressure to fit in than to express oneself. In collectivist countries, self-concept arises from group rather than from the individual. BESC measures the tendency to use brands to build and express the individual self, and if group conformity is valued and individual self-expression is not, consumers will use brands less often to express the self. An interview with a South Korean professor revealed that Koreans wear specific brands of clothing to express Korean identity not self-identity. That motivation would serve to make BESC lower in Korea despite higher levels of materialism. In addition, per-household disposable income in Korea is about \$8000 compared to the U.S. figure of about \$35,000 (Atsmon & Magni, 2012), so that self-expressive brands might be out of reach for many Korean consumers.

Another possible explanation comes from the fact that the consumer market in South Korea is different from that in the U.S. In South Korea, there are simply fewer brands available. There are few mid-range brands, and while status brands are available, they are significantly more expensive than they are in the U.S. Status brands available in South Korea are usually two to three times the cost of the same items in the U.S. These situations might make bonding with luxury brands less likely in South Korea.

Because we found BESC to be less important in the subjects from South Korea, and because Spratt et al. (2009) show a strong correlation between materialism and BESC in samples in the U.S., we thought it would be interesting to look at how the two constructs correlate with each other in the two samples. Table 6 shows that the relationships between BESC and the materialism subscales are much weaker for the Korean subjects. It is interesting that a characteristic like brand engagement with self-concept functions differently in a different society. It seems that consumers in South Korea score higher on most dimensions of materialism when compared to U.S. consumers, but that level of materialistic tendencies do not translate to more brand-engagement. This supposition is more evidence of the culturally dependent nature of materialism.

Marketing practitioners might profit from these findings when they seek to sell in South Korea. The relatively higher level of materialism manifest there suggests a market eager for goods that fulfill the desire for social success and attractiveness, especially for men. Asian markets are attractive places to sell status symbols (Atsmon & Magni, 2012; Webster & Beatty, 1997). Our findings confirm this claim. However, positioning of status brands (not to mention other brands) may need to emphasize how they express Korean self-identity more than individual self-identity to be successful. The fundamental collectivist values of that country have a powerful impact on consumption that marketers can emphasize, rather than the “express your individuality” message that appeals to Western consumers.

Despite the limitations of the study’s non-probability sample, we feel that it makes an important contribution by adding new information to the growing body of knowledge on cross-cultural materialism, and we make several recommendations for future studies. Our first overall conclusion, after examining the literature and the findings of the current study, is that differences

in materialism related to age and gender are both weak and specific to the country studied, as well as the measuring instrument. Perhaps researchers could make it a rule to report these and other demographic results in their studies, even when demographic differences are not the focus, so that researchers can aggregate more data points. Even if there are demographic differences in materialism, they appear to be limited. Culture seems to have a much stronger effect on materialism than demographics.

The second conclusion we reached is that student subjects are appropriate for the study of materialism. The lack of a sizable relationship between materialism and age, coupled with the similarity across genders, suggests that the limited demographic range of students is not an obstacle to sourcing them for data if one is not trying to make point and interval estimates for applied purposes. This recommendation is consistent with Highhouse and Gilespe's (2009) conclusion regarding the appropriateness of student subjects for social science research.

Third, the study shows that Kasser's AI scale gives new, different insights into the important topic of materialism, and therefore deserves widespread use. Examining specific dimensions of materialism reveals the insights obscured when only total scale scores are used. It makes little sense to say that one country or gender is more or less materialistic than another without considering differences in the dimensions.

Fourth, we emphasize the use of the subscales comprising the various materialism scales because they provide more fine-grained insights into materialism and its role in social behavior. Because each component of materialism might behave differently in a given instance, such insights will be lost if the aggregated scale is used. Researchers should use the scale or its subscales that most closely align with the theoretical or practical goals of their study.

Fifth, the failure to reveal the prescribed factor structure for both scales in Korea suggests that further research should examine materialism within specific cultural contexts to determine if, while the basic concept is applicable, it needs to be adapted to the culture under study. This suggestion goes beyond merely rewording items to adapt them to the language of the participants, and suggests examining the meaning of materialism in that culture. Failure of the variable represented by the data to correspond to the conceptual structure of the concept might lead to incorrect or imprecise findings.

Finally, brand engagement is an important concept deserving further study, especially cross-culturally. Ours is a first step in this direction. As countries become more industrialized, materialism will also grow in influence, as might brand engagement, so further cross-cultural study is vital to understanding the new populations of consumers that live in them. As a final note, however, the BESC scale as it currently stands measures the concept at a broad or marketplace level of abstraction. What researchers and practitioners and researchers need is a "brand specific" measure to assess consumers' levels of using a specific brand to express self-concept, thus facilitating research on this topic. How such a scale would behave cross-culturally is another fruitful topic for future research.

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### Discussion Questions

1. What is the value of measuring materialism using two different scales? What additional information does this strategy provide?
2. How can the question of nature versus nurture be explored by looking at differences in personality and psychological variables across different cultures?
3. Brand engagement in self-concept is a new construct. Explain what it means and what its value might be to marketing practitioners.
4. This article shows that brand engagement in self-concept and materialism are related to each other. Do you think this would be the case for every materialist person? How about for each brand engaged person? Why or why not?
5. Do you think the differences we found between Korean and U.S. consumers would hold up if we surveyed French consumers? How about Brazilian or Saudi consumers?

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***Hoodoos and 2 Trees*** (Northern section of Bryce Canyon National Park, Utah)

Photograph by Susan S. Buzzi

“Hoodoos” are totem-pole shaped spires of eroded sedimentary rock that have been formed by years of extreme weathering. These amusing sculptures are found in the Badlands region of the Great Plains and can actually exceed the height of a 10-story building.

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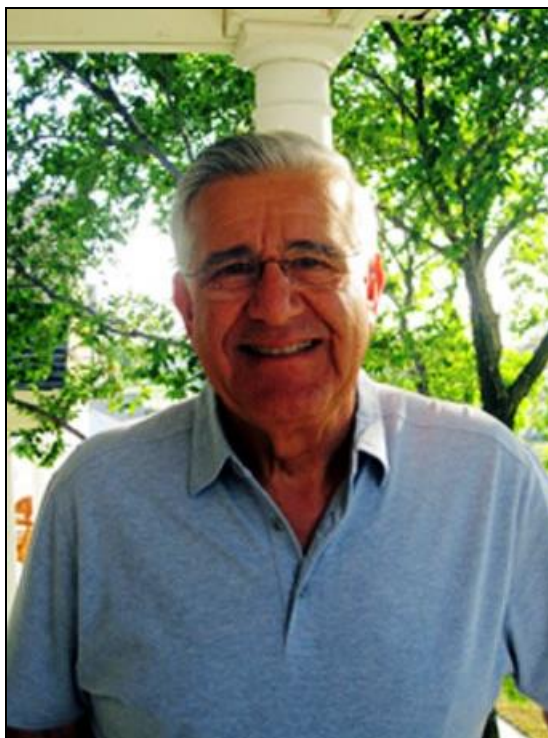
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## **Life Forward**

### **Bob Morro**

*International Rowing and Dragon Boat Racing  
Executive and Official*



Bob Morro has been an active participant in water sports as a competitor, an official, and an organizer for almost six decades.

In the world of rowing, he was on three teams to win consecutive National Titles in 1956, 1957, and 1958. In 1978, the entire 1957 Crew Team was inducted into the LaSalle College Athletes Hall of Fame; in 2004, he was inducted individually; and at both the 25<sup>th</sup> and 50<sup>th</sup> anniversaries of their wins, he and the team were honored at the Dad Vail Regatta. Until just recently, he served as the Secretary of the Dad Vail Regatta, the largest collegiate rowing

competition in the United States. In 2013, the event had entries from more than 125 colleges from the United States and Canada.

He has won several major awards for his contributions to rowing including the “John A. Seitz Award” (1997) for outstanding service to the Dad Vail Regatta (in 1997); the “Dr. George Morton Illman Award” from the Malta Boat Club, an organization founded in 1860, “for long time service and volunteer work to the rowing community” (with his wife Peggy, in 2007); and the “President’s Award” to the Morro Family for their contributions and support of the Regatta for many, many years (in 2013).

\*

In the world of dragon boat racing, he served as Chief Organizer of the United States Dragon Boat Association, the Secretary of the United States Dragon Boat Federation, a Vice President of the International Dragon Boat Federation (IDBF), a member of the IDBF Technical and Competition Committee, and the North American Continental Representative to the IDBF. He has served as a race official at every U.S. National Championship since 2000 (including the first one, which he helped organize and run) in such places as Philadelphia, Fort Dodge, Tampa, Long Beach, Chattanooga, and Mercer County (Princeton). He also has served as a race official at almost every Club Crew World Championship and at every World Championship from 1995 to the present – in locations as diverse as China, Hong Kong, England, the U.S.A., Poland, Germany, Australia, Czech Republic, and Hungary.

\*

His long experience, vast technical knowledge, and calm demeanor have been vital contributions to the lasting prominence of rowing and the extraordinary growth and increasing worldwide impact of dragon boat sport.

**Interview by**  
**Raúl Fernández-Calienes**  
*Managing Editor, Journal of Multidisciplinary Research*

### **Q1. How and why did you become involved in the two sports of Rowing and Dragon Boat Racing?**

#### **Rowing**

I competed in high school and collegiate rowing, winning a national title three years in a row. Also, I have acted as an official in rowing events, serving in the following areas: Starter, Timer, Chief Judge, Umpire, Dock Master, Jury, etc. At the high school level, this has included the Stotesbury Regatta, the Scholastic National Rowing Championship, and the Robert White Regatta (high school first-year students). At the collegiate level, this has included the Dad Vail Regatta (the largest collegiate rowing competition in the U.S.), the Murphy Cup, the U.S. Navy Day Regatta, the Frostbite Regatta, the Independence Day Regatta, the Head of the Schuylkill Regatta, and the annual Bayada Regatta (Adaptive Rowing).

I have assisted in organizing collegiate rowing events for many years. I have been the Secretary of the Dad Vail Regatta. This year’s Dad Vail had entries from over 125 colleges from the United States and Canada. We had 3,500 competitors rowing in 519 boats. With the help of more than 100 volunteers, we were able to run 6-boat heats every 7 minutes for 12 hours a day

during the 2-day event. I was responsible for drafting and mailing all *Information Bulletins* to the coaches, receiving entries and payments, organizing the heats, accepting scratches, overseeing the progression of the races from heats to *repachages* to semi-finals to finals, handling protests, overseeing officials, providing results to competitors, media, etc. I also produced the regatta program and racing schedules. As Regatta Secretary, I was a member of the Executive Board of the Regatta and was involved in securing sponsorship and meeting with city officials and police.

## **Dragon Boat Racing**

In relation to dragon boat racing, the dragon boat first arrived in Philadelphia in 1982 through the help of the Hong Kong Tourist Association. I was contacted and asked to assist in the running of the festivals held in Philadelphia during the mid-1980s. The purpose of the festivals was to choose a team to participate in the International Hong Kong Dragon Boat Festival. I accompanied the U.S. teams to Hong Kong from 1987 through 1997. In 1990, I became the chief organizer of the United States Dragon Boat Association and brought teams to the first and second World Dragon Boat Championships. Our U.S. team won a silver medal in Yue Yang (1995) and a gold medal in Hong Kong (1997).

As Secretary of the newly formed United States Dragon Boat Federation (USDBF), I was given the task of organizing and leading the U.S. team to Nottingham, England, for Dragon '99, the Third World Dragon Boat Championships.

In 1990, I was asked by the Hong Kong Tourist Association of New York and the Hong Kong Economic and Trade Office to assist them in organizing their first dragon boat festival. Vince Szymkowski and I provided officials from Philadelphia to assist us in this task, and we organized the entire on-water part of the event for three years. Our Philadelphia Men's Open team won this event every year through the 1990s, until they changed the rules.

In 1995, the first meeting of the proposed USDBF was held in Dubuque, Iowa, at the suggestion of Gary Carstens for the purpose of forming one national organization for the sport of dragon boat racing in the United States. In 1997, in Philadelphia, the first officers and Board of Directors were elected. This organization finally was incorporated in 1998 after several years of very stressful work. All of the factions finally came to an agreement to join forces and form a national organization. Today, Board members and officers come from all over the U.S., from the East Coast, West Coast, and Mid-West.

## **International Dragon Boat Racing**

I am a licensed IDBF (International Dragon Boat Federation) official and a member of the IDBF Technical and Competition Committee.

In 1995, I served as Chief Judge in Yue Yang, China, for the First World Championship in 1995. In 1996, I was a course Umpire in the Asian Championships held in Hong Kong. In 1997, I was the Chief Judge at the Second World Championships in Hong Kong. In 1999, I was the Chief Judge as well as the Assistant Chief Official at the Third World Dragon Boat Festival in Nottingham, England.

In 2001, I was one of three principals who organized and ran the 4th World Dragon Boat Championships in Philadelphia. The year before, 2000, I helped organize and run the First U.S.

National Championships in Philadelphia. In 2002, I was the Chief Timer at the Rome Club Crew Championships. In 2004, at the World Championships in Shanghai, I was the Chief Timer.

I have attended and been a race official at every World Championship from 1995 to the present. From 2003 to 2005, I was the North American Continental Representative to the IDBF. In 2005, in Berlin, I was elected a Vice President of the IDBF. I was re-elected in Prague in 2009. I am a member of the IDBF Technical Commission.

In my spare time, I conduct Referee classes for Dragon Boat Racing officials in the U.S., teaching along with the President and Vice President of the USDBF.

## **Q2. You have been deeply involved in both the U.S. National and the World Governing Bodies of the Sport of Dragon Boat Racing. What have been some of the challenges and some of the rewards?**

Some of the challenges in Dragon Boat Racing are that this sport came to the U.S. in three different areas: the West Coast, the East Coast, and the Mid-west. In the early 1980s, none of the three entities had knowledge of the others. In the East, the Hong Kong Tourist Association (HKTA) contacted Philadelphia's rowing community to see if there would be interest in starting dragon boat teams. The answer was affirmative, and the HKTA sent traditional Hong Kong teak dragon boats to Philadelphia, Chicago, Virginia, and New York to start dragon boat teams. The Mid-west and the West Coast were sent Taiwan style dragon boats, which were larger in size and had a flag catcher over the bow of the boat.

The invitation from the HKTA came to Philadelphia in 1982, and that organization invited us to participate in the International Dragon Boat races in Hong Kong. An organization was formed in Philadelphia and called itself the United States Dragon Boat Association. This Association held races in Philadelphia with the winner of the event receiving free airline tickets from United Airlines to participate in the Hong Kong International race. The winner also received hosting in a fine Hong Kong hotel. It was during these years, 1985 through 1993, that we met the people from Iowa and from the West Coast at the Hong Kong races, where we all became aware of one another. Meanwhile, an organization was forming in Hong Kong to develop an international federation for the sport. This happened in 1990, and the American Dragon Boat Association out of Iowa received the mantle as the representative of the U.S. at these events. It was one of the original members of the newly formed International Dragon Boat Federation (IDBF). As it turned out, Philadelphia (USDBA as we called ourselves) was really only a club and a small part of the U.S. organization. Iowa had many clubs at that time, and that is how it got to be the representative of the U.S. The newly formed IDBF decided to have its first World Championship in 1995 in Yue Yang, China. At this time, there were 10 to 20 countries signed on as members of the IDBF, and the U.S. was represented by this American Dragon Boat Association (ADBA) (Iowa).

We, as the USDBA (Philadelphia) joined together with this ADBA group and formed Team USA to participate in the first World Championship. It was during this championship that Bob Morro (USDBA) and Gary Carstens (ADBA) saw the need to form a truly national organization. Both parties agree to meet in Iowa at a strategic planning session. After several of these sessions in different locations, we were able to hammer out an agreement to form a national body. A group of volunteers took it upon themselves to draw up the bylaws of this new united organization. The formal meeting was held in Philadelphia where the By-Laws were accepted and

the first slate of officers was elected. Bob Morro was elected the first Secretary of the organization and held that position until 2013. Every two years, the IDBF has its general meeting at the World Championships. The newly formed United States Dragon Boat Federation (USDBF) was recognized as the official representative of America, and we were able to send three voting delegates to the Congress. In 2005, Bob Morro was nominated for the position of Vice President of the IDBF and was elected at that Congress. He held that position through the end of 2013.

Seeing the growth of the sport and being a part of those formative years, at both the national and international levels, has been the most important reward to me.

**Q3. Dragon Boat Racing may be described as multi-disciplinary, incorporating sport, culture, international relations, diplomacy, economics, human relations, and so on. How do you blend these different fields in your work as an International Official?**

One of the major tenets of the IDBF is the importance of the cultural part of the sport. Dragon Boating goes back some 2,000 years in China and tells the legend of Qu Yuan, a popular politician and poet of his time, who was so distraught about the politics of the day, that he threw himself into the river as a protest. The local fishermen set out after him, beating the water with their paddles and throwing rice cakes to divert the fish from consuming his body. The custom at the beginning of every major dragon boat festival is an Eye Dotting Ceremony in which the Taoist priest paints the eyes of the dragon to awaken it for the new festival. The traditional food of rice cakes is an integral part of this ceremony. This is called the Opening Ceremony. The beating of the drum during every race is essential. At the conclusion of the Championships, there is often a Celebration Party, and the Chinese Lion Dance is performed.

As an International Race Official, you get to know and interact with paddlers from all over the world. Race Officials are drawn from the many countries that attend these championships. So, it is necessary to interact with both race officials and paddlers from upwards of 20 to 30 countries at an event.

In the organizing of a World Championship, economics plays a major role. Funds have to be raised, entry fees collected, boats provided, venues obtained, announcers procured, and programs, schedules, medals, trophies, etc. all need to be secured. There is a need for publicity and possible television and streaming-Web coverage. There are many costs involved in producing a World Championship, both to the hosting country and to the IDBF.

**Q4. What is your assessment of the current state of competitive sports, and what improvements can be made (for example, in the areas of ethics, financing, anti-doping policy, intercultural relations, or others)?**

In relation to anti-doping, at the present time, I find it most distressing that we have to have an anti-doping policy and actually test paddlers to make sure they are not taking power enhancing drugs. Dragon Boating is an amateur sport. The paddlers are not professional, paid athletes. Why would these athletes want to get themselves involved with drugs, instead of just competing for the love of the sport?

In relation to ethics, it is necessary for paddlers to provide photo IDs before racing to ensure they are the ones assigned to that team. Unfortunately, there are always some who want to gain an unfair advantage over their fellow competitors.

**Q5. What have been the most rewarding or fulfilling experiences in your life – personally, professionally, cross-culturally?**

Perhaps my greatest reward of all is when the U.S. delegation put in a bid to host the Fourth World Championships in the U.S. in 2001. We then had to choose a site. Philadelphia was chosen, and I was one of three people on the Organizing Committee. Although it was an enormous amount of work, the challenge of dealing with the representatives of 18 countries was rewarding. It was necessary to have on hand interpreters for many of the countries. We also had to be able to provide foods that would be appropriate for the various nationalities and cultures. The Opening Ceremony consisted of a Parade up the Benjamin Franklin Parkway under the flags of all nations. It concluded on the Philadelphia Art Museum steps where participants (outfitted in their national colors) sat on the steps (see photograph below) and watched the Opening Ceremonies. These included the Eye Dotting Ceremony, performances by the Philadelphia Boys Choir, dancers, the Fireman's Marching Band, etc. The Lions Dance, as always, was the conclusion.



More than 1,500 athletes representing national federations from four continents gather for the Opening Ceremony of the Fourth World Dragon Boat Championships, in Philadelphia, Pennsylvania, in August of 2001. Photo: Bob Morro.

**Q6. What have been the most difficult challenges you have ever faced? (For example, what have been some of the most difficult officiating decisions you have ever made?)**

The most difficult challenge I faced was in the raising of funds for the World Championship. The corporations that we thought we had lined up were not able to fulfill their pledges because of the economic downturn at that time. Although I was not the chief fundraiser for the event, I had to step in and personally ask friends and business associates for support. As for difficult officiating decisions, I never really found them to be all that challenging. In my experience, when you are a knowledgeable race official and are familiar with the technical rules of racing, you just apply the rules to the current situation, and a judgment is made.

**Q7. What sources of strength have you drawn upon to face such challenges?**

In the beginning of my officiating career, I was mentored by very knowledgeable officials, who would discuss with me their rationale for the decisions they would make. I learned all the positions a little at a time and assisted a senior official more knowledgeable than I. It was in this way that over the years you accumulate your own experiences and are able to refer to past decisions to make a good and proper judgment. Generally speaking, nothing is absolutely brand new that you have never seen before.

**Q8. What do you see as your life's legacy?**

In the 30-plus years of my association with the sport of dragon boating, I feel a great sense of satisfaction in having helped to develop and grow the national federation (USDBF). We started with our concept of what a national organization should look like, and I have witnessed it grow and expand beyond what I thought was possible. It is all possible through the work and dedication of the hundreds of people who have given their time and energy to the sport at both the national and international level.

**Q9. What message do you have for the next generation of persons who choose to pursue sports management or international sports officiating?**

In this past year, I have retired as a Director of the annual rowing regatta (Dad Vail Regatta) held in Philadelphia since 1953. This is the largest collegiate regatta in the U.S., with more than 125 universities and colleges from the U.S. and Canada participating. I have been part of this organization for 58 years, starting as a competitor and finishing as the long time Secretary. I have missed only one regatta in those 58 years.

I had been the only Secretary, since its founding, of the United States Dragon Boat Federation in 1998. Although I have retired this year from this office, I will continue to be an active part of this organization.

Also, I have retired as Vice-President of the International Dragon Boat Federation where I have served since 2002. Here too, I will continue to be a Level 4 Race Official and will serve where needed at Championships.

I have retired from these positions in order to make room for the next generation to step up and hone their skills as I have done. It is time for new ideas and new directions. I urge would-be officials to come forward and not feel intimidated or feel they are not capable for a position they might seek because, after all, everything is a learning process, and why not give it a try.

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## **The Psychological Effects of a Pre-workout Warm-up: An Exploratory Study**

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### Abstract

The purpose of the current study was to investigate the relationship between a pre-workout warm-up and psychological processes. The study surveyed seventy-six ( $n=76$ ) participants from a small, Midwestern college aged 18-25. Study primarily focused on the participant's reported levels of enjoyment and motivation for those who used warm-up prior to exercise versus those who did not. Additionally, the researcher was interested in reported short and long-term adherence rates of warm-up users, versus non-users. The study hypothesized that exercisers who reported using a warm-up prior to exercise would report significantly higher levels of exercise-related motivation, enjoyment, and greater short and long-term adherence rates to exercise programs than those who did not. The results demonstrated significantly higher ratings for motivation and enjoyment for those participants who reported using a warm prior to exercise. Results for short and long-term exercise adherence were higher for those using a pre-workout warm-up, though not statistically significant. A larger scale replication is necessary to more powerfully generalize these findings to the population, and to study the possible effects of other types of pre-workout routines, such as stretching. If follow-up research demonstrates a significant effect for motivation, enjoyment, and adherence reports, this may warrant experimental research examining the underlying mechanisms affecting these results.

*Keywords:* warm-up, exercise, motivation, adherence, psychology

### Introduction

Multiple sources support the view that performing a pre-workout warm-up has significant positive physiological effects on the participant (see Gourgoulis, Aggeloussis, Panagiotis, Mavromatis, & Garas, 2003; Safran, Seaber, & Garrett, 1989; Woods, Bishop, & Jones, 2007). Prevailing evidence reports a decreased prevalence of musculotendinous injury likely due to

increasing the elasticity of muscles and smoothing muscular contractions. However, the structure of warm-up is important, as improperly warming-up or over-using the muscles can predispose them to damage (Safran et al., 1989). Warm-ups also can facilitate athletic performance. In a study by Gourgoulis et al. (2003), participants performed a warm-up prior to a vertical jump task. After analysis of the results, there was a significant increase in vertical jump performance, compared to the non-warm-up control. Drawing on this evidence, warm-ups are nearly always included as a precursor to athletic activity in experimental situations (O'Sullivan, Murray, & Sainsbury, 2009). Despite these reported benefits, upon casual observation in a gym setting, one usually will observe a markedly small percentage of participants engaging in a pre-workout warm-up.

In fact, although the physiological effects of warm-up have been well-documented (Gourgoulis et al., 2003; O'Sullivan et al., 2009; Safran et al., 1989; Woods et al., 2007), there has been little empirical research investigating the psychological effects. In the few instances mentioning warm-up in the literature, the prevailing amount of information pertaining to the issue is anecdotal and often includes vague statements such as a warm-up may "provide valuable time for athletes to mentally prepare for their event," and "that warm-up may benefit performance by providing time to concentrate" (Gourgoulis et al., 2003, p. 445). Considering the anecdotal nature of these statements, there is a need for further empirical research into the effects and potential mechanisms related to the psychology of warm-up.

Three theoretical underpinnings may help to conceptualize the potential psychological benefits of warm-up routines prior to exercise: (1) Self-Determination Theory (SDT; Deci & Ryan, 2000), (2) Dual-Mode Model (Ekkekakis & Lind, 2005), and (3) Hedonic Psychology (Kahneman, Diener, & Schwarz, 1999).

Deci and Ryan's (2000) Self-Determination Theory is comprised of three components: the needs for (1) competency, (2) autonomy, and (3) relatedness. From a SDT perspective, if a person participates in activities that sufficiently fulfill these needs, their subjective motivation for that activity likely will increase, which may result in greater adherence to the activity. In theory, exercisers may draw a sense of competency from a warm-up routine completed prior to physical activity and a sense of autonomy due to the chosen and self-prescribed nature of a warm-up routine.

In fact, the autonomy portion of the warm-up routine could be critical for motivation to adhere as well as the positive affective responses associated with exercise. To that end, Ekkekakis and Lind (2006) found that in overweight women, the use of imposed exercise intensity, as opposed to self-prescribed intensity, led to decreases in overall exercise enjoyment, which eventually could lead to reduced adherence and motivation to complete the exercise routine. Similar mechanisms may play a role in self-reported levels of motivation in warm-up users, as they may do so in a self-prescribed nature, helping to fulfill their need for autonomy.

Subsequently, Dual-Mode Model (Ekkekakis & Lind, 2005) postulates that affective responses to exercise are evolutionary and that they have a tendency to push an exercise participant to seek adaptive doses of physical activity and avoid the maladaptive. Dual-Mode Model predicts that exercisers will prefer activities encouraging the maintenance of a homeostatic state, an example being aerobic exercise, as opposed to those that disrupt this state, such as anaerobic exercise. The use of a pre-workout warm-up may increase the likelihood that an exerciser maintains a homeostatic state for a longer period than an exerciser who does not use

a warm-up routine. In the short and long term, this could lead to higher levels of exercise-related enjoyment as well as increased motivation for exercise and adherence to an exercise regimen.

Finally, Hedonic Psychology (Kahneman, Diener, & Schwarz, 1999) may help conceptualize the psychological mechanisms of warm-up prior to exercise by providing a third theoretical framework. In a similar fashion to the Dual-Mode Model, Hedonic Psychology states that in general, an overriding drive in individuals is to seek pleasurable situations and avoid the painful, and that subsequent recollection of these experiences can impact later decision making. Demonstrating this effect, Miron-Shatz, Stone, and Kahneman (2009) found that negative daily experiences are more prominent in memory than positive experiences, hence their substantial role in deciding against an action. Drawing upon these assertions, one can argue that if an exerciser experiences an unpleasant workout, the exerciser will recall the memory for this event more readily than they would have if the experience were more pleasant. Overall, these unpleasant memories could negatively impact exercise enjoyment and motivation if the exerciser cannot find a way to mitigate them. Exercisers who perform warm-ups prior to exercise may have more positive memories of their exercise routines. In turn, the positive memory for the workout may lead the exerciser to continually use the warm-up routine that first elicited this positive experience. This more salient and positive memory could potentially facilitate short- and long-term adherence to an exercise program by the participant.

The current pilot study will gather information on overall warm-up<sup>1</sup> use in young adults. In addition, the study will investigate the effects a pre-workout warm-up has on overall adherence to an exercise plan. The researcher hypothesized that (1) participants who warm-up prior to exercise would report significantly higher levels of exercise-related enjoyment and motivation, and (2) the use of a warm-up would have a significant positive effect on exercise adherence.

## **Method**

### **Participants**

Seventy six (n=76) students from a small, Midwestern university participated in the study, thirty-three (n=33) male, forty-three (n=43) female. Participants were members of introductory psychology and fitness management classes on the researcher's campus and were between the ages of 18 and 25 (M=19.21, SD=.93). The researcher's Institutional Review Board approved the study.

### **Materials**

The researcher collected data using a ten item pen-or-pencil questionnaire. The first two questions asked for information pertaining to how often the participant exercised (one day per week) to (more than five days per week) and how long the participant had been exercising at this rate (less than three months) to (over one year). Following these items, the questionnaire asked participants to report whether or not they used a pre-workout routine (Yes) or (No). If answering

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<sup>1</sup>Woods et al. (2007) defined warm-up as an activity that produces a light sweat but does not fatigue the exerciser.

yes to this question, the next item asked participants to specify the type of pre-workout routine (Warm-up) or (Stretch). The researcher formulated the option “stretch” to mask the fact that researcher was interested in solely warm-up use. The researcher omitted results from participants who reported using only stretch or a combination of warm-up and stretch. A debate exists in the literature over the use of five or seven point ordinal Likert-type scales in the measurement of exercise-related motivation and other affective ratings (Plonczynski, 2000; Wininger, 2007). As this debate is currently not settled, the researcher opted to use five point Likert-type scales to measure exercise-related motivation and enjoyment. The questionnaire measured participant’s average level of motivation for exercise with options ranging from 1 (Not motivated at all) to 5 (Very motivated); enjoyableness of an average workout with a scale from 1 (Very Unenjoyable) to 5 (Very Enjoyable); how often participants completely finish planned workouts with a (0%) to (100%) scale in 10% increments. Participants rated their long-term adherence rates to their exercise programs from 1 (Less than a week) to 5 (Six months or more). Additionally, participants reported two final items regarding age and gender. The researcher did not ask participants to report ethnic differences in the study.

## **Procedure**

The researcher obtained permission from the class instructors and scheduled class visits. Following the instructor dismissing themselves from the class, the researcher informed the class of the nature of the study and solicited participation (See appendix B for the recruitment script). Additionally, the researcher informed the participants that participation was voluntary and would have no bearing on their grade in the class. The results would also be confidential; the questionnaires recorded no identifiable information. The researcher asked participants to place completed surveys in a manila envelope located at the front of the classroom. Finally, the researcher thanked the participants for their participation prior to leaving the classroom.

## **Results**

Of the 76 participants, 51 responded “yes” to using a warm-up and 25 responded “no” to this item. Independent samples t-tests were used to compare the mean scores of those who reported engaging in a warm-up relative to those who did not. There was a significantly greater difference for participants who indicated use of a warm-up ( $M=4.3$ ,  $SD=.74$ ) and those who did not utilize a warm-up ( $M=3.60$ ,  $SD=.957$ );  $t(74) = 2.315$ ,  $p < .05$ , in rating their average level of enjoyment for exercise. Additionally, there was a significantly greater difference for those participants who indicated use of a warm-up ( $M=4.6$ ,  $SD=1.24$ ) and those who did not utilize a warm-up ( $M=3.92$ ,  $SD=1.48$ );  $t(74) = 3.593$ ,  $p < .05$ , in rating their level of motivation for completing their workout.

Results were not significant for those who indicated warm-up use ( $M=8.52$ ,  $SD=1.40$ ) and those who did not ( $M=7.67$ ,  $SD=2.51$ );  $t(30.07) = 1.551$ ,  $p > .05$ , for what percentage of the time participants completed their workout. The results were not significant for those who indicated use of a warm-up ( $M=3.73$ ,  $SD=1.23$ ) and those who did not ( $M=3.16$ ,  $SD=1.31$ );  $t(74) = 1.838$ ,  $p > .05$ , for how long participants adhere to workout routines. The researcher excluded twelve ( $n=12$ ) participants for reporting only stretch use and additionally, five ( $n=5$ ) participants who selected both warm-up and stretch options.

Table 1

*Independent Samples t-test Results comparing Motivation Ratings for Warm-up versus no Warm-up*

Warm-up	N	Mean (1-5)	SD	T	t crit.	df	p	Decision
Yes	51	4.61	.622	2.32	1.99	74	.023	Reject null
No	25	3.92	.735					

Table 2

*Independent Samples t-test Results comparing Enjoyment Ratings for Warm-up versus no Warm-up*

Warm-up	N	Mean (1-5)	SD	T	t crit.	df	p	Decision
Yes	51	4.31	.735	3.59	1.99	74	.001	Reject null
No	25	3.60	.957					

Table 3

*Independent Samples t-test Results comparing Percentage of Time finishing Warm-up for Warm-up versus no Warm-up*

Warm-up	N	Mean (1-10)	SD	T	t crit.	df	p	Decision
Yes	51	8.52	1.40	1.55	1.99	74	p>.05	Retain null
No	25	7.67	2.51					

Table 4

*Independent Samples t-test Results comparing Long-term Adherence for Warm-up versus no Warm-up*

Warm-up	N	Mean (1-5)	SD	T	t crit.	df	P	Decision
Yes	51	3.73	1.23	1.83	1.99	74	p>.05	Retain null
No	25	3.16	1.31					

## Discussion

After analyzing the data, there is clear support for one of the major hypotheses. Participants responding “yes” to warm-up use reported significantly higher overall mean scores for both exercise-related motivation and enjoyment than those who did not report using a warm-up. However, participants reporting warm-up use did not have significantly greater scores for

whether or not participants finished their workouts more often or for how long participants adhered to a workout program.

A plausible explanation for these effects could be that exercisers who use warm-up may prepare their bodies in such a way that allows the participant to enjoy more fully their exercise session, as proposed by Ekkekakis and Lind's (2005) Dual-Mode Model. Additionally, preparing the body to deal with the demands of exercise could lead to more positive overall experiences that participants remember more easily in retrospective evaluation of the exercise session, in a similar fashion to Kahneman et al.'s (1999) Hedonic Psychology. Finally, the use of a warm-up prior to physical activity may aid in the fulfillment of the autonomy and competency portions of Deci and Ryan's (2005) Self-Determination Theory. Taking all of these theoretical frameworks into account, it is plausible that undertaking a pre-workout warm-up could result in elevated levels of enjoyment that could, in turn, lead to a greater level of motivation to finish workouts. The exerciser may recall these positive events more easily and this may encourage the exerciser to become motivated for a workout in the first place, possibly translating to greater short and long-term exercise adherence—an effect that follow-up research should study further.

The researcher noted high skewness levels for the item where participants rated their average level of workout enjoyment. The researcher advises caution when interpreting the results as they violated the assumption of normality. The cause of this skewness may be that those who already do utilize a warm-up may be quite exercise adherent and already rate their workouts more favorably than those who do not warm-up. Future research may help to mitigate skewness by using a larger, more diverse sample.

### **Conclusion**

Follow-up studies should utilize a larger, more diverse sample of young adults to more readily generalize these findings. Because a large percentage of respondents were fitness management students, this group may already have been more active than the other respondents, which could have affected overall scores. Additionally, one of the limitations of this study was that the research did not target whether one type of pre-workout routine—warm-up, stretch, or a combination of the two—produced significantly higher scores relating to motivation, enjoyment, and adherence. Future studies should examine these possible differences. Another limitation of the current study was that the design only yielded correlations between the variables and not a cause-and-effect relationship. If larger scale follow-up research demonstrates a significant effect for reported motivation, enjoyment, and adherence scores, this may warrant experimental research examining the underlying mechanisms affecting these results.

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## Appendix A

### Questionnaire

1. How often do you exercise per week?

1 day \_\_\_\_\_ 2 days \_\_\_\_\_ 3 days \_\_\_\_\_  
4 days \_\_\_\_\_ 5 days \_\_\_\_\_ More than 5 days \_\_\_\_\_

2. How long have you been working-out at this rate?

Less than 3 months \_\_\_\_\_ 3-6 months \_\_\_\_\_ 6-9 months \_\_\_\_\_  
9-12 months \_\_\_\_\_ Over 1 year \_\_\_\_\_

3. Do you have a pre-workout routine? (e.g. warm-up/stretch)

Yes \_\_\_\_\_ No \_\_\_\_\_ If No, skip to 5.

4. What does your pre-workout routine involve? (Check all that apply)

Warm-up to a light sweat \_\_\_\_\_ Stretch \_\_\_\_\_

5. What percentage of the time do you completely finish your workout as planned?

0% \_\_\_\_\_ 10% \_\_\_\_\_ 20% \_\_\_\_\_ 30% \_\_\_\_\_ 40% \_\_\_\_\_ 50% \_\_\_\_\_  
60% \_\_\_\_\_ 70% \_\_\_\_\_ 80% \_\_\_\_\_ 90% \_\_\_\_\_ 100% \_\_\_\_\_

6. When you make an exercise plan for yourself, how long do you stick to it?

Less than a week \_\_\_\_\_ less than 1 month \_\_\_\_\_ 1-3 months \_\_\_\_\_  
3-6 months \_\_\_\_\_ 6 months or more \_\_\_\_\_

7. On a scale of 1-5, with 1 being very unenjoyable and 5 being very enjoyable, how enjoyable do you find your workouts? \_\_\_\_\_

8. When you begin a workout, how motivated are you to finish your workout?

1. not motivated at all \_\_\_\_\_  
2. not very motivated \_\_\_\_\_  
3. neither motivated or unmotivated \_\_\_\_\_  
4. motivated \_\_\_\_\_  
5. very motivated \_\_\_\_\_

9. Age

18 \_\_\_\_\_ 19 \_\_\_\_\_ 20 \_\_\_\_\_ 21 \_\_\_\_\_ 22 \_\_\_\_\_ 23 \_\_\_\_\_ 24 \_\_\_\_\_  
25 \_\_\_\_\_

10. Sex

M \_\_\_\_\_ F \_\_\_\_\_

## **Appendix B**

### Recruitment Script

I am conducting a short survey on the psychological effects of exercise.

If you exercise at least once per week and are between the ages of 18 and 25, I would really appreciate it if you would participate in my study.

Your responses will be completely confidential, and the entire survey will only take two or three minutes.

When you finish, just slip your survey into this large manila envelope with the others.

### About the Author

Matthew A. Ladwig (maladwig@bsu.edu) is a first-year master's student at Ball State University majoring in both sport and exercise psychology and cognitive psychology. He received his bachelor's degree in psychology from Purdue University-Calumet in 2013. Matthew's primary interest is the link between cognitive processes (e.g., perception and imagery), and sport and exercise performance. Additionally, he is interested in interventions that may enhance or weaken motivation for participation in exercise. He is currently a member of several professional organizations including the American Psychological Association and the Association for Psychological Science. Matthew would like to thank his undergraduate mentor, Dr. David Pick for his help in gaining IRB approval for the study and for having a positive and powerful influence on his development in the field.

### Discussion Questions

1. Based on the results of the current study, how would you examine motivation for exercise in an experimental situation, such as a gym setting?
2. What constitutes a warm-up for you? Do any of the study findings apply to experiences you have had using a warm-up before exercise?
3. What would you have done differently to make this a stronger study?

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*The Grand Ones* (Grand Teton National Park, Wyoming)

Photograph by Susan S. Buzzi

The range covers 310,000 acres with a diverse ecosystem and amazing elevations up to 13,770 feet. I have been forever touched by this grand odyssey.

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## **Apportioning St. Thomas University Urban and Green Area Using Satellite Imaging**

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## Abstract

There are multiple personal and social benefits to greenery in urban areas. When such greenery includes a forest climax community, benefits and responsibilities can also increase. St. Thomas University (STU), an urban 120-acre campus in Miami, Florida, houses one of the few remaining Dade County Slash Pine forests in this metropolitan area. A quantitative assessment of the greenery on campus, including its ratio-to-built area can aid the delicate planning of campus expansion. Phase I of this study measured the 2-Dimensional green area and Phase II measured the 3-Dimensional green area on STU. Adding these two measurements and contrasting it to the built area on campus yields an almost 10:1 ratio of greenery versus built area. Considering that STU is within a major residential, commercial, and industrial zone of Miami-Dade County, and considering a heavily-trafficked highway and a commercial airport flank the campus, it behooves all those associated with STU to preserve and promote this very high green-to-grey ratio.

**Keywords:** apportioning, carbon sink, climax community, highland, *Pinus elliottii*, triangulation, urban greenery

## Introduction

Greenery in urban areas has multiple benefits, such as, carbon sink (Siry, 2006), pollution filter (Beckett, Free-Smith, & Taylor, 1998), flood control (Xiao & McPherson, 2002), cooling (Simpson, 1998), noise and wind reduction (Bolund & Hunhammar, 1999), and educational and aesthetic value (Tyrväinen, Pauleit, Seeland, & de Vries, 2005). Overall, one may call these the personal and social benefits of urban greenery, and its constant threat is urban encroachment (grey area) (Merse, Boone, & Buckley, 2008). Therefore, preserving urban greenery is a desired goal of society. Urban greenery exists in the form of public land (parks, recreational areas, nature preserves) or private land (universities, private parks, office complexes, and other commercial or residential properties). Urban greenery that includes a climax forest community is increasingly rare (Kämpf Binelli, Gholz, & Duryea, 2001).

Not all urban greenery has the same social and personal value. For example, regarding the abovementioned benefits, an acreage of forest is logically more beneficial than the equivalent acreage of lawn. One main reason for this is simply the much greater overall surface area of greenery in a forest than on a lawn. For purposes of mathematical quantification, the surface area of a forest and free-standing trees may be referred as three-dimensional (3-D), and that of a lawn, two-dimensional (2-D). Once obtained, these 2-D and 3-D measurements can be combined, and an overall green-to-grey ratio can be estimated for any given urban area. Intuition tells us that, the higher that ratio, the better the quality of life for that community (Florida Urban Forestry Council, 2013).

The average height above sea level for Metropolitan Miami-Dade County, Florida, is about 1.8 m ( $\approx$  6 ft) (National Aeronautic and Space Administration, 2012). Topographically and ecologically, the county can be divided generally into lowland and highland, depending on whether the land is above or below the average height above sea level (Allen & Main, 2005). Also, this region of South Florida receives an average of 157.3 cm ( $\approx$  62 in) of rain per year (National Oceanographic and Atmospheric Administration, 2012). Due to the relatively high amount of precipitation in Miami-Dade County, a highland topography tends to flood much less

– or not at all – contrasted to a lowland. The predominant native tree of the County highland is the South Florida slash pine (*Pinus elliottii*), whose roots tolerate little standing ground water (U.S. Department of Agriculture, 2013). Hence, wherever *P. elliottii* grows, there is good assurance that land seldom, if ever, floods. In Miami-Dade County, a *P. elliottii* forest is the highland climax community (Smithsonian Marine Station, 2012).

St. Thomas University (STU) is an urban campus of about 5,000 students and 300 fulltime employees (St. Thomas University, 2012-2013). It is located on the northern part of Miami-Dade County, Florida, and is surrounded by residential, commercial, and industrial neighborhoods. The campus is almost a square lot of approximately half million square meters ( $\approx$  124 Acres). Opa-locka Airport, a midsize commercial airport, is located about three blocks southwest of STU. The entire northern boundary of campus extends just south of State Road 826 (SR 826), which is a major highway that connects many residential, commercial, and industrial sections of the metropolitan area. Thus, SR 826 carries heavy car and truck traffic, which is a significant source of pollution in the area (Florida Department of Transportation, 2013). Hundreds of people visit STU daily.

STU was founded in 1961 (St. Thomas University, 2013) and has much greenery on campus, as detailed below. A significant amount of that greenery consists of mature trees, palms, and even a small coniferous forest. Indeed, many of the trees on campus are Dade County slash pine (*P. elliottii*), a protected evergreen species that has adapted to live in subtropical zones. *P. elliottii* can live for up to 200 years, and a free-standing tree can reach a 30 m ( $\approx$  98 ft) height, a 25 m ( $\approx$  82 ft) crown diameter, and a 1.5 m ( $\approx$  5 ft) trunk girth (U.S. Department of Agriculture, 2012). Because they constitute a climax community, it is of interest to the university, to the neighborhood, and to the county to preserve these majestic pine trees as much as possible. Other main trees and palms on campus are live oak (*Quercus virginiana*), banyan (*Ficus spp*), *Eucalyptus*, Australian “pine” (*Casuarina spp*), and royal palms (*Roystonea spp*).

One way to help preserve the STU greenery is by quantifying its contribution to the total amount of surface area on campus. A relatively fast way of accomplishing this is by a simple measure of a satellite view of campus. However, this will reveal only the 2-D surface area, which is not representative when much of the greenery is comprised of trees. Therefore, the 3-D dimension is also of much interest. Considering there are more than 1,500 trees and palms on campus (see Results, below), the question arises as to how to measure the 3-D surface area of greenery at STU within a reasonable amount of time and resources.

The Summer Research Institute (SRI) at STU is an educational effort of the School of Science, Technology, and Engineering Management (STEM) to provide research opportunities for undergraduate students. In the summer of 2012, one STEM researcher and fourteen SRI students took on the challenge of quantifying the total 2-D and 3-D surface area of all the greenery on the STU campus. Given this project had to be accomplished within two months, a methodology was developed that combined visual observation with satellite imaging and basic geometry to accomplish the task at hand; the project was divided into Phase I (2-D calculations) and Phase II (3-D calculations), as described next. The Discussion and Conclusion section, below, describes the overall benefits of this project.

## Materials and Methods

### Two-Dimensional Study Area (Phase I)

To determine surface area, satellite view was used (Google Maps, 2012). The STU satellite view is a rectangle; total surface area was calculated by rectangulation. For ease of calculation for green and grey areas, total surface area was subdivided into eighteen quadrants (Q1 - Q18, Figure 1).



Figure 1. Satellite image of St. Thomas University showing two-dimensional quadrant subdivision.

### Averaging

The total STU surface area was an average of 10 individual measurements, with a percentage deviation of  $\pm 0.1\%$  (Table 1). Each quadrant was then measured by three students independently (Table 2) and averaged; the sum of quadrant averages is within 7% of the total average  $\{100 - [(503,649.9/534,845.3)100]\}$ . Each quadrant grey area was the average of at least three independent measurements; if the three measurements were not within 5% of the mean, a fourth or fifth measurement was taken (Table 3). Microsoft (MS) Excel (2010) spreadsheet was used for all calculations.

Table 1

*Total STU Area Averaged by Ten Independent Measurements Including Standard Deviation and Percentage Deviation*

Total STU Area (m <sup>2</sup> )	Deviation from the Mean (m <sup>2</sup> )	Deviation Squared (m <sup>4</sup> )
504,135.0	-485.1	235,322.0
503,341.0	308.9	95,419.2
504,135.0	-485.1	235,322.0
504,135.0	-485.1	235,322.0
503,806.0	-156.1	24,367.2
502,712.0	937.9	879,656.4
503,476.0	173.9	30,241.2
503,804.0	-154.1	23,746.8
504,135.0	-485.1	235,322.0
502,820.0	829.9	688,734.0
Mean = 503,649.9	Sum = 0.0	Variance = 268,345.3
Standard deviation =		518.0
Percentage deviation =		±0.1%

Table 2  
Total STU Area Averaged by Three Independent Measurements of each Quadrant

Quad	First measure (m <sup>2</sup> )	Second measure (m <sup>2</sup> )	Third measure (m <sup>2</sup> )	Average (m <sup>2</sup> )
1				24,792.0*
2				15,593.0*
3	15,892.0	16,348.0	15,892.0	16,044.0
4	16,629.0	16,445.0	16,514.0	16,529.3
5	26,277.0	25,912.0	25,912.0	26,033.7
6	50,544.0	49,790.0	50,544.0	50,292.7
7	32,400.0	32,344.0	33,505.0	32,749.7
8	12,432.0	12,176.0	12,208.0	12,272.0
9	9,643.0	9,767.0	9,609.0	9,673.0
10	5,770.0	6,035.0	5,882.0	5,895.7
11	12,197.0	12,335.0	12,197.0	12,243.0
12	12,636.0	12,994.0	12,742.0	12,790.7
13	6,491.0	6,555.0	6,602.0	6,549.3
14	24,400.0	24,494.0	23,354.0	24,082.7
15	14,048.0	13,846.0	14,055.0	13,983.0
16	16,240.0	16,369.0	16,400.0	16,336.3
17	46,860.0	46,860.0	46,933.0	46,884.3
18	193,800.0	191,050.0	191,453.0	192,101.0
Sum =				534,845.3

Note. \*Quadrants (Quads) 1 and 2 averages were obtained by ten students independently as practice for subsequent calculations.

Table 3  
Average Two-Dimensional Grey Area for each Quadrant

Quad	First Measure (m <sup>2</sup> )	Second Measure (m <sup>2</sup> )	Third Measure (m <sup>2</sup> )	Fourth Measure (m <sup>2</sup> )	Fifth Measure (m <sup>2</sup> )	Average (m <sup>2</sup> )
1	17,434.0*					17,434.0
2	6,811.0*					6,811.0
3	11,652.0	11,481.0	11,595.0			11,576.0
4	9,489.3	9,918.3	10,827.3	10,366.3		10,150.3
5	5,667.7	5,956.7	5,928.7			5,851.0
6	2,407.7	2,706.7	1,883.7	2,802.7	2,197.7	2,399.7
7	349.7	3,986.7	2,223.7	1,993.7	3,381.7	2,387.1
8	4,287.0	4,713.0	4,264.0			4,421.3
9	3,173.0	2,256.0	2,774.0			2,734.3
10	3,126.7	2,647.7	3,486.7			3,087.0
11	7,236.0	5,939.0	6,081.0	7,472.0	6,953.0	6,736.2
12	5,220.7	5,523.7	5,532.7			5,425.7
13	3,066.3	4,222.3	3,868.3	3,748.3		3,726.3
14	9,176.7	10,170.7	10,927.7	10,802.7		10,269.4
15	5,652.0	5,360.0	5,205.0	4,627.0		5,211.0
16	6,161.3	7,278.3	7,131.3	7,180.3		6,937.8
17	7,555.3	7,959.3	8,093.3			7,869.3
18	7,593.0	6,328.0	3,437.0			5,786.0
SUM =						118,813.5

Note. \*Quads 1 and 2 averages were obtained by ten students each independently as practice for subsequent calculations.

### Surface Area of Green Planar

A satellite image of each quadrant, containing a specific scale (in meters), was printed in a MS Word (2010) file (Figure 2). Each quadrant was analyzed for grey area (buildings, parking lots, sidewalks; any construction) versus green area (vegetation). Grey area of each quadrant then was measured by triangulation or rectangulation. Grey areas were measured in millimeters on the printed files and converted to meters using the scale provided by the satellite image. The grey area of each quadrant then was subtracted from the total area of each quadrant to find the green area of each quadrant (Table 4). The Variation from the Mean and the Standard Deviation for the average grey and green areas (Table 5) also was calculated. Table 9 summarizes the results of the 2-dimensional study.

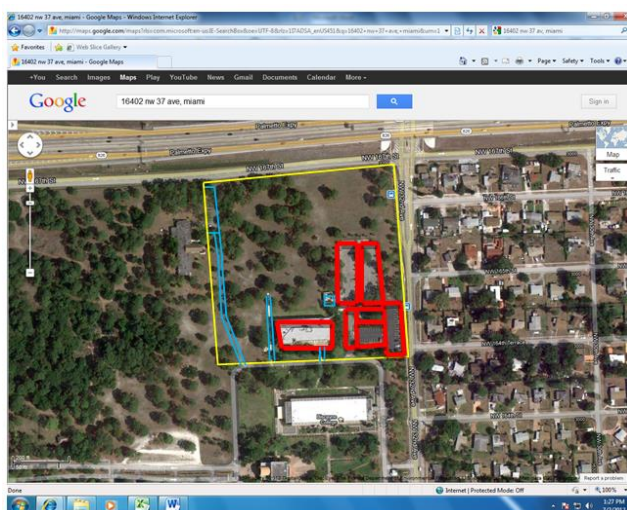


Figure 2. Satellite image of quadrant 17 highlighting grey area for triangulation and rectangulation.

Table 4

*Average Two-Dimensional Total Area, Grey Area and Green Area for each Quadrant*

Quad	Average quad area (m <sup>2</sup> )	Average grey area (m <sup>2</sup> )	Average green area (m <sup>2</sup> )
1	24,792.00	17,434.00	7,358.00
2	15,593.00	6,811.00	8,782.00
3	16,044.00	11,576.00	4,468.00
4	16,529.33	10,150.33	6,379.00
5	26,033.67	5,851.00	20,182.67
6	50,292.67	2,399.67	47,893.00
7	32,749.67	2,387.07	30,362.60
8	12,272.00	4,421.33	7,850.67
9	9,673.00	2,734.33	6,938.67
10	5,895.67	3,087.00	2,808.67
11	12,243.00	6,736.20	5,506.80
12	12,790.67	5,425.67	7,365.00
13	6,549.33	3,726.33	2,823.00
14	24,082.67	10,269.42	13,813.25
15	13,983.00	5,211.00	8,772.00
16	16,336.33	6,937.83	9,398.50
17	46,884.33	7,869.33	39,015.00
18	192,101.00	5,786.00	186,315.00
Sum =	534,845.33	118,813.52	416,031.82

Percentage deviation for each quadrant and average percentage deviation of grey and green areas

Average percentage deviation =  $\pm 10.0\%$

### Three-Dimensional Study Area (Phase II)

To determine 3-dimensional (3-D) green surface, Google Maps (2012) satellite view was used. Total STU surface area was obtained from Phase I. For ease of calculation, total surface area was subdivided into 24 quadrants (A1-8, B1-4, C1-4, D1-5, E1-2, F1, Figure 3).



Figure 3. Satellite image of St. Thomas University showing three-dimensional quadrant subdivision

### 3-D Green Surface Area of Each Quadrant

Satellite image of each quadrant was printed as described in Phase I. Each tree canopy in each quadrant was circled (using MS Word Drawing toolbar, Autoshapes, Basic Shapes, Oval feature, Fixed ratio) to represent a sphere (Figure 4). The diameter (mm) of each circle was obtained in each file through the MS Word Drawing Tool, Format, Size feature. Then, each diameter was halved to obtain the radius. The surface of each tree canopy then was calculated using the formula for the Area of a Sphere (Excel 2010).



Figure 4. Satellite image of quadrant A1 illustrating numbered tree canopy circles.

## Approximation

For ease of calculation, the canopy surface of an idealized tree was approximated to the Area of a Sphere. A further refinement of this first approximation was to estimate the overall shape of a canopy to be a full sphere, a three-quarter sphere, or a half sphere; all palm fronds were estimated to approximate a full sphere (Figures 5a, b, c, d, respectively). The average percentage deviation of this approximation, by 10 independent measures, is just under  $\pm 7\%$  (Table 6).

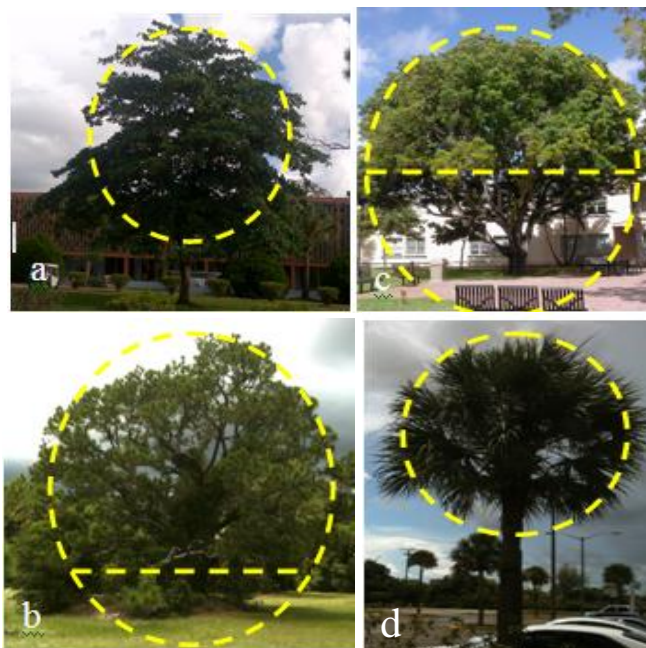


Figure 5. Superimposed circles on representative tree and palm canopies: Full sphere, a; three-quarter sphere, b; half sphere, c; full sphere, d.

Table 6

*Average Percentage Deviation of Idealized Palm and Tree Spherical Canopies Based on Ten Independent Measures*

Tree shape	Average diameter (cm)	Variance	Standard deviation	Percentage deviation
Palm	1.59	0.02	0.15	9.33
Full sphere	2.48	0.03	0.18	7.41
3/4 sphere	2.58	0.01	0.12	4.52
1/2 sphere	2.64	0.03	0.17	6.54
Average percentage deviation =				6.95

A second approximation was to decide, by two independent visual inspections of each quadrant, whether the majority of the canopies resembled more a full sphere, a  $\frac{3}{4}$  sphere, or a  $\frac{1}{2}$  sphere. All canopy surface areas from each quadrant were added to obtain a total individual-tree 3-D green area (Table 7).

Table 7  
Number of Trees and Palms and Average Sphere-Shape for each Quadrant with Canopy Surface Area

Quad	Average shape	Number of circles	3-D Tree green area (mm <sup>2</sup> )	Conversion factor (mm/m)	3-D Green area (m <sup>2</sup> )
A1	6/8	89	17,899.2	12.0	12,368.1
A2	7/8	103	18,824.3	12.5	11,970.8
A3	7/8	69	32,646.3	9.8	34,061.9
A4	8/8	71	17,140.6	12.8	10,544.0
A5	5/8	72	11,803.3	12.5	7,566.2
A6	8/8	71	16,568.6	12.4	10,810.5
A7	4/8	54	5,436.3	12.0	3,768.9
A8	8/8	71	8,108.1	12.9	4,864.8
B1	8/8	95	18,636.2	8.7	24,621.7
B2	5/8	93	17,757.6	8.8	23,035.4
B3	5/8	70	4,339.7	8.8	5,629.6
B4	5/8	66	9,795.8	8.9	12,394.7
C1	6/8	41	5,167.0	9.2	6,091.4
C2	0	0	-	-	-
C3	6/8	60	3,380.5	9.7	3,607.7
C4	6/8	25	589.9	9.7	621.8
D1	6/8	92	17,517.4	9.6	18,889.3
D2	14/8*	87	46,410.5	9.8	47,932.0
D3	6/8	32	3,675.9	9.8	3,835.2
D4	4/8	41	1,075.2	9.8	1,121.8
D5	4/8	14	1,155.9	9.7	1,233.6
E1	8/8	35	11,424.7	9.6	12,319.5
E2	4/8	39	11,812.8	9.7	12,451.8
Sum =					269,740.7

Note. \*Quad D2 also contains significant underbrush, estimated by visual inspection to best approximate  $\frac{3}{4}$  of a sphere, which, when added to the full circle canopy, gives a  $\frac{7}{4}$  factor.

### Forest Special Calculations

Quadrant F1 is a satellite image of the STU forest; visual inspection revealed much greenery beneath the forest canopy, which is not visible by satellite imaging due to high canopy density (Figure 6, a and b, respectively). It was estimated visually that this greenery comprised an

approximate equivalency of  $\frac{3}{4}$  of the canopy above. Hence, the total forest greenery was estimated to be  $\frac{7}{4}$  of a sphere. Table 8 shows the 3-D green area contribution by the forest canopy.



Figure 6. Satellite image of pine forest, a; representative forest underbrush, b.

Table 8  
*Average Forest Green Area*

Quad	Average shape	Number of circles	3-D Tree green area (mm <sup>2</sup> )	Conversion factor (mm/m)	3-D Green area (m <sup>2</sup> )
F1	14/8	398	22,780.4	11.1	461,396.2

### Grand Total Green Area

The grand total 3-D STU green surface area was obtained by adding the 2-D green area of Phase I, plus the 3-D area of individual trees, plus the total green area of the forest (Table 9).

Table 9  
*Ratio of Overall Green-to-Grey Area on STU Campus*

	Area (m <sup>2</sup> )
Total area of campus =	503,649.9
Total grey area on campus =	118,813.5
2-D Green area =	416,031.8
3-D Green area =	731,136.9
Total green area =	1,147,168.8
Green-to-grey area percentage ratio =	9.7:1

## Results

Four main results flow from these measurements: the planar green area of STU; the three-dimensional green area; the sum of these two areas as the total green surface area; and the overall ratio of green versus grey area on campus.

### Planar Green Area (Phase I)

Phase I of this project sought to measure the planar (2-D) green area of the St. Thomas University campus. To calculate this, one first needed to obtain an initial total area of campus (Table 1). Results of these measurements gave an average of  $503,649.9 \text{ m}^2$  ( $\approx 5,421,242 \text{ sq ft}$ ) for the total area of STU, as measured independently by 10 students, with a Standard Deviation of  $518.0 \text{ m}^2$ , giving a  $\pm 0.1\%$  margin of error (ME).

To make the project feasible within a reasonable amount of time, the plot of Phase I was subdivided into 18 quadrants (Figure 1). The total area of each quadrant was calculated independently by 3 students, averaged, and summed (Table 2); this yielded a per-quadrant total area of  $534,845.3 \text{ m}^2$  ( $\approx 5,757,027 \text{ sq ft}$ ). Since the initial total area and the per-quadrant total area are within 6% of each other  $\{100 - [(503,649.9/534,845.3) 100] = 5.8\}$ , this becomes our confidence level for this first phase.

A simple observation of a satellite image of STU (Figure 1) reveals there is significantly less grey area (buildings, asphalt, sidewalks; all non-vegetation surface) than green area (lawn, shrubs, trees, and palms). Therefore, it was decided to calculate the grey area of each quadrant, subtract it from each quadrant area to obtain the green area of each quadrant, and then add all the quadrant green areas to obtain the total planar green area of STU (Table 4). Each quadrant was assigned to 3 students, who calculated the grey area in their quadrant independently by triangulation and rectangulation (Figure 2). If the three measurements were not within 5% of the average, the quadrant was assigned to a fourth (Q 4, 6, 7, 11, 13, 14, 15 and 16), and even a fifth (Q 6, 7 and 11) student (Table 3). Those calculations yielded an average total grey area of  $118,813.5 \text{ m}^2$  ( $\approx 1,278,898 \text{ sq ft}$ ).

Subtracting the average grey area of each quadrant from its corresponding average total area gives the average green area of each quadrant (Table 4). The sum of all quadrant green areas yields a total average 2-D green area of  $416,031.8 \text{ m}^2$  ( $\approx 4,478,129 \text{ sq ft}$ ), with an average percentage deviation of  $\pm 10.0\%$  (Table 5). This amounts to approximately 77.8%  $[(416,031.8/534,845.3) 100]$  of the campus planar surface comprised of green area. Overall, then, about  $\frac{3}{4}$  of St. Thomas University planar surface area presently is dedicated to vegetation.

### Three Dimensional Green Area (Phase II)

Phase II of this project sought to estimate the excess contribution of tree and palm canopies to the planar green area on STU. For ease of calculation, the campus satellite image was re-plotted into 24 quadrants, according to tree canopy density (Figure 3). To arrive at this result in a relatively simple way and in a timely manner, several assumptions were necessary.

The first assumption was that foliage contained within a tree or palm would not count directly toward green area. Rather, it was assumed a "canopy" represented an equivalent of solid green area (foliage) enveloping a tree or palm much like the surface area of a bubble on a stick

would represent the green surface area of that tree or palm. Visual inspection of any living tree or palm on campus reveals this is generally an underestimation of that greenery.

The second assumption was that an idealized tree or palm canopy approximates the shape of a sphere (Figure 4). This allowed using the formula for the area of a sphere – which contains only one variable, the radius, to calculate the contribution of each tree or palm on campus to the total 3-D green surface area. A further refinement of this assumption was to evaluate whether a tree canopy best approximated a full sphere,  $\frac{3}{4}$  of a sphere, or  $\frac{1}{2}$  a sphere. Palms were all considered full spheres (Figure 5).

A third assumption was to estimate, by visual inspection, whether the majority of trees in each quadrant best approximated a full sphere,  $\frac{3}{4}$  of a sphere, or  $\frac{1}{2}$  a sphere. Students worked in pairs to estimate these shapes by visual inspection; if both students could not agree on the predominant shape of most canopies within a given quadrant, a third student was assigned to “break the tie.” Only one quadrant (A 3) required a tiebreaker.

To calculate the percentage deviation from the mean for each idealized canopy, whether a full sphere,  $\frac{3}{4}$  of a sphere, or  $\frac{1}{2}$  a sphere, the following procedure was used: Ten students independently measured, from a digitalized photograph, the canopy of a representative palm (full sphere) and a full,  $\frac{3}{4}$ , and  $\frac{1}{2}$  sphere tree. The Standard Deviation then was calculated for each one of these four sets, and the average percentage deviation from the mean of each yielded: 9.3%, 7.4%, 4.5%, and 6.5% respectively (Table 6). The overall average of these 4 deviations is just under 7%, which becomes our confidence level for this second phase.

Each quadrant satellite image again was given to three separate students to calculate independently the diameter of each tree or palm canopy within that quadrant (Figure 4). All diameters then were halved to obtain the radius, and that radius was used to calculate the spherical green area contribution of each tree or palm on campus. Spherical green surface areas from quadrants where most tree canopies resembled  $\frac{3}{4}$  of a sphere were multiplied by 0.75, and areas from quadrants where most canopies resembled  $\frac{1}{2}$  a sphere were multiplied by 0.5. These calculations yielded a total of 269,740.7 m<sup>2</sup> ( $\pm$  7%) of individual tree and palm canopy green surface area (Table 7).

The calculation of the forest 3-D green surface area required additional manipulation. By visual inspection, it was observed that the forest area on the northwestern sector of the campus included much shrubbery beneath it (Figure 6, b). Even though this underbrush is not visible by satellite imaging, it does contribute significantly to the greenery on campus. It was then decided that the team should estimate by visual inspection, to the best approximation possible, what excess percentage of the forest canopy constituted the underbrush. Three independent observations by three persons coincided that this shrubbery was approximately equal to  $\frac{3}{4}$  of the forest canopy. The canopy of the vast majority of the forest trees was estimated to best approximate a full sphere. The diameter of each forest tree canopy was recorded and the total forest canopy area was calculated (Table 8). This number was then multiplied by 1.75 (1 from full sphere canopy plus 0.75 from shrubbery), to yield a total of 461,396.2 m<sup>2</sup> ( $\pm$  7%). This number was then added to the total of individual tree and palm canopy area, to yield a total of 731,136.93 m<sup>2</sup> ( $\pm$  7%), which represents the 3-D green surface area of greenery on STU.

## **Combining Phase I and Phase II**

Phase I sought to calculate the planar “lawn” area of STU; this yielded approximately 416,031.8 m<sup>2</sup>. Phase II sought to calculate the 3-D “canopy” area on campus; this yielded approximately 731,136.9 m<sup>2</sup>. Together, these two measurements resulted in 1,147,168.7 m<sup>2</sup> (Table 9). Comparing this number to the initial total campus surface area of 503,649.9 m<sup>2</sup>, it represents a greenery overage of about 128%  $\{[(1,147,168.7/503,649.9) 100] - 100 = 127.8\}$ .

## **Contrasting Green Area versus Grey Area**

Phase I yielded a total of approximately 118,813.5 m<sup>2</sup> of grey area at STU. Phases I and II yielded a total of approximately 1,147,168.7 m<sup>2</sup> ( $\approx 12,348,021$  sq ft) of green area. When these two numbers are contrasted, it gives a ratio of about 1:9.7 (Table 9). This means there is almost 10 times more green surface than grey surface on campus, including all rooftops, roads, parking lots, and sidewalks within the property. For an urban campus that is surrounded by residential, commercial, and industrial neighborhoods, this ten-fold ratio of greenery over build area can have only very positive implications and value, as is discussed next.

## **Discussion and Conclusion**

When one observes a relatively large area of vegetation within an urban setting, perhaps one of the first thoughts that comes to mind is how much oxygen (O<sub>2</sub>) that patch of greenery is producing. The production of O<sub>2</sub> by trees varies greatly according to species, size, maturity, light exposure, and other variables. Even so, one reported O<sub>2</sub> production average by urban trees in the United States is about 49.2 kg ( $\approx 108.5$  lbs) per tree a year (Nowak, Hoehn, & Crane, 2007). Phase II of this project revealed a total of 1,788 trees on campus. This translates into a capacity to generate roughly 87,969.9 kg ( $\approx 97.0$  tons) of O<sub>2</sub> annually. However, considering the earth’s atmosphere is approximately 21% O<sub>2</sub>, the amount generated at STU is negligible. More significant would be the amount of greenhouse gases, such as carbon dioxide (CO<sub>2</sub>), sequestered by the greenery on campus.

It has been estimated that, on average, a mature tree can sequester about 23 kg ( $\sim 51$  lbs) of atmospheric carbon dioxide (CO<sub>2</sub>) per year (Broward County, 2012). Multiplying this number times the number of trees and palms on campus (1,788) gives a total of about 41,124 kg ( $\approx 45.3$  tons) of CO<sub>2</sub> absorbed annually. In addition, Phase I of this project revealed approximately 416,031.8 m<sup>2</sup> of 2-Dimensional green space (mostly grasses). Also, it has been estimated that, on average, one square meter of lawn grass can sequester approximately 0.14 kg of CO<sub>2</sub> annually (Trumbore, Czimczik, & Townsend-Small, 2009). Therefore, the STU lawn can absorb about 58,244.5 kg ( $\approx 64.2$  tons) of CO<sub>2</sub> yearly. Together, then, the 3-D plus the 2-D green surface area of STU can sequester roughly 110 tons of atmospheric CO<sub>2</sub> annually. Being located adjacent to a major urban expressway and a commercial airport, the greenery on campus is making a significant contribution in ameliorating the air quality of the neighborhood.

Three-dimensional green space is also very efficient in trapping airborne chemicals and particulate matter harmful to one’s health. The U.S. Environmental Protection Agency (EPA) reports there are six major air pollutants in urban areas: Carbon Monoxide (CO), Nitrogen

Dioxides ( $\text{-NO}_2$ ), Sulfur Dioxides ( $\text{-SO}_2$ ), Ozone ( $\text{O}_3$ ), particulate matter, and Lead (Pb) (U.S. Environmental Protection Agency, 2012a).

CO is an odorless and colorless gas emitted by combustion engines; it can be a major health hazard by interfering with the normal delivery of oxygen to organs and tissues of the body, and at high concentrations, it can cause death (U.S. Environmental Protection Agency, 2012b).  $\text{NO}_2$  and  $\text{SO}_2$  are highly reactive gases that also produced by combustion engines; they are major irritants of respiratory airways, particularly for asthmatics (U.S. Environmental Protection Agency, 2012c). In addition,  $\text{NO}_2$  can react with volatile organic compounds to produce  $\text{O}_3$ , which also can cause respiratory ailments, such as chest pain, coughing, throat irritation, and congestion, and can worsen bronchitis, emphysema, and asthma (U.S. Environmental Protection Agency, 2012d). Particulate matter is defined by the EPA as a mixture of extremely small particles ( $< 10 \mu\text{m}$ ) and liquid droplets; they can lodge deep into the lungs, and even enter the bloodstream, which can cause damage to the heart and other vital organs (U.S. Environmental Protection Agency, 2012e). Finally, Pb can be found in the air, drinking water, food, paint, soil, and dust; it can accumulate in bone tissue and can adversely affect kidney function, and the immune, nervous, reproductive, and cardiovascular systems (U.S. Environmental Protection Agency, 2012f).

All these common air pollutants, which tend to be more abundant at or near highways and airports, are effectively trapped and filtered from the air by trees and shrubs. The STU campus developed just south of a major six-lane urban highway (SR 826), which services commercial and industrial areas of Miami-Dade County, and thus sustains constant heavy traffic of cars and trucks. It is not by accident that the highest concentration of mature trees and the standing forest on campus expand the entire width of the northern boundary of campus, which runs parallel and adjacent to SR 826. Hence, this whole northern swath of 3-D green space constitutes the “first line of defense” against harmful pollutants constantly being emitted by this heavily traveled road. In addition, all the trees on campus, but particularly that northern swath of mature trees and forest, serve as a noise-reduction buffer from the constant highway and surrounding neighborhood traffic.

Beyond its anti-pollutant effect, perhaps one of the major contributions of the large amount of greenery on campus (ratio of about  $10 \text{ m}^2$  of vegetation for every  $1 \text{ m}^2$  of built area) is its educational, aesthetical, and ecological value. While driving or walking through the forested area from the main entrance to the built area on campus, one cannot help but admire the natural beauty of the greenery, with one of the very few remaining original strands of Dade County slash pine forests on one side and a shady grove of live oaks on the other. This natural beauty, in turn, within an academic setting of higher learning, lends itself to the promotion of conservation of the natural environment, and to thinking about alternative sources of energy that are not dependent on fossil fuel combustion. In fact, along the southern edge of the pine forest, one notices a small green house with solar panels on its roof. This is a prototype model solar research station: The one-room house is powered totally by photovoltaic cells affixed to its roof; it is fully air-conditioned and even feeds excess electricity into the main power grid of the university.

Overall, then, this SRI 2012 Green-Space Project at St. Thomas University has helped raise an awareness of the following: the large amount of vegetation on campus; its essential role in promoting health and wellbeing, not only for the hundreds of people who visit, study or work on campus daily, but also for the surrounding neighborhood and region; the educational value of all this greenery; the need to pursue alternative energy sources that are independent of fossil

fuels; the need for a comprehensive program of *P. elliottii* reforestation in urban areas, due to encroachment; and an appreciation for the beauty and usefulness of the native vegetation in South Florida, especially when it is allowed to grow to the level of a highland climax community.

#### Personal Note

One July morning of 2012, there was a thunderstorm and heavy rainfall on the STU campus –typical for summertime here. This professor was in his office, working. The large picture window in his office faces toward the northern swath of campus where a number of free-standing mature slash pines stand tall. All of a sudden, a flash of lighting came thundering down on one of the pine trees, just about 200 meters away from his window. In the blinking of an eye, that tree lit up in a bright yellow-orange ball of fire. The next second, the fire was gone, the downpour continued, and the pine tree stood there as if nothing had happened. After the rain subsided, this professor went to visually inspect the tree, and all he found was a wide scar that serpentine the trunk from the upper branches to its base; could it be that this old giant managed to survive the wrath of one of the greatest forces of nature?

For the following weeks, this professor stared daily with hope at the full green canopy of the impacted tree: so far, so good. But then, one morning of September, a few brown needles appeared at the distal end of one of the long, lower lateral branches. Browning progressed steadily, and by October, the tree was dead....Today, October 29, 2012, the skeleton of that majestic giant was cut down, leaving only a large clearance, full of sawdust, amid the strand of its neighboring giants. In my opinion, that clearing begs for a *P. elliottii* seeding...

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### Discussion Questions

1. Acknowledging that urban forests have a high personal and social value, and that they are increasingly rare due to expanding urbanization; what incentives do you think can be provided to communities living next to or near urban forests, in order to help preserve that greenery?
2. Assuming that most people living in urban areas nowadays have relatively easy access to the web; based on what you have learned from reading this article, how can you encourage others to calculate the two-dimensional and three-dimensional green-versus-grey area ratio of greenery around their local neighborhood?
3. What level of responsibility do you believe that local, county, state and federal government agencies should have regarding the preservation of urban greenery?

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***Cypress Magic*** (Everglades National Park, Florida)  
Photograph by Susan S. Buzzi

The magical, mystical “*River of Grass*”...holds indescribable beauty and serenity, as well as intrigue and mystery.

Image Copyright © by Susan S. Buzzi.  
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## **Advocacy, Charity Fundraising, and Sport: A Reflection**

**Renée Victoria Hoyos**  
*Tennessee Clean Water Network*

The Tennessee Clean Water Network (TCWN) is a 501(c)3 environmental advocacy group working to protect water quality in Tennessee. As an advocacy organization in the south, there are difficulties fundraising for an organization that uses the courts to protect the public's environmental rights. These activities seem to discourage success from traditional fundraising activities such as major donor acquisition and membership as the public culturally is squeamish about lawsuits and lobbying. As a result, TCWN must rely on creative fundraisers to bring the public to its mission. Recently TCWN, in partnership with Dynamic Dragon Boat Racing LLC and Duncan-Williams, Inc., produced the Duncan-Williams Dragon Boat Races in Memphis, Tennessee, to raise money for the organization, promote awareness of water quality issues in Tennessee, encourage healthy living and fitness, and have a good time on the water.

Dragon boat racing is especially well suited to charities involved in water pollution and restoration activities. Getting people on the water helps create an appreciation for the condition of our rivers and streams. The Duncan-Williams Dragon Boat Races takes place in the fall of each year on the Wolf River Harbor adjacent to the Mississippi River. This location provides an excellent backdrop to educate the public about water quality and water quantity with the mighty Mississippi on one side of the venue and the Wolf River Harbor on the other side.

In the first year of the dragon boat race in Memphis, 2011, TCWN was in negotiations with the City of Memphis for violating the Clean Water Act by allowing raw and partially treated sewage to flow in the Wolf River, Nonconnah River, and Loosahatchie and Mississippi Rivers. A sign discouraging people from eating the fish from that body of water greeted paddlers on their way to the loading dock. During team practices, this author explained in detail the problems with water quality in the Wolf River Harbor and other urban streams to each team that practiced. After the race, this author conducted surveys using a standard questionnaire to evaluate the race. TCWN personnel delivered these questionnaires in person to either team captains or entire teams. TCWN personnel evaluated results and made changes to the following year's race. One question was devoted to the educational component. To a one, each team identified they learned

a great deal from the educational component, and many changed behavior because of the activity presented on race day.

In the second year, TCWN offered an educational activity around using less bottled water. TCWN asked participants to take a “Clean Water Pledge” and receive a refillable water bottle in return. More than 500 people took the pledge. The pledge had more than 30 questions. Only a few questionnaires remained incomplete. TCWN conducted observations at the booth, and these indicated the participants took time to consider each question, asking for clarification or contributing their insights to their behavior or others behavior on certain questions. In calculating the results, TCWN determined if the participants did half of what they pledged to do, they could reduce water consumption by about 12 million gallons in one year. The event is now a permanently ‘bottled-water-free’ event.

In the third year, TCWN used the race to educate the public on the effects of drinking sugary sweetened beverages on obesity and diabetes.<sup>2</sup> Research (The InterAct Consortium, 2013) shows the addition of one sugary sweetened beverage to a daily diet will increase diabetes by 22%. Conversely, the reduction of one sugar sweetened beverage to a daily diet will *halt* obesity in 90% of the affected population (Hill, Wyatt, Reed, & Peters, 2003). Our goal was to encourage the drinking of water, instead of a sugar-sweetened beverage. The booth had a drinking water taste test in which participants had to identify which water sample was Memphis drinking water (from the great Sand Aquifer) and which was a sample from generic bottled water. One hundred people correctly identified Memphis drinking water, and 75 people incorrectly identified bottled water as tap water. One hundred out of 185 people preferred Memphis drinking water to bottled water. Four hundred fifty participants took a survey about their opinions of public drinking fountains. TCWN now is calculating the survey data, and it will use it to inform its “Bringing Tap Back” project to encourage drinking water from drinking fountains.

In team interviews after the race, TCWN asked teams or team leaders an open-ended question on the educational component of the race. In the two years of conducting these surveys, all teams answered affirmatively regarding the educational question. In conversation, many participants added further information about their changed behavior or increased awareness and about their gratefulness that we do this work. During the event, participants pointed out to TCWN staff and board members that they are participating by not bringing bottled water to the event and that they want positive feedback from us regarding this behavior.

There have been a number of research findings, to date largely on rats and mice, indicating that exercise increases brain function (Hillman, Erickson, & Kramer, 2008; Brisswalter, Collardeau, & René, 2002). One study (Radák, Kaneko, Tahara, Nakamoto, Pucsok, Sasvari, Nyakas, & Goto, 2001) using mice alluded to an increased ability to learn from a task when strenuous exercise enriches an environment. This author could find no research directly correlating increased openness to new ideas to increased exercise. However, an event with an atmosphere of fun and games with an exercise component, the TCWN thinks allows it to insert its mission to an audience. The TCWN likely would not reach these participants using conventional outreach techniques such as hearings and neighborhood meetings where the public is facing a threat to their water resources. Furthermore, the sheer size of the event allows us to touch more than 10,000 people in one day who hear about our work over the public announcement system at least 10 times during the day of the race.

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<sup>2</sup> The author gratefully acknowledges the research assistance of Melnick, P.A.

Charities would do well to maximize their recreational fundraisers with an educational activity that builds awareness to their mission into the event. The state of the brain after a strenuous race may play a role in how people respond to a novel idea and may have a positive effect on how they view the organization and its work, even though some may consider that work controversial. The TCWN has had tremendous success building organizational and issues awareness at the Duncan-Williams Dragon Boat Races by building on each interaction with participants by explaining our mission and what we do statewide during the practice sessions; having an educational component at the races so paddlers and their families, friends, co-workers, and spectators can participate; and, following up with teams to see what kind of impact the event and its educational component had on them. These extra activities can help make the event more fun for the public while increasing exposure to the charity and advancing its mission—A win-win combination.

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Renée Victoria Hoyos (renee@tcwn.org) became the Executive Director of the Tennessee Clean Water Network (TCWN) in October 2003. Her primary duties at TCWN are fundraising, conducting limited policy work, coordinating outreach, editing *The Current*, TCWN's thrice-yearly newsletter, and public speaking. She is also the board president of the national Clean Water Network in Washington, D.C. Renée previously worked with the California Resources Agency and served as Special Assistant to Secretary Mary D. Nichols for Watersheds and Outreach. Renée holds a Masters of Agriculture and Management degree (with concentration in nonprofit organization management) as well as a Masters of Avian Science degree, both from the University of California in Davis. Renée enjoys rafting, hiking, kayaking, and skiing. She is a member of the National Ski Patrol and patrols on the weekend at Cataloochie Ski Ranch in Maggie Valley North Carolina. Currently, she is the Chair of the Knoxville Transportation Authority and is a member of the Knox County Charter Review Committee, both in Tennessee.

### Discussion Questions

1. How do you use your event to further your mission?
2. What role can an athletic event play in forwarding your mission?
3. How does your organization touch everyone at your athletic fundraiser? How do you reach participants with your mission? How do you reach spectators? How do you reach sponsors?
4. How can you increase your sponsor's role in your mission outside of the event?
5. How can you add an exercise-movement component to your current non-athletic fundraiser? (For example, before our annual dinner, we serve hors d'oeuvres such that the diners must walk to get to them.)

### To Cite this Article

Hoyos, R. V. (2013, Fall). Advocacy, charity fundraising, and sport: A reflection. *Journal of Multidisciplinary Research*, 5(3), 111-114.

## Book Review

### Book Details

Ferguson, A. (2013). *My autobiography*. London: Hodder & Stoughton, 402 pages, paperback, \$29.95, ISBN-100340919396.

### Reviewer

Larry Treadwell, M.A. Library & Information Science.

### Synopsis and Evaluation

It is arguable whether Manchester United is the most successful and storied sports club as Real Madrid, Barcelona, and Bayern Munich at times have vied for that honor. In January 2013, *Forbes* reported that Manchester United had a value of over \$3 billion and was the first sports franchise to reach this valuation. In November 2013, Manchester United reported record revenue for its first quarter as the club continues to strive to be the largest, most valuable, and most successful club in the world of sports. While many have contributed to the legend, mystique, and success of Manchester United, one man has been the architect of that success, and he is Sir Alex Ferguson.

No manager in any sport has ever been as successful Sir Alex Ferguson. He began his managerial career in Scotland before moving to Manchester United in 1986 where he remained until 2013. He famously has said that when he arrived at Manchester United, he was there to knock Liverpool off its perch. During his time at Manchester United, he won the Premier League 13 times, the FA Cup 5 times, the League Cup 4 times, The Champion's League 2 times, the Community Shield 9 times, and the Intercontinental Cup, FIFA Club World Cup, European Super Cup, and the European Cup Winner Cup once – totaling 38 pieces of silverware. Under his guidance, he more than knocked Liverpool off its perch: He transformed Manchester United into his own image. He became the most successful manager in history, and Manchester United became the most successful English Club in history.

There have been many iconic names amongst the ranks of U.S. coaches – Phil Jackson, Vince Lombardi, Mike Krzyzewski, Chuck Noll, and Don Shula to name but a few. None of these men has matched Sir Alex Ferguson's longevity, number of wins, and collection of silverware. Neither have they made their respective teams into a global force and brand. The product of a sports franchise is its production on the field. It was his leadership and vision that led to Manchester United's success on the field, and it was this guidance that propelled Manchester

United into the global force in business and sport that it is today. This unique level of success and leadership was recognized by the Harvard Business School. In 2013, the Harvard Business School invited Sir Alex Ferguson to participate in lectures on leadership and produced a case study for the education of leaders based on his leadership model of Manchester United.

Sir Alex Ferguson's retirement in 2013 surprised the sporting world. When he retired, he was amongst the most respected and admired managers to have been involved in any sport. The world may never again see a coach with his charisma, leadership skills, and vision for success. *Alex Ferguson: My Autobiography* is his story, the story of how he built Manchester United in his image, and how he began his post-playing career from the humble origins of managing in Scotland with East Stirlingshire, while simultaneously running two pubs in the stockyards district of Glasgow. Each step he took built upon his previous success and lessons. From East Stirlingshire, he moved to St. Mirren, and from there to Aberdeen, and from Aberdeen, he was given the task of restoring glory to Manchester United and returning it to its proper place of prominence and dominance amongst the elite clubs in the world. During his time, he led some of the biggest names in sports: Ronaldo, Wayne Rooney, Rio Ferdinand, Ryan Giggs, Jam Staap, and David Beckham. The lessons his leadership imparts are those of loyalty, family values, rewarding those for their contributions, the importance of trust and candor, embracing change and developing the expertise, experience, and courage to make decisions. Most important, always believe you can win and succeed. He instilled these beliefs in his teams. They trusted him and each other, and they believed they would win. No matter the score or the situation, the last 15 minutes of a match were his team's defining moments. They simply believed. It didn't always happen, but his teams believed and followed where he led. The belief was so strong that the opposition believed as well. The opposition never won, they survived.

Recommended for universities with business, sports administration, and leadership programs, especially in combination with the *Harvard Business Review* case study.

### **In the Author's Own Words**

"Football management is a never-ending sequence of challenges. So much of it is a study in the frailty of human beings" (p. 26). "I decided right away that in order to build trust and loyalty with the players, I had to give it to them first. That is the starting point for the bond on which great institutions thrive" (p. xii). "Some people walk into a room and don't notice anything. Use your eyes; it's all out there" (p. xii). "Origins should never be a barrier to success. A modest start in life can be a help more than a hindrance" (p. 15). "One asset I possessed when I started as a manager was that I could make a decision. I was never afraid of that even as a schoolboy picking teams" (p. 31). "No matter how good your CV there are moments when you feel vulnerable, exposed...In management you have to face that isolation" (p. 38). "The thing every good leader should have is an instinct" (p. 236). "There's no secret to success in this world. The key is graft" (p. 146). "Yet when you are managing change, you have to accept the quieter spells and acknowledge that transformations take longer than a year" (p. 133).

"If you want my summary of what it was to be Manchester United manager, I would direct you to the last 15 minutes...I always took risks. My plan was: Don't panic until the last 15 minutes, keep patient until the last quarter of an hour, and then go gung-ho" (pp. 45-46). "I couldn't take sides against my players. I had to find solutions other than castigating them in public. Sometimes I had to fine or punish them, of course, but I could never let it out of the

dressings room. I would have felt I had betrayed the one constant principle of my time as manager: to defend. No not to defend but to protect them from outside judgments. That's Manchester United. This is a club which bases all its history and its tradition on the loyalty and trust between managers and players and the club" (p. 333).

### **Reviewer's Details**

Larry Treadwell IV (ltreadwell@stu.edu) is an Associate Professor at St. Thomas University, in Miami Gardens, Florida. His research interests are multidisciplinary in nature and concentrate on the collaboration with the library and faculty of other disciplines, such as counseling, religion, education, and business.

### **To Cite this Review**

Treadwell, L. (2013, Fall). [Review of the book *My autobiography*, by A. Ferguson]. *Journal of Multidisciplinary Research*, 5(3), 115-117.



*Respite* (Mendenhall Glacier, near Juneau, Alaska)

Photograph by Susan S. Buzzi

At the foot of the glacier...peaceful and majestic, yet a constant reminder of an impending environmental tragedy.

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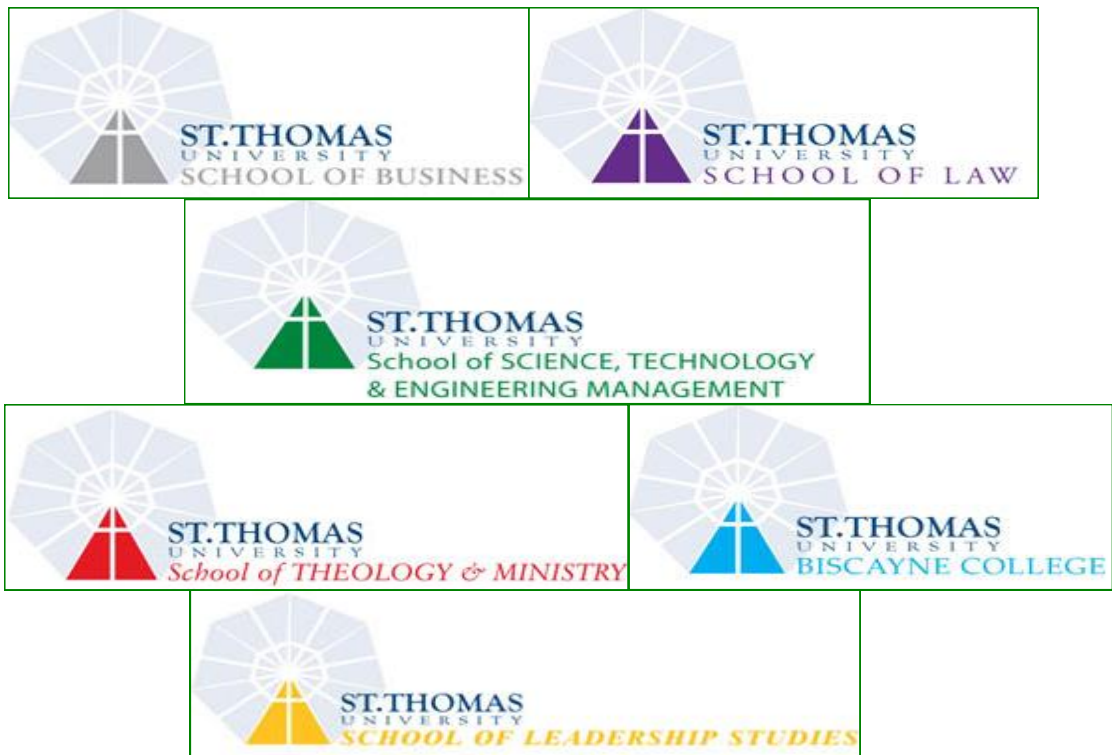
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