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Title:

**An Evolutionary Psychology Perspective on Physical Exercise Motives: Implications for
Social Marketing**

Running Title:

An Evolutionary Psychology Perspective on Exercise

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An Evolutionary Psychology Perspective on Physical Exercise Motives: Implications for Social Marketing

Abstract

This study uses the theoretical framework of evolutionary psychology to examine the motives driving physical exercise behavior, as evolutionary psychology is still under explored in the social marketing literature. The study employs a survey that draws on a sample of 220 participants. Independent sample t-tests and analysis of variance are conducted, and findings show significant sex and marital status differences in terms of motivations to exercise. Research findings have original implications for social marketing interventions that seek to understand physical exercise motivations, and to encourage increased levels of physical exercise. Further, findings contribute to the extant literature by establishing the importance of sex-based segmentation strategies, and message appeals that resonate with specific segments' innate physical exercise motives.

Keywords: Evolutionary Psychology, Social Marketing, Physical Exercise

An Evolutionary Psychology Perspective on Physical Exercise Motives: Implications for Social Marketing

Introduction

Social marketing refers to “a process that applies marketing principles and techniques to create, communicate, and deliver value in order to influence target audience behaviors that benefit society as well as the target audience” (Cheng, Kotler, & Lee, 2009, p.2). Previous research highlights that social marketing adopts a customer-oriented approach (Peattie & Peattie, 2009) and uses various marketing methods to influence change in individual and group behaviors for a social good (Hastings, 2003; Lefebvre, 1992; Andreasen, 2006).

Social marketers develop programs and interventions to understand, influence, and change a varied spectrum of social and health behaviors (French, Blair-Stevens, McVey, & Merritt, 2010; Gordon, McDermott, Stead, & Angus, 2006; Hastings & Saren, 2003; Hastings, Angus, & Bryant, 2011; Peattie & Peattie, 2009). To design such programs that explain and promote psychological and behavioral changes, social marketers have used commercial techniques such as the ‘4 Ps’ (Wood, 2008), but also more integrative theoretical frameworks including social cognitive theory (Bandura, 2001), the theory of reasoned action (Ajzen & Fishbein, 1980), the theory of planned behavior (Ajzen, 1991; Rhodes, Blanchard, & Hunt Matheson, 2006) and self-determination theory (Deci & Ryan, 1985; 2001; 2008). Although social marketing has achieved wide recognition for adopting such approaches to understanding social and health behaviors, as well as for promoting social change (Andreasen, 2003), limited attention has been dedicated to alternative perspectives that explain social and health behaviors within the extant literature. One

of these alternative perspectives is evolutionary psychology, which is still an emerging paradigm in psychology-informed disciplines (Saad & Gill, 2000).

Evolutionary psychology is said to explain all aspects of human nature and behavior (Akiskal & Akiskal, 2005). For example, research in psychology and psychiatry has shown that evolutionary psychology explains personality traits, emotions, temperament and character, including variety and novelty seeking behaviors, harm avoidance, and reward dependence (Nesse, 1990; Cloninger, Svrakic & Przybeck, 1993; Kluger, Siegfried & Ebstein, 2002; Savitz & Ramesar, 2004; Schinka, Letsch & Crawford, 2002). Other research has also shown that evolutionary psychology can explain certain personality traits, as well as behavioral and health disorders (Akiskal & Akiskal, 2005). For example, research has shown that genetic effects explain alcohol usage, susceptibility to, and dependency on alcohol (McGue, 1999; Heath, 1995; Dick & Foroud, 2003). Further, evolutionary psychology has been studied in other disciplines to explain behaviours, such as political sciences and marketing. Specifically, research has found a link between evolutionary psychology, and political views and behaviors, which manifest due to personality traits such as openness, and authoritativeness (Klemmensen, et al., 2012; Hatemi, Byrne & Mc Dermott, 2012; Settle et al. 2010). Similarly, Saad and Gill (2003) have used evolutionary psychology to explain gift-giving behavior between males and females. Given the broad spectrum of behaviors and human aspects that evolutionary psychology covers, this perspective can rationalize health-related actions through a multitude of Darwinian aspects including status, risk-behaviors, and power. On this basis, evolutionary psychology can offer an innovative approach to social marketing issues. However, this study focuses only on the reproductive strategies and sexual behavior aspects of evolutionary psychology to explain

physical exercise, primarily because this work is based on the research of Saad and Peng (2006). In this way this paper offers alternative explanations with important implications for targeted social marketing intervention strategies.

Saad and Peng (2006) suggest that the lack of success of many public and social marketing intervention programs emanates from an inadequate understanding of the innate motives which drive people to engage in unhealthy behaviors. Additionally, Saad (2006, p. 197) suggests that “to develop appropriate intervention strategies (e.g. public service announcements) requires that we comprehend the ultimate Darwinian-based motives behind such behaviors.” According to the author, most intervention programs and campaigns adopt an “economics-based viewpoint” (Saad, 2006, p. 197), and assume that the lack of information explains individuals’ engagement in sub-optimal behaviors such as unhealthy eating and smoking, among others. Evolutionary psychology has the potential to offer plausible explanations for sex and marital status differences in motives to engage in health behaviors, as it seeks to answer why specific cognitions, emotions, or behaviors exist (Saad & Gill, 2000). Yet, this perspective has been underexplored in the social marketing literature.

Therefore, this study uses evolutionary psychology as the theoretical perspective to explain physical exercise motives. This context was selected given that the lack of physical exercise is linked to obesity, which has risen globally in the last 20 years. Indeed, North America and European countries have a high number of obese citizens, that is, people with a Body Mass Index (BMI) above 30kg/m² (NHS, 2010; WHO, 2011). Additionally, the social marketing literature currently lacks comprehensive understanding of the psychological determinants of physical

exercise, which would allow for the design of effective interventions to promote physical exercise to both children, and adults. Bui, Kemp and Howlett (2011) argue that limited research in the domain of marketing has focused on the intrinsic, psychological factors that impact physical exercise. This study draws from and extends the work of Saad (Saad, 2004; 2006) and Saad and Gill (2000; 2003) in the area of evolutionary psychology by focusing on how evolutionary psychology can offer insights to social marketers. It differs from previous social marketing studies on health behaviors, as it contributes to knowledge by drawing on evolutionary psychology, and by focusing on sex, and marital status, to explore differences regarding motivations to exercise. The paper discusses the extant literature, methodology, and data analysis below, concludes with a discussion of the findings through an evolutionary psychology lens, and addresses implications for social marketing practitioners, as well as areas for future research.

Physical Exercise

Previous research has used protection motivation theory, the theory of reasoned action, and the theory of planned behavior (Milne, Orbell, & Sheeran, 2002; Blue, 1995, Godin, 1993; Jackson, Smith, & Conner, 2003; Rhodes, Blanchard, & Hunt Matheson, 2006; Hagger, Chatzisarantis, & Biddle, 2002; Housenblas, Carron, & Mack, 1997; Courneya, 1995) to explain intention to exercise. This stream of research shows that attitudes, subjective norm, and perceived behavioral control impact intention to exercise (Blue, 1995; Godin, 1993; Conner & Norman, 2005). Additional psychological variables such as self-identity, moral norms, and self-efficacy have also been examined with regards to their impact on physical exercise (Jackson, Smith, & Conner, 2003), and previous research supports that motivation is an antecedent to exercise (Ulbrich, 1999).

According to self-determination theory (Deci & Ryan, 1985; 2001; 2008), intrinsic and extrinsic motives refer to the foundation of the desire to engage in a particular behavior (Calder & Shaw, 1975). Intrinsic motives are those which lead to rewards that are internal to the individual, whilst extrinsic motives lead to external rewards or punishment (Deci & Ryan, 1985). Research suggests that individuals exercise for intrinsic motives including health and fitness, socialization, enjoyment and self-image, as well as extrinsic motives such as appearance and attractiveness, social recognition, and externally-imposed health motives (Gould, 1990; Willis & Campbell, 1992; Davis & Cowles, 1991). Additionally, intrinsic and extrinsic exercise motives lead to different outcomes, including intention to engage in, commitment to, and long-term maintenance of exercise behavior (Deci & Ryan, 1985; Frederick & Ryan, 1993).

Previous research using the transtheoretical model of behavior change (Prochaska & DiClemente, 1983) links intrinsic and extrinsic motives to different stages of behavioral change, namely pre-contemplation (when people are not thinking about changing their behavior), contemplation (when people are seriously considering changing their behavior), preparation (when they have tried to alter their behavior, and are seriously considering trying again in the short-term), action (when behavioral change has occurred in the last six months), and maintenance (behavioral change has been maintained for more than six months) in the context of intention to engage in physical exercise (Ingledeew, Markland, & Medley, 1998). Ingledeew, Markland and Medley (1998) argue that extrinsic motives (e.g., appearance, weight management) are more relevant in the earlier stages of change (e.g., pre-contemplation), whereas intrinsic motives (e.g., enjoyment) are more valid to the later stages of change (e.g.,

maintenance). Although much research has been done in this area, less attention has been dedicated to exploring motivations to exercise from other theoretical perspectives, including evolutionary psychology.

Evolutionary Psychology

Evolutionary psychology is based on Darwin's (1859) theories about natural selection and the evolution of species, which have only recently been employed to investigate human psychology (Saad, 2004). It combines the fields of cognitive psychology and evolutionary biology (Saad & Gill, 2000), provides insights into human thought processes, preferences, and behaviors (Lynn, Kampschroeder, & Pereira, 1999), and is concerned with "the fundamental biological and evolutionary characteristics" of organisms; in this case, humans (Hantula, 2003, p.758). Evolutionary psychology endeavors to explain behavior in relation to 'genetic' cognitive, perceptual and/or motivational processes, including desires, and attitudes (Jackson, 2005), which developed through natural, and sexual selection as adaptive responses to ancestral environmental circumstances and pressures (Lynn, Kampschroeder, & Pereira, 1999; Jackson, 2005; Saad & Peng, 2006). Further, this theoretical perspective acknowledges that humans have biologically evolved, and adapted over millennia to function in environments that no longer exist; environments that have changed much more radically, and dynamically than the sluggish process of natural selection (Hantula, 2003). Although cultural evolution has helped to devise structurally sophisticated, collective solutions to what in past environments posited huge challenges to humans (e.g., finding food, mating), functionally individuals still face similar challenges, and respond to them using the same basic range of behaviors (Hantula, 2003). Just as the environment selects for and against specific physical characteristics of a species, the same

process of selection occurs with psychological and behavioral features (Hantula, 2003).

As suggested by Lynn, Kampschroeder and Pereira (1999), evolutionary psychology relies on five key concepts. The first concerns innate characteristics, which are characteristics that are the product of human genes, and go hand in hand with the environment in which humans have evolved. Evolutionary psychology sees genes, and environment as interacting constructs that must be considered together for reasonable explanations of the human psyche to emerge (Lynn, Kampschroeder, & Pereira, 1999). The second concept entails perceptual, cognitive, and motivational mechanisms, which concern the innate, psychological processes through which humans gain and process information about their environment, in a manner that facilitates adaptive behavior (Lynn, Kampschroeder, & Pereira, 1999). The third concept refers to evolution through natural selection, which in essence contends that genetic changes ‘drive’ the evolutionary process, while competition for reproduction and survival ‘directs’ the process of evolution; this is what has been called the survival and reproduction of the fittest (Lynn, Kampschroeder, & Pereira, 1999), or fitness of the organism, which concerns reproductive success (Saad & Gill, 2000). Adaptations are the fourth concept, and encompass three types of genetic adaptations (Lynn, Kampschroeder, & Pereira, 1999). The first type includes product-adaptations, which are inherited characteristics of a species that are developed by natural selection in order for organisms to deal with long-term problems encountered by their ancestors during the species’ evolution (Lynn, Kampschroeder, & Pereira, 1999). The second type entails by-product adaptations, which are normally-occurring genetic features of a species that are naturally selected by the evolutionary process, not because of their evolutionary functionality, but because they are bundled with important product-adaptations (Lynn, Kampschroeder, &

Pereira, 1999). The third type is noise, which regards random characteristics that are passed on to new generations of a species, but have no real evolutionary or reproductive purpose (Lynn, Kampschroeder, & Pereira, 1999). The final concept refers to ancestral conditions, which regard the fact that natural selection generates adaptations only for long-standing issues, as complex adaptations take millions of years and generations to evolve (Lynn, Kampschroeder, & Pereira, 1999).

Physical Exercise from an Evolutionary Psychology Perspective

In the domain of marketing, evolutionary psychology has been used to examine marketing practices (Colarelli & Dettmann, 2003), to explain sex differences in motives for gift-giving (Saad & Gill, 2003), as a framework for neuromarketing (Garcia & Saad, 2008), to explain the representation of women in advertising (Saad, 2004), and as a means to guide interventions (Saad & Peng, 2006). According to evolutionary psychology, certain health behaviors can be sex-related and, thus, can be seen as components of reproductive strategies that impact dominance and mating (Hantula, 2003; Saad, 2006; Saad & Peng, 2006). With regard to physical exercise, authors suggested that exercise behaviour is linked to sex-appropriate strategies for attracting mates (Mealey 1997; Jonason, 2007). Mealey (1997) suggests that exercise behavior is gendered and connected to reproductive strategies, which indicates that exercise behavior can be linked to theories found in evolutionary psychology. The author suggests that men and women adopt sex-specific exercise behavior, and argues that this is due to competition for mates. Similar research by Kilpatrick, Hebert and Bartholomew (2005) also identifies the role of sex in physical exercise, which indicates that men exercise for different reasons compared to women. However,

Kilpatrick, Hebert and Bartholomew (2005) do not link their findings to evolutionary psychology theories.

Further, evolutionary psychology contends that, compared to men, women bear more physical adversity and risk in order to reproduce, cannot reproduce as much, and do not have the same opportunities to leave their offspring behind (Lynn, Kampschroeder, & Pereira, 1999). This means that women are innately more sexually discriminating and selective than men in order to ensure a good genetic endowment for their offspring; this also means that they have innate motives to want long-term relationships, that is, partners who will stay around and help raise the offspring (Lynn, Kampschroeder, & Pereira, 1999). Due to natural selection, women also look for mates who are strong and fit (Saad & Gill, 2000; Lynn, Kampschroeder, & Pereira, 1999). In order to attract such mates, women pay more attention to their physical appearance, which they enhance with 'nubility cues' (e.g. apparel, make-up, diet, physical exercise), as men value their mates' physical attractiveness, and are more sexually attracted by external cues (Symons, 1995; Saad & Gill, 2000). Indeed, it is suggested that both men and women are aware of the opposite sex's preferences (Saad & Gill, 2000). From a Darwinian perspective, physical exercise is related to appearance and health motives, but in this paper it is also suggested that the extent to which exercise relates to appearance and health motives should vary according to marital status. Thus, in line with Jonason, (2007) who found that women focus more on losing weight when exercising, women in this study are likely to exercise for appearance reasons, and to maintain and/or lose weight compared to men. Concurrently, women who are single are more likely to exercise to improve their physical appearance to attract mates, compared to those who are married or in a long-term relationship, who are likely to exercise mainly for health reasons in

order to prepare for reproduction. Thus,

H1: Compared to men, women will exercise mostly a) to improve appearance, and b) to maintain or lose weight.

H2: Compared to married women (and those in a long-term relationship), a) single women will exercise to improve their appearance; and b) married women (and those in a long-term relationship), will exercise mostly for health motives.

Further, compared to women, men have an innate propensity to be more competitive, more aggressive, and have short-term (Saad & Gill, 2000), indiscriminating, variety-seeking sexual behavior, which in the long term enhances a man's reproductive success due to the number of offspring produced (Lynn, Kampschroeder, & Pereira, 1999). This reflects the 'survival of the fittest', which suggests that men are more concerned with physical power, fitness, and endurance (Lynn, Kampschroeder, & Pereira, 1999), achieved through physical exercise. In a similar line, Jonason (2007) suggests that maleness is equated with 'largeness' (e.g. fitness, muscle building exercise), whereas femaleness is equated with 'smallness' (e.g. losing weight). Therefore, from an evolutionary psychology perspective, men are expected to exercise mostly for health and fitness rather than losing weight, irrespective of marital status. Thus,

H3: Compared to women, men will exercise mostly for health and fitness.

H4: Men will exercise mostly for health and fitness motives, irrespective of marital status.

Lynn, Kampschroeder and Pereira (1999) argue that evidence of such innate sexual behaviors is abundant, and that although some would attribute sexual behavior to social and cultural norms, cultural norms may also be genetically-based; a reflection of the genetic and environmental adaptations that humans have undergone over millennia. Indeed, although sex socialization arguments mostly derive from social role theory, evolutionary psychology goes farther and suggests that such socialization processes, as well as traits and preferences, play an important part in sustaining social behaviors that maximize Darwinian fitness (i.e., reproductive success), which is why they were selected during the evolutionary process (Saad & Gill, 2000). On this basis, physical exercise can be seen as a fun process for meeting and attracting mates through socialization (e.g., at the gym), and this should be more salient to individuals who are single. Therefore, single individuals are more likely than married individuals (and those in a relationship) to engage in physical exercise for fun, to socialize, and to attract mates, as singles are more likely to focus on improving their attractiveness and appearance. Thus,

H5: Compared to married individuals (and those in a long-term relationship), single individuals will exercise to improve their appearance and attractiveness; and b) married individuals will exercise for health and fitness.

H6: Compared to married individuals (or those in a long-term relationship), single individuals will exercise for a) socialization and b) fun.

Method

Data was collected from a sample of 220 respondents at three central locations of a large metropolitan city in England. Respondents were approached and asked to complete a questionnaire, and an interviewer was present to answer questions regarding the survey. The data was collected over three days at several times of the day to ensure that a representative sample was obtained. Respondents who exercised due to a sports-related program and/or injury rehabilitation were excluded from the research. The questionnaire was pre-tested, and measures were based on previous research. Both intrinsic and extrinsic motives were captured in line with previous studies (Willis & Campbell, 1992; Courneya & Hellsten, 1998): health/fitness, physical appearance and attractiveness, weight reduction and control, socialization, mental health/stress relief, and fun/enjoyment. Items were measured on 7-point scales (0-6, low-high).

Results

The data consisted of 51% women and 49% men aged 18 and above. With regards to marital status, at the time of the research 40% reported that they were single (or currently not in a relationship, including divorced and widowed), and 60% were married or in a long-term relationship, either living or not living with their partner (table 1).

[Insert table 1 about here]

Physical Exercise Motives by Sex and Marital Status

To examine sex and marital status differences on motives to exercise, independent sample t-tests were conducted. Findings show significant differences between men and women for the appearance motive (F 54.225, $p < .005$) as well as weight (but at $p < .06$), which indicates that women exercise for appearance and weight control compared to men (table 2). These findings, thus, support H1a and H1b at 94% confidence interval. Support for H3 is not found, as no significant differences are reported between men and women in terms of health/fitness. However, the mean values suggest that men indicate stronger motives to exercise for physical and fitness reasons compared to women. Table 3 reports the findings of married (including those in a long-term relationship) and single individuals regarding physical exercise motives. Significant differences are reported between married (including those in a relationship) and single individuals regarding health/fitness (F 5.535, $p < .000$), appearance (F 81.801, $p < .000$), and mental motives (F 2.476, $p < .005$), which supports H5a and H5b. This means that married individuals (including those in a relationship) exercise more for health/fitness and mental health (e.g., stress relief) reasons, while singles exercise more for appearance. However, support is not found for H6a and H6b, as there are no significant differences between married and single individuals regarding socialization and fun motives.

[Insert table 2 about here]

[Insert table 3 about here]

To gain a better understanding of the differences in motives among individuals, responses were grouped by sex (men vs. women) and marital status (5 categories), and analysis of variance

(ANOVA) was conducted to examine differences in exercise motives among those groups. Sex-age differences were not examined given that such differences have already been examined in previous studies (e.g., Kenrick et al., 1995). Findings report significant differences among groups in terms of all exercise motives: health/fitness (df 9, F 12.429, $p < .000$), appearance (df 9, F 23.077, $p < .000$), weight control (df 9, F 7.000, $p < .000$), socialization (df 9, F 5.622, $p < .000$), mental health (df 9, F 9.302, $p < .000$), and enjoyment (df 9, F 4.113, $p < .000$). Table 4 shows the mean values of the different groups. Further, post-hoc tests (Tukey) indicate significant pairwise differences between groups on all motives (tables 5, 6, 7).

[Insert table 4 about here]

ANOVA findings do not provide support for H2a; no significant differences are found for appearance motives between married and single women, and those in a relationship (living or not living with a partner). However, findings report significant differences between married women and single women (but not those in a relationship), thus providing partial support for H2b. Therefore, married women score higher than single women on health and fitness motives. Interestingly, results also show that women in long-term relationships (not living with partners) exercise less than married and divorced women (table 4). In fact, divorced women score the highest on health/fitness compared to all other women. The same is valid for men, with married and divorced men scoring the highest on health and fitness, compared to single men. Therefore, there is no support for H4. In fact, appearance seems to be important for single compared to married men, who score the lowest among the other marital groups.

[Insert table 5 about here]

[Insert table 6 about here]

[Insert table 7 about here]

Discussion

The findings reported above present differences between men and women with regards to motives to exercise. Despite the lack of support for some of the hypotheses (H2a, H3, H4, H6), such sex-related differences in exercise motives can still be explained by evolutionary psychology. Findings confirm that significant sex differences exist only for the appearance motive, whereby women exercise for appearance more than men. This indicates that appearance and physical attractiveness may be more important to women than men. Indeed, evolutionary psychology suggests that women are genetically aware that men value youth and physical attractiveness in their potential mating partners because these characteristics work as proxy indicators for health and fertility, which in turn offers greater potential for reproductive success (Saad & Peng, 2006). Also, the finding that women score high on appearance is in line with the fact that physical attractiveness has been identified as being of great concern to women across many cultures; it is consistent with the argument that the early socialization of women helps them to develop communal (nurturance and yielding) traits, and is aligned to female mating strategies based on looks and youth that aim to facilitate reproductive success (Saad & Gill, 2000).

Significant differences in exercise motives are also evident when marital status is examined in relation to sex. In fact, findings highlight significant sex-marital status differences for all physical exercise motives, which have not been highlighted in previous studies. The analysis also shows that most sex-marital status groups exercise for health-related reasons, which indicates the importance of maintaining good health through physical exercise behavior. Specifically, both men and women score high on health/fitness, which means that this is a relevant motive to both sexes. However, the data also indicates that health and fitness may be more relevant to people in long-term, committed relationships than for single people, and it is also salient to both divorced men and women. Similarly, mental health may be more important for people in long-term relationships and divorcees than for single men and women. Evolutionary psychology would support the proposition that health-related motives such as health and fitness, as well as mental health, are important for people in committed relationships, given that being healthy is in keeping with reproductive success (Saad & Gill, 2000). It can also be argued that health motives are very salient to both men and women divorcees because they are ageing, but are still striving to find mating partners for short-term (men) or long-term (women) relationships.

With regards to physical attractiveness, findings show that women groups score higher on appearance and weight control motives than their respective male groups (e.g. Jonason, 2007). Despite the expected intra-sex differences, such as the fact that appearance is generally important to singles and people who do not live with their partners (probably because of their younger ages), on balance it can be argued that physical attractiveness is important to all women. In fact, for individuals who do not live with their partners the only motive that appears to really matter is appearance. One interesting exception is that men living with their partners score significantly

higher on the appearance motive than their female counterparts. This may relate to an innate fear of 'being tamed.' Indeed, this group represents men who are in long-term, committed relationships, but who are still not married. Therefore, looking good may be their way of conveying their reproductive fitness and availability to women. These findings are consistent with evolutionary psychology in relation to the significant sex differences regarding the appearance motive (Saad & Gill, 2000).

Further, both men and women who are either married or living with their partners score high on enjoyment. Single women and all divorcees also score high on the enjoyment motive. Following evolutionary psychology, it can be argued that both men and women associate enjoyment with physical exercise because they are taking care of themselves (i.e., taking care of their reproductive fitness) in ways that are relevant to their respective mating strategies for reproductive success. Therefore, men can be argued to derive enjoyment from the competitiveness and even aggressiveness (Saad & Peng, 2006; Saad & Gill, 2000) of sports and sporting games, whereas women may enjoy the fact that sports and exercise (at the gym, for example) may provide opportunities for flirting as well as body toning (enhanced physical attractiveness). Finally, only married and divorced participants score high on the socialization motive, with married and divorced men scoring higher than their women counterparts. Indeed, going to the gym and/or engaging in sports-related activities more generally may be the only opportunity for married individuals with children to socialize with people other than their spouses; for divorced people, such activities can represent opportunities to get to know new mating partners.

Conclusion, Limitations and Implications

This study has used an evolutionary psychology perspective and focused on sex and marital status to explore differences regarding motives to exercise. Survey findings report significant sex and marital status differences in terms of motives to exercise. This study differs from previous studies on physical exercise, and contributes to the extant literature by providing an enhanced understanding of the innate motives (Saad & Peng, 2006) that drive physical exercise.

It is important to acknowledge that evolutionary psychology has been widely criticized by interpretivist researchers for being too deterministic (cf. Saad, 2004). However, such criticisms fail to consider that evolutionary psychology accepts the existence of changes and environment-based variations in preferences, albeit at a slower pace, and in different ways, than those discussed by alternative theoretical perspectives. Indeed, evolutionary psychology can shed some new light on the impacts of motivations on healthy behaviors such as physical exercise, and to explain any sex differences that may arise in terms of physical exercise motives.

Limitations and areas for future research

Similar to other studies, this study is not free of limitations. The study has drawn on evolutionary psychology and focused specifically on sex and marital status to examine and explain physical exercise motives. On this basis findings are discussed in relation to evolutionary psychology principles, particularly sexual attraction and mating strategies. While this serves the purpose of this study as explicitly outlined in the introduction, it is recognized that other variables, not examined in this research, may also explain differences in the physical exercise motives between sexes identified in this study. For example, variables such as different levels of health

consciousness, or different health goals, the presence of children, life experiences, as well as environmental psychology traits and temperaments (e.g., novelty and sensation seeking) may explain physical exercise motives. To this end, and given that evolutionary psychology covers a broad spectrum of behaviors dealing with personality traits, temperaments, character, status as well as risk-related behaviors that may be used to explain physical exercise motives, this represents a limitation of the current study. Future research on physical exercise and other health-related behaviors could seek to explore these areas of evolutionary psychology to explain motives of healthiness, attractiveness and enjoyment. Further, the study adopted a convenience sample, which hinders the potential to generalize the findings. Therefore, future research should seek to adopt different types of samples to ensure generalizability. Also, one of the findings in this study warrants further research, that is, the fact that men living with their partners score higher in the appearance motive than their female counterparts. Thus, future studies should look to engage with complementary data analysis techniques, alternative sampling methods, and/or larger samples, which may yield better results, shed some light on such finding, and allow for additional evolutionary psychology explanations to emerge. Further examples of areas for future research include the application of evolutionary psychology to other social marketing and public policy problems, in addition to explorations of message appeals and execution styles that resonate with innate human motives to exercise.

Social marketing implications

Social marketing campaigns aimed at increasing physical exercise can capitalize on such innate, sex-based differences in exercise motives in ways that resonate with contemporary audiences. Evolutionary psychology suggests that humans' decisions to behave in the ways that they do are

impacted by the perceived immediate (reproductive) benefits associated with a particular behavior, as immediate benefits “loom larger than the future risks;” thus, “the immediate reproductive benefits reaped by one’s ability to attract potential suitors are substantially greater than the uncertain risks looming in a distant future” (Saad & Peng, 2006, p. 626). Therefore, social marketers seeking to design effective marketing communications and intervention programs aimed at increasing exercise rates should aim to emphasize the immediate benefits of physical exercise to each sex within marital status segments. For example, intervention campaigns about physical exercise can use specific types of messages linked to Darwinian motives of physical exercise to target different sex-marital status groups (table 8).

[Insert table 8 about here]

On the whole, messages and programs targeting men should focus on relevant enjoyment cues, whereas those targeted at women should emphasize attractiveness through health and fitness, weight control, as well as fun and enjoyment. Indeed, pro-physical exercise messages and intervention programs must go beyond informational methods, and use downstream as well as upstream approaches to foster behavioral change (Verplanken & Wood, 2006) based on the innate motives highlighted in this study.

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Tables

Table 1: Sample Demographics

	N	Percentage
Sex		
<i>Men</i>	108	49
<i>Women</i>	112	51
Age		
<i>18-24</i>	88	40
<i>25-34</i>	33	15
<i>35-44</i>	24	11
<i>45-54</i>	21	9.5
<i>55-64</i>	42	19
<i>65+</i>	12	5.5
Marital Status		
<i>Single</i>	60	27.3
<i>Married</i>	26	11.8
<i>Living with partner</i>	18	8.2
<i>In long term relationship not living with partner</i>	89	40.5
<i>Divorced/separated</i>	27	12.3
Employment status		
<i>Full time</i>	153	69.5
<i>Part-time</i>	23	10.5
<i>Student</i>	39	17.7
<i>Unemployed</i>	5	2.3
Education		
<i>High school</i>	42	19
<i>A-levels/College</i>	51	23
<i>University UG</i>	69	32
<i>University PG</i>	57	26

Table 2: Physical Exercise Motives by Sex

Motives of physical exercise	Men (n= 87)		Women (n= 72)	
	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>
Health/fitness	5.24	1.31	4.88	1.43
Appearance	4.26	1.93	5.14	1.15
Weight	4.39	1.36	4.84	1.55
Social	2.35	1.58	2.23	1.92
Mental	3.78	1.58	3.80	1.95
Fun/enjoyment	4.11	1.45	4.01	1.61

Table 3: Physical Exercise Motives by Marital Status

Motives of physical exercise	Single (<i>n</i> = 61)		Married (in relationship) (<i>n</i> = 98)	
	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>
Health/fitness	4.57	1.45	5.39	1.23
Appearance	5.70	.69	4.02	1.79
Weight	4.54	1.27	4.63	1.58
Social	2.03	1.72	2.46	1.73
Mental	3.26	1.77	4.12	1.66
Fun/enjoyment	4.03	1.37	4.03	1.62

Table 4: Physical Exercise Motives by Sex and Marital Status

Group		Health/ Fitness	Appear ance	Weight control	Social ization	Mental Health	Enjoy ment
MEN							
Single	M	3.77	5.57	4.03	1.34	2.42	3.76
	SD	1.53	7.57	1.39	1.54	1.72	1.53
Not living with partner	M	5.60	4.80	5.20	1.50	5.30	3.90
	SD	.699	1.54	1.22	1.58	.823	1.44
Living with partner	M	5.33	5.50	2.66	1.83	4.66	5.33
	SD	.516	.547	2.58	.983	1.03	.516
Married	M	6.00	2.32	4.58	3.11	4.08	4.20
	SD	.000	1.42	.820	1.29	1.08	1.47
Divorced/widow	M	6.00	6.00	4.81	3.45	4.18	4.18
	SD	.000	.000	1.07	.687	.981	1.40
WOMEN							
Single	M	4.44	5.61	4.72	1.94	3.33	4.38
	SD	1.04	.849	1.07	1.62	1.74	1.09
Not living with partner	M	3.50	5.10	2.80	.40	1.30	1.80
	SD	2.22	1.28	2.04	.516	1.63	1.22
Living with partner	M	4.75	4.66	4.66	2.33	4.33	4.50
	SD	.965	1.07	1.87	1.87	2.14	1.00
Married	M	5.54	4.88	5.61	3.00	4.57	4.19
	SD	1.14	1.27	.697	1.91	1.30	1.72
Divorced/widow	M	5.83	6.00	6.00	2.80	5.00	5.00
	SD	.408	.000	.000	2.68	2.68	1.00

Table 5 Pairwise Differences in Health/Fitness and Appearance by Sex and Marital Status

Motives	Sex/Marital Status		Mean Difference	Std. Error	Sig.	
Health/ Fitness	Single men	Men not living with a partner	-1.831	.398	.000	
	Single men	Men living with partner	-1.564	.485	.048	
	Single men	Married men	-2.231	.279	.000	
	Single men	Divorced men	-2.231	.385	.000	
	Single men	Married women	-1.769	.297	.000	
	Single men	Divorced women	-2.064	.485	.001	
	Men not living with partner	Women not living with partner	2.100	.479	.000	
	Men living with partner	Women not living with partner	1.833	.553	.985	
	Married men	Single women	1.556	.312	.000	
	Married men	Women not living with partner	2.500	.385	.000	
	Married men	Women living with partner	1.250	.360	.023	
	Divorced men	Single women	1.556	.410	.008	
	Divorced men	Women not living with partner	2.500	.468	.000	
	Single women	Married women	-1.094	.328	.035	
	Women not living with partner	Married women	-2.038	.398	.000	
	Women not living with partner	Divorced women	-2.333	.553	.002	
	Appearance	Single men	Married men	3.253	.291	.000
		Men not living with partner	Married men	2.476	.402	.000
Men living with partner		Married men	3.176	.495	.000	
Married men		Divorced men	-3.676	.388	.000	
Married men		Single women	-3.287	.326	.000	
Married men		Women not living with partner	-2.776	.402	.000	
Married men		Women living with partner	-2.343	.375	.000	
Married men		Married women	-2.561	.291	.000	
Married men		Divorced women	-3.67	.536	.000	

Table 6 Pairwise Differences in Weight Control and Socialization by Sex and Marital Status

Motives	Sex/Marital Status		Mean Difference	Std. Error	Sig.
Weight Control	Single men	Married women	-1.576	.351	.001
	Men not living with partner	Men living with partner	2.533	.654	.006
	Men not living with partner	Women not living with partner	2.400	.566	.002
	Men living with partner	Married men	-1.921	.560	.027
	Men living with partner	Divorced men	-2.151	.642	.034
	Men living with partner	Single women	-2.055	.597	.025
	Men living with partner	Married women	-2.948	.573	.000
	Men living with partner	Divorced women	-3.000	.731	.003
	Married men	Women not living with partner	1.788	.455	.005
	Divorced men	Women not living with partner	2.018	.553	.013
	Single women	Women not living with partner	1.922	.499	.007
	Women not living with partner	Women living with partner	-1.86	.542	.025
	Women not living with partner	Married women	-2.815	.471	.000
	Socialization	Single men	Married men	-1.771	.403
Single men		Divorced men	-2.108	.556	.008
Single men		Married women	-1.653	.429	.006
Married men		Women not living with partner	2.711	.556	.000
Divorced men		Women not living with partner	3.054	.676	.001
Women not living with partner		Married women	-2.600	.575	.001

Table 7 Pairwise Differences in Mental Health and Enjoyment by Sex and Marital Status

Motives	Sex/Marital Status		Mean Difference	Std. Error	Sig.	
Mental Health	Single men	Men not living with partner	-2.876	.537	.000	
	Single men	Men living with partner	-2.243	.654	.026	
	Single men	Married men	-1.665	.376	.001	
	Single men	Divorced men	-1.758	.519	.030	
	Single men	Married women	-2.153	.400	.000	
	Single men	Divorced women	-2.576	.654	.005	
	Men not living with partner	Single women	1.966	.570	.025	
	Men not living with partner	Women not living with partner	4.000	.646	.000	
	Men living with partner	Women not living with partner	3.366	.746	.001	
	Married men	Women not living with partner	2.788	.519	.000	
	Divorced men	Women not living with partner	2.881	.631	.000	
	Single women	Women not living with partner	2.033	.570	.017	
	Women not living with partner	Women living with partner	-3.033	.618	.000	
	Women not living with partner	Married women	-3.276	.537	.000	
	Women not living with partner	Divorced women	-3.700	.746	.000	
	Fun/Enjoyment	Single men	Women not living with partner	1.969	.523	.009
		Men not living with partner	Women not living with partner	2.100	.629	.035
		Men with partner	Women not living with partner	3.533	.726	.000
Married men		Women not living with partner	2.405	.506	.000	
Divorced men		Women not living with partner	2.381	.614	.006	
Single women		Women not living with partner	2.588	.554	.000	

Table 8: Proposed Communication Appeals for Social Marketing Campaigns Promoting Physical Exercise

Motives	Focus of Messages	Target
Appearance	Messages emphasizing youth and beauty through exercise	Women
	Messages focusing on exercise as a means to 'remain attractive and available' despite the long-term relationship	Men living with partners
Physical and Mental Health	Messages emphasizing the physical and mental health, and therefore fertility benefits of physical exercise	Men and women who are married or in long term relationships
Physical Health and socialization	Messages emphasizing the health and socialization benefits of physical exercise in enhancing sexual attractiveness after divorce	Divorced men and women
Socialization	Messages focusing on meeting new people and making new friends through sports	Married men and women
Enjoyment	Messages emphasizing competitiveness	Men
	Messages focusing on flirting, fitness, and therefore attractiveness	Women