

Sport and Exercise Psychology*

Perceptions of coaches' social environment: Supporting or thwarting women coaches' psychological needs?

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Coaches have been the focus of considerable research, including examinations of coach behavior, athlete relationships (Jowett & Lavallee, 2007) and coach development (Erickson, Cote, & Fraser-Thomas, 2007), typically with the aim of enhancing the quality of athletes' experience. However, researchers have also argued that coaches should be viewed as performers (Gould, Greenleaf, Guinan, & Chung, 2002) and coaches' psychological needs be considered (Giges, Petitpas, & Vernacchia, 2004). Furthermore, sport organizations' practices and culture influence coaches' experiences and effectiveness (Gould et al., 2002; West, Green, Brackenridge, & Woodward, 2001). Self-determination theory (Deci & Ryan, 2002) has been employed to examine the characteristics of the social environment that support or thwart need satisfaction among athletes (Mageau & Vallerand, 2003) but not for coaches. In addition, there is concern over the under-representation of women in coaching, particularly in high performance sport (Lyle, 2002; Kilty, 2006). Therefore, the purpose of this research was to examine women coaches' perceptions of their sport organizations' social environment, with specific attention to psychological need support. Eight regional high performance women coaches from two sports participated in semistructured interviews. Coaches reported considerable autonomy in their activities; however, for some coaches this was experienced as isolating. All coaches reported opportunities to develop their competence through formal coach education; however, they also expressed a desire for more "informal" learning opportunities. A strong connection with their organization and other coaches was considered important; however, the coaches felt that this was challenging owing to existing informal social networks and competition with other coaches for positions. The findings provide insight into the motivational climate women coaches operate within, which should prove useful to those working with coaches, whether as coach educators, administrators, or sport psychology practitioners.

Women exercisers' affective reactions to gender variations in class leaders and co-exercisers

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A recent study by Kruisselbrink et al. (2004) found that young women reported higher levels of social physique anxiety (SPA) when imagining taking part in mixed-sex exercise groups compared to all-female groups. Exercise class instructors have also been shown to affect exercisers' psychological states (Bray et al., 2005). The purpose of this study was to investigate women's ratings of SPA in response to four different exercise environments:

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female instructor/all-female co-exercisers, female instructor/mixed-sex co-exercisers, male instructor/all-female co-exercisers, and male instructor/mixed-sex co-exercisers. A secondary objective was to examine whether ratings of SPA in response to the different exercise scenarios varied depending on participants' levels of trait self-monitoring (Snyder, 1987). Young women with experience in group exercise classes ($N = 90$; M age = 23.51 ± 5.86) completed baseline measures of trait SPA and self-monitoring and state SPA after being presented with written descriptions of each of the 4 exercise scenarios (in random order). Results showed that women expected to feel more anxious about their physiques when exercising with men in the environment. Effects were stronger when the men present were imagined as co-exercisers, with the strongest effects observed when there was male instructor along with mixed-gender co-exercisers, paired $t(91)$ range = $2.17-3.09$, $p < .05$). Contrary to hypotheses, women who were lower in trait self-monitoring showed significant variations in their SPA ratings across the scenarios, paired $t(57)$ range = $2.05-4.06$, $p < .05$, whereas there were no differences ($p > .10$) across the 4 exercise situations for those who were high in trait self-monitoring. Low self-monitors may be more affected by changes in the exercise setting whereas high self-monitors may be accustomed to regulating their environment. Since SPA has been found to be negatively associated with exercise adherence (Martin Ginis et al., 2007), it may be important to take these factors into account when designing exercise programs for young women.

Predicting changes in volleyball players' well-being from changes in need satisfaction over the course of a competitive season

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According to basic needs theory (BNT; Ryan & Deci, 2002), the extent to which the psychological needs for competence, autonomy, and relatedness are satisfied will influence one's physical and psychological well-being. While recent studies in the sport context have provided support for these relationships (e.g., Gagné et al., 2003; Reinboth & Duda, 2006; Reinboth et al., 2004), many questions remain. The goal of this study was to extend the literature by exploring the relationships among need satisfaction and indices of well-being over time. Specifically, we tested whether changes in perceived competence, autonomy, and relatedness over the course of a season were predictive of changes in self-esteem and burnout. Female club volleyball players ($N = 93$, M age = 15.78 ± 1.28 years) completed valid and reliable questionnaires at both the beginning and end of their season. Paired t tests indicated no significant ($p > .05$) changes over the season in any of the needs or indices of well-being; however, there was considerable intraindividual variability in the changes that occurred in perceived competence (M change = $-.21 \pm 1.44$), autonomy (M change = $-.03 \pm .94$), relatedness (M change = $.05 \pm 1.76$), burnout (M change = $.10 \pm .92$), and self-esteem (M change = $-.00 \pm .62$). A series of hierarchical regression analyses tested whether changes in need satisfaction over the season predicted changes in each of the well-being variables after statistically controlling for scores at the beginning of the season. As expected, perceived competence ($\beta = -.21$), autonomy ($\beta = -.36$), and relatedness ($\beta = -.23$) significantly predicted changes in burnout (total $R^2 = .38$, $p < .01$) after controlling for preseason scores on the set of variables. Changes in self-esteem were also predicted by changes in the needs after controlling for the preseason scores (total $R^2 = .41$, $p < .01$); with perceived competence ($\beta = .50$), autonomy ($\beta = .28$), but not relatedness ($\beta = -.01$) significantly contributing to the relationship. Results are discussed in relation to BNT and implications for creating a positive sporting environment are provided.

Examining the combined role of individual and environmental factors on leisure-time physical activity behavior in people with spinal cord injury

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The purpose of the present study was to determine whether neighborhood environmental perceptions can enhance the theory of planned behavior's (TPB; Ajzen, 1985) ability to explain leisure-time physical activity (LTPA) intentions and behavior in people living with SCI. Baseline cross-sectional data from 246 men and women (M age = 44.18 ± 12.17) with an SCI were used to test the study hypotheses. Measures of the TPB constructs, perceptions of the neighborhood aesthetics and wheeling infrastructure, and LTPA behavior were administered over the phone by a trained research assistant. Structural equation modeling was used to test the hypotheses. In partial support of our first hypothesis, subjective norms and self-efficacy were significant predictors of LTPA intentions (β 's = 0.53 and 0.28, respectively). Together, the TPB constructs explained a significant 59% of the variance in LTPA intentions. In partial support of our second hypothesis, intentions emerged as a significant, positive predictor of LTPA behavior ($\beta = 0.21$). However, neither of the two PBC constructs (i.e., self-efficacy and perceived controllability) was found to be a significant predictor of LTPA behavior. Overall, the TPB constructs accounted for 10% of the variance in LTPA behavior. Contrary to hypothesis, neighborhood aesthetics and wheeling infrastructure were not found to explain a significant amount of additional variance in either LTPA intentions ($\Delta R^2 = 2\%$) or LTPA behavior ($\Delta R^2 = 1\%$). Of interest, though, was the significant, negative relationship between wheeling infrastructure and LTPA intentions ($\beta = -.13, p < .05$). Overall, results from the present study suggest that perceived neighborhood aesthetics and wheeling infrastructure do not enhance the TPB's predictability of LTPA intentions and behavior in people with SCI. Further investigation is needed to determine specific environmental barriers that influence LTPA intentions and behavior in people with SCI.

Determining the anxiolytic effects of an acute exercise bout on high anxious individuals using the dot probe protocol

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Approximately 40 million individuals suffer from anxiety disorders. The anxiolytic effects of exercise are well documented and are substantiated by a large body of literature that advocates exercise as a successful intervention for reducing anxiety levels and increasing positive affect. Although researchers agree that exercise is an effective tool to alleviate anxiety, questions concerning the mechanisms driving these anxiolytic effects remain unanswered. The purpose of the current experiment, therefore, was to measure the anxiolytic effects of aerobic exercise by investigating pre- and postexercise levels of attentional allocation that are known to generate and perpetuate anxiety. High trait anxious participants ($N = 30$) completed exercise and quiet rest protocols on separate visits. During the exercise condition, participants engaged in 30 min of exercise on a cycle ergometer at 70% of their HRR, whereas the quiet rest condition consisted of 30 min of solitary rest. During each intervention, pretest and posttest dot probe assessments were completed. Dot probe testing consisted of 48 counterbalanced trials with probes being presented for 500 ms. Reaction times (RT) to emotional stimulus pairs (pleasant or unpleasant images paired with neutral alternatives) were calculated, and a series of self-report anxiety and affective questionnaires (STAI and PANAS state assessments) were administered. As hypothesized, RT was significantly

faster following exercise compared to the pre- and post-rest conditions and the pre-exercise condition. Contrary to expectations, however, the reduction in RT was ubiquitous across all stimulus pairs, suggesting that attentional allocation was broadly facilitated following exercise. Analyses of self-report data confirmed that positive affect increased significantly, whereas negative affect and state anxiety decreased after exercise. Implications concerning the relevance of these findings to existing psychological interventions will be presented, and future directions will be offered.

The relationship between physical activity, functional independence, and depression in individuals with spinal cord injury

Barr, Neil; Kelly P. Arbour, Kathleen A. Martin Ginis; McMaster University

Participation in physical activity has been associated with a reduction in depression (e.g., Craft & Landers, 1998). Given that individuals with spinal cord injury (SCI) have higher levels of clinical depression (30%) than the general population (5%), physical activity participation may be particularly valuable for this population (North, 1999). Some research has shown that individuals with SCI who exercise exhibit significant increases in measures of functional independence (Duran et al., 2001). Given that trouble in performing daily role functioning (Bombardier et al., 2004) and lower levels of functional independence (Kennedy & Rogers, 2000) have been associated with depression in those with SCI, it was hypothesized that exercise would be related to depression through the mediating influence of functional independence. This possibility was examined in the present cross-sectional study. Study participants were 223 men and women with SCI (M age = 43.66, SD = 12.09). Assessments were completed through telephone-administered questionnaires. Leisure time physical activity (LTPA) was assessed with the Physical Activity Recall Assessment for people with Spinal Cord Injury (PARA-SCI; Martin Ginis et al., 2005). Depression was measured using the Perceived Health Questionnaire (PHQ-9; Spitzer et al., 1999). Functional independence was measured using the telephone motor Functional Independence Measure (FIM; Dijkers & Yavuzer, 1999). Structural equation modeling revealed less than adequate fit indices for the hypothesized model (IFI = 0.86, CFI = 0.85, RMSEA = 0.10). LTPA was associated with increased functional independence (β = 0.17, p = 0.01), and greater functional independence was associated with lower depression (β = -0.18, p = 0.03). Although LTPA was associated with increased functional independence, it was not related to depression (β = 0.02, p = 0.75). Our results suggest that in this cross-sectional study, other unmeasured factors (e.g., social participation, pain) account for more variance in depression than physical activity.

It takes more than just a little dissatisfaction: Body image investment moderates the relationship between leisure time physical activity and body image satisfaction

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There has been mixed evidence regarding the direction of the relationship between leisure time physical activity (LTPA) and body image among individuals with spinal cord injury (SCI), with some studies finding a positive (e.g., Hicks et al., 2003) and others finding a negative relationship (e.g., Heinberg et al., 2001). This suggests that other variables may moderate the relationship between LTPA and body image. For the current study, Cash's (2002) model of body image was used to examine the relationship between LTPA and functional body image (i.e., satisfaction with physical function) in men living with SCI. Specifically, we explored the moderating role of body image investment (i.e., the effect of

functional body image on quality of life [QOL]). Men with SCI ($N = 50$, 50% paraplegic) reported their functional body image (Adult Body Satisfaction Questionnaire; Reboussin et al., 2000), body image investment (Cash, 2002), and completed a 3-day recall of their LTPA (Martin Ginis et al., 2004). Linear regression analysis found LTPA was a significant predictor of functional satisfaction ($\beta = -.27, p < .01$). However, the main effects of LTPA were superseded by an interaction with body image investment ($\beta = .43, p < .01$). Post hoc analysis showed that among individuals who reported a negative effect of body image on QOL, those who engaged in LTPA were less satisfied with their physical function than those who did not. For those who did not perceive their body image to negatively impact their QOL, there was generally no difference in functional satisfaction between those who engaged in LTPA and those who did not. It has been suggested that body dissatisfaction may motivate some individuals to engage in LTPA (Heinberg et al., 2001). However, for men living with SCI, functional body image may be associated with LTPA only when a negative effect on QOL is perceived. Future research should consider the moderating role of body image investment when examining the relationship between LTPA and body image among people living with SCI.

Optimized pre-performance music increases corticospinal excitability

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Music is used by athletes to optimize pre-performance emotional state, and higher music tempi and volumes can elicit approach-type behavior, which facilitates subsequent choice reaction time (CRT) performance; this may be mediated by activation of neural motor structures. Therefore, the objective of this study was to examine changes in athletes' motor corticospinal excitability (CE) as a result of listening to purposively selected music. Ten full-time tennis players (8 M, 2 F; M age = 23.0, $SD = 4.5$ years), participated in each of three conditions (baseline, silence, music) prior to performance of a CRT task, and recorded their affective state. Pulses of magnetic stimulation were subsequently applied transcranially to the motor cortex, and motor evoked potentials (MEPs) in the biceps brachii (BB) were recorded. The participant then responded as quickly as possible to each of 30 randomized CRT trials (10×3 alternatives) by striking a corresponding button; EMG data were continuously acquired. Music was rated as significantly more arousing than baseline ($p < .01$), although ratings were not significantly higher than those for silence. CE was not significantly different across conditions. However, mean stimulation threshold and MEP latency were lower and shorter, respectively, in the music condition when contrasted with both baseline and silence conditions, and average MEP amplitude was higher for music when contrasted with silence. EMG latency in the music condition during CRT performance was significantly shorter than for silence and baseline conditions ($p < .05$). RTs were not significantly different but, importantly, mean values were again in the predicted direction: 3% and 4% shorter in the music condition than in the silence and baseline conditions respectively. Explanations for the present findings can readily be couched within motivation-based theories of emotion: heightened arousal resulting from emotional responses to music appears to heighten corticospinal activity, the cortical component of which is crucial in determining approach-type behaviors.

The role of intentions and planning in relation to current leisure time physical activity levels in first-year undergraduate students

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Previous research has demonstrated that there is a significant decline in physical activity behavior during the transition from high school to university (Bray, 2007). This change is of particular importance because it represents a time when young people develop new health habits. Current literature identifies an inconsistency between leisure time physical activity (LTPA; defined as physical activity completed in one's spare time, structured or nonstructured) intentions and behavior (Sheeran, 2002; Conner & Norman, 2005), termed the *intention-behavior gap* (Orbell & Sheeran, 1998). Gollwitzer (1993) identified the creation of implementation intentions, or planning, as a useful strategy to help people translate their intentions into behavior. The purpose of the current study was to explore the contribution of planning to the intention-LTPA relationship as described in the health action process approach (HAPA; Schwarzer, 2004). First-year undergraduate students ($N = 98$) completed assessments of current LTPA levels (mild, moderate, and strenuous intensity), intentions, and planning for LTPA. The planning variable measured the extent to which participants planned when, where, what, and how they would participate in LTPA. A significant correlation was noted between intentions and planning ($r = .51, p < .001$), and between planning and strenuous LTPA ($r = .45, p < .001$). However, hierarchical regression analyses revealed that planning did not explain any additional variance in LTPA behavior beyond intentions ($R^2 \text{ adj.} = .50$), providing evidence contrary to the HAPA. However, this may suggest that the lack of planning for LTPA plays a significant role in the lack of strenuous LTPA behavior in the undergraduate population.

Body representation, body activity, and the use of (phantom) body parts

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Body schema has been described as a multimodal representation of the body that integrates somatosensory, proprioceptive, and vestibular information as well as visual information from observing body dynamics (Funk, Shiffrar, & Brugger, 2005). We investigated mental representations of body parts in two participants with congenitally absent limbs, one of which (Participant A) has perceived phantoms of all four limbs since birth (Brugger et al., 2000) whereas the other (Participant B) has never experienced any phantoms (Funk et al., 2005). Additionally, we tested a control group (group C, $N = 12$, age: 46.2 ± 9.8) matched to A and B in age and occupation and a group of sport students (group D, $N = 18$, age: 24.2 ± 2.4). The SDA-M method (Structure Dimensional Analysis–Motorics; Schack 2004) used here has been applied successfully to evaluate cognitive structures of sports movements in the long-term memory of athletes (Schack & Mechsner, 2006). Verbal labels indicating body parts (e.g., thumb, eye, knee) and body-related activities (e.g., writing, walking) were presented to the participants in randomized lists that had to be sorted according to a hierarchical splitting paradigm. Participants were instructed to refer to their somatosensory perception of their own body rather than to an outside image. Results of the hierarchical cluster analysis revealed similar cognitive structures of Groups C and D. The representation structure of Participant A resembles the structures of Groups C and D to a higher degree than does the structure of Participant B. Although the clustering solutions of A, C, and D show a differentiation of upper and lower body, the results of B reflect his specific way of using his foot for writing and gesturing. Results show that different modes of activity and use of body parts strongly influence the representation of one's own body, and that this also applies to phantoms of limbs never physically experienced.

Individual versus group-level effects of barrier and task self-efficacy on physical activity

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Background: To date, the vast majority of research examining the influence of varying types of self-efficacy on physical activity (PA) have relied on group level, i.e., aggregated weighting in the analyses. However, social cognitive theory would suggest that individual efficacy judgments also be considered. Fortunately, having hierarchical data (e.g., individual efficacy judgments) nested within work-related divisions allows one to examine individual and group-level effects of self-efficacy on PA levels. Purpose: To examine the individual and group-level associations of task and barrier self-efficacy with PA. Method: A total of 1,941 employees (mean age = 40.25; $SD = 11.41$) throughout 17 divisions across the United States completed a Web-based survey that included questions pertaining to demographics, task and barrier self-efficacy, and PA. Results: Hierarchical linear modeling analyses showed that PA was significantly predicted by task ($\beta = .15$) and barrier ($\beta = .51$) self-efficacy at the individual level and task ($\beta = .10$) and barrier ($\beta = .07$) self-efficacy at the group, i.e., division level controlling for age, gender, education, race, and marital status. Conclusions: Self-efficacy interventions aimed at changing PA should potentially focus on individual and group-level approaches, particularly for task self-efficacy.

The role of barrier self-efficacy and outcome expectations in explaining physical activity in people living with multiple sclerosis

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The importance of physical activity (PA) to people living with multiple sclerosis (MS) has emerged in recent years, yet few people with MS engage in enough PA to reap the benefits. The purpose of the present study was to determine whether barrier self-efficacy and outcome expectations could help explain PA levels in people living with MS. Seventy-six participants with MS (mean age = 50.58; $SD = 10.38$) completed a baseline questionnaire and the Godin Leisure Time Exercise questionnaire via the phone one month later. Mean levels were 44.06 ($SD = 25.49$) for barrier self-efficacy, 5.87 ($SD = 1.12$) for outcome expectations, and 35.13 METS ($SD = 28.36$) for PA. Multiple regression analyses showed that 29% of the variance in one-month PA was accounted for by barrier self-efficacy ($\beta = .34, p < .001$) and outcome expectations ($\beta = .27, p < .001$) after controlling for functional limitations and education. The present study's results suggest that developing strategies for people living with MS to increase confidence in overcoming PA barriers and providing knowledge pertaining to the positive outcomes associated with PA may help to increase their physical activity levels.

Short-term effects of acute exercise on cognitive functions

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In healthy adults, previous research has noted a beneficial effect on Stroop performance after twenty minutes of physical activity (Sibley et al., 2006). Acute exercise has also been shown to positively influence verbal fluency in older, diseased adults (Emery et al., 2001). The purpose of this study was to determine the effect of an acute bout of physical activity on these two aspects of cognitive function in healthy adults, using a true experimental design. Twenty participants were given the Color Word Interference (CWI) and Verbal Fluency (VF)

scales of the Delis-Kaplan Executive Function System before and after twenty minutes of walking (exercise group) or reading (control group). Eight 2 × 2 (Group × Trials) repeated measures ANOVAs were calculated on the four subtasks of the two scales. Three significant, univariate interactions (VF Category, CWI Naming, Color Word Reading) favored exercisers. The results are discussed in terms of arousal effects on cognitive information processing efficiency.

Social and achievement goal orientations, moral disengagement, and antisocial behavior in soccer

Boardley, Ian D.; Maria Kavussanu, University of Birmingham

Previous research has shown that achievement and social goal orientations predict engagement in antisocial behavior directed toward opponents in sport (Sage & Kavussanu, 2007). The current research extended this work by examining antisocial behaviors toward opponents and teammates, investigating the goal of toughness social status, and investigating whether moral disengagement mediates the relationship between goal orientations and antisocial conduct. Participants were 307 male soccer players (M age = 21.35 years, SD = 4.17), who completed questionnaires measuring task and ego orientations; the goals of social affiliation, social recognition, popularity social status, and toughness social status; antisocial behavior; and demographics. Popularity social status pertains to a player's desire to be seen as popular within the team, whereas toughness social status refers to gaining respect from teammates by dominating and being aggressive toward opponents. Regression analyses revealed that antisocial behavior toward opponents was predicted by the social goals of toughness social status (β = .19), popularity social status (β = .27), social recognition (β = .13), and social affiliation (β = -.16) and by the achievement goals of task (β = -.26) and ego (β = .45) orientation. Antisocial behavior toward teammates was predicted by the social goals of toughness (β = .20) and popularity (β = .19) social status and the achievement goals of task (β = -.14) and ego (β = .26) orientation. Moral disengagement partially mediated the effects of ego goal orientation and all social goals except for social affiliation on both types of antisocial behavior. Overall, these results aid our comprehension of the motivations that drive antisocial conduct in soccer and suggest that moral disengagement may be an important variable in these relationships.

Contextual influences on antisocial and prosocial behavior: Does moral disengagement mediate their relationship?

Boardley, Ian D.; Maria Kavussanu, University of Birmingham

Past research has demonstrated the importance of the social context in understanding antisocial and prosocial conduct in sport. This study aimed to extend previous work by examining whether moral disengagement mediated the relationships between two aspects of the team environment and four types of antisocial and prosocial behavior in sport. The two aspects of the environment were athletes' perceptions of their coach's character-building competency and their perceptions of a mastery motivational climate, while the four behavior types were prosocial and antisocial behavior toward teammates and opponents. Athletes participating in the sports of field hockey (n = 200) and netball (n = 179) completed questionnaires assessing moral disengagement, perceptions of their coach's character-building competency, perceptions of a mastery team motivational climate, and frequency of engagement in the four types of behavior. Structural equation modeling indicated that perceptions of coach's

character-building competency predicted moral disengagement ($\beta = -.31$), which in turn predicted prosocial behavior toward opponents ($\beta = -.22$) and antisocial behavior toward both teammates ($\beta = .28$) and opponents ($\beta = .66$). Moral disengagement mediated fully the relationships between perceptions of character-building competency and prosocial and antisocial behavior toward opponents and partially the relationship between these perceptions and antisocial behavior toward teammates. Perceptions of a mastery motivational climate predicted prosocial ($\beta = .49$) and antisocial ($\beta = -.42$) behavior toward teammates. Multisample analyses demonstrated that the measurement and structural models were largely invariant across the two sports. Overall, these findings assist our understanding of the processes underlying antisocial and prosocial conduct in team sports and may have implications for interventions that aim to eliminate unsportspersonlike conduct.

The Moral Disengagement in Sport Scale–Short: Multisample and multilevel confirmatory factor analyses

Boardley, Ian D.; Maria Kavussanu, University of Birmingham

The Moral Disengagement in Sport Scale (MDSS; Boardley & Kavussanu, 2007) measures the 8 moral disengagement mechanisms proposed by Bandura (1991) and consists of 32 items. The present study aimed to (a) investigate whether a subset of these items could form a short version of the scale; (b) test the measurement invariance of the short scale across gender and sport type; and (c) examine the multilevel factor structure of the short scale. The MDSS was administered to hockey ($n = 200$) and netball ($n = 179$) players. Confirmatory factor analysis (CFA) indicated that a model with 3 first-order factors, consisting of 17 items, had a good fit to the data. Based on these results, the Moral Disengagement in Sport Scale–Short (MDSS-S) consists of 17 items and three subscales. The first subscale is termed *conduct reconstrual and victim targeting* and measures the moral justification, euphemistic labeling, dehumanization, and attribution of blame mechanisms; the second subscale is termed *cognitive distortion* and measures the advantageous comparison and distortion of consequences mechanisms; and the third subscale is termed *nonresponsibility* and measures the diffusion and displacement of responsibility mechanisms. The 3-factor structure was confirmed with a second sample of 592 athletes from the sports of soccer ($n = 228$), rugby ($n = 108$), netball ($n = 130$), field hockey ($n = 59$), and basketball ($n = 67$). A strong ($r = .98$) correlation between the total scores of the long and short versions of the scale indicated a high level of convergent validity for the MDSS-S. Multisample CFAs established the measurement invariance of the scale across gender and its partial measurement invariance across the sports of soccer, field hockey, and netball. Finally, multilevel CFA confirmed the factor structure at the within and between-team levels. In conclusion, the MDSS-S is a reliable and valid scale for measuring moral disengagement in sport.

Guiding physical activity during transition to university

Bray, Steven R.; McMaster University; Mark R. Beauchamp, University of British Columbia; Amy E. Latimer, Queen's University; Sharleen D. Hoar, University of Lethbridge; Chris A. Shields, Acadia University; Mark W. Bruner, Queen's University

Research has shown a dramatic drop in physical activity (PA) during first year at university compared to the last year of high school (Bray & Born, 2004). In a recent pilot study, Bray et al. (2007) showed that providing first-year students with a specially designed physical activity

guide resulted in less of a decline in PA during the first semester at university compared to students who received either a general guide (Canada's Physical Activity Guide; CPAG) or no guide. We extended that study to a broader field trial involving first-year undergraduate students ($N = 238$) from 4 Canadian universities. A secondary objective was to explore students' ratings about the student guide in comparison to the CPAG in terms of interest, credibility, and information provision. Students completed measures of physical activity during the second and eighth weeks of their first semester at university and responded to questions about their respective PA guides at the second data collection. Results of a mixed model (Time \times Guide Condition) ANOVA showed a main effect for time, demonstrating that average weekly volume of moderate/vigorous intensity PA declined during the first semester at university from pre-university levels, $F(1, 231) = 86.10, p < .001$. There was also a significant Time \times Condition interaction, $F(2, 231) = 4.24, p < .05$, indicating less decline in PA among students who received the student guide compared to the other two conditions. Those who received the student guide also reported that guide to be more interesting and containing more new information than the CPAG. Both guides were perceived to be highly credible. These findings support previous results indicating first-year students may benefit from the provision of a specially targeted, print-based intervention to encourage moderate and vigorous physical activity during the acute transition to first-year university. The ongoing study will investigate whether these acute effects can persist.

Martial art training and philosophy as a moderator of children's aggression and conduct

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One hundred controls, plus 100 children referred for behavioral issues related to conduct and aggression, participated in an intensive program that alternated 30-day baseline periods (A) with 60-day periods of martial art training (B) according to an ABABABA design. The activities and time spent in the martial arts were balanced between programs that either emphasized a traditional martial philosophy or that presented no philosophical context for training, and, after matching on sex, age, academic performance, prior sport experience, and SES, equal numbers of controls and children with behavior issues were randomly assigned to one of the two martial art programs. Upon completion of the ABABABA design, the participants were followed for 90 days to assess carry-over effects. Multivariate analyses showed significant reductions in the inappropriate behavior of participants referred for behavioral issues when they participated in the martial arts, with the greatest reductions observed for the traditional martial art program centered on a philosophy for using aggression appropriately. Reductions in the inappropriate behavior of participants referred for behavioral issues in the traditional martial art group averaged 73% (median: 58%; range: 35% to 100%) whereas reductions in the nontraditional martial art group averaged 21% (median: 20%; range: 5% to 68%). The magnitude of these reductions continued to be observed during the follow-up period, especially for children who trained on their own or who had joined a martial art style espousing a philosophy for using aggression appropriately. These data support the results of on-going studies in which students with issues related to conduct and aggression who were participating in mixed martial arts (MMA) programs achieved the greatest reductions in behavioral issues when training in MMA programs that espoused a philosophy governing the appropriate and measured use of aggression only during self-defense situations.

Examining the effects of team building on group task satisfaction in a youth exercise setting

Bruner, Mark W.; Kevin S. Spink, University of Saskatchewan

Team building (TB) in an activity setting has resulted in higher levels of individual satisfaction (Carron & Spink, 1993). Unfortunately, in that research, satisfaction was only measured at the end of the program so the effects of the TB on the development of satisfaction could not be determined. Further, the study examined individual satisfaction only. Given that satisfaction with the group has been associated with other measures of “groupness” (Spink et al., 2005), one wonders whether the effects of TB could be extended to group satisfaction. The purpose of this study was to examine the effects of TB on the development of group task satisfaction of individuals participating in a physical activity club. Participants included 100 youth (13–17 years) who were participating in 1 of 10 rural, school-based physical activity clubs and completed the program. Participants in five of the clubs were exposed to a 6-week TB program that was adapted from one used previously by Carron & Spink (1993), whereas those in the other five clubs were participants in a 6-week standardized group exercise program. Prior to the intervention, all participants were exposed to a 2-week standardized group exercise program to establish a baseline. To measure satisfaction, a modified measure of group task satisfaction (Reimer & Chelladurai, 1998) was assessed twice—after the baseline and at the end of the intervention. Results from a repeated measures ANOVA revealed a significant Group \times Time interaction, $F(1, 97) = 11.69, p = .001$, wherein perceptions of group task satisfaction did not change over the course of the program for those in the TB program, but it declined significantly for those not exposed to the team-building program. These results extend previous research, which has found a relationship between TB and individual measures of satisfaction (Carron & Spink, 1993), to a measure assessing satisfaction with elements of the group. Further, it appears as if exposure to TB does not enhance satisfaction, but rather helps to maintain it. Supported by CIHR

A self-determination theory approach to understanding the relationship between social physique anxiety and physical activity

Bruner, Jennifer; Catherine M. Sabiston, McGill University

Based on self-determination theory (SDT; Deci & Ryan, 1985) perspectives, this study investigated the relationship between social physique anxiety (SPA) and physical activity behavior. Three hundred and eighty-one older adolescent males ($n = 161$) and females ($n = 220$) completed scientifically supported questionnaires. The sample had a mean age of 18.7 ($SD = 1.2$) years and mean BMI of 22.6 ($SD = 3.8$) kg/m². Main data analyses testing the integration of SPA within the self-determination theory were conducted using maximum likelihood structural equation modeling. The theoretically derived model was tested in which SPA was hypothesized to relate to the basic psychological needs, the basic psychological needs were hypothesized to relate to motivation, and motivation was hypothesized to relate to physical activity behavior. Goodness-of-fit statistics revealed good measurement models for the total sample and gender subsamples. Findings of gender invariance suggested that the male and female measurement models were similar. The path models were also deemed good-fitting models and accounted for 46–57% of the variance in physical activity behavior. The paths in the model were not significantly different for adolescent males and females. Collectively, these findings suggest that SPA experiences can be understood within a motivational framework. Further, these results suggest that interventions aimed at decreasing

SPA among older adolescents may be helpful in promoting physical activity motivation and behavior.

The role of active self-regulation and goal progress in promoting the integration of physical activity into the self-concept

Carraro, Natasha; Patrick Gaudreau, University of Ottawa

A growing body of research indicates that defining oneself as a physically active person relates positively to performance and goal attainment (e.g., Houser-Marko & Sheldon, 2006; Marsh, Trautwein, Lüdtke, & Köller, 2006). However, less is known about the process by which people incorporate physical activity into their self-concept. The aims of the present study were to (a) test whether identification with the physical activity domain would increase the likelihood that people form action plans that could result in greater progress on their goals, and (b) explore whether planning for and successfully progressing on a physical activity goal would increase the extent to which people identify themselves as physically active. The study used a prospective design with 118 university students involved in the pursuit of a self-set physical activity goal. Participants completed measures of identity and action planning at Time 1 and measures of goal progress and identity roughly four weeks later. Results from structural equation modeling with manifest variables indicated that Time 1 identity was positively associated with action planning ($\beta = .47, p < .01$) which, in turn, predicted goal progress one month later ($\beta = .40, p < .01$). Of even greater interest, it was found that both action planning ($\beta = .13, p < .05$) and goal progress ($\beta = .25, p < .01$) related to an increase in physical activity identity across time and that goal progress was a significant partial mediator in the planning-identity change relationship. These findings suggest that the use of action planning contributes to a spiraling effect in which the increased likelihood of goal attainment in the physical activity domain is bolstering the integration of this domain within the self-concept. The concrete process of actively working toward a personal goal through the use of planning strategies is thus a means whereby people can obtain success while strengthening important components of their self-concept. These findings have implications for the long-term adoption and maintenance of physical activity behavior.

The relationship between perceived coaching behaviors and developmental experiences of high school athletes

Carson, Sarah; Daniel Gould, Michigan State University

Although sport has the potential to be a valuable psychosocial training ground for youth because of its capacity to instill life lessons and teach life skills (e.g., Hansen et al., 2003), it has been suggested that many variables have to be set in place for the sport experience to promote positive youth development (e.g., National Research Council and Institute of Medicine, 2002). Teams have to be affirming environments, roles and responsibilities have to be clearly stated, and athletes need a supportive leader who coaches beyond basic sport skills. Because of the central role coaches play in promoting youth development, the purpose of this study was to examine how coaching behaviors relate to developmental experiences in high school sports. To address this topic, 297 high school athletes attending 1 of 12 summer sports camps completed Hansen and Larson's (2005) Youth Experiences Survey-2, the Coaching Behavior Scale for Sport (Cote, et al., 1999), and a set of questions derived from Gould et al.'s (2006) study of life-skill building strategies of successful high school coaches. A canonical correlation analysis revealed, as hypothesized, significant relationships between

quality of coaching and positive and negative experiences in high school sport. For example, athletes who were more likely to report their coaches exhibited positive behaviors (e.g., helped with mental preparation, talked about how sport lessons relate to life, developed positive rapport with athletes) were also likely to report personal (e.g., initiative) and interpersonal (e.g., teamwork and social skills) developmental experiences through sport. Other findings revealed a correlation between coach–athlete negative rapport and athletes' negative sport experiences (e.g., stress, negative group dynamics) and a relationship between coaches who emphasized putting team before self and athletes reporting teamwork and social skills developmental experiences in sport. Findings are discussed in light of current research and theory on the positive youth development and sport participation link.

Predictive validity of a three-dimensional model of performance anxiety in the context of Chinese tae kwon do sports

Cheng, Wen-Nuan K.; Taipei Physical Education College; Lew Hardy, University of Wales, Bangor

A three-dimensional model of performance anxiety was proposed to acknowledge the adaptive potential (producing positive effects) of anxiety by including a regulatory dimension (reflected by perceived control) in addition to the traditional intensity-oriented symptoms of cognitive and physiological anxiety. The predictive validity of this model was preliminary examined in the context of elite level of university-based tae kwon do sports performers ($N = 99$) in Taiwan. Precompetitive anxiety ratings were obtained 30 minutes before performance using a 21-item measure of performance anxiety, previously developed in Chinese according to the proposed conceptual framework. A self-assessed performance measure based on six criteria for optimal tae kwon do performance was administered 30 minutes after competition. Data was analyzed via moderated hierarchical multiple regression. As hypothesized, the component of perceived control accounted for significant additional variance in performance (20.4%) over and above cognitive and physiological anxiety. A significant divergent form of interaction between perceived control and physiological anxiety also emerged, significantly accounting for additional performance variance (11.6%) over and above main effects of anxiety. In total, the whole model explained 36.9% of performance variance. To conclude, this study revealed initial support for the predictions based on the three-dimensional model of performance anxiety. Noteworthy, the regulatory component of perceived control has shown potential in further unfolding the complex relationship of anxiety and sports performance.

The influence of team performance on athletes' self-efficacy and collective efficacy beliefs

Chow, Graig M.; Teri J. Hepler, Deborah L. Feltz, Michigan State University

Research has consistently found that previous performance accomplishments are the most salient factor contributing to an individual's self-efficacy. Team research on collective efficacy has found similar results to those obtained with self-efficacy (Feltz & Lirgg, 1998). Even though there are similar antecedents that predict efficacy beliefs at different levels of analysis (Chen et al., 2002), there is a lack of research on the cross-level determinants of efficacy

beliefs. The primary purpose of this study was to examine the effect of team performance on players' subsequent self- and collective efficacy beliefs. Participants ($N = 537$) were golf, baseball/softball, and basketball athletes from 41 male and female intercollegiate teams. Within 24 hours prior to a competition, players completed a questionnaire that assessed perceptions of self- and collective efficacy. Following the conclusion of the competition, a postcompetition questionnaire was administered that assessed athletes' self- and collective efficacy. Using game statistics, a composite measure of individual performance was computed for each athlete, adjusting for the average individual performance of the competition. A composite measure of team performance was computed for each team, adjusting for the performance of the opponent. The individual performance scores and team performance scores were standardized by sport. Multilevel modeling was used to examine the influence of team performance on subsequent self- and collective efficacy while controlling for players' previous efficacy beliefs, individual performance, and team gender. Separate multilevel analyses were conducted for self- and collective efficacy. In accordance with previous research, team performance significantly predicted athletes' collective efficacy. Moreover, team performance significantly predicted subsequent self-efficacy, with members of higher performing teams holding stronger beliefs in their personal capabilities than members of lower performing teams. The findings provide support for the cross-level sources of efficacy beliefs.

Self-regulatory depletion and physical performance: An examination of depletion effects and trait self control as an effect modifier

Clayton, Courtney S., Steven R. Bray, Kathleen A. Martin Ginis; McMaster University

Baumeister's limited strength model of self-regulation (Schmeichel & Baumeister, 2004) proposes that people have a limited capacity to exert control over tasks requiring self-regulation. When self-regulatory strength is depleted, performance on other tasks requiring self-regulation is impaired. Tangney et al. (2004) have also proposed that people vary in their dispositional capabilities to exert self-control. The purpose of this study was to examine the effects of a self-regulatory depletion manipulation on physical performance and to investigate the extent to which trait self-control predicts performance following self-regulatory depletion. Undergraduate students ($N = 49$) completed the Brief Self Control Scale (BSCS; Tangney et al.) and were randomly assigned to an experimental protocol where they were stratified by gender and randomized to either a cognitive depletion condition (modified Stroop task) or a control (color word) group and completed two maximal isometric handgrip exercise endurance trials separated by the cognitive task. Consistent with the predictions of the limited strength model, participants in the depletion condition showed performance decrements following the Stroop manipulation when compared to the control condition, $F(1, 47) = 3.80$, $p = .05$. Residualized change scores for the depletion and control groups were -5.02 and $+5.68$ s, respectively. For participants in the depletion condition, scores on the BSCS were positively correlated with physical performance ($r = .44$, $p = .04$). Results are consistent with an interpretation that performance of cognitive and physical tasks draws on the same self-regulatory reserve. People who report higher levels of self-control for everyday tasks show resistance to acute depletion effects on their physical performance. Findings have implications for understanding why people fail at self-regulation and why some people are more prone to lapses in self-control compared to others.

A structural perspective on the generality of achievement motives across competence pursuits

Conroy, David E.; Pennsylvania State University

Achievement motive dispositions serve to energize and provide the initial direction for achievement behavior. Although such motives were conceived as general motivational dispositions that transcend specific achievement contexts, this proposition has never been tested. This presentation will review seminal theoretical conceptions of achievement motives, and explain how different operationalizations of the original theory have led to questions about the contextual specificity of achievement motives (and self-attributed motives in particular). One approach to resolving questions about contextual specificity involves testing the latent structure of motives rated in different achievement contexts. Participants ($N = 223$) rated their need for achievement (nAch) and fear of failure (FF) during academic, athletic, and extracurricular competence pursuits. Mean differences between contexts were apparent for both motives—nAch was higher in athletic than in academic or extracurricular pursuits, FF was higher in academic than in athletic or extracurricular pursuits, and FF was higher in athletic than in extracurricular pursuits ($p < .05$). A structural equation model was estimated with six first-order factors corresponding to the context-specific motives, higher-order factors representing general nAch and FF, and three correlations between first-order disturbances that represented context-specific variance: $\chi^2(369) = 727.50$, NNFI = .92, CFI = .93, RMSEA = .07 (90% CI = .06 to .07). Fit did not change significantly when the correlations between disturbances from corresponding contexts were constrained to zero: $\chi^2(3) = 0.60$, $p > .05$. The higher-order nAch factor accounted for 54%–67% of the variance in nAch within each context; the higher-order FF factor accounted for 70%–85% of the variance in FF within each context. These results indicated that, mean differences notwithstanding, general appetitive and aversive achievement motive dispositions account for more variability in self-attributed motive scores than do context-specific cues.

Exercise beliefs of pregnant and nonpregnant women

Cook, Brian J.; Heather A. Hausenblas, University of Florida

Because pregnant and postpartum women are at high risk for physical inactivity and thus developing diseases such as obesity and diabetes, theoretically based PA interventions are needed to increase and maintain the PA behaviors and motivational determinants of this special population. The purpose of our study was to theoretically examine pregnant women's normative, control, and behavioral beliefs guided by the framework of the theory of planned behavior (TPB). Women ($N = 59$; pregnant = 38, M age = 28.66; nonpregnant = 21, M age = 28.16) completed self-report assessments of TPB constructs for exercise during their first trimester. Nonpregnant controls completed similar assessments of TPB constructs for exercise during the current three-month period. Pregnant and nonpregnant women did not differ in their reporting of beliefs, $\chi^2(7) = 5.55$, $p = .593$. A 2 (status) \times 8 (belief type) ANOVA revealed no difference in reporting belief type, $F(1, 862) = .031$, $p = .860$. Both pregnant and nonpregnant women reported more advantages of exercise. The most commonly reported behavioral beliefs were behavioral beliefs were pregnancy benefits (pregnant) and overall health benefits (nonpregnant). The most commonly reported control beliefs were difficulty exercising when feeling sick (pregnant) and difficult scheduling exercise (nonpregnant). The most commonly reported normative beliefs were approval from husbands/boyfriends (pregnant) and approval from family (nonpregnant). Further understanding of specific beliefs

throughout each trimester and applying theoretical paradigms is needed to create more efficacious interventions for specific populations such as pregnant women.

Informal roles and cohesion within sport teams

Cope, Cassandra J.; Mark A. Eys, Laurentian University; Mark R. Beauchamp, University of British Columbia

Informal roles evolve as a result of the interactions that take place among the members of a group. Recent research by Cope and colleagues (2007) has identified twelve informal roles that could play an integral part within sport teams (e.g., comedian, enforcer, distracter, spark plug, informal leader nonverbal, informal leader verbal, team player, star player, malingerer, social convener, mentor, and cancer). Cope et al. also noted that discussion of these informal roles often was in context of other individual (e.g., satisfaction) and group level (e.g., cohesion) variables. The purpose of the present study was to compare perceptions of cohesion between two groups: those athletes who viewed various informal roles to exist on their sport team with those who did not. Athletes from a variety of competitive levels ($N = 68$; males = 35, females = 33; mean age = 19.97) participated by completing a questionnaire designed specifically to assess informal roles in addition to the Group Environment Questionnaire (Carron et al., 1985) for task and social cohesion. This was conducted prior to or after a practice session. Multiple MANOVAs were utilized and indicated that group differences on cohesion were present for two of the informal roles: cancer, $F(4, 61) = 2.01, p < .05, \eta^2 = .120$; and star player, $F(4, 62) = 3.53, p < .05, \eta^2 = .185$. At the univariate level, those who noted the presence of a “cancer” on their team held lower perceptions of Attractions to the Group-Task ($M = 5.35$) and Group Integration-Task ($M = 5.72$) than those who did not ($M = 6.49$ and 6.56 , respectively). In addition, those who indicated that a “star player” was present on their team ($M = 5.47$) held lower perceptions related to Attractions to the Group-Task than those who did not ($M = 6.27$). Finally, implications and future research directions are discussed.

Physical activity during a time of transition: An analysis of expectant and new mom’s exercise patterns

Cramp, Anita G.; Steven R. Bray, McMaster University

The transition from adolescence to adulthood marks a significant trend in decreasing physical activity levels for young women (Gordon-Larsen, Nelson, & Popkin, 2004). One factor which may contribute to the decline in women’s physical activity is pregnancy and the demands of motherhood (Godin et al., 1989; Mottola, 2002). Although there are a number of studies that have demonstrated that physical activity declines during pregnancy, few studies have examined change in physical activity during pregnancy and in the postnatal period compared to pre-pregnancy levels. The purpose of the present study was to examine the trajectories of women’s physical activity across pre-pregnancy, during pregnancy and through to the postnatal period. A total of 304 pre- and postnatal Canadian women completed the 12-month Modifiable Activity Questionnaire (MAQ; Kriska et al., 1990) and demographic information. Multilevel modeling was used to estimate a growth curve representing changes in physical activity (MET hr/month) over time and the degree of individual variation over time. Time (18 × 1-month intervals) was treated as the Level-1 within-person predictor with the individual represented at Level 2. The mean growth curve estimates for the linear, quadratic, and cubic trends were all significant ($p < .05$), indicating that physical activity levels declined during

pregnancy compared to pre-pregnancy levels but then increased again following birth. One demographic predictor variable (having other children at home) was significant ($\beta_{01} = -.87$, $SE = .44$, $p = .05$). Physical activity levels were higher for first-time mothers compared to women who had other children. Importantly, the results also showed that the base rate and slopes varied significantly across participants; $Var(\text{intercept}) = 3.88$, $Var(\text{linear}) = .58$, $Var(\text{quadratic}) = .12$, $Var(\text{cubic}) = .01$. Although physical activity generally shows accelerated decline during pregnancy, many women quickly resume activities postpartum. Changes in the forms of physical activity undertaken by postnatal women are discussed.

Yoga and quality of life in cancer survivors: Room for alternative physical activity

Culos-Reed, S. Nicole; Jill M. Norris, Linda E. Carlson; University of Calgary; Tom Baker Cancer Centre, Calgary; Susi Hatelty-Aldous, Functional Synergy Inc., Calgary

Purpose: Alternative forms of PA have been seldom examined in cancer survivors. This study explored the impact of a seven-week yoga intervention on QoL and associated outcomes in a sample of off-treatment mixed-cancer survivors. **Methods:** Fourteen waves ($n = 140$) of prescreened PAR-Q/PAR MED-X participants were randomized 2:1 to the weekly 75-minute group-based intervention (YI; $n = 96$) or wait-list control group (WC; $n = 44$). Assessments at preintervention (T1) and postintervention (T2) used patient-reported demographics, PA GLTEQ, and psychological outcomes: European Organisation for Research and Treatment of Cancer Quality of Life Questionnaire-Core 36 version 3.0 (EORTC QLQ-C30), Profile of Mood States (POMS), Symptoms of Stress Inventory (SOSI), Mindful Attention Awareness Scale (MAAS). **Results:** Participants were predominantly females mean 51.4 years, with a previous breast cancer diagnosis mean 31.2 months since diagnosis. Adherence was 77%, with retention at T2 81% for YI, and 70% for WC. ANOVAs were significant for total PA frequency ($p = 0.04$) and duration ($p = 0.01$), with an interaction effect for mild PA frequency ($p = 0.04$), mild PA duration ($p = 0.01$), and strenuous PA duration ($p = 0.02$). Specifically, the YI increased mild PA duration, mean 22.4 to 42.7 min, $p = 0.005$. In contrast, the WC decreased in mild PA frequency, mean 5.8 to 2.5 times/wk, $p = 0.04$, and increased strenuous PA duration 19.5 to 36.4 min, $p = 0.04$. Controlling for T1 covariates, a significant Group \times Time interaction was observed for QoL ($p = 0.006$). Specifically, YI significantly increased QoL over the intervention mean 67.1 to 75.3; $p < 0.001$. Significant effects for total mood disturbance ($p < 0.001$), total stress ($p < 0.001$), and mindfulness ($p < 0.001$), with improvements seen in both groups. Many of the QoL, POMS, and SOSI subscales also achieved significance. **Conclusions:** The yoga therapy intervention was effective in improving QoL and demonstrated psychological benefits for cancer survivors. Future work must address the issue of control-group contamination.

Congruency of role perceptions in intercollegiate basketball teams

Cunningham, Ian J.; Mark A. Eys, Laurentian University

The purpose of the present study was to explore the degree to which task-related team knowledge (i.e., role behaviors) was shared between members of competitive basketball teams. In addition, the degree to which role knowledge was shared was examined in relation to perceptions of group cohesion. Participants included basketball team members ($N = 106$, M age = 20.19) of five male and three female intercollegiate basketball teams. Participants were asked to rank themselves and other members on task categories relevant to formal

roles. Visual analog scales were utilized on which participants indicated the relative rank order of group members with regard to their contribution to each task-related role responsibility (e.g., rebounding). Responses for each role responsibility were further examined to create four variables for each participant: (a) a self-ranking (i.e., how each member ranked him/herself), (b) a normative ranking (i.e., the average of all members' rankings for each individual), and (c) a reciprocal rank (i.e., the discrepancy between the self-ranking and normative ranking). Finally, each group's overall consensus regarding specific role responsibilities (i.e., the consistency of rankings within each group) was determined. Perceptions of group cohesion were measured using the GEQ (Carron et al., 1985). With regard to four of the five task-related role responsibilities, results indicated that team members who ranked their own contributions closer to the normative ranking (i.e., how others viewed their role) held greater perceptions of cohesion ($-.30 < r < -.21$; $p < .05$). In addition, team members who had played a greater number of years with their present basketball team were found to rank their own role-related contributions closer to the normative ranking ($-.27 < r < -.22$; $p < .05$). The results of the present study offer both theoretical and applied implications to sport group functioning through highlighting the importance of role knowledge distribution within an interactive sport team.

Who chokes under pressure?: An exploration of motivation and goals as processes involved in performance under pressure.

Davis Marchand, Hannah; Luc Pelletier, University of Ottawa

Choking has been broadly defined as a performance decrement under pressure. We propose a unique multidimensional approach to the study of choking using the self-determination theory (SDT). The SDT proposes that individuals engage in activities for different reasons (i.e., high self-determination [because it is chosen, important or fun] versus low self-determination [to comply with external pressure, to gain a reward, to avoid guilt]). Complementary to SDT is the achievement goal theory, differentiating between ego-involved goals (self/others focused) and task-involved goals (mastery/learning focused). We propose a model based on predispositional and situational factors using these two approaches to help explain choking under pressure. Findings represent the first two studies of a series of studies that will be conducted to test our model of choking. The purpose of Study 1 was to examine the relationship between motivation, goal orientations, and the perception of successful performance under pressure. Participants ($n = 464$) completed the Global Motivation Scale (GMS), the Task and Ego Orientation in Sport Questionnaire (TEOSQ), and a pressure to perform survey. Significant correlations were found between self-determination and goal orientations. Regression analyses revealed that scores on the GMS and the TEOSQ significantly predicted perception of performance. The purpose of Study 2 was to identify how motivation and specific goals interact with performance using a laboratory pressure situation. Participants ($n = 100$) completed the GMS and the TEOSQ, and participated in three separate trials of shooting basketball free throws, with randomly assigned task-involved or ego-involved goals. Significant correlations were found between the GMS and the TEOSQ and low self-determined participants performed significantly worse under pressure in comparison to self-determined participants. Findings indicate that motivational orientation and goals, as predispositional and situational factors, help explain choking. Practical and theoretical implications will be discussed.

Predicting collective efficacy through team-referent causal attributions: A multilevel analysis

Dithurbide, Lori; Graig M. Chow, Michigan State University; Philip J. Sullivan, Brock University

Research of team referent causal attributions in sport has examined the attributional differences between successful and unsuccessful teams (Bird & Brame, 1978; Greenlees, Lane, Thelwell, Holder, & Hobson, 2005). These studies have produced inconsistent results. In addition, little is known about the consequences of the different team attributions made by successful and unsuccessful teams, for instance on collective efficacy beliefs. The goal of this study was to examine the predictive value of team-referent causal attributions on collective efficacy beliefs while controlling for subjective and objective performance. Volleyball players ($N = 248$) from 45 recreational teams completed a subjective team performance measure and a team-referent causal attribution scale following the first match. Objective team performance was measured by the point differential of the match. Prior to the second match, each team completed a scale measuring the team's collective efficacy regarding the match they were about to play. Due to the nested nature of the data (individuals nested in teams), hierarchical linear modeling was used to evaluate the predictive relationship. Results indicated that at the athlete level, team control was a significant and positive predictor of collective efficacy, whereas at the team level, stability was a significant, but negative predictor of collective efficacy. However, the influence of stability on collective efficacy was moderated by subjective team performance. These results suggest that the more athletes attribute the team's performance to team controllable factors, the more they believe in their team's ability. For teams with higher subjective team performance, the more stable the attribution was, the higher the athlete's collective efficacy. For teams with lower subjective team performance, the more stable the attribution was, the lower the athletes collective efficacy.

Parents' experiences of child-to-parent socialization in youth sport

Dorsch, Travis E.; Alan L. Smith, Meghan H. McDonough; Purdue University

Sport psychologists exploring socialization processes have largely considered how young athletes are affected by their sport involvement, not how young athletes may affect others through that involvement. To build upon the sparse literature on child-to-parent influences in sport (Snyder & Purdy, 1982; Weiss & Hayashi, 1995), we conducted an in-depth exploration of parents' beliefs about how they are socialized through the sport participation of their children. Within a grounded theory paradigm (Strauss & Corbin, 1994), the content of five semistructured focus groups with youth sport parents ($N = 26$) was inductively analyzed through open-, axial-, and selective coding. Emerging themes were separated into three broad categories of perceived parental change (i.e., changes in parent affect, behavior, and cognition). Eighteen descriptive themes were coded as changes in parent affect. The consequences of parents' changes in affect were an increased emotional tie to sport (both the setting and outcomes) and emotional growth. Twenty-three descriptive themes were coded as changes in parent behavior, contributing to changes in the parent-child relationship and social networks of parents. Ten descriptive themes were coded as changes in parent cognition, resulting in parents' increased appreciation of sport. Findings also exhibited an interplay of parental changes. For example, communication with children led to changes in parents' thoughts about sport, parents' regulation of emotion influenced their behavior, and reshaping their thoughts about sport influenced parents' expression of emotion. This

interplay resulted in parents learning and identifying with the “youth sport parent” social role. Finally, parents perceived child age, parent sport experience, parent and child gender, child temperament, community sport context, and sport type (i.e., team or individual) to moderate their socialization outcomes. This descriptive research extends both the depth and breadth of sport socialization knowledge and opens avenues for future research on parent sport socialization.

Coping in the context of dyadic sport: Relationships with dyadic motivation, cohesion, and performance.

Fecteau, Marie-Claude; Patrick Gaudreau, University of Ottawa; Stéphane Perreault, University of Quebec in Trois-Rivières

The coping resources an athlete can use to face a stressful situation have broadly been studied in the field of sport psychology. Little attention has been allocated to coping of athletes in a dyadic sport context. Furthermore, coping has been found to predict individual outcomes such as affect (Ntoumanis & Biddle, 1998), and psychological adjustment (Hoar & al., 2006). Motivational orientations, as defined by tenants of self-determination theory (Deci & Ryan, 1985), have been identified as antecedents of coping in competitive sport (Amiot & al., 2004; Gaudreau & Antl, in press). Up to now, these researches have focused on motivation and coping at the individual level without considering the group and dyadic levels of these processes in team and dyadic sports, respectively. The goal of this study was to examine the relationship of dyadic coping of individual athletes with their dyadic motivational orientations as well as their dyadic cohesion and performance. This study was conducted with 70 competitive athletes from 35 dyads between 14 and 24 years of age before an important event. They completed a questionnaire measuring their individual perceptions of motivation, coping, performance, and cohesion at the dyadic level. The results indicated that self-determined motivation was significantly correlated with logical analysis ($r = .35$); cohesion ($r = .58$); and performance ($r = .48$). Also, logical analysis was significantly correlated with cohesion ($r = .58$) and performance ($r = .35$). Moreover, regression analyses indicated that coping mediated the relationship between self-determined motivation and cohesion. These results highlight the role of coping not only in the prediction of individual-level outcomes but also in explaining cohesion and performance at the dyadic level. Also, this study extends prior research on the mediating role of coping in the relationship between motivation and indicators of dyadic adjustment. These results will be discussed in light of burgeoning literature of sport-related coping. Theoretical and methodological implications are discussed.

Examining the relationship between perceived coaching behaviors and changes across a competitive season in collegiate athletes' evaluation of their teams dynamics

Fenton, Lindsay R.; Thelma S. Horn, George Pappas, Miami University

Although previous research has shown that coaches' behaviors and leadership styles have a significant effect on individual athletes' psychosocial well-being (e.g., anxiety, self-esteem, levels of intrinsic motivation), relatively less research has been conducted to examine the effects of different types of coaching behaviors on team dynamics. The purpose of the current study was to determine if the changes that occurred across a competitive season in athletes' evaluations of their team's cohesion and collective efficacy could be predicted by athletes' perceptions of their coaches' behaviors and leadership styles. The study sample included 180 NCAA Division I college athletes from a variety of sports. Self-report questionnaires

were administered at two time points (early and late season) during the athletes' competitive season to assess athletes' perceptions of their team's cohesion and collective efficacy. Athletes' perceptions of their coaches' behavior and leadership style were assessed at the end of the season using the Leadership Scale for Sports (LSS) and the Coaching Feedback Questionnaire (CFQ). Multivariate multiple regression analyses revealed that athletes who perceived their coaches to exhibit higher frequencies of democratic behavior, training and instruction, social support, and positive and informational feedback showed an increase over the season in their perceptions of their team's level of cohesion and collective efficacy. Correspondingly, athletes who perceived their coaches to be higher in autocratic behavior and to provide high frequencies of punishment-oriented feedback and nonreinforcement/ignoring mistakes exhibited a decrease in perceived cohesion and collective efficacy over the season. The relatively large redundancy index (57.4%) indicated that the combination of coaching behavior variables accounted for a significant and meaningful amount of the variance in the changes that occurred in athletes' perceived levels of team cohesion and collective efficacy over the course of a competitive season.

Focus group methodology: Strengths and limitations in sport and exercise psychology research

Fifer, Angela M.; Eric A. Bean, Dan R Gould; Michigan State University

Qualitative methodologies, including observation, in-depth interviews, and video analysis, have gained substantial use and impact in sport and exercise psychology in recent years. One underused method is focus group research. It is designed to understand a phenomenon through the discussion and interaction of multiple perspectives (Morgan, 1998). This presentation will discuss the strengths and limitations of focus group research by presenting results from two studies. Advantages of focus group research include its socially oriented nature, opportunities for peer interaction, and an increased depth of information (Marshall & Rossman, 2006). Limitations of this method include the potential for a single dominant voice, participants getting off topic, a lack of depth in responses, and complicated logistics. Study 1 was designed to identify coaches' perspectives on positive youth development (PYD) through sport. This method allowed investigators to identify a range of specific factors involved in PYD through sport (e.g., failure of league administrators to commit to a PYD philosophy, the perception that PYD coaching education content is not culturally specific). The disadvantages of focus group methodology for this study included the logistics of organizing the time and place, coaches not showing up or arriving late, and a lack of time to ask all pertinent questions. The second study focused on coaches, athletic directors, and parents' perspectives on the role parents play in educational athletics. The study allowed participants to share common experiences while discussing and debating different perspectives. Focus groups then seemed well suited to identify a range of responses and allow participants to stimulate each others' thoughts and responses. Chief limitations were a lack of depth in responses and a few people dominating the discussion. In the future, focus group research should include a greater focus on logistics, encouraging triangulation across various subgroups, exploring grounded theory methodology, and incorporating field notes and observation.

Affective responses to 10-minute and 30-minute walks in sedentary, obese women

Focht, Brian; Ohio State University

Accumulating recommended amounts of daily physical activity (PA) through multiple 10-min walks has been proposed as an alternative strategy for facilitating the adoption of PA in obese women. Efforts to promote PA through multiple 10-min walks are based on the expectation that brief walks are more pleasant and will foster greater motivation for regular PA participation. Nonetheless, relatively little research has directly addressed this contention. Therefore, the purpose of this study was to examine differences in affective responses and proxy measures of motivation for regular participation with 10-min and 30-min walks among sedentary, obese women. Twenty-three women (M age = 26.62 years; BMI = 33.53 kg/m²) completed 10-min walk, 30-min walk, and quiet rest (QR) conditions. Affective responses were assessed prior to, during, and following each condition using the Feeling Scale (FS) and Felt Arousal Scale (FAS). Self-efficacy and intention for daily participation in multiple 10-min walks or single 30-min walks during the next month were also assessed postexercise. ANOVA analysis yielded significant Condition \times Time interactions for the FS, $p < 0.05$, and FAS, $p < 0.01$. Follow-up analysis revealed that significant increases in the FS and FAS emerged during and following both the 10-min and 30-min walks, whereas no changes were observed with QR. T -test analyses demonstrated that self-efficacy ($p < 0.01$) and intention for future participation ($p < 0.01$) were significantly higher for multiple 10-min walks. Thus, although overweight women exhibited comparable affective benefits with both 10-min and 30-min walks, they reported more favorable responses on proxy measures of motivation to participate in multiple daily 10-min walks. Consequently, even though affective responses to acute exercise may be an important determinant of PA participation, the present findings underscore the importance of addressing other barriers in interventions designed to promote walking among sedentary, obese women.

Understanding adolescents' positive and negative developmental experiences in sport

Fraser-Thomas, Jessica L.; York University; Jean Côté, Queen's University

Organized activities have been proposed as an effective vehicle to foster positive youth development (Larson, 2000). Past studies (e.g., Hansen et al., 2003) have examined adolescents' development across activity contexts, but there is a need to further understand youths' development through sport, given programs' popularity and diversity. The purpose of this study was to gain understanding of adolescents' positive and negative developmental experiences in competitive swimming. High-investment adolescent competitive swimmers ($N = 22$) of mixed genders, competencies, and clubs were purposefully sampled (Patton, 2002). Participants engaged in a semistructured interview focused on positive and negative developmental experiences in competitive swimming during adolescence. Content analysis followed previously established guidelines (Tesch, 1990). Athletes suggested that swimming fostered primarily positive developmental experiences related to a strong work ethic, meaningful adult and peer relationships, a sense of community, and other life attributes. Athletes also outlined negative experiences related to poor coach relationships, negative peer influences, parent pressure, and the psychological challenges of competitive sport. Findings suggest sport facilitates distinct developmental experiences. Athletes outlined how characteristics of their sport (e.g., early morning practices) fostered a solid work ethic and how coaches' unfaltering belief in their abilities built their self-esteem, motivation, and determination. Further, athletes spoke of the special relationships they developed with

their parents as a result of traveling and sharing the highs and lows of their sport with them. Athletes also suggested their swim club facilitated their sense of belonging to a larger community. Finally, some athletes discussed their inability to deal with the mental challenges of competitive sport, whereas others outlined coping skills they developed as a result of their sport stress. Findings suggest important implications for practice and interesting directions for future research.

A prospective examination of social cognitive predictors of walking for active transportation

Fuller, Daniel L.; Nancy C. Gyurcsik, Lawrence R. Brawley, Kevin S. Spink; University of Saskatchewan

Active transportation (AT) is any human-powered transportation. Walking for AT may be a viable strategy to increase physical activity levels. Limited research has examined motivational determinants of walking for an AT purpose and found some personal variables within social cognitive theory (SCT), such as attitude and perceived barriers, predicted AT. To advance this research, reliable predictors of exercise and physical activity for fitness/health purposes need to be studied relative to their predictive utility for purposeful walking for AT. The aim of the study was to examine whether the SCT constructs of walking self-efficacy, self-regulatory efficacy (i.e., barrier, scheduling), intention, and outcome expectations, as well as perceptions of distance and time were related to walking for AT. Participants were 106 university students, faculty, and staff aged 17–55 years ($n = 105$; 69.8% female) who reported living within a walkable distance to the university campus. Social cognitions for a 10-day period of school/work (Monday to Friday for 2 weeks) were assessed via a baseline Web-based survey. Walking for AT over the same 10-day period was assessed via weekly Web-based surveys. Participants reported walking for AT on 4.55 days ($SD = 4.12$). A multiple regression analysis including all social cognitions indicated that the model accounted for 65% of the variance in walking for AT, $p < .01$. Barrier self-efficacy ($\beta_{std} = 2.41$, $p < .05$) and intention ($\beta_{std} = 5.74$, $p < .01$) were significant independent predictors. Barriers to walking, for which participants were least efficacious included the following: walking when feeling sick, in the dark, and when faster transportation was available. Efficacy in overcoming AT barriers and intention may be important social cognitions related to purposeful walking for AT. Future research should examine whether self-efficacy to overcome AT barriers mediates and/or a reduction in salient barriers (e.g., provision of adequate lighting) moderates the relationship between the purpose of walking (i.e., AT, health, both) and adherence to walking as a mode of AT.

Relations between body dissatisfaction, motivation, and perceived autonomy support in high school physical education

Gammage, Kimberley L.; Ken Lodewyk, Melissa Pirrie; Brock University

In North America, enrollment in high school physical education classes has continued to decline steadily. Throughout the high school years, males consistently have higher participation rates than females, but, in both genders, enrollment rates drop each year of high school (CDC, 2007). Given the increasing rates of obesity linked with physical inactivity, it is important to examine factors that may be related to physical education participation in this age group (CDC, 2001). Body dissatisfaction (BD), the discrepancy between one's current perceived body and one's ideal, may be one such factor. The purpose of the present study

was to examine the relationship between BD, motivational factors for physical education, perceived autonomy support (i.e., the extent to which students feel understood by their teachers, and feel that they have choice), and perceived achievement in physical education. A total of 216 female and 108 male grade 9 and 10 students completed a series of questionnaires in their physical education classes. For males, BD was not significantly related to motivation for physical education, perceived achievement, or perceived autonomy support. However, for females, a different pattern of results emerged. Specifically, correlations showed that BD was negatively related to self-efficacy for learning and performance in physical education ($r = -.15, p = .03$) and perceived autonomy support ($r = -.21, p = .002$), and positively related to test anxiety ($r = .24, p = .002$). However, it was unrelated to achievement in physical education. Results of a regression analysis showed that the overall model was significant, $F(7, 187) = 2.94, p = .006$, with only perceived autonomy support ($\beta = -.18, p = .03$) and test anxiety ($\beta = .20, p = .02$) making significant contributions. The findings of this study suggest that BD may be linked to important motivational variables in physical education settings. Physical educators should recognize that, in high school females, BD may be an important factor in influencing motivation within the physical education context.

The relationship between frontal brain asymmetry and exercise addiction

Gapin, Jennifer I.; Jennifer L. Etnier, University of North Carolina at Greensboro

Previous research on the causes of exercise addiction has focused mainly on personality traits, social influences, and disordered eating (Bamber et al., 2000; Beals, 2004). However, few studies have examined the psychophysiological nature of exercise addiction. Numerous studies have repeatedly found that baseline frontal asymmetry, as measured by electroencephalogram EEG, predicts important qualities of dispositional mood, temperament, and psychopathology. A common finding across studies is greater activity at right frontal electrode sites among individuals suffering from negative affect and depression. Because a defining feature of exercise addicts is to use exercise to control negative mood states, it is expected that those with symptoms of exercise addiction will exhibit different frontal activity. The objective of this study was to explore the hypothesized relationship between exercise addiction and frontal EEG activity. Regularly physically active women ($n = 29, M$ age = 31.64, $SD = 11.31$) were recruited to participate in the study. Participants completed the Exercise Addiction Inventory EAI (Terry, Szabo, & Griffiths, 2004). After completing the EAI, each participant took part in an EEG session that consisted of eight 1-minute resting trials, four with eyes open and four with eyes closed, presented in counterbalanced order. Data were collected from the left and right F3 and F4 mid-frontal sites. Based upon scores on the EAI, participants were categorized as exercise addicts ($n = 10, \text{score} = 24$) or symptomatic exercisers ($n = 19, \text{score of } 13\text{--}23$). Results showed that there was not a significant correlation between EAI score and F3 left frontal, $r = .29, p > .05$, but there was a significant positive correlation between EAI score and F4 activity right frontal, more negative affect, $r = .38, p < .05$. These findings support the hypothesis that exercise addicts would demonstrate EEG activity consistent with a need to control negative mood states and suggests that exercise addiction is similar in its psychophysiological nature to other forms of addiction.

Socially prescribed perfectionism, well-being of athletes, and health-related strivings of university students: The moderating role of self-oriented perfectionism

Gaudreau, Patrick; University of Ottawa; Richard Koestner, McGill University

Research on the achievement and well-being outcomes of dispositional perfectionism remains limited in sport and exercise psychology. Nonetheless, there is now growing evidence that socially prescribed perfectionism is reliably associated with negative outcomes. In contrast, self-oriented perfectionism has been labeled as a maladaptive-unhealthy (Flett & Hewitt, 2005), adaptive-healthy (Dunkley et al., 2006), or a neutral disposition (Bieling et al., 2004). A potential explanation for these inconsistencies could be the failure to fully account for the multidimensional nature of perfectionism and, more specifically, to examine the potential interaction between the self and the social dimensions. Two studies were conducted to examine whether self-oriented perfectionism buffers the relationships of socially prescribed perfectionism with subjective well-being of athletes (Study 1, $n = 208$) and goal progress of university students in the pursuit of a self-set health-related goal (Study 2, $n = 64$). Results of moderated hierarchical regressions indicated, both concurrently Study 1 and over a four-week period Study 2, that socially prescribed perfectionism was severely associated with lower levels of subjective well-being ($\beta = -.48, p < .01$) and health-related goal progress ($\beta = -.53, p = .05$) for individuals who were low on self-oriented perfectionism. As expected, the thwarting association with well-being ($\beta = -.22, p < .05$) and goal progress ($\beta = .28, p = .09$) was strongly attenuated for individuals who were high on self-oriented perfectionism. These results indicate that labels such as neurotic or unhealthy should be limited to a clear-cut style of socially prescribed perfectionism, i.e., high on socially prescribed and low on self-oriented perfectionism rather than to people with a mixed profile of perfectionism, i.e., high on both socially prescribed and self-oriented perfectionism.

The dynamics of goal involvement states in table tennis: The role of the historicity of scoring

Gernigon, Christophe; Walid Briki, University of Montpellier 1; Katie Eykens, Catholic University of Leuven

Research conducted in a natural sport context has shown that goal involvement states can undergo some abrupt variations (Gernigon, d'Arripe-Longueville, Delignières, & Ninot, 2004). Based on the dynamical systems perspective, the purpose of the present study was to experimentally investigate the influence of the historicity of scoring on the flow of goal involvement states in table tennis. Twenty-three male table tennis players, either regional or national level, had to empathize with a highly important contest by watching two video scenarios of a table tennis game in two sessions separated by one month. The videos presented two inverted and symmetrical scenarios in which score gaps gradually varied in increasing versus decreasing ways. Based on Elliot and McGregor's (2001) model, goals of performance-approach (PAP), performance-avoidance (PAV), mastery-approach (MAP), and mastery avoidance (MAV) were assessed through single items before each point. Multivariate and univariate analyses of variance ($p < .05$) revealed some abrupt changes according to the score gaps for MAV, thus allowing to class this goal as a psychological content of momentum in sport (e.g., Perreault, Valleraud, Montgomery, & Provencher, 1998). Only PAP and MAV goals were sensitive to the historicity of scoring, displaying their highest scores in the increasing scenario and in the decreasing scenario, respectively. Moreover, MAV goals displayed a hysteresis pattern. These findings encourage further research on psychological momentum in sport based on the dynamical systems approach.

Social cognitive and control theory: A test of self-efficacy and performance in strength and conditioning

Gilson, Todd A.; Deborah L. Feltz, Michigan State University

Research, along with anecdotal evidence, has argued that self-efficacy is a key component when it comes to measuring performance in sport. Presently, social-cognitive theory (SCT: Bandura, 1986, 2001) and perceptual control theory (PCT: Powers, 1978, 1991) differ in how each explains the manifestation of confidence in individuals who are repeatedly tested at a skill/task over a period of time. Specifically, Bandura and Locke (2003) found that self-efficacy has been consistent in its significant contribution to motivation and performance over a series of nine meta-analyses. In contrast, Vancouver and colleagues revealed that self-efficacy was negatively related to performance at the within-person level over time, but was positively related to performance at the between-person level (Vancouver & Kendall, 2006; Vancouver et al., 2001, 2002). In this study, 115 Division I collegiate football players from 5 universities (M age = 20.55, SD = .966) completed a self-efficacy measure within 72 hours of a 1-repetition max test in the squat at three time points during off-season training. Utilizing a linear growth model with HLM, results revealed that self-efficacy was nonsignificantly positively related to squat performance ($p = .118$) at the within-person level and significantly related to performance between-persons ($p < .01$) when controlling for athletes' raw past performance. Furthermore, 17.7% of the Level 1 variance and 99.8% of the Level 2 variance surrounding current performance was explained with self-efficacy and raw past performance included in the model. Although results did not fully support either theory at the within-person level, they were in the opposite direction of what Vancouver et al. predicts within PCT. This study helps further the understanding concerning the relationship between self-efficacy and performance when using a unique real-world task that is less cognitively demanding and allows for changes in performance over time.

Struggling with decisions about exercise therapy: Relation of efficacy and thought valence

Glazebrook, Karen E.; Lawrence R. Brawley, University of Saskatchewan

Previous social cognitive research in the asymptomatic population has shown that exercisers experience both acute positive and negative thoughts when contemplating their upcoming exercise. Acute positive thinking is related to lower decisional struggle, greater self-efficacy, and more consistent exercise behavior (Gyurcsik, Brawley, & Langhout, 2002). Self-regulatory efficacy (SRE) is crucial for adherence to rehabilitative exercise (e.g., cardiac: Berkhuysen et al., 2001; Woodgate & Brawley, in press); however, these studies have not examined either thoughts or decisional struggle in relation to SRE. Our purposes were to (a) examine social cognitive differences in positive/negative thinkers and (b) identify variables related to extent of decisional struggle and SRE among individuals participating in a structured center-based exercise program for disease prevention and rehabilitation. Forty-four participants were asked to record positive and negative thoughts about exercise at the program for the next 2 weeks, and the extent to which these thoughts made them struggle with their exercise decisions. Exercise SRE (scheduling) was measured relative to the same time frame. MANOVA revealed that negative thinkers (i.e., the valence of total thoughts was more negative than positive) experienced significantly more decisional struggle and had lower self-regulatory efficacy than positive thinkers (Wilks's $\Lambda = .769$, $p = .005$). Decisional struggle and overall thought valence were correlated ($r = -.423$, $p = .004$). Multiple regression analysis indicated that SRE for upcoming exercise was significantly predicted by overall thought valence and decisional struggle (R^2 adj. = .317, $p < .001$). Together, these results agree with previous research on acute positive and negative cognitions and extend the findings to the context of rehabilitation exercise therapy. Future research should examine what moderators prompt negative thinking in this population (e.g., experiencing a lapse; beginning vs. maintaining rehabilitation) given its relationship to lower SRE.

Dissecting the “obesogenic” environment of a psychiatric hospital

Gorczynski, Paul; Guy Faulkner, Laura Zeglen; University of Toronto; Tony Cohn, Centre for Addiction and Mental Health

There is a higher prevalence of obesity and obesity-related diseases in individuals with serious mental illness in comparison to the general population. The purpose of this study was to examine the “obesogenic” factors, environmental influences on diet and physical activity that contribute to obesity, in the inpatient setting at one large psychiatric hospital. A qualitative approach was adopted and 25 semistructured interviews were conducted with a range of key stakeholders at the hospital. Interviews were audio-recorded and transcribed verbatim. Transcripts were analyzed through content analysis using the analysis grid for environments linked to obesity (ANGELO) framework as a categorical template (Swinburn, Egger, & Raza, 1999). In total, 54 factors related to food consumption and 30 factors related to physical activity or sedentary behavior were reported. Five valid, relevant, and modifiable factors included: (1) staff shortages; (2) inconsistent treatment delivery across all units; (3) a lack of educational programs for clients about diet and physical activity; (4) the nature of food services delivery; and (5) the client and survivor run food operations. Overall, interviewees noted that obesogenic factors related to diet had a greater impact on weight gain than sedentary behavior. However, many stressed the importance of addressing both in order to decrease obesity in the service user population. Obesogenic factors were extremely interconnected and mutually reinforcing. This highlights the need for greater interprofessional collaboration in reducing obesity prevalence in psychiatric settings.

Does weight status moderate the motivation–physical activity relationship?

Grattan, Kimberly; Philip M. Wilson, Brock University; Chris M. Blanchard, Dalhousie University; Samantha C. Major, Brock University

Previous research supports the importance of physical activity as a mechanism for health promotion (Bouchard et al., 2007) yet few attempts have been made to understand the influence of weight status on the motivation–physical activity relationship (Blanchard et al., 2005). This study tested the moderating effects of weight status on the motivation–physical activity relationship. Participants were male ($n = 297$) and female ($n = 1,724$) employees of the American Cancer Society who ranged in age from 19 to 79 years ($M = 40.26$ years; $SD = 11.42$). Body mass index (BMI) values were slightly greater than the healthy range for this age cohort ($M = 26.32$, $SD = 5.81$). Participants completed the Behavioural Regulation in Exercise Questionnaire (BREQ; Mullan et al., 1997) and the Godin Leisure Time Exercise Questionnaire (GLTEQ; Godin & Shephard, 1985) on a single occasion. Preliminary analyses suggested no particular areas of concern with the fit of the BREQ or full measurement models (CFI/NNFI = 0.94; RMSEA 90% CIs = 0.06–0.08; SRMSRs = 0.05) across subgroups stratified based on BMI values. Results of the simultaneous multigroup covariance analyses supported the partial invariance of a structural model whereby identified regulation (β s ranged from .43 to .44 across BMI subgroups; $ps < .05$) was the strongest predictor of regular physical activity (R^2 ranged from .23 to .29 across BMI subgroups) irrespective of subgroup membership (change in CFI = -0.01). Overall, the results of this investigation suggest that the relationship between motivation and physical activity behavior is not moderated by weight status classified on the basis of BMI risk profiles. Furthermore, these findings corroborate the worth of identified regulation as a motivational basis for physical activity behavior and imply that the degree of self-determination regulating physical activity

appears more relevant than the intrinsic or extrinsic nature of the motivation itself. Funding for this study was provided by the American Cancer Society and SSHRC.

Dimensions of perceived coaching style and athlete motivation: A self-determination theory perspective

Gregson, Paige; Philip M. Wilson, Brock University

Previous commentary indicates that sport participation is a complex process susceptible to the influence of a coach's interpersonal style (Vallerand, 2007). The purpose of this study was to examine the relationship between markers of perceived coaching style (namely, autonomy support, structure, and involvement) and motivation indices using a framework drawn largely from self-determination theory (SDT; Deci & Ryan, 2002). Participants ($N = 82$; 53.7% female) were Canadian interuniversity rugby players aged 18 to 27 ($M = 20.04$; $SD = 2.62$) who completed a multisection questionnaire at the mid-point and end of their competitive season. Intraclass correlation coefficients (ICC) indicated moderate stability across perceived coaching style and psychological need satisfaction indices over time (ICCs = .58 to .75). Hierarchical multiple regression analyses (HMRA) controlling for demographic and training variables indicated that perceived involvement of the head coach predicted effort put forth within sport by athletes at the midpoint (R^2 adj. = .31; $\beta = .24$) and end of season assessments (R^2 adj. = .21; $\beta = .22$). Additional HMRAs indicated that perceptions of competence and relatedness to fellow team members predicted the majority of variance in more self-determined motives to continue playing rugby the following season (R^2 adj. values ranged from .20 to .38; β s ranged from .27 to .49, respectively). In line with previous research (Deci & Ryan; Vallerand), the results of the present study illustrate the dynamic nature of perceived coaching style and psychological need fulfillment over time in sport and imply that coaches who display empathy and genuine interest will likely motivate athletes to work harder during the competitive season. Furthermore, these findings also suggest that an enhanced sense of connection with other athletes in association with feeling effective in mastering challenging tasks is an important consideration for athletes when making decisions to continue sport involvement in future seasons. Funding for this study was provided by the SSHRC

Predictors of well-being in persons with osteoporosis: Associations with demographic, health, and physical activity indices

Gunnell, Katie E.; Diane E. Mack, Philip M. Wilson, Kristin G. Oster, Kimberly P. Grattan; Brock University

The purpose of the investigation was to identify demographic, health, and physical activity correlates of psychological health in Canadians diagnosed with osteoporosis. Participants were 1,538 ($n_{\text{male}} = 167$; $n_{\text{female}} = 1,371$) self-reported osteoporotics over the age of 51 ($Md = 71$ years) or older who participated in the Canadian Community Health Survey Cycle 2.2. Participants provided data concerning demographics (e.g., gender, age, marital status, educational attainment, and annual household income), health indicators (e.g., body mass index [BMI], smoking status, and high blood pressure), physical activity (i.e., estimated daily energy expenditure over three months), and indices of psychological health. Bivariate correlations revealed a pattern of weak to small relationships between physical activity behavior and psychological health (r s ranged from $-.04$ to $-.29$). Simultaneous multiple regression analyses accounted for 4 to 23% of the variance in markers of psychological health using

demographic, health, and physical activity variables. Controlling for key demographic and health variables ($p < .05$), the unique variance accounted for by physical activity ranged from R^2 change = 0% to 4% across regression equations. The meaningfulness of physical activity on psychological health was not uniform across all indices examined. Given that physical activity is advocated as a key component in intervention programs targeting either prevention or maintenance of osteoporosis and its comorbidities (Osteoporosis Canada, 2007), sustained research on the effectiveness of physical activity on promoting psychological health in people living with osteoporosis is warranted. This research was supported by the Social Sciences and Humanities Research Council of Canada.

The use of observational learning in sport officials

Hancock, David J.; Amanda M. Rymal, Diane M. Ste-Marie; University of Ottawa

Observational learning (OL) is an evolving area within the sport psychology literature; OL is observing oneself or others, either live or on videotape, performing a task. Within the sport context, Cumming, Clark, Ste-Marie, McCullagh, and Hall (2005) have developed the Functions of Observational Learning Questionnaire (FOLQ), which identifies three functions of OL. The three functions of OL are skill, strategy, and performance. The skill function refers to observing and learning technical aspects of the sport. The strategy function refers to observing and learning the in-game strategies or game management, and the performance function denotes observing and learning how to obtain proper mental states required for performance. These functions of OL have been researched with athletes (Cumming et al.; Wesch, Law, & Hall, 2007); however, the functions of OL employed by sport officials have yet to be explored. Therefore, the purpose of this research was to examine whether sport officials utilize OL to increase officiating performance. Specifically, we asked whether officials use the functions of OL and, if so, is one function used more than another. To achieve this, the FOLQ (Cumming et al.) was administered to sport officials from a variety of sports. Participants rated, on a 7-point scale, their use of OL for the specific function described in the statement. Analysis of variance indicated a significant, $F(2, 50) = p < .01$, difference between all three functions of OL. The sport officials employed the skill function ($M = 5.3$, $S = 1.1$) significantly more than the strategy ($M = 4.8$, $S = 1.0$) and performance ($M = 4.1$, $S = 1.2$) functions of OL. Participants also utilized the strategy function ($M = 4.8$, $S = 1.0$) significantly more than the performance function ($M = 4.1$, $S = 1.2$). Discussion will consider the use of OL by sport officials and the implications of these findings.

Elite female adolescent athletes perceptions of the motivational influences and social support of coaches, parents, and peers: A grounded theory approach

Hassell, Kristina A.; Catherine M. Sabiston, Gordon A. Bloom; McGill University

Self-determination theory (SDT; Deci & Ryan, 1985) research in sport has been directed almost exclusively towards the motivational influence of the coach (e.g., Vallerand, in press; Mageau & Vallerand, 2003). Parents' and peers' motivational influences, although important, have been studied to a much lesser extent (e.g., Gagné, Ryan, & Bargmann, 2003; Ntoumains & Duda, 2005). In addition, most recent research on social influences and self-determined motivation in sport with youth has been nomothetic and quantitative—disregarding youths' meanings and interpretations of their social context (Garcia Bengoechea & Streat, 2007). Therefore, this presentation will focus on findings from a study which explored elite female adolescent swimmers' perceptions of the motivational influences of their coaches, parents, and peers using a constructivist grounded theory approach (Charmaz, 2000). Nine elite

female swimmers (aged 13–15 years) participated in two semistructured interviews that were audiotaped and transcribed verbatim. Six categories emerged, including individual factors, and social aspects, including assistance, informational, esteem, emotional, and network support. Results indicated girls' unique interpretations of social support types and highlighted the differential importance of coaches, parents, and peers as salient providers. Swimmers' social support experiences were uniquely linked to their perceptions of competence, autonomy, relatedness, and motivation in elite competitive swimming. These findings were consolidated into separate models linked to social support providers, which incorporated past SDT theoretical tenets and offered new insights into the important and differential influences of coaches, parents, and peers in youth elite sport.

The influence of team perceptions and leader efficacy on team-referent attributions

Hepler, Teri J.; Graig M. Chow, Deborah L. Feltz; Michigan State University

Research has demonstrated that attributions are important factors in sport (McAuley, 1992). Recently, there has been growing interest in team-referent attributions (Greenlees et al., 2007). Most of this research has focused on differences in attributions based on outcome or gender. However, group perceptions and leader efficacy may also predict team attributions. The purpose of this study was to explore the predictive strength of team perceptions and coach efficacy on team-referent attributions. Participants included 537 intercollegiate athletes from 41 teams and their head coaches (golf, basketball, baseball/softball). Questionnaires assessed self-efficacy, collective efficacy, group cohesion, and coaching efficacy before a competition and team attributions afterward. The CDS-II (McAuley, Duncan, & Russell, 1992), which measures attributions, was modified to fit teams and three items were also added. These items assessed if the attributions were team-focused or self-focused. Multilevel modeling was used to analyze the data. Individual factors such as perceptions of individual success and self-efficacy were used as control variables. Results indicated that team perceptions and leader efficacy significantly predicted team attributions. Members of teams with higher collective efficacy made attributions that were more internal, team controllable, and team-focused than members of teams with lower collective efficacy. For group cohesion, individual attraction to the group–task was associated with less internal, team controllable and team-focused attributions. Moreover, athletes who played for coaches with high coaching efficacy attributed their team's performance to factors that were more internal, team controllable, and less externally controllable. Finally, teams that perceived their performance as successful made more stable, externally controllable, and team-focused attributions. The findings of this study suggest that team and leader perceptions should be considered when examining team-referent attributions in team sports.

Are proximal outcome expectancies and value associated with exercise identity?

Linking self-efficacy theory to identity

Jung, Mary E.; Lawrence R. Brawley, University of Saskatchewan; Shaelyn M. Strachan, University of Ottawa

Role identities are considered essential components to one's concept of self. Endorsement of a particular identity provides value to past behavior and directs future behavior in that individuals seek identity-behavior congruence (Anderson & Cychosz, 1995; Strachan, Jung, & Brawley, 2007). Determining which adherence-related social cognitions are associated with exercise identity (EXID) may clarify the relations between the more stable construct of identity and specific social cognitions. For example, strong endorsement of an EXID

has been related to self-regulatory exercise efficacy (Strachan, Brawley & Woodgate, 2005, Strachan, Jung, & Brawley, 2007). However, the link between EXID and other self-efficacy theory variables (Bandura, 1986), such as outcome expectancies (OE) and value (OV), has not been examined. Theoretically, individuals who expect positive proximal outcomes from exercise and value these outcomes should wish to identify themselves as exercisers. The relationships between EXID, OE, OV, and self-regulatory efficacy were explored in a sample of 325 university students (*M* age = 24.9; 217 females). Participants completed one online questionnaire at the beginning of the academic year. A hierarchical multiple regression predicting EXID was performed. Self-regulatory efficacy was entered in Block 1. Proximal physical, social, and psychological OE and OV were entered in Block 2. The overall model was significant, $F = 165.5(1, 324)$, adj. $R^2 = .44$, $p < .001$. Self-regulatory efficacy explained 34% of the variance of EXID ($B = .138$, $p < .001$). After controlling for efficacy, OE and OV explained an additional 11% of the variance (social OE, physical OE, and OV were main contributors; $B = .28$, $-.15$, and $.22$ respectively, $p < .05$). Findings confirm past research associating EXID and self-regulatory efficacy, and offer the first support for the OE, OV, and EXID relationships. Future research using a prospective design should determine the direction and strength of this latter relationship and consider when proximal OE matter for identity-behavior congruence.

There is no “I” in team: Reconceptualizing immoral sport behavior as an interpersonal construct.

Kaye, Miranda P.; Pennsylvania State University

Moral issues are inherently interpersonal as immoral behaviors are actions that affect the material or psychological well-being of other people (Kohlberg, 1971) and are judged by their consequences to others (Haidt et al., 1993). Immoral sport behaviors may be considered interpersonal in nature in two ways. First, they focus on the violations of others' rights such as having fair competition; an equal opportunity to strive for success; being safe from malevolence and degrading treatment or punishment; and being treated with dignity (Seefeldt & Martens, 1979). Second, immoral sport behaviors vary in their blend of agency and communion, thus potentially mapping onto a circumplex structure. There is general agreement that the appropriate structural model for representing interpersonal issues is a two-dimensional circumplex in which variables are ordered in a circular arrangement around the orthogonal dimensions of agency and communion (Wiggins, 1979). Circumplex models are well established in several psychological domains (i.e., interpersonal problems, traits, values, and social support) and may well serve to organize immoral sport behavior. This work proposes the circumplex as a theoretical model for the organization and understanding of immoral sport behavior. Items for an instrument to measure interpersonal immoral sport behavior were developed, including previously studied behaviors such as cheating and aggression as well as unstudied interpersonal behaviors such as acquiescence and melodramatic exhibition. A list of items representing the proposed categories of immoral sport behavior was developed and the psychometric properties were examined. Construct validity was assessed through associations with related measures (aggression, sportpersonship, and hypercompetitiveness) and to potential correlates of immoral sport behavior (personality, achievement motives and goals, anxiety, and social desirability). Initial results indicate support for the interpersonal nature of immoral sport behavior.

Dispositional reinvestment and choking in cognitive and motor tasks of varying complexity

Kinrade, Noel P.; Brunel University; Robin C. Jackson, University of Hong Kong; Kelly J. Ashford, Brunel University

Performance breakdown under pressure has received considerable interest over the past two decades. This has generated a considerable body of evidence in support of “explicit monitoring” theories of choking. The purpose of the present study was to examine the predictive validity of the Reinvestment Scale in cognitive and motor tasks of varying complexity. This scale was designed to predict susceptibility to skill failure but has only been assessed using well-learned proceduralized motor skills. In the present study, university students ($N = 60$) completed low- and high-complex motor tasks (pegboard and golf putting), psychomotor tasks (card sorting at two levels of complexity), and working memory tasks (modular arithmetic at two levels of complexity). The test battery was completed on two occasions, once under low pressure and once under high pressure. Results indicated that performance deteriorated under pressure in the pegboard task but not in the golf putting task. In the low-complex card-sorting task, performance was stable across pressure conditions; however, participants performed faster but with more errors in the high-complex version of the task. In the modular arithmetic tasks, the mean number of errors increased more under pressure in the complex version than in the simple version of the task, but completion time was unaffected. Reinvestment Scale scores were significantly related to skill failure under pressure in both the pegboard and golf putting motor tasks; were associated with faster task completion times under pressure in the low-complex and high-complex card sorting tasks (but not with change in errors); and were associated with the increase in errors under pressure in both modular arithmetic tasks (but not with change in completion time). These results are inconsistent with the Reinvestment Scale predicting conscious processing per se; rather, it predicts more general performance changes that result from increased pressure, be it speeding up of performance (card sorting) or the increased number of errors made (modular arithmetic).

The two-component model of self-presentation: Examination of a weightlifting stereotype

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Self-presentation is the mechanism by which individuals attempt to monitor and control impressions formed of them by others (Leary, 1995). Substantive evidence suggests that, regardless of gender, self-presentational advantages exist for exercisers (Martin et al., 2000). Although this exerciser stereotype has been well documented, stereotypes proscribed to weightlifters (WL) have received considerably less attention. Thus, the purpose of this study was to examine whether the provision of an individual’s weight lifting habits influences the impressions that others form of that individual, and if those impressions are moderated by self-presentational motives. Male and female undergraduate students ($N = 195$) were presented with one of four vignettes depicting a male target who was described as an excessive WL, a typical WL, a non-WL, or a control. Participants rated the target on a series of personality and physical characteristics, and completed an adapted version of the Self-Presentation in Exercise Questionnaire (Conroy & Motl, 2000), modified for weight lifting. Results indicated that the excessive and typical WL targets were perceived more

favorably in comparison to their non-WL and control counterparts in terms of both physical and personality attributes ($p < .01$). Although the motivation to self-present as a WL did not moderate impression formation based on WL habits information, a significant interaction emerged between impression construction and target type for one physical characteristic specific to attractiveness ($p < .017$). Participants high in the inclination to construct the image of being a WL attributed more favorable physical features to the excessive and typical weightlifters, in comparison with the non-WL and control targets. Results not only suggest that a social advantage is associated with being perceived as a WL, but also offer preliminary evidence that self-presentational motives may moderate the physical appearance attributed to men of varying musculature.

Students with attitude: A retrospective examination of social cognitive variables that influence physical activity behavior during students' transition from high school to university

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The transition from high school to university is one timeframe during which researchers have observed an abrupt decline in physical activity (PA) (Bray & Born, 2004), yet factors contributing to this decline are poorly understood. Retrospective examination of factors related to PA among students who are active compared to those who are inactive may be informative. The purpose of this case-control study was to compare active students (>4 days of 30 min of moderate/vigorous PA) and inactive students on selected social cognitive variables and relationships between those variables and PA. Two hundred and twelve first-year university students (female, $n = 145$) aged 17–19 ($M = 17.79 \pm .58$), voluntarily participated. A MANOVA was computed to compare students' scores on attitudes, subjective norms, perceived control, and intentions. The overall model was significant, $F(4, 207) = 3.46$, Wilks's $\Lambda = .094$, $p < .01$, showing differences in subjective norms, perceived behavioral control, and intentions ($ps < .01$). Separate multiple regression analyses were conducted to predict students earlier intentions to be physically active. Results of both models were significant ($p < .001$). For students who were active, 44.5% of the variance in intentions was explained by one predictor: attitudes ($\beta = .61$). For insufficiently active students, 34.5% of the variance was explained by a combination of attitudes ($\beta = .29$), subjective norms ($\beta = .18$), and perceived behavioral control ($\beta = .35$). Thus, students who were active during their first semester at university had more positive PA cognitions going into university and a strong attitude-intention relationship. Given the high social and environmental volatility and vulnerability involved in adjustment to first-year university, PA promotion efforts in university should focus on personal evaluations and outcomes expectancies for PA to help bolster positive attitudes to be physically active.

The effects of experimenter gender on state social physique anxiety and strength in a testing environment

Lamarche, Larkin; University of Toronto; Kimberley L. Gammage, David A. Gabriel; Brock University

Self-presentational concerns can influence actual effort put forth during exercise (Rhea et al., 2003; Worryingham & Messick, 1983). Social physique anxiety (SPA), concerns over one's body being evaluated by others (Hart et al., 1989), is a specific self-presentational concern that may be particularly relevant in a physical testing environment. A factor that may

influence SPA, which may in turn influence the outcomes of a physical test, is experimenter gender. The present study examined the influence of experimenter gender on SPA and actual muscle strength in an experimental testing environment. Male ($n = 49$) and female ($n = 51$) university students were randomly assigned either a male or a female experimenter such that there were equal numbers of male and female participants in each condition. Prior to a strength test, a single-item measure of state social physique anxiety (SPA-S) was completed. Actual strength was represented by participants' maximum voluntary contraction (MVC)-100 values. A MANOVA was conducted with participant gender and experimenter gender as the independent variables and strength and SPA-S as the dependent variables. Results revealed a significant gender of the participant, $F(2, 94) = 23.11, p < .001$, and gender of the experimenter $F(2, 94) = 3.09, p = .05$, effect. Follow-up univariate ANOVAs indicated that MVC-100 values were significantly higher for men ($p < .001$). However, although the overall effect of experimenter gender was significant, univariate follow-ups showed no significant differences with regard to strength or SPA-S between those having a male or female experimenter. Although the gender of the experimenter did not influence SPA-S or muscle strength, other forms of anxiety (i.e., performance anxiety) may have been more relevant in the testing setting. It is important to investigate other factors in the testing environment (e.g., type of task, number of observers present) which may be more influential on psychological or performance outcomes. Research supported by NSERC.

Attention and movement variability: Facilitation of compensatory mechanisms under optimal attentional focus

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The study of expert performance has been examined by multiple scientific disciplines, each with their own unique level of analysis. However, up to this point, there has been little research that has attempted to illuminate the interaction between cognitive and more biomechanical systems in the production of skilled movement. Specifically, a firm link between the role of attention and variability of the motor system has yet to be established. The present study examined novice ($n = 24$) and skilled golfers ($n = 20$) on a putting task while performing under a discrete and continuous secondary task designed to aid external focus. Putting performance was measured via both a product- and process-oriented approach, which provided a comprehensive account of performance under optimal and nonoptimal focus. Results revealed that under both "optimal" external focus manipulations, skilled performance improved accompanied by increased variability in key kinematic parameters associated with the putting stroke. The increased movement variability associated with improved performance suggests that optimal attentional focus may facilitate functional and compensatory mechanisms that can aid overall performance. In contrast, novice outcome performance was unaffected by the "nonoptimal" secondary task demands, but exhibited decreased movement variability. We suggest that the increased task demands brought about by the secondary tasks resulted in novices freezing degrees of freedom in order to reduce task complexity. Overall, these findings highlight the relationship between attention and compensatory variability, and suggest that attentional focus may be vital to facilitating compensatory mechanisms in the motor system.

Athletes' use of modeling in injury rehabilitation

Law, Barbi; Queens University; Craig Hall, University of Western Ontario

Previous examinations of athletes' use of modeling in natural sport environments have focused on the functions that it serves in practice and competition contexts (Cumming, Clark, Ste-Marie, McCullagh, & Hall, 2005; Hall et al., 2006; Wesch, Law, & Hall, 2007). Through the use of surveys, Cumming et al. (2005) found that athletes reported using modeling to aid the learning and performance of specific skills and strategies, as well as to attain optimal mental states for performance. However, athletes may also benefit from modeling in other sport-related contexts. The purpose of this study was to gather descriptive data on athletes' use of modeling in injury rehabilitation. As part of a larger qualitative study, eleven varsity athletes (6 male, 5 female) participated in semistructured interviews about when, where, why, what, and who they observe in relation to several sport-related contexts. With respect to the use of modeling during injury rehabilitation, content analysis of the interview transcripts provided descriptive information on the structure (i.e., frequency and duration) and content (i.e., modality and focus of attention) of their modeling experiences. Athletes also described the specific types of models they observed and identified the functions modeling served for them during injury rehabilitation. Results are discussed in terms of directions for future research and possible applications of modeling throughout the injury rehabilitation process.

Personal and contextual determinants of elite young athletes persistence in versus dropping out of national training centers

Le Bars, Hervé; Christophe Gernigon, Grégory Ninot; University of Montpellier 1

The aim of this study was to examine whether elite young judokas (M age = 17.9) who persisted in national training centers ($n = 52$) were different from dropouts ($n = 52$) in their perceptions of coach-, parent-, and peer-induced motivational climates, goal orientations, self-perceptions, perceived competence, and intention of dropping out. Participants completed the following set of questionnaires six times during a period of two years: SOGIRSQ (Le Bars, Ferron, Maïano, & Gernigon, 2006), French versions of the POSQ (Durand, Cury, Sarrazin, & Famose, 1996) and of the PSPP (Ninot, Delignières, & Fortes, 2000), two items of perceived competence in judo, and two items of intention of giving up high level judo. For dropouts, the last measures that were recorded before they gave up were considered for the analyses. For persisting athletes, the times of measurement that were retained were yoked to dropouts. Self-perceptions were higher for males than for females but did not differ according to dropout versus persisting status. Compared to persisting athletes, dropouts perceived the roles of all the significant others as less task-involving, were less task-oriented, and intended more to drop out. No differences were observed regarding ego orientation and perceptions of ego-involving climates which were high for both samples. Dropping out or persisting might thus be more a matter of capacity to endure the difficulty of elite context, thanks to the emphasis on task perspective, rather than a matter of perception of it as more or less ego-involving.

Development and validation of the collective efficacy scale in football

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Introduction: Collective efficacy has been defined by Bandura (1997) as a group's shared belief in its own collective ability to organize and execute a course of action to produce a given level of attainment. Because high collective efficacy teams possess major advantages

on low collective efficacy teams (Greenlees, et al., 2000; Hodges et al., 1992), it seems necessary develop a valid means of evaluating team collective efficacy in sport. In football, Myers et al. (2004) developed a scale measuring efficacy solely for offensive unit. However, this game is interdependent in nature and requires three separated units (the offensive, the defensive, and the special teams). The aim is to present the results of a sport specific collective efficacy scale in football. Method: Based on a literature review and interviews with six experienced players (college to professional level), 63 items were developed. Second, items were assessed for face and content validity by five football coaches. This step eliminated nine items and led to 54 test items. Following this steps, the remaining items were submitted to a sample of 820 players from 19 teams ($M = 18.9$ years old, $SD = 1.9$). Analysis and Results: First, item analysis was conducted using Rasch modeling, a model from item response theory. Results from this modeling procedure rejected 11 items, yielding a final version of this scale composed of 43 items, 23 items (specific to the offensive unit), 17 items (specific to the defensive unit), and 3 (specific for the specials teams). Response scale ranges from 0 to 10 ($M = 7.56$ and $SD = 1.1$). The person reliability coefficient and item reliability demonstrated good psychometric qualities (0.96 and 0.99). Results from the confirmatory factor analysis showed that a hierarchical first-order model best fitted the data (NNFI = 0.95 and SRMR = 0.066). Discussion: Strengths and limits will be discussed in addition to the use of this newly developed scale as a diagnostic tool for coaches and sport psychologists when attempting to improve confidence in football team.

Skilled memory performance in soccer coaches and players

Locquet, Claire; Université de la Méditerranée; Bachir Zoudji, Université de Valenciennes et du Hainaut Cambrésis; Allistair P. McRobert, Paul Ford, A. Mark Williams, Liverpool John Moores University; Hubert Ripoll, Université de la Méditerranée

We examined skilled memory performance in intermediate level soccer coaches ($n = 11$) and players ($n = 10$) using a novel modification of the traditional recognition paradigm. In the viewing phase, participants were presented with 30 min of continuous film footage from the first half of a televised professional soccer match. The subsequent recognition phase contained 36 discrete trials each lasting between 8 and 12 s. Altogether, 24 sequences had been seen previously in the viewing phase and the remaining 12 sequences were new and taken from the remaining 15 min of the same half. During the entire test procedure, visual point-of-gaze data were recorded using a head-mounted, corneal reflection system. Participants were required to indicate whether or not they had previously viewed the sequences presented in the recognition phase. The dependent measures were recognition accuracy (RA), and the location, number, and duration of fixations. A mixed 2-way ANOVA was employed to assess RA with group (coaches vs. players) as a between-participant and condition (seen vs. new) as a within-participant factor. There was a significant main effect for Group, $F(1, 19) = 8.0622, p = .01048$. The soccer coaches ($M = 76\%$, $SD = 5$) recorded higher accuracy scores than players ($M = 66\%$, $SD = 7$). There were no other significant effects. The visual point-of-gaze data indicated that the coaches employed fewer fixations of longer duration and spent less time fixating on the ball than the players. The results suggest that coaches develop refined memory structures that enable them to more accurately recognize match action sequences than players. Implications for the training and development of coaches are discussed.

Tactical bias in professional tennis: Generalized hitting preferences causing the left-handers' advantage in interactive sports?

Loffing, Florian; Norbert Hagemann, Bernd Strauss; University of Münster

Many interactive sports like tennis, table tennis, or cricket are characterized by a higher incidence and a higher-than-average rate of success of left-handed professionals, respectively. Following the strategic advantage hypothesis (Wood & Aggleton, 1989), left-handers take advantage of having different angles of attack and mirrored stroke or shot movements compared to their right-handed competitors. As right-handers are overrepresented, athletes are supposed to be more familiar with their playing techniques and tactics leading to a left-right bias, which is characterized by an imbalance in the proportion of attacking putative weak areas of the opponent. As a consequence, we hypothesize a tactical bias in athletes' behavior when facing a left-hander; i.e., competing against a left-hander in tennis leads to a decrease in proportion of balls played to the commonly weaker backhand side compared to when playing against a right-hander. A total of $N = 24,068$ ball placements ($n = 3,127$ left-left, $n = 11,671$ left-right, and $n = 9,270$ right-right constellations) of 54 randomly chosen professional tennis matches from ATP, WTA, and Grand Slam tournaments were analyzed (data of ball coordinates by courtesy of Hawk-Eye Innovations). According to the lateral displacement relating to the midline of the tennis court, ball bounces were classified as backhand vs. forehand placements in the opposing field. Nonparametric analyses of proportion of ball placements suggest no tactical bias for left-handed players when competing against right- and left-handers (backhand 60%, forehand 40%), respectively. However, for right-handed players a significant 3.2% difference in proportion of balls placed on the backhand side (58.3% right-handed and 55.1% left-handed opponents) was found, $\chi^2(1, N = 15, 130) = 14.23, p < 0.01$. The results indicate a tactical left-right bias in right-handers even at the highest level of professional tennis. Thus, the advantage of left-handers in interactive sports may be at least partially a consequence of players' generalized hitting preferences to the right side.

Has peak performance changed over time? An update of Schulz and Curnow (1988)

Logan, Jane; Joseph Baker, York University

In 1988, Schulz and Curnow presented data on the age at which peak performance occurs in sprint (e.g., track), endurance (e.g., marathon), and skill-based sports (e.g., golf, baseball). Twenty years have passed since this classic study was published, and in light of the current controversy surrounding performance-enhancing substances, it seemed pertinent to re-examine age of peak performance in the sports examined by Schulz and Curnow. Data from Olympic swimming, Olympic track and field, professional baseball, and professional golf were collected from official archives, from 1980 through to the present time. For the Olympic sports, the age and time of the gold medal winners in track and field and swimming events were collected from 1984 to 2004. For baseball, the top three performances in hitting and pitching statistics were collected, as well as the age of the athlete. The ages of the players of the year in PGA golf were also included in the sample. *T*-tests demonstrated that the peak for events requiring explosive power (e.g., high jump in men) has increased over the past twenty years ($t = 2.66, p < 0.04$), from early twenties to late twenties (e.g., 28 for long jump). As well, peaks for female athletes have aged as well (e.g., 100-m dash, $t = 4.75, p < 0.005$), from early twenties to late twenties; this increase may be explained by higher rates

of participation in Olympic sports. However, the peak performance in the majority of events did not change. Implications of these findings will be discussed.

The influence of team goal setting on cohesion and team performance

Loughead, Todd M.; Krista J. Munroe-Chandler, University of Windsor

It has been shown that higher levels of cohesion is related to improved performance (Carron, Colman, Wheeler, & Stevens, 2002). Given the significant relationship between cohesion and performance, it is not surprising that coaches make attempts to enhance cohesion. The process of developing or enhancing cohesion can be accomplished through a process known as team building. One common method of team building is goal setting (Widmeyer & Ducharme, 1997). Overall, the research suggests that team goal setting positively influences cohesion and individual goal setting positively influences performance. However, it is unknown how the different types of goals influence cohesion and team performance. Therefore, the purpose of the study was to examine the influence of assigned and participative team goal setting on cohesion and team performance. The participants were 201 undergraduate kinesiology students who completed a novel task in teams of three. Participants were randomly assigned to one of three team goal setting conditions: assigned, participative, or control. The results revealed a significant multivariate effect for team goal type, Pillai's trace, $F(10, 390) = 3.12$, $p < .05$. Insofar as cohesion is concerned, post hoc ANOVAs revealed significant differences between participative team goal setting and the control condition on perceptions of social cohesion ATG-S and GI-S as measured by the GEQ. Specifically, the participants in the control condition perceived ATG-S and GI-S to a greater extent than participants in the participative team goal setting condition, $F(2, 198) = 2.98$, $p < .05$ and $F(2, 198) = 5.48$, $p < .05$, respectively. As for performance, participants in the assigned team goal setting condition significantly improved their performance more than their participative team goal setting counterparts, $F(2, 198) = 5.39$, $p < .05$. The results are discussed in terms of their implications for understanding the role of team goal setting in sport.

The why and how of exercise goal pursuit: Self-determination and goal process cognition

Lutz, Rafer; Baylor University; Paul Karoly, Morris A. Okun; Arizona State University

There is ample evidence to suggest that self-determination for exercise predicts variance in exercise participation. It is less clear, however, what motivational strategies are employed by those who have more self-determined motivational profiles. Such an understanding may lead to better interventions to promote adherence to physical exercise regimens. Goal process cognition, thoughts about the goal striving process, organized within a control systems (Ford, 1987) framework exist as a possible means to assess motivational strategies and processes. The purpose of this research was to examine goal process cognition as a mediator of the relationship between the self-determination index and strenuous exercise participation. Surveys were administered to university students ($N = 535$) who were asked to identify their most important exercise goal and rate this goal according to nine goal process dimensions of the Goal Systems Assessment Battery (Karoly & Ruehlman, 1995). Students were also asked to complete measures of self-determination for exercise and leisure-time exercise participation (Leisure Time Exercise Questionnaire; Godin & Shephard, 1985). To examine mediation, a multiple mediator model was tested using the Preacher and Hayes

(2007) bootstrapping procedure. There was a fully mediated effect of self-determination for exercise on strenuous leisure-time exercise. There was no direct effect of self-determination on strenuous exercise participation and 72% of its total effect on strenuous exercise was indirect via the goal processes of self-monitoring, planning, and positive arousal for exercise goals. Thus, it appears that goal process cognition is a viable means for understanding how self-determination influences strenuous exercise behavior. Also, future studies should further examine intervention strategies centered on self-monitoring and planning, as well as attempts to create greater positive arousal for exercise goals.

The relationship between coaching efficacy, coaching experience, and leadership styles among coaches in Botswana

Malete, Leapetswe; University of Botswana; Philip J. Sullivan, Brock University

Much research has supported the construct of coaching efficacy and its various predictors, particularly coaching education and coaching experience. However, little is known about how these factors are related to leadership styles. Examining the impact of coaching efficacy and coaching experience on leadership styles of coaches should make significant contribution to the burgeoning literature on this less studied yet important construct. The current study examined the relationships between coaching efficacy, coaching experience, and leadership styles. One hundred and eighty-four coaches from Botswana completed the Coaching Efficacy Scale (Feltz et al., 1999) and the Revised Leadership Scale for Sports (Zhang et al., 1997). Given that the four factors of the CES were highly intercorrelated, a second-order factor of general coaching efficacy (GCE) was used in the subsequent analysis. Further, only the LSS factors of positive feedback, training and instruction, situational consideration and social support were significantly related to coaching experience and GCE. Four stepwise multiple regressions were run with each factor of the LSS as a dependent variable to determine the nature of the relationships between coaching efficacy, experience, and leadership style. Conceptual models of both coaching efficacy and coaching effectiveness state that experience affects efficacy, which in turn affects leadership style. Therefore, in each model coaching experience was entered as a predictor on the first step and GCE on the second. For each LSS factor, each stepwise regression was significant ($p < .001$). Further, the addition of efficacy as a predictor led to a significant improvement to each model ($p < .001$). Together, these two variables accounted for between 12 and 25% of the variance in coaching style. In each model, coaching efficacy resulted in an R^2 change of approximately .10. Therefore, both coaching experience and coaching efficacy appear to be significant sources for a variety of leadership styles of coaches.

Team building interventions in sport: A meta-analysis

Martin, Luc J.; Albert V. Carron, Shauna M. Burke; University of Western Ontario

Team building has been defined as “a method of helping the group to (a) increase effectiveness, (b) satisfy the needs of its members, or (c) improve work conditions” (Brawley & Paskevich, 1997, p. 13). The primary purpose of the present study was to conduct a meta-analysis of studies that have used team-building interventions in sport teams. A secondary purpose was to examine the influence of various moderator variables: source of publication (refereed, unpublished), study design (quasi-experimental, nonexperimental), method of delivery (indirect, direct), dependent variable examined (performance, cohesion), and type of intervention goal setting (adventure experience, omnibus). Standard literature searches produced 16 studies containing 166 effect sizes. The effect sizes were subjected to the

corrections suggested by Hedges and Olkin (1985). Overall average Hedges's g was .452 ($p < .001$). Subsequent analyses indicated (a) a small positive effect for published ($g = .232$, $p < .004$) and a moderate positive effect for unpublished ($g = .624$, $p < .001$) studies, (b) a small effect for studies with quasi-experimental designs ($g = .223$, $p < .003$) and a moderate-to-large effect in nonexperimental studies ($g = .638$, $p < .001$), (c) moderate effects for both direct delivery ($g = .460$, $p < .001$) and indirect delivery interventions ($g = .466$, $p < .001$), (d) a moderate positive effect for performance ($g = .634$, $p < .001$), (e) small effects for individual attractions to the group-social ($g = .265$, $p < .005$) and group integration-social ($g = .330$, $p < .001$), (f) moderate-to-large effects for individual attractions to the group-task ($g = .520$, $p < .007$) and group integration-task, respectively ($g = .744$, $p < .001$), (g) moderate-to-large effects for goal setting and adventure experiences interventions ($g = .686$ and $.674$ respectively, $p < .001$), and (h) no effect for omnibus interventions ($g = .089$, $p > .05$). The results are discussed in relation to their contribution to group dynamics theory and practice in sport.

Exercising self-control: A lab-based measure of exercise-related self-regulatory strength predicts 8-week exercise adherence

Martin Ginis, Kathleen A.; Steven R. Bray, McMaster University

The limited strength model (Schmeichel & Baumeister, 2004) posits that self-regulatory strength is a finite, renewable resource that is drained when people attempt to regulate emotions, thoughts, or behaviors. Consequently, when a situation demands two consecutive acts of self-regulation, performance on the second act is frequently impaired. Self-regulatory depletion may explain people's inability to follow through with their exercise intentions (Baumeister et al., 1994). As such, we hypothesized that a trait measure and an exercise-specific measure of self-regulatory strength would predict exercise adherence. Participants were 27 women (M age = 19.96) whose motivation to perform an impending exercise bout was assessed immediately before and after a cognitive self-regulatory depletion task. Changes in motivation were considered an index of exercise self-regulatory strength. They also completed the Self-Control Scale (Tangney et al., 2004) and indicated how many days/week and min/session they intended to exercise over the next 8 weeks. Adherence was operationalized as the difference between the amount of exercise participants planned to do and the amount that they actually did over 8 weeks. Exercise self-regulatory strength significantly predicted adherence-days/wk, over Weeks 1 to 4 ($r = .43$) and Weeks 5 to 8 ($r = .52$, $ps < .05$); women who reported a greater decrease in motivation following the self-regulatory depletion manipulation also did fewer days of exercise than planned. Exercise self-regulatory strength did not predict adherence-min/session. Trait self-control did not predict adherence-days/wk or adherence-min/session (all $ps > .07$). In partial support of the limited strength model, our results indicate that women who are more susceptible to the acute effects of self-regulatory depletion on exercise motivation are more likely to skip planned exercise sessions. These findings have implications for understanding how daily self-regulatory demands can lead to episodes of exercise nonadherence.

An investigation of the influence of self-modeling on causal attributions

McCardle, Lindsay; Diane M. Ste-Marie, Rose Martini; University of Ottawa

Dowrick (1999) proposed the method of feed-forward self-modeling (FF-SM) in which a video is edited to show a higher level of performance than the learner's current ability. In this experiment, the FF-SM video showed a gymnast performing a combination of two floor

skills which they were able to do separately but not yet in combination. Eight gymnasts (7 females, 1 male; M age = 9.9) participated in a pretest, nine intervention sessions, and a posttest. During the intervention sessions, the gymnasts received a FF-SM video for one skill combination and no intervention for a control skill combination. We investigated the possible influences of viewing the FF-SM video on the gymnasts' self-regulatory processes within the context of Zimmerman's (2000) model of self-regulation. We had a specific focus on the causal attribution process of the self-reflection phase. Weiner's 1986 theory of causal attributions puts forward three important dimensions to individuals' attributions: locus of causality, controllability, and stability. These were tested by having participants complete a modified Revised Causal Dimension Scale (McAuley, Duncan & Russell, 1992) for both the control and FF-SM skill combinations. First, they reflected on a well-performed skill combination. A repeated measures ANOVA revealed that there were no differences between the FF-SM and control combinations ($F = 2.4, p > .05$). There was, however, a significant main effect for dimension ($F = 14.25, p < .001$). In addition, participants reflected on a poorly performed combination for each FF-SM and control conditions. A repeated measures ANOVA was performed and again found significant differences as a function of dimension ($F = 23.99, p < .001$) but no main effect for FF-SM versus control conditions ($F = 1.17, p > .05$).

Adolescent swimmers' goals and stress appraisals across a swim season

McDonough, Meghan H.; Purdue University; Valerie Hadd, Peter R.E. Crocker, University of British Columbia; Katherine A. Tamminen, Nicholas L. Holt; University of Alberta; University of Alberta

Adolescent athletes experience considerable stress surrounding competition in sport. Lazarus's (1991, 1999) cognitive-motivational-relational theory suggests that stress is dynamic, context-dependent, and influenced by goals and goals importance. Many previous studies have examined stress in sport using retrospective or cross-sectional designs. More recently there has been an emphasis on examining the stress process over time to better understand the patterns of stress appraisals and how they change and develop over time in competitive situations. Therefore, this study used a qualitative approach to document patterns of stress appraisals and links to their goals among elite adolescent swimmers across one season. Four female and four male swimmers who were participating in provincial and national level meets took part in the interviews. Four of the swimmers were in the 14 and under age category and four were 17 and under. Swimmers were interviewed nine times each: at the beginning of season and before and after each of four major meets. Data was analyzed first using a content analysis approach to identify the types of goals and stress appraisals experienced, and then using an interpretive phenomenological analysis (Smith & Osborn, 2003) to examine changes in goals and stress appraisals across the season. Swimmers identified several types of stress appraisals relating to swimming performance (e.g., pressure to improve time, technique, qualifying for future events, pressure to perform), interpersonal relationships (e.g., coach, friends/teammates, parents), and environmental (e.g., unfamiliar conditions) and physiological (e.g., fatigue, pain, injury/sickness) conditions. Stress appraisals that were linked to goals (e.g., pressure to improve time) exhibited some consistency between the pre- and post-race interviews and across the season for many swimmers. Findings have implications for future research examining the link between stress and coping attempts over time in athletic settings.

Examining needs satisfaction in “action” stage exercisers

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The purpose of the study was to examine the relationship between perceived need satisfaction as conceptualized in self-determination theory (SDT; Deci & Ryan, 1985; 2002) and physical activity behavior over a six month period of time. Participants included “new exercisers” ($N = 186$; 81.2% female) between the ages of 18 and 50. At baseline (T1) participants completed demographic information as well as the Psychological Need Satisfaction in Exercise Scale (PNSE; Wilson, Rogers, Rodgers, & Wild, 2006) that measures competence, autonomy, and relatedness, and the International Physical Activity Questionnaire (IPAQ; Craig et al., 2003). The PNSE and the IPAQ were again completed by participants at 2 months (T2), 4 months (T3), and 6 months (T4). Path analysis results indicated that (a) competence, autonomy and relatedness remained stable over the four time points; (b) baseline competence and relatedness were both significantly related to physical activity behavior at T2, and T2 physical activity behavior was significantly related to T3 competence and relatedness; and (c) T2 physical activity behavior was significantly related to T3 autonomy. Overall, the results demonstrate that SDT appears to be useful for understanding the temporal pattern of physical activity behavior in “new exercisers.”

Physical activity and successful aging in Canadian older adults

Meisner, Brad A.; A. Jane Logan, York University; Ann-Marie Kungl, North Simcoe-Muskoka Local Health Integration Network; Patricia Weir, University of Windsor; Joseph Baker, York University

The number of older adults living in Canada will increase considerably over the next few decades. Alas, many older adults may experience conditions of morbidity and/or dependency. Consequently, gerontologists have focused on latent factors associated with optimal health with aging. Rowe and Kahn 1987 proposed that successful aging (SA) is the balance of three components: (a) absence of disease and disease-related disability; (b) high functional capacity; and, (c) active engagement with life. The main purpose of this study was to examine the Rowe and Kahn (1987) model criteria in older Canadian individuals to determine the role that physical activity (PA) has on the promotion of SA. A secondary objective was to identify potential demographic correlates associated with SA. An ordinal regression model was used to examine the relationship between PA and SA. Data from the Canadian Community Health Survey, cycle 2.1, were used ($N = 12,042$). Main results indicated that PA is a significant predictor of SA such that active respondents were more than two times as likely to be rated as SA. This effect was present after adjusting for significant demographic covariates. Furthermore, three demographic covariates reliably predicted SA: (a) younger respondents were more likely to be aging successfully than older respondents; (b) those with lower SES were less likely to be rated as successful compared to reports of greater SES; and, (c) males were more likely than females to be rated as aging successfully. Findings provide additional evidence regarding the role that PA plays in maintaining optimal health in later life. This main effect highlights the need for increased public health awareness, particularly for PA promotion. Also, at-risk groups were discovered that will aid when targeting prospective interventions. Implications of these findings in a clinical setting will be discussed.

Exploring growth, maturation, and social physique anxiety in female athletes

Monsma, Eva V.; Jennifer L. Gay, Toni Torres-McGehee; University of South Carolina

This study examined the relationship between indicators of puberty and social physique anxiety (SPA) among female adolescent athletes. SPA, a salient predictor of eating disorders, tends to increase with age but little is known about underlying pubertal factors such as the growth spurt and menarcheal timing. Participants were adolescent female athletes, $n = 362$ (74.6% aesthetic) who completed the SPA scale (Martin et al., 1997), self-reported age at menarche, and underwent anthropometric measurements. Maturity offset (MO), a proxy estimate of peak height velocity (PHV), was derived (Mirwald et al., 2002). SPA was significantly correlated ($p < 0.01$) with MO ($r = -0.29$) and age at menarche ($r = 0.18$) but not with age. Aesthetic individual sport participants reported higher SPA scores than other sport types (aesthetic team, nonaesthetic individual, or nonaesthetic team) and attained menarche later ($p = .001$). SPA did not differ between pre- and postmenarcheal girls. Late maturers had higher SPA scores than early maturers who had the youngest age at PHV ($M = 12.10$, $SD = 2.12$). Late maturers had the oldest age at PHV ($M = 14.03$, $SD = 1.49$). Age accounted for 1% and sport type 8% ($p = .001$) of the variance in SPA. Separate hierarchical regression analyses indicated that MO explained 15% of SPA variance ($p = .001$), but age at menarche was not a significant predictor. Aesthetic individual sport participants were late maturers but reported higher SPA. Because leanness and linearity are associated with later maturation and certain sport contexts, these findings indicate that aesthetic sports may perpetuate negative self-perceptions through size-related mechanisms. MO predicted more variance in SPA than age, suggesting that SPA is associated with growth and maturation and is not just age-related. Given the association with maturational timing, the construct validity of MO is supported by these results. Subsequent investigations should consider critical growth periods in the etiology of maladaptive perceptions and perhaps behaviors.

Transformational teaching and health promotion: A focus group study

Morton, Katie L.; Sharon E. Keith, Mark R. Beauchamp; University of British Columbia

The present study drew from Bass and Riggio's (2006) full range model of leadership, to examine adolescent perceptions of the prevalence of, and preference for, transformational and transactional teaching behaviors within school-based physical education settings. Eight focus groups were conducted with 62 Canadian high school students (aged 13 to 15) and data were analyzed using a combination of deductive and inductive content analytic procedures. The results revealed that physical education teachers were primarily perceived by adolescents to employ transactional behaviors (i.e., management-by-exception, contingent reward) rather than transformational behaviors (i.e., idealized influence, inspirational motivation, individualized consideration and intellectual stimulation). However, adolescents also indicated a greater preference for teachers to employ transformational teaching behaviors within physical education settings. Issues related to theory development, future research, and the application of transformational teaching to physical activity and health promotion settings are considered. Implications for fostering physically active lifestyles amongst adolescents are also discussed.

Transformational teaching and physical activity among adolescents: What is it and does it matter?

Morton, Katie L.; Mark R. Beauchamp, University of British Columbia

A potentially important framework, and one that has yet to be applied to the fields of health promotion, behavioral medicine, and indeed physical education, relates to the full range model of leadership developed by Bass and colleagues (Bass & Riggio, 2006). This model conceptualizes transformational and transactional leadership. The purposes of this study were twofold. Using a qualitative interview-based methodology, the first purpose of this study was to examine the extent to which transformational behaviors manifest themselves within school-based physical education settings. The second purpose was to examine the extent to which transformational teaching behaviors, as utilized by physical education teachers, were aligned with adaptive physical activity outcomes among adolescents. Semistructured interviews were conducted with 18 students (10 females, 8 males, *M* age = 14 years) and data were analyzed using a constructivist grounded theory approach (Strauss & Corbin, 1990). Results revealed that students who perceived their physical education teachers to utilize transformational behaviors (e.g., idealized influence) also described more adaptive responses, which were categorized as cognitive (e.g., self-efficacy to be physically active), affective (e.g., satisfaction with the teacher), or behavioral (e.g., effort in class) in nature. Directions for future research and theory development are addressed, along with implications that relate to the fostering of physically active lifestyles among children and adolescents.

Sources of support for exercise: A self-determination perspective

Muon, Sovoeun; Meghan E. LeBlanc, Philip M. Wilson; Brock University

Previous research examining the relationship between exercise behavior and perceived support from others has typically focused on a restricted array of sources (Wilson & Rodgers, 2004; Edmunds et al., 2006). The purpose of this study was to identify and describe other relevant sources of perceived support for exercise as reported by young adults, using self-determination theory (SDT; Deci & Ryan, 2002) as a guiding framework. The sample in this study ($N = 257$; 62.7% female) were physically active (M METS = 52.88; $SD = 29.30$), healthy (M BMI = 23.48; $SD = 3.05$), and in young adulthood (M age = 20.83 years; $SD = 2.20$). Participants completed a series of open-ended questions prompting them to declare which individuals they perceived to be important to their exercise participation and experiences with respect to perceptions of autonomy support, structure, and involvement (Deci & Ryan). Preliminary analyses revealed that participants reported 76 different sources of autonomy support, 81 sources for structure, and 49 sources for involvement. Descriptive statistics indicated that 29.4% of participants reported 5 sources of autonomy support, whereas 16.9% and 13.3% of participants provided 5 sources for structure and involvement respectively. Among the diverse sources reported, the most frequently stated sources were friends (ranging from 17.2%–28.8%), fathers (6.4%–8.8%), and mothers (6.9%–13.4%). Overall, the results of this study extend previous SDT-based research by implicating multiple sources of perceived support for exercise participation that may be relevant to adherence decisions in young adults. Future studies may wish to be cognizant of the various sources of perceived support relevant to young adults engaged with regular exercise and consider using SDT as a guiding framework for understanding the manner in which various sources (as well as agents of support) influence adherence, maintenance, and termination decisions in young adults. Funding for this study was provided by SSHRC

Lifting anxiety: Strength-training in a mixed-sex environment induces greater state social physique anxiety than in a same-sex environment

Murru, Elisa C.; Kathleen A. Martin Ginis, Heather A. Strong; McMaster University

Self-presentational concerns have been identified as a potential barrier to exercise participation requiring further study (Hausenblas, Brewer, & Van Raalte, 2004). Two aspects of self-presentation that have been studied in the context of exercise are situational social physique anxiety (SSPA) and self-presentational efficacy (SPE). Characteristics of the exercise environment have been found to influence both SSPA (e.g., Kruisselbrink, Dodge, Swanburg, & MacLeod, 2004) and SPE for exercise (e.g., Gammage, Martin Ginis, & Hall, 2004). One aspect of the exercise environment that has been found to influence SSPA and SPE among women is the presence of men (Kruisselbrink et al., Gammage et al.). However, it is not known how mixed- and same-sex exercise environments influence SSPA and SPE in the context of strength-training. Therefore, the purpose of the present study was to examine changes in SSPA and SPE among 47 sedentary women with little strength-training experience (M age = 21.70 years, SD = 3.45), who were randomly assigned to strength-train in either mixed-sex or women-only exercise environments. SSPA and SPE were measured immediately pre- and postparticipation in a 45-min beginner's level group strength-training class. Repeated-measures ANOVAs revealed a significant Condition \times Time interaction for SSPA, $F(1, 45) = 15.36, p < .001, \eta^2 = .25$, indicating that women exercising in the same-sex environment experienced a significant decrease in SSPA, whereas women exercising in the mixed-sex environment had consistently high SSPA from pre- to postexercise class. Also, a main effect for time on SPE was found, $F(1, 45) = 9.48, p < .01, \eta^2 = .17$. Participants in both conditions experienced significant increases in SPE of similar magnitude. Results of this study suggest that it may be beneficial for sedentary women who wish to start strength training to begin in a women-only environment in order to minimize social physique anxiety.

A qualitative analysis of athletes' voluntary image speed manipulation

O, Jenny; Craig R. Hall, Samantha Pang, Krista J. Munroe-Chandler; University of Western Ontario

It is common for sport psychology practitioners to suggest that imagery be performed at "real time" speed (e.g., Nideffer, 1985); however, several studies have anecdotally reported the use of slow and fast motion images by athletes (e.g., Munroe et al., 2000). In a recent quantitative analysis, O and Hall (2007) found that athletes reported employing not only real time, but also slow motion and fast motion image speeds for all imagery functions (Hall et al., 1998). O and Hall proposed that voluntary manipulation of image speed may serve a functional role for athletes. The primary purpose of the present study was to gather descriptive data regarding elite athletes' voluntary use of image speed manipulation when imaging for sport. Sixteen varsity athletes (8 male, 8 female; team and individual sports) participated in semistructured interviews that focused on identifying the various functions that voluntary image speed manipulation serve for athletes. Content analysis of interview transcripts provided insight into the nature of athletes' image speed manipulation in both practice and competition. Slow motion images were most often used by athletes in practice to focus on specific movements or sequences of novel or complex skills and strategies. Real time images were reported as being used most frequently overall, and used most often before competition to assist in accurately replicating the competition environment to increase feelings of familiarity and confidence. Fast motion images were used most often during competition to "fast forward" through sections of images that athletes deemed as unhelpful in strategy selection. Additional information was also gleaned concerning developmental changes in image speed use, the combination of image speed manipulation with other visual features of images, and

the use of multiple image speeds in single imagery sessions. Results are discussed in terms of directions for future voluntary image speed research and applications.

The relative age effect among female Brazilian youth volleyball players

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The aim of this study was to examine the relative age effect among female youth volleyball players in Brazil. The relative age effect refers to performance disadvantages of children born early in the competition year compared to children born soon after the cutoff date. Only a few studies have concentrated in female youth sports, and they generally did not support the relative age effect (Helsen, Winckel, and Williams, 2005; Vincent & Glamser, 2006). For the current study, birth dates were acquired from the rosters of teams registered to play the female Under-14 2005-International Volleyball Cup held in Curitiba, Brazil. A total of 114 under-14 female players participated in the study of which 62 were born in 1991 and 52 in 1992. Three separate chi-square analyses were performed to examine the birth date distribution. An overall analysis combining years 1991 and 1992 was performed first. Results from this analysis were significant ($M = 34.82$, $df = 3$, $p < .0005$). More players were born in the first quarter than in any other quarter of the year. Similar results were achieved when the years 1991 and 1992 were considered separately. The results for 1991 ($M = 14.26$, $df = 3$, $p = .003$) and 1992 ($M = 15.23$, $df = 3$, $p = .002$) were also significant. This study indicates an overrepresentation of youth female players born in the early quarters of the competition year (Jan.–Dec.). Results may be due to the popularity of women's volleyball in Brazil. In more popular sports, there is a larger competition for a spot in the team.

Well-being indices: The association with health-enhancing physical activity

Oster, Kristin G., Diane E. Mack, Katie E. Gunnell, Philip M. Wilson, Brock University; Peter R.E. Crocker, University of British Columbia; Kent C. Kowalski, University of Saskatchewan

Physical activity has consistently demonstrated small, albeit meaningful, relationships with indices of psychological well-being (Biddle, Fox, & Boutcher, 2000). The present investigation extended existing literature by operationalizing well-being as purposeful engagement in life (i.e., eudaimonic well-being; Waterman, 1993). More specifically, the pattern of relationships between indices of eudaimonic well-being, the satisfaction of basic psychological needs, and engagement in health-enhancing physical activity HEPA were examined. A convenience sample of university students ($N = 168$; n [females] = 106) volunteered to participate. On a single occasion, participants completed an Internet-based questionnaire comprised of three instruments: the Scales of Psychological Well-being (Ryff & Keyes, 1995), which assesses six dimensions linked to eudaimonic well-being; the Psychological Need Satisfaction in Exercise (PNSE; Wilson, Rogers, Rodgers, & Wild, 2006) and; the Short Questionnaire to Assess Health-Enhancing Physical Activity (Wendel-Vos & Schuit, 2002). Bivariate correlations revealed moderate-to-strong relationships across dimensions of eudaimonic well-being ($r_s = .42-.80$). Consistent with suppositions advocated by Ryan, Huta, and Deci (in press), positive relationships between eudaimonic well-being and PNSE scores were noted $r_s = .25-.37$. The pattern of relationships between eudaimonic well-being and HEPA ($r_s = -.04-.13$) was somewhat inconsistent with Ryff and Singer (in press), who

suggested that eudaimonic well-being may be positively associated with active engagement in health behaviors. Based on this preliminary investigation, theoretical predictions between eudaimonic well-being and psychological need satisfaction were supported. The link between eudaimonic well-being and HEPA warrants continued exploration. This research was supported by the Social Sciences and Humanities Research Council of Canada.

The athlete-parent-coach triad: Perceptions of coaching competence and coaching efficacy in youth sport

Paiement, Craig A.; Ryan Hedstrom, William Porecca; Castleton State College

In youth athletics, a coach plays a variety of roles, such as teacher or role model. The interplay between positive adult role models, nonparent adult relationships (i.e., coach), and youth programs (i.e., organized sports) have been found to greatly influence the “developmental assets” that a young person acquires. Within the current youth sport structure, there is interplay among parents of young athletes, the athletes, and coaches. Hellstedt (1987) refers to this phenomenon as the *athlete-parent-coach triad*. The relationship between athlete, parent, and coach can be one of strength or strain on a child’s sport involvement. Understanding this triangulation can allow coaches, parents, and athletes to maximize the experience of sport involvement. The purpose of this research is to examine the athlete-parent-coach triad by investigating coaches’ level of efficacy and how it relates to athletes and parents’ perceptions of coaching competency. Participants include 275 youth athletes, parents, and coaches from 19 teams. The coaching competency scale (CCS; Myers, et al., 2006), a 24-item scale that measures athletes and parents’ perceptions of their coach’s competency was used for this study. This measure is analogous to the coaching efficacy scale (CES; Feltz et al., 1999) used with the coaches. A factorial MANOVA was conducted to assess the differences in parent and athlete perceptions and coaches’ efficacy. Results indicate that parents, athletes and coaches differ in perceptions, Wilks’s $\Lambda = .881$, $F(10, 462) = 2.71$, $p = .03$, of competency and efficacy, and these perceptions also differ by team, Wilks’s $\Lambda = .475$, $F(90, 1,014) = 1.89$, $p < .001$), although the effect sizes were small. Scheffe post hoc results indicate that coaches rate their efficacy significantly higher than the perceptions of athletes and parents and significantly lower than perceptions of parents in game strategy. Only one team indicated difference in all areas. The lack of difference between groups’ perceptions can lead to positive support relationships from parents and athletes, an important factor for coaches.

Social support and exercise in cardiac patients: Does it really help?

Pelaez, Sandra; Concordia University; Kim L. Lavoie, Université de Quebec a Montreal; Andre Arsenault, Montreal Heart Institute; Simon L. Bacon, Concordia University

Background and goal: Coronary heart disease (CHD) is one of the leading causes of death in the Western world. The benefits of exercise (EX) in these patients are widely known; however, it has been well documented that these CHD patients fail to either initiate or maintain EX programs. Social support (SS) has been shown to influence EX adherence. The aim of this study was to investigate the role of SS on EX in patients with CHD. Method: 758 cardiac outpatients (236 women, 520 men) referred for an exercise stress test at a tertiary care cardiac center were recruited. All patients completed sociodemographic, anthropometric, and EX questionnaires. Results: After controlling for age, sex, and peak exercise METS, living with someone—irrespective of the relationship—was related to EX, $F = 5.41$, $p = .020$, such that those individuals who lived with someone (28.17 % of the population) tended to

exercise less than people who did not live with anyone (71.83 %). With regards to different sources of SS, living with a partner ($F = 0.37, p = .544$), living with a parent ($F = 1.78, p = .182$), living with a friend ($F = 0.00, p = .984$), and living with anyone else ($F = 0.00, p = .944$) was not significant related to EX. The only source of SS related to EX participation was living with children ($F = 8.24, p = .004$). Living with children was significantly related to a lack of EX in the patients of this sample. Further analyses were run to assess the interaction between living with children and cohabitation and living with children and sex. Results indicated that there were no interactions ($F = 0.00, p = .970$, and $F = 1.30, p = .255$, respectively). Irrespective of sex and cohabitation, having children resulted in a reduction of EX. Discussion: This pattern suggests that interventions to promote adoption, maintenance, commitment, and adherence to EX involvement in cardiac patients should probably target the whole family in order to attain better results regarding EX adherence. Future research is needed to investigate the dynamic underlying the present relationship. FQRSC Doctoral Research Fellowship #122942.

Accuracy of free throw shooting during dual-task performance: Implications of attentional disruption on performance

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The division of attention among multiple demands has been studied in psychology for many years. Researchers in sport psychology have begun to map out the time course of attentional demands in athletic skills ranging from horseshoe pitching to sprinting, finding that particular points of a task pose a greater demand for attention than others. The purpose of this research was to use a dual-task paradigm to determine the point of peak attentional demand during the free throw shooting process. Thirty men ($n = 26$) and women ($n = 4$), ranging in age from 18 to 62 ($M = 23.9 + 8.3$ years), with at least two years high school basketball experience, comprised the sample. After baseline measures, each subject completed 40 free throw trials. During the free throw, the participant was instructed to respond verbally to a sound stimulus to determine reaction time (RT). The sound stimulus was administered at one of 4 probe position (PP) conditions or was not administered catch trial condition. The participant was blinded to the randomly ordered presentation of conditions. No significant difference in free throw performance as a function of PP was found ($p > .05$), suggesting that any differences in RT across conditions could be attributed to differences in attentional demand. Repeated measures analysis revealed significant differences in RT as a function of PP. Simple contrasts showed that RT at PP1 and PP2 was significantly slower ($p < .05$) than baseline RT, whereas PP3 and PP4 did not produce RTs significantly different ($p > .05$) from baseline RT. These results suggest that the pre-shot routine PP1 requires the greatest attentional demand, followed by the first upward motion of the ball PP2, and that later stages PP3, remaining upward motion of the ball, and PP4, immediately after ball leaves fingertips, create little attentional demand. Results lead to the implication that focusing strategies utilized during the pre-shot routine and the first upward motion of the ball may be beneficial to successful performance.

Peer leadership in sport: Relationships among personal characteristics, leadership behaviors, and team outcomes

Price, Melissa; Maureen Weiss, University of Minnesota

The purpose of the present study was to extend previous research (Glenn & Horn, 1993; Moran & Weiss, 2006) by examining relationships among personal characteristics, peer leadership behaviors, and team outcomes. Adolescent female soccer players ($N = 191$) completed measures of perceived competence, peer acceptance, behavioral conduct, and intrinsic motivation; teammate ratings (Glenn & Horn, 1993) and self-ratings of leadership (Glenn, 2003); and team cohesion and collective efficacy. Because the peer leadership measures were new, factor analyses were conducted. The teammate-rated measure produced two factors—instrumental behaviors (confident, consistent, determined, skilled, respected) and prosocial behaviors (honest, responsible, positive, organized). Factor analysis of the self-rated measure produced a one-factor solution—effective peer leadership. Factor scores were created and used in canonical correlation analyses: (a) relationship between personal characteristics and peer leadership, and (b) relationship between peer leadership and team outcomes. The first analysis revealed a significant relationship ($Rc1 = .62$, $Rc2 = .38$, redundancy = 18.5%). Athletes who were rated higher by teammates on instrumental leadership and rated themselves higher in leadership behavior reported higher soccer competence, peer acceptance, and intrinsic motivation. Athletes rated higher on prosocial leadership by teammates scored higher on perceived behavioral conduct. The second analysis showed a significant relationship ($Rc1 = .56$, $Rc2 = .18$, redundancy = 15.8%). Athletes who rated themselves higher in leadership behavior reported greater task and social cohesion and collective efficacy. Athletes who were rated higher by teammates on instrumental and prosocial leadership reported greater social cohesion. Collectively, findings extend previous research by providing further validity for self- and teammate-rated leadership behaviors, and by demonstrating relationships among positive personal characteristics, effective peer leadership, and positive team outcomes.

Prospective examination of physical activity and gestational weight gain in pregnancy

Rauff, Erica; Danielle A. Symons Downs, Jennifer M. DiNallo; Pennsylvania State University

High gestational weight gain (GWG) is associated with negative maternal and fetal outcomes. Meeting exercise guidelines in pregnancy may help women to mitigate their GWG; however, limited research has examined the possible protective effects of exercise during each pregnancy trimester. Purpose: To prospectively assess exercise behavior and GWG across the pregnancy trimesters. We hypothesized that (1) exercise behavior and mean GWG would be inversely associated, and (2) across each trimester women meeting exercise guidelines would have lower mean GWG than women who were less active. Method: Pregnant women ($N = 316$; M age = 30 years) prospectively self-reported their exercise behavior and GWG across the pregnancy trimesters. Women were classified as meeting or not meeting exercise guidelines based on the ACSM 2000 guidelines of 150 min of exercise/wk. Groups were first compared on pre-pregnancy BMI and no significant differences were found; thus, it was not entered as a covariate in the analyses. Results: Pearson correlations revealed that exercise and mean GWG in Trimester 3 were significantly inversely associated ($ps < .05$); however, these associations were not observed in Trimesters 1 and 2. One-way ANOVAs found no significant differences in GWG between women who met and did not meet exercise guidelines in Trimesters 1 and 2. However, in Trimester 3, women who met exercise guidelines gained significantly less weight ($M = 8.9$ lbs, $SD = 5.2$) compared to women who did not meet exercise guidelines ($M = 12.9$ lbs, $SD = 4.2$; $F(1, 86) = 13.87$, $p < .05$). Conclusions:

During pregnancy Trimester 3, regardless of prepregnancy BMI, women who met exercise guidelines gained significantly less weight. These results suggest that meeting the current exercise recommendations may be a useful tool in preventing high weight gain, particularly in Trimester 3. Prenatal exercise interventions targeting the unique physical changes of each pregnancy trimester are warranted and may help to control GWG.

Effects of green tea extract on cognition, mood, workload, physiology, and athletic performance

Reed, Alex; Bryan Raudenbush, Wheeling Jesuit University

Previous anecdotal reports indicate that green tea extract can have beneficial effects on overall health, cognitive functioning, and athletic performance. The purpose of the present study was to determine whether green tea extract could significantly impact cognitive functioning, endurance, perceived workload, mood, and physiology over time in a controlled experimental environment. The participants were 18 athletes who were tested over a 6-week time period. In a participant-blind administration, athletes consumed one capsule each day of the 6-week period that may or may not have contained green tea extract (experimental condition vs. placebo control condition). To assess cognitive functioning, athletes completed a variety of computer-based physiological and neuropsychological tests assessing word discrimination, verbal memory, design memory, attention span, reaction time, problem solving, and response variability. In addition, physical endurance was evaluated via a modified treadmill stress test (Bruce protocol) and performing pushups to exhaustion. Perceived workload was measured by the NASA-Task Load Index, and mood was assessed using the Profile of Mood States. Results of the experiment revealed athletes showed a significant improvement in the number of push-ups completed when given green tea extract. No statistically significant improvements were found for cognition or a positive mood; however, the majority of these measures were greater in the green tea condition. The implication of these results is that natural, and in the case of green tea, very healthy, substances could be used to enhance exercise-related endurance, rather than pharmacological methods such as caffeine and steroids.

EEG coherence associated with using an explicit strategy during a motor task

Rietschel, Jeremy C.; Brad R. King, Melissa M. Pangelinan, Jane E. Clark, Brad D. Hatfield; University of Maryland–College Park

During motor skill acquisition, those given explicit instructions about a task demonstrate enhanced performance compared to those who are prevented from engaging explicit strategies. Recently, the electroencephalographic metric of coherence (specifically between the verbal-analytical region (T3) and motor-planning region (Fz)) has been used to index the degree of explicit, cognitive processes guiding movement. The purpose of this study was to investigate the relationship of T3-Fz coherence between those provided with an explicit strategy (ES), compared to those provided no explicit strategy (NES), during execution of a novel visuo-motor task. The task consisted of 150 trials of a 30° visual-feedback distortion causing a discrepancy with actual movement. The ES group was told about the rotation and how to compensate for it, whereas the NES group was not provided with this information. Coherence and initial directional error (IDE, indicative of performance) were calculated for the beginning (1–30 trials) and end of the task (120–150) and separately subjected to a 2 (strategy) × 2 (time) ANOVA with time as a repeated-measures variable. An interaction was revealed for coherence, $F(1, 13) = 13.629, p = .003$. Post hoc analysis revealed that the ES

group had higher coherence than the NES group during the end of the task. As predicted, the ES group demonstrated better performance than the NES group regardless of time, $p = .015$. Further, the ES group developed increased cortico-cortical communication between task-relevant areas (T3-Fz coherence) as a result of being given an explicit strategy. This suggests adoption of this strategy over time. Future analysis will further investigate the relationship between T3-Fz coherence and motor performance.

The athlete to coach transition: Does a new coach teach old tricks?

Rotteau, Thea O.; James Lyons, McMaster University

Evidence suggests that coach development begins during athletic participation (Erickson et al., 2007). Thus, novice coaches with previous playing experience should be more advanced in their development relative to those without such a background. However, others have found that expert performers have difficulty understanding the challenges associated with learning basic skills within their domain of expertise (e.g., Hinds, 1999). This study explored the effects of previous athletic experience on current coaching abilities in novice and experienced coaches. Twenty-three elite level gymnastics coaches were divided into four subgroups based on their coaching and athletic history. The coaches performed both a knowledgebase test asked to list technical errors associated with nine gymnastic elements, and an error detection task in which they watched a series of gymnastic video clips and were asked if and where a technical error occurred during the performance. Overall, experienced coaches demonstrated both a superior knowledgebase ($F = 6.18, p < 0.03$) as well as a greater sensitivity in detecting the presence of errors $d' = 1.066$ vs. $d' = 0.788$. Further analysis of the error detection task revealed a significant main effect for coaching experience ($F = 22.7, p < 0.0002$) as well as an Athletic Experience \times Coaching Experience interaction ($F = 5.3, p < 0.033$). As expected, experienced coaches outperformed novice coaches. However, for the novice coaches the participants without previous athletic experience were better at identifying errors than those with previous athletic experience. These results suggest that although previous domain specific experiences do not affect a coach's knowledgebase, there appears to be some degree of negative transfer between performing gymnastic elements and error detection within those elements. Further, these results suggest that rather than serving as a strong foundation for future coaching efforts, previous participation within the domain may in fact hinder coaching development.

Promoting autonomous physical activity through autonomy need satisfaction following a group-mediated cardiac rehabilitation intervention.

Russell, Kelly L.; Steven R. Bray, McMaster University

Despite the known benefits of regular physical activity (PA) for cardiac patients, long-term adherence rates remain low following graduation from cardiac rehabilitation (CR) programs (Oldridge, 1991). Self-determination theory (Deci & Ryan, 1985) considers how the social environment can promote behavior through the nurturing of three psychological needs: competence, autonomy, and relatedness. Needs satisfaction is enhanced when individuals interact in social contexts that provide opportunities for mastery experience, positive feedback, and a chance to feel connected with others (Ryan & Deci, 2000). Individuals participating in CR would likely benefit from an environment that provides support for competence, autonomy and relatedness. The present study examined the effects of a 6-week group-mediated intervention promoting practice of self-regulatory skills on needs

satisfaction and PA behavior compared with an exercise-only condition. It was hypothesized that autonomy and competence needs satisfaction during the intervention would mediate the effects of the intervention on postintervention PA behavior. Fifty-one volunteer graduates from a hospital-based CR program (M age = 66; 90% male) were randomly assigned to either a group-mediated intervention program (GMCB) ($n = 25$) or an exercise-only group ($n = 26$). Participants completed the PNSE (Wilson et al., 2006) at the start and completion of the program, and PA was assessed 6 weeks post-program using a 7-day PAR (Blair et al., 1985). The intervention group reported higher autonomy need satisfaction and postprogram PA compared with the exercise-only group ($\beta = .38, p < .01$ and $\beta = .35, p = .01$, respectively). After controlling for the effect of autonomy satisfaction, the intervention effect on PA was nonsignificant ($p = .10$) and reduced by approximately 30% (from $\beta = .35$ to $\beta = .23$), indicating partial mediation. Findings provide evidence of the behavioral benefits of participating in a group-mediated counseling program and the role that psychological need satisfaction can play in facilitating PA behavior among cardiac patients.

Participation in school athletic teams and use of alcohol, tobacco, and cannabis among 10th graders: United States, 2006

Santiago, Olga J.; Carlos F. Rios-Bedoya, Deborah L. Feltz; Michigan State University

Analyzing epidemiological data from the 2006 Monitoring the Future (MTF) survey, we evaluated a hypothesized negative association between participation in school athletic teams and use of alcohol, tobacco, and cannabis. The MTF survey assessed a national probability sample of 8th and 10th graders attending public and private schools in the United States ($n = 5,612$). The 10th-grader sample used in this study consisted of 2,786 students. The key response variables in this study are odds ratios for ever having used alcohol, tobacco, and cannabis (OR_a, OR_t, OR_c). The extent of sport participation was dichotomized in the low extent (LE) group (i.e., moderate, slight, or no involvement) and high extent (HE) group (i.e., considerable or great involvement). Results revealed that the estimated crude OR_a, OR_t, and OR_c from a logistic regression model for the HE group compared to the LE group were 1.3 ($p < 0.001$), 0.8 ($p < 0.05$), and 0.8 ($p < 0.005$).). Statistical adjustments for sex, race/ethnicity, mother's education, father's education, and school grades produced no attenuation on the OR_a estimate (1.5; $p < 0.001$). The HE group had a 50% higher likelihood of ever using alcohol than the LE group. But the negative association found for tobacco and cannabis was no longer present ($p > 0.05$). Researchers and youth sport advocates suggested that sport participation could prevent or delay substance use. However, data from MTF survey do not support this hypothesis. On the contrary, HE participation tends to increase the likelihood of ever using alcohol among 10th graders. Further studies are needed to confirm or reject our findings because of their prevention implications.

Relationship between passion, perfectionism, and general life satisfaction

Schiphof, Lieke; University of Paris Sud-Orsay; Philippe C. Brunel, University of Limoges

Vallerand et al. (2003) proposed a motivational approach of the passion individuals develop towards activities. This concept is based in part on SDT. Authors proposed a dualistic model in which they define passion as a strong inclination toward an activity that individuals like, that they find important, in which they invest time and energy, and which comes to be internalized in one's identity. Obsessive passion (OP) results from a controlled internalization of

the activity into one's identity. Individuals feel compelled to engage in it owing to internal contingencies that come to control them. Harmonious passion (HP), by contrast, results from an autonomous internalization of the activity into the person's identity and individuals feel free to engage in. Studies found a positive relation between HP and flow or positive affect experienced during task engagement, whereas OP was positively related to negative affect and rumination after engagement and when prevented from engaging in the activity altogether. The purpose of this study was to test the dualistic model. Participants ($M = 22.56$; $SD = 1.55$; $N = 108$, 42 males, 66 females) were requested to fill out the passion scale, the multidimensional perfectionism scale, the global motivation scale, perceptions of autonomy and competence and general life satisfaction. Results of partial correlation indicated that HP was positively linked to perceived autonomy ($r = .31, p < .02$) and consequently with the self-determined form of motivation ($r = .25, p < .01$), whereas OP was linked to the non-self-determined one ($r = .29, p < .003$). However, no relationship emerged between both types of passion and perceived competence. Furthermore, OP appeared positively linked to self-referenced perfectionism ($r = .25, p < .01$) and socially prescribed perfectionism ($r = .35, p < .001$). Finally, HP was positively related to life satisfaction ($r = .41, p < .001$), whereas OP was negatively linked to life satisfaction ($r = -.21, p < .03$). Results confirm the dualistic model and it appears that the more perfectionist individuals are the more obsessively passionate they are.

Does relative frequency of augmented knowledge of results influence perceptual learning and retention in a handball task?

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In motor learning, the role of frequency of augmented feedback is a well-studied subject. However, to date, the influence of frequency of augmented feedback on learning and long-term retention using video-based perceptual training has not been examined. The current study examined the influence of four frequencies of augmented feedback on perceptual learning and retention of an acquired anticipation task in a handball. The 48 novice goalkeepers were divided randomly into four groups of twelve participants. These included groups with augmented feedback in 0%, 33%, 66%, or 100% of the cases. A temporal occlusion approach with three different occlusion conditions was administered. Participants had to decide in which of four corners of a handball goal throws from four expert penalty shooters would go. Video stimuli were presented on a notebook with Presentation 9.81, and reactions were measured by keyboard presses, which were chosen in accordance with the different corners of the goal. As expected, results revealed differences between the three temporal occlusion conditions, $F(1.45, 53.78) = 309.90; p < .01; \eta^2 = .89$. Additionally, a significant interaction was found for temporal occlusion and test phase, $F(4, 148 = 5.71); p < .01; \eta^2 = .13$. Even after a 7-month retention interval, participants showed better performances than in pretest conditions, $F(2, 74 = 10.77); p < .01; \eta^2 = .22$. However, results revealed no significant interaction between feedback conditions and tests, $F(6, 74 = 0.75); p = .62$. These findings suggest that concurrent visual feedback seems more important than augmented feedback in perceptual learning. To test this assumption, further studies using spatial and temporal occlusion paradigms are proposed.

Goal striving and well-being in sport: An investigation of marathon runners' responses to success and failure.

Smith, Alison L.; Nikos Ntoumanis, University of Birmingham

Grounded in self-determination theory (Deci & Ryan, 1985), the present study examined the impact of motives underlying runners' target times upon tendencies towards self-aggrandizement and self-derogation following a marathon. Consequences of these tendencies for psychological well-being were also investigated. Target times were recorded for 193 British runners one week prior to a marathon along with self-report measures of motives underlying their target and psychological well-being (positive and negative affect). Follow-up well-being measures were completed in the week following the marathon. In addition, runners who attained their time ($N = 74$) completed measures of comparative (CSA) and noncomparative self-aggrandizement (NCSA), whereas those who did not ($N = 119$) completed a measure of self-derogation. Structural equation modeling supported a model—scaled $\chi^2(17) = 22.94$, $p > .05$, CFI = .95, NNFI = .92, RMSEA = .07 (CI = .00–.13), SRMR = .10—in which autonomous motives predicted both CSA and NCSA. Controlled motives were found to only predict CSA. In turn, NCSA was positively associated with changes in positive affect whereas CSA was positively associated with changes in negative affect. Additionally, autonomous and controlled motives were found to have positive and negative direct paths to premarathon positive affect, respectively. For those who did not attain their target time, structural equation modeling revealed—scaled $\chi^2(13) = 19.66$, $p > .05$, CFI = .94, NNFI = .91, RMSEA = .07 (CI = .00–.12), SRMR = .06—that controlled goal motives were linked to self-derogation, which in turn positively and negatively predicted changes in negative and positive affect, respectively. Autonomous motives were positively associated with premarathon positive affect alone. The findings support links between the motives underlying marathon runners' target times and their responses following success and failure, and highlight implications for well-being. These findings are discussed in relation to implications for runners and future research directions.

Season-long goal striving in sport: An investigation of the temporal interplay between goal motives, coping strategies, and well-being

Smith, Alison L.; Nikos Ntoumanis, Joan L. Duda, University of Birmingham; Maarten Vansteenkiste, Ghent University

Using a cross-sectional design, Smith, Ntoumanis, and Duda (2007) supported the self-concordance model (Sheldon & Elliot, 1999) as a framework for further goal setting research in sport. Expanding upon these findings, the present study examined the goal motives underlying season-long goal striving in sport as well as the role of coping strategies in the goal striving process. Self-report measures of goal motives, effort, and goal attainment (Smith et al., 2007), in addition to measures of goal-related coping strategies, psychological need satisfaction, and psychological well-being (positive affect and life satisfaction), were administered to 97 British athletes at three time-points (start, mid-, and end of season) during a University sport season. Structural equation modeling supported a model—scaled $\chi^2(26) = 27.42$, $p > .05$, CFI = .99, NNFI = .99, RMSEA = .02 (CI = .00–.08), SRMR = .11—in which autonomous goal motives at the start of the season linked to goal striving during the season through the following sequence: autonomous motives \rightarrow mid-season effort \rightarrow end of season attainment \rightarrow changes in need satisfaction \rightarrow changes in well-being. Changes in need satisfaction were additionally predicted by the interaction of autonomous motives and goal attainment. Controlled goal motives were found to be unrelated to goal striving. An additional structural model—scaled $\chi^2(53) = 58.55$, $p > .05$, CFI = .97, NNFI = .96, RMSEA = .03 (CI = .00–.08), SRMR = .11—identified opposing associations of autonomous and controlled goal motives with mid-season effort, via approach and avoidance coping

strategies utilized up to mid-season, respectively. The findings provide further support for the adaptation of the self-concordance model to context-specific goal striving in sport as well as demonstrating the differential roles of approach and avoidance coping strategies for goal persistence. These findings will be discussed in relation to the implications for athletes and directions for further research.

Relationship between adolescent exercise identity scale scores and self-reported rates of physical activity

Soukup, Gregory J.; Linwood B. Clayton, Ferrum College

Anderson and colleagues have suggested that higher exercise identity is positively related to higher rates of physical activity in adults (1995, 1998, 2001). The purpose of this study was to determine if a significant relationship existed among high school adolescents regarding rates of exercise identity and physical activity. It was hypothesized that adolescent students with stronger rates of exercise identity would have higher rates of physical activity. Data were collected from a convenience sample of 310 students (164 females and 146 males) with an average age of 17 years and 4 months. Permission for the study was obtained from the university and school district where data were collected. Student assent and parental consent forms were obtained from all participants before data collection. The Exercise Identity Scale (EIS; Anderson & Cychosz, 1994) was used to estimate rates of exercise identity. The EIS has nine items rated on a 7-point Likert format. Responses range from *strongly disagree* (1) to *strongly agree* (7). Scores on the EIS range from 9 to 63. Higher scores indicate greater exercise identity. The Previous Day Physical Activity Recall (PDPAR; Weston, Petosa, & Pate, 1997), a self-report instrument, was used to determine rates of physical activity. A regression was executed to determine if a significant relationship existed between adolescent rates of exercise identity and physical activity. EIS scores were used as the independent variable and PDPAR rates were used as the dependent variable. Regression analysis of the data generated an r value of .366, which indicates a significant positive relationship between higher rates of exercise identity and higher rates of physical activity among adolescent participants. The R^2 indicated that EIS scores explained 13.4% of the variance of the PDPAR rates. Results of the study indicate the EIS could be used as a tool by physical education, health, and exercise professionals to predict future rates of physical activity for adolescent students and clients.

Social physique anxiety in pre-adolescents

Stadulis, Robert E.; Kent State University; Mary J. MacCracken, University of Akron

One of the important components of an individual's self perception is how satisfied one feels about her/his body or physique and whether society's emphasis on a person's shape can lead to increased anxiety. To this end, Hart, Leary, & Rejeski (1989) developed the Social Physique Anxiety Scale (SPAS). Recently, Fender-Scarr et al. (2003) adapted Martin, Rejeski, Leary, McAuley, & Bane's 1997 revised 9-item SPAS to a form that is appropriate to children (the SPAS-C). Stadulis et al. (2005) have reported adequate reliability and validity for the SPAS-C. The focus of the present investigation is to determine if and how social physique anxiety changes in preadolescence. Is there evidence that as a child advances in age anxiety concerning one's body increases? At present, there appears to be little data that describes how social physique anxiety might change over age. A related question concerns the sex of the child: are boys and girls influenced differently such that their social physique anxiety

responses are different? The SPAS-C was administered to preadolescent girls and boys ($N = 319$) between the ages of 9 and 14 years old. Cronbach alpha internal reliability = .791. Factor analysis yielded results matching a number of previous outcomes using adult data (Stadulis et al., 2007). Therefore, the reliability and validity of the SPAS-C with the current sample was supported. A two-factor ANOVA (Age \times Sex) indicated significant ($p < .05$) effects due to both age and sex. The younger children, 9 and 10, evidenced the lowest levels of anxiety ($M = 20.8$), with the highest levels ($M = 24.5$) evidenced by the older children, 13 and 14. Females evidenced an earlier rise in anxiety, reaching the highest levels by 12 years of age and then remaining fairly stable through age 14. The boys reached approximately the same level of anxiety as the girls but not until age 14. These descriptive findings suggest that both boys and girls experience heightened social physique anxiety but that girls evidence an increase in anxiety at an earlier age.

Are we having fun yet? Testing the effects of imagery use on affective states and enjoyment during and after moderate exercise

Stanley, Damian M.; Jennifer Cumming, University of Birmingham

Although many people start exercising for health reasons, the more intrinsic reasons of well-being and enjoyment typically predict higher levels of exercise behavior and adherence (e.g., Salmon, Owen, Crawford, Bauman, & Sallis, 2003). Such findings suggest the importance of identifying strategies to maximize people's enjoyment of, and affective responses to, exercise. The current study compared the effects of different audio imagery scripts on exercise-related enjoyment and affect during and following an acute bout of 20 min of moderate intensity cycle ergometry (50% heart rate reserve). Physically active participants ($n = 72$) were randomly assigned to one of four experimental conditions: (a) enjoyment imagery; (b) energy imagery; (c) technique imagery; or (d) exercise only (control). It was hypothesized that the enjoyment and energy imagery groups would demonstrate greater enjoyment and larger improvements in affect than the control group. The interest/enjoyment subscale of the Intrinsic Motivation Inventory (Ryan, 1982) measured exercise-related enjoyment before and after the bout, and the Feeling Scale (FS; Hardy & Rejeski, 1989) and Felt Arousal Scale (FAS; Svebak & Murgatroyd, 1985) both measured exercise-related affect. A single-item 7-point scale was developed for this study to measure exercise-related enjoyment at Minutes 6, 12, and 18 of the bout. Repeated measures mixed analyses showed that the enjoyment and energy imagery groups reported enjoying the exercise bout significantly more than the control group at 5 min postexercise. The energy imagery group also reported a significant improvement in affect (both FS and FAS) from pre- to postexercise. One-way between-subjects analyses revealed that the enjoyment imagery group reported significantly higher enjoyment than the control group at Minutes 12 ($p = .02$) and 18 ($p = .00$) during the exercise bout. These findings highlight imagery, in particular enjoyment and energy imagery, to be a psychological strategy that influences exercise-related cognitions.

When the referee sees red . . .

Strauss, Bernd; Norbert Hagemann, Jan Leißing; University of Münster

Hill and Barton (2005) have shown that wearing red sports attire impacts positively on the outcome of single-combat sports. They suggest that it enhances performance in contests by triggering a psychological effect in the wearer (or in the opponent) reflecting an evolutionary association of the color red with dominance and aggression. We disagree

with this interpretation, because the effect of red on performance and on the decisions of referees may well have been confounded in the original data. We propose alternatively that the perception of colors triggers a psychological effect in referees that can lead to bias in evaluating an identical performance. We conducted an experiment on the effect of the color of the protective gear in taekwon do on the decisions of referees. A total of $N = 42$ experienced referees (13 female, 29 male; age: $M = 29.30$ years; experience as referees: $M = 8.02$ years) watched 22 videotaped excerpts from sparring rounds (2 balanced blocks of 11 clips in random order with an average length of 3.3 s). They had to decide how many points they would award either the red or the blue competitor. The color of the protective body gear was switched in both blocks using a digital toolkit. The main findings were that the competitor wearing red protective gear was awarded an average of 13% (1.88 points) more points, $t(41) = 2.85, p < 0.01, d = .35$, than the blue competitor. The number of points awarded increased when a blue competitor was digitally transformed into a red competitor ($t(41) = 2.45, p < 0.01$, one-tailed, $d = .36$) and decreased when a red competitor was digitally transformed into a blue competitor ($t(41) = 1.66, p < 0.05$, one-tailed, $d = .25$). Hence, competitors dressed in red are awarded more points than competitors dressed in blue despite identical performance. The effect found here can also explain the stronger influence of color in relatively symmetric contests. We argue contrary to Hill and Barton (2005) that it is the referee who is mainly responsible for the bias.

What not to wear: Revealing exercise attire and public exercise settings increase women's acute body image concerns and cortisol levels

Strong, Heather A.; Kathleen A. Martin Ginis, McMaster University; Shawn M. Arent, Rutgers University; Steven R. Bray, McMaster University

Body image concerns are ubiquitous among women. Poor body image has been linked to low self-esteem (Levine & Smolak, 2002), depression, and anxiety (Stice & Whitenton, 2002). However, it is not known if body image concerns are related to physiological markers of stress, such as cortisol. Therefore, the purpose of our study was to experimentally manipulate body image to determine if an acute increase in body image disturbance elicits an increase in cortisol secretion. Participants were 43 women (M age = 20.74 years, $SD = 2.62$) who were randomly assigned to one of two conditions. In the experimental condition, participants were shown a very public, mirrored fitness facility where they were told they would be exercising. They were also given revealing exercise attire, and were told that the session would be videotaped by a man (Gammage et al., 2004). In the control condition, participants were shown a private, nonmirrored fitness room, given nonrevealing exercise attire, and the session was not videotaped. Participants completed a trait and state version of the SPA Scale (Hart et al., 1989) and the BIS Scale (Cash et al., 2002) and provided two saliva samples to measure cortisol secretion before and after the manipulation. Results revealed the experimental condition experienced higher state social physique anxiety ($M = 31.9, SD = 8.5$) and poorer state body image ($M = 24.5, SD = 11.6$) after the manipulation than those in the control condition ($M = 24.0, SD = 9.0; M = 32.7, SD = 9.1, p = .02$). Results also revealed that after the manipulation, the experimental condition had higher cortisol levels ($M = .25$ mg/dL, $SD = .15$) than the control condition ($M = .16$ mg/dL, $SD = .09, p = .01$), indicating a higher stress response. Finally, regression analyses revealed that situational social physique anxiety explained 7.6% of the variance in postmanipulation cortisol ($p = .005$). These findings indicate that situational body image concerns increase cortisol. This

study provides an empirical basis for developing interventions to improve body image and regulate cortisol levels.

Sources of social support and perceived competence on same-sex and coed competitive sport teams: Does the athlete's gender matter?

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The benefits of attending coed (CE) or same-sex (SS) schools and physical education have been hotly debated (see Mael, Alonso, Gibson, Rogers, & Smith, 2005). Most findings point to different psychological and emotional environments for males and females depending upon the CE or SS nature of the environment, with females generally benefiting more in terms of comfort, support, and feedback in SS than in CE settings (e.g., Derry & Phillips, 2004; Lirrg, 1994; Osborne, Bauer, & Sutliff, 2002). Even though the impact in education-focused settings has been studied, the impact of participating on SS and CE competitive sport teams has not been examined. This study addressed whether athletes on SS and CE teams differed in the sources of social support as well as sources and level of perceived competence reported. One hundred and ten (62 male, 48 female) collegiate athletes from a variety of sport teams completed questionnaires assessing social support, level of perceived competence, and sources of competence information. A series of group difference analyses with team type and gender as the independent variables and sources of social support, level of perceived competence, and sources of perceived competence as dependent variables were performed. A significant Gender \times Team Type interaction effect revealed that males on SS teams perceive more social support from teammates and friends and less support from coaches than males on CE teams. Differences in sources of social support based on team type were much smaller for females. Whereas level of perceived competence did not significantly differ, several sources of perceived competence (e.g., coach evaluation, same-sex peer evaluation, effort) significantly differed based on gender and team type. Results are compared to past work in the physical domain (e.g., Horn, Glenn, & Wentzell, 1993; Lirrg, 1993, 1994). The results of this study clearly indicate that male and female athletes experience participating in CE and SS competitive sports differently with regards to sources of social support and competence information.

Athlete satisfaction as an outcome of humor styles in recreational sport teams

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Humor is a personal attribute that has been researched in team dynamics in a variety of settings (Martin et al., 2003). Recent research on humor in sports has found that it is closely linked to perceptions of team cohesion, particularly individual attraction to group (Sullivan & Brachlow, 2006). However, it appears that Martin et al.'s conceptual model of humor styles may not be valid in sports. As opposed to the original four-factor model, Sullivan and Dithurbide (2007) found support for a two-factor model comprising positive humor directed at teammates, and self-deprecating humor. The current study sought to examine the relationship between humor styles and the outcome of athlete satisfaction, as well as to examine the factor structure of this revised model. A sample of 148 (66 female, 78 male; 4 did not respond) recreational team sport athletes completed a modified (i.e., two-factor) version of the Humour Styles Questionnaire and an abbreviated version of the Athlete Satisfaction Questionnaire (per Eys et al., 2007) that measured satisfaction with respect to

individual and team performance, team task contributions, and team integration. The scales were counterbalanced across the sample. Although the sample was small, a preliminary confirmatory factor analysis was run to examine the fit of the data to the two-factor model from the previous EFA. Results showed adequate fit (robust CFI = .922, robust RMSEA = .052). All factors of both the ASQ and HSQ were normally distributed and showed acceptable levels of internal consistency. A set correlation analysis was then conducted to examine the relationship between these two sets of variables. Results showed that there is a significant, but small multivariate correlation between the constructs, and further that athlete satisfaction with respect to team integration and team task coordination is significantly predicted by humor styles, particularly positive team-oriented humor.

Ways of learning to cope among female adolescent basketball players during a season

Tamminen, Katherine A.; Nicholas L. Holt, University of Alberta

We examined ways in which athletes learned to cope with stressors over the course of a competitive basketball season. This study was guided by proactive coping theory (Aspinwall & Taylor, 1997). Proactive coping consists of efforts undertaken in advance of the occurrence of a potential stressor in order to avoid it or minimize its severity. This theory emphasizes the individual's coping resources as well as the recognition of stressors and the elicitation and use of feedback in learning about past coping efforts. Thirteen female basketball players (*M* age = 16 years) completed pre- and postseason interviews and maintained audio diaries during the season. Through idiographic analyses, individual coping profiles were created and athletes were grouped into two types of coping approaches: A reactive-exploratory coping approach (10 athletes) and a proactive coping approach (3 athletes). During the early season, athletes who used the reactive-exploratory approach tended to react to stressors rather than anticipate them. However, as the season progressed, these athletes appeared to evaluate their previous coping efforts and plan ahead for future stressors. Their perceptions of coping effectiveness also improved as the season progressed. Athletes grouped as having a proactive approach planned their coping and used feedback to evaluate success consistently from the start of the season. Their coping also appeared to improve as the season progressed. Results suggest that temporal aspects in the deployment of coping strategies and eliciting and using feedback about coping efforts were important features of how these athletes learned to cope over the season. Furthermore, the results suggest that proactive coping theory may be a useful framework for assessing coping in sport.

Motivational predictors of students' leisure time physical activity and general physical self concept in physical education: A multilevel growth curve analysis

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Embedded in self-determination theory, this study explored the degree to which changes in Physical education (PE) students' psychological needs and their motivational regulations for PE predict changes in their general physical self concept (GPSC) and leisure-time physical activity behavior (LTPA). Extending previous research, this study explored change at the intra- and inter-individual levels of two important motivational consequences in PE. Physical education students (*N* = 178) aged between 11 and 16 years (*M* = 13.82, *SD* = 1.29, 69%

male) were asked to complete a multisection inventory at the beginning, middle, and end of a school semester. Linear multilevel growth models revealed that, of the three needs, only changes in perceived competence positively predicted changes in LTPA and GPSC at the intra- and interindividual levels. In addition, a significant Time \times Perceived Competence interaction was found, indicating that students with high levels of perceived competence increased their physical activity levels more over time compared to students with low levels of perceived competence. Of the five motivational regulations, changes in intrinsic motivation positively predicted changes in GPSC at the inter- and intraindividual levels. Also, changes in external regulation positively predicted changes in GPSC at the intraindividual level. Moreover, changes in LTPA were positively predicted by changes in identified regulation at the intraindividual level, as well as intrinsic motivation at the interindividual level. Finally, a significant Time \times Intrinsic Motivation interaction was found, indicating that students with high levels of intrinsic motivation increased their physical self-concept more over time when compared with students with low levels of intrinsic motivation. The results underscore the importance of facilitating students' perceived competence and self-determined regulations in PE.

Domain specific coping as intermediate processes in the relationships between dispositional optimism-pessimism and satisfaction in the school and sport domains

Thompson, Amanda S.; Patrick Gaudreau, University of Ottawa; Sharleen D. Hoar, University of Lethbridge; Valerie Hadd, University of British Columbia; Jonathan Lelièvre, University of Ottawa

Prior research has revealed that optimism-pessimism plays a role in the differential use of coping skills in both athletes (Gaudreau & Blondin, 2004) and students (Thompson & Gaudreau, 2007), but limited attention has been allocated to the student-athlete population. The focus of this study was to investigate domain specific coping skills as intermediate processes in the relationship between dispositional optimism-pessimism and the multidimensional life-satisfaction of student-athletes. Initially, a sample of 146 high school student-athletes completed measures of optimism and general life-satisfaction. After a final exam and sport competition, respectively, participants completed measures of academic coping and academic satisfaction and sport coping and sport satisfaction. Using structural equation modeling with manifest variables, dispositional optimism was a significant predictor of academic ($\beta = .29, p < .05$) and sport ($\beta = .24, p < .05$) task-oriented coping. Academic task-oriented coping was a significant predictor of school satisfaction ($\beta = .32, p < .05$), whereas sport task-oriented coping was a significant predictor of sport satisfaction ($\beta = .38, p < .05$). In contrast, dispositional pessimism was a significant predictor of both academic ($\beta = .27, p < .05$) and sport ($\beta = .29, p < .05$) disengagement-oriented coping. In turn, academic disengagement-oriented coping was negatively related to academic satisfaction ($\beta = -.39, p < .05$), whereas the use of sport disengagement-oriented coping was negatively related to sport satisfaction ($\beta = -.37, p < .05$). Furthermore, domain specific task-oriented coping mediated the relationship between optimism and domain specific satisfaction (indirect effects: $\beta = .09, p < .05$; $\beta = .09, p < .05$). Complementary analyses revealed no significant cross-domain effects between coping and satisfaction. This research highlights the importance of self-regulation in explaining the relationship between dispositional expectancies and psychological adjustment of individuals participating in multiple activities.

Mood and enjoyment following 10 and 30 minutes of cycling: The role of cycling enjoyment

Tobar, David A.; Nicole Serene, Bowling Green State University

The purpose of this study was to determine the role of cycling enjoyment on mood and enjoyment following 10 and 30 min of cycling at a moderate intensity. College students ($N = 47$) completed 10- and 30-min cycling (counterbalanced) on an upright cycle ergometer in a laboratory. Cycling conditions were completed on separate days at the same time of day. RPE and HR were collected at 3-min intervals during exercise, and participants could adjust the resistance to maintain an RPE of 13. Cycling enjoyment (PACES-Trait) was assessed prior to the 1st cycling condition on a separate day, and low (LCE) and high (HCE) cycling enjoyment groups were formed using a median split procedure. Mood (POMS) was measured at pre-, 5 min post-, and 20 min postexercise, and enjoyment (PACES-State) was measured only at 5 min postexercise. Data were analyzed using repeated-measures MANOVA and ANOVA. Independent variables included groups (LCE, HCE), conditions (10 min, 30 min), and time (pre, post-5, post-20). Groups did not differ in average HR for either condition. Results revealed a significant time effect for tension ($p < .001$), depression ($p < .001$), anger ($p < .001$), vigor ($p < .05$), fatigue ($p < .01$), confusion ($p < .001$), and total mood (TM: $p < .005$). Mood states improved following exercise. A Group \times Conditions \times Time effect was found for TM ($p < .05$). For 10-min cycling, the LCE reported a greater improvement in TM compared to HCE at 5 and 20 min after. For 30-min cycling, the improvement in TM was evident only at 5 min after for the LCE, whereas the HCE reported improvement at 5 and 20 min postexercise. A group effect and a Group \times Conditions effect were found for enjoyment ($p < .05$). HCE reported similar postexercise enjoyment for both cycling conditions, whereas LCE reported significantly lower postexercise enjoyment for 10-min cycling. No other main or interaction effects were found ($p > .05$). These findings suggest that 10 and 30 min of cycling are associated with similar improvements in mood, but cycling enjoyment and exercise duration do influence postexercise enjoyment and total mood.

The utility of motivation regulation profiles for understanding students experiences in physical education

Ullrich-French, Sarah C.; Purdue University; Anne E. Cox, Illinois State University

Self-determined motivation is desirable in physical education, relating positively to students' effort, enjoyment, and physical activity out of school (see Hagger & Chatzisarantis, 2007). A popular approach to assessing self-determined motivation is to create a relative autonomy index (RAI; see Vallerand, 1997) by weighting different motivational regulations to form one score. Though accounting for the multidimensionality of motivation, different combinations of motivational regulations are not captured and it is possible for different combinations to result in the same RAI score. To address this issue, cluster analysis was used to identify distinct motivational profiles of external, introjected, and identified regulation, and intrinsic motivation. The utility of this approach was examined by testing for differences in theoretical antecedents (competence, autonomy, relatedness, and consequences enjoyment) of motivation among profiles. Middle school PE students ($N = 384$) completed a survey containing valid and reliable measures of study variables. Cluster analysis revealed four motivation profiles: externally regulated ($n = 59$), motivated ($n = 147$), self-determined ($n = 109$), and amotivated ($n = 69$). An ANOVA showed the profiles differed on the RAI, $F(3, 1) = 367.24$, $p < .01$; $\eta_p^2 = .74$. Pairwise comparisons indicated all profiles differed on the RAI except

the motivated and amotivated profiles. A MANOVA revealed differences among profiles on theoretically relevant constructs, Pillai's trace = .55; $F(4, 12) = 21.43, p < .01; \eta_p^2 = .18$. Follow-up ANOVAs indicated that enjoyment differed ($p < .01$) among all profiles. Profiles also differed on perceived competence, autonomy, and relatedness ($p < .05$) with the exception of the motivated and self-determined profiles. Profile differences on study variables were consistent with theory. Of note is that the motivated and amotivated profiles differed on all study variables though their RAI scores did not differ. Findings suggest that the motivational profiles provide unique information over and above the RAI.

Cardiorespiratory and cortisol responses to mental challenges during exercise in high and low-fit females

Webb, Heather E.; Supatchara E. Tangsilat, Kelly A. McLeod; University of New South Wales; Edmund O. Acevedo, Virginia Commonwealth University

Stress responses to physical and mental challenges are regulated by hormones released following activation of the sympathoadrenal (SA) axis and the hypothalamo-pituitary-adrenocortical (HPA) axis. This activation subsequently results in increased cardiorespiratory (CR) responses and cortisol (CORT) levels. However, the impact of CR fitness on the combination of mental and physical stress has not been investigated beyond activation of the SA axis. This study compared CR and CORT responses in females of below-average fitness ($VO_2\text{max} = 31.30 \pm 2.59 \text{ mL/kg/min}^{-1}$) and above-average fitness ($VO_2\text{max} = 48.41 \pm 3.4 \text{ mL/kg/min}^{-1}$). Twenty-four apparently healthy females (12 high fit [HF] and 12 low fit [LF]) participated in two counterbalanced experimental conditions. In the dual-stress condition (DSC), the participants were mentally challenged while exercising on a cycle ergometer at 60% of $VO_2\text{max}$, whereas in the exercise-alone condition (EAC) the participants exercised at the same intensity without the mental challenge. State anxiety measures and the NASA Task Load Index (NTLX) were used to assess the perceived mental and physical workload during each condition. NTLX scores were significantly greater in the DSC. The DSC also elicited greater elevations in heart rate, respiration rate, ventilation, ventilatory efficiency, and cortisol values than the EAC. Additionally, HF participants demonstrated no differences compared to LF participants in CR variables at the conclusion of the DSC, although cortisol levels were significantly lower for the HF participants compared to the LF participants. The combination of a mental and physical challenge resulted in an increase in CR responses and an activation of the HPA axis. Furthermore, although HF participants did not differ from the LF participants in CR responses to the DSC, cortisol levels were attenuated for the HF participants. Thus, suggesting that greater cardiorespiratory fitness may attenuate HPA axis responses to concomitant stressors or high stress conditions.

Summarizing the efficacy of public-access stair climbing interventions:

A data synthesis

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Stair climbing is a freely available activity with proven health benefits. Previous interventions in public-access sites sought to encourage stair choice by introducing simple message prompts adjacent to the stairs and escalators. To verify the efficacy of this intervention format we initiated a research synthesis. Data from 20 comparable studies was combined to produce a total sample of 468,059 pedestrian observations, which was analyzed using logistic regression. This approach was preferred to traditional meta-analysis, as it enabled

the exploration of interactive relationships in addition to main effects. Several demographic variables were shown to have main effects: males, under 60s, Whites, and those without children/bags all climbed the stairs more than their counterparts. Stair climbing was also positively influenced by the volume of pedestrian traffic. In train stations, prompts increased stair climbing by an odds ratio (OR) of 1.08. In malls, greater effects were produced, OR = 2.10. Baseline differences most likely explain this disparity; baseline stair climbing is higher in stations (40.9%) than in malls (8.1%), leaving fewer potential converts. In malls, the effects of message prompts were found to interact both with gender and ethnicity, such that women and non-Whites increased their stair use more markedly. Curiously, station data showed different interaction effects, with more pronounced responses among males. Evidence of differential responding warrants further investigation, possibly using qualitative methods. The enhanced effects among women and non-Whites can be met with cautious optimism, however, given the heightened risk of certain morbidities among these groups. Further analyses will incorporate additional variables, such as weather conditions and physical specifications (e.g., stair height). This project helps to clarify the determinants of pedestrian behavior and the potential impact of message prompts. Overall, our findings corroborate the efficacy of promoting stair climbing as a means of elevating population activity levels.

Understanding sport commitment in senior bowlers

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Understanding the nature of long-term motivation in older exercisers may play a critical role in promoting adherence to physical activity across the lifespan. The purpose of this study was to examine functional and obligatory sport commitment in 91 senior bowlers (68 male; 22 female; *M* age = 65 ± 9 years) sampled from local bowling centers. The conceptual framework encompassed the sport commitment model (Scanlan et al., 1993); participants completed a sport-modified version of the Exercise Commitment Scale (Wilson et al., 2004), which assessed the two dimensions of sport commitment (functional and obligatory) along with its determinants in adult exercisers. Simultaneous linear regression analyses revealed that the determinants explained 84.8% of the variance in functional commitment ($p < .001$), with satisfaction and personal investment as the only significant predictors. For obligatory commitment, the model explained 60.7% of the variance ($p < .001$) with satisfaction, social constraints, involvement alternatives, and personal investment as significant predictors. Overall, these data replicate and extend the findings of Scanlan et al. (1993) and Wilson et al. (2004) that bowlers have higher functional than obligatory commitment. Furthermore, both functional and obligatory commitments are determined by higher satisfaction and personal investments, whereas obligatory commitment is also predicted by higher social pressures to continue to participate and higher attractiveness of the most preferred alternative activities. Overall, this study indicated that the sport commitment model may be useful for understanding motivated behavior of older athletes.

Lessons learned and core values adopted in a sport-based youth development program: A longitudinal qualitative analysis

Weiss, Maureen R.; Jennifer A. Bhalla, Nicole D. Bolter, Melissa S. Price; University of Minnesota

Longitudinal evaluation research is needed to document the effectiveness of sport-based youth development programs in teaching life skills. Using a longitudinal qualitative design (Gilmartin, 2006; Saldaña, 2003), we analyzed knowledge and transfer of life skills in 18 youth (ages 10 to 19) over the course of three years. Youth were participants in the First Tee, a program whose goal is to foster positive development by using golf as a context and coaches as external resources to teach life skills. In-depth interviews were conducted each year to determine the extent to which youth transfer life skills learned in the golf context to multiple domains. Interview questions in Years 2 and 3 were customized to each respondent's narrative in previous years. Inductive content analyses were coded for between- and within-participant change to document (a) convincing evidence of life skills transfer, (b) domains in which life skills are used, (c) themes characterizing use of life skills, and (d) compelling quotes showing successful life skills transfer. Findings showed that 89% of youth provided convincing evidence of retaining knowledge and transfer of life skills over the three-year period, including emotion management, goal setting, coping with challenges, resolving conflicts, and helping others. Participants were consistent in using these life skills in many domains including school, home, friends, job, and extracurricular activities. Common themes such as STAR (stop, think, anticipate, respond) and goal ladder (sequential goals coupled with strategies to achieving them) emerged over time for self-management, resolving conflicts, and goal setting. Participants increasingly alluded to life skills becoming automated over time, in much the same way physical skills do. Many rich quotes were derived that convey compelling evidence of successful life skills transfer over time in multiple domains and using several thematic strategies. These longitudinal qualitative data provide evidence that the First Tee is effective in attaining its goals of teaching life skills.

Life skills, youth development, and sport participation: Retention effects over a one-year period

Weiss, Maureen R.; Nicole D. Bolter, Jennifer A. Bhalla, Melissa S. Price; University of Minnesota; Ellen S. Markowitz, University of Virginia

According to Petitpas et al. (2005), positive youth development is most likely to occur when organized sport programs emphasize a mastery climate (context), positive adult behaviors (external resources), and personal skills (internal assets). The First Tee is a youth development program that has these components in place by using golf as a context and coaches as external resources for teaching life skills to maximize positive psychosocial outcomes. Evaluation research is necessary to document whether sport-based youth development programs, like the First Tee, is effective in achieving its goals. In Year 1, Weiss et al. (2007) found that participants in the First Tee compared favorably to youth involved in other organized activities on life skills transfer, general life skills, and developmental outcomes. While these findings provided evidence of the First Tee's effectiveness at one occasion, longitudinal research is needed to determine whether positive outcomes are retained over time. Thus the purpose of the present study was to evaluate whether life skills and developmental outcomes of First Tee participants observed in Year 1 remain stable in Year 2. The sample included 303 of 533 participants (ages 10 to 19) from Year 1. First, using the target model of the life skills transfer measure in Year 1, a confirmatory factor analysis at Year 2 showed an acceptable fit (NNFI = .99, RMSEA = .05) of an 8-factor model, providing additional validity for the measure. Second, multivariate analyses of variance showed no significant change in participants' scores from Year 1 to 2 on most scales of life skills transfer (6 of

8 scales), general life skills (6 of 8 scales), and developmental outcomes (7 of 10 scales). Third, effect sizes were small ($d < .41$) in change scores from Year 1 to 2 for all life skills and developmental outcomes. Collectively, findings show stability of life skills learning and developmental outcomes over a one-year period, providing evidence that the First Tee is having a sustained positive impact on youth development.

An examination of imagery use and self-efficacy during rehabilitation

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Sordoni and colleagues (2000, 2002) developed the Athletic Injury Imagery Questionnaire (AIIQ) to measure imagery use in athletic-injury rehabilitation; however, the AIIQ was not developed based on empirical work but on existing theoretical frameworks of athlete's imagery use in sport training and competition. As a result, Dreidiger, Hall, and Callow (2006) conducted a qualitative study in order to expand the knowledge and increase the understanding of imagery use by athletes in sport-injury rehabilitation. Based on the results from the work by Dreidiger and colleagues (2006), the AIIQ was revised and termed the *Injury Rehabilitation Imagery Questionnaire* (IRIQ). Objectives: One purpose of the present study was to test the factor validity of the IRQ. A second purpose of the present study was to revisit the relationships between imagery use, self-efficacy, and adherence in athletic injury rehabilitation using this new instrument. Participants: The IRQ was administered to 285 athletes, aged 18 to 74 years, undergoing injury rehabilitation. Athletes participated in a wide variety of sports. Main Outcome Measures: IRQ, the Athletic Injury Self-Efficacy Questionnaire (Milne, Hall, & Forwell, 2005), and an adherence measure. General Results and Conclusions: Support for the factorial validity of the IRQ was found. Injured athletes used more motivational, pain, and cognitive imagery than healing imagery. Injured athletes were stronger in task than in coping efficacy. Motivational imagery was found to be the strongest predictor of both task and coping efficacy. Motivational imagery was found to be the only significant predictor of rehabilitation adherence, while both task and coping efficacy predicted adherence.

Quiet competence: Hidden contributions of trailblazing women in sport and exercise psychology

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The written history of sport and exercise psychology provides a fairly comprehensive record of the contributions of prominent males in the field (e.g., Cox, 2001; LeUnes & Nation, 2001; Murphy, 1995; Weinberg & Gould, 2003). The contributions of women sport and exercise psychologists, however, are largely overlooked, even though they have been at the forefront of developing our discipline (Gill, 1995; Vealey, 2006). Using life history methodology, we aimed to explore and document the contributions of eight trailblazing women in sport and exercise psychology. Criteria for inclusion in the study were quantity and significance of scholarly publications, leadership in professional associations, influence on a substantial number of graduate students, and 25 years of professional involvement in sport psychology. Each woman participated in a life history interview lasting 5–8 hours. Additional data were obtained through follow-up conversations, personal and autobiographical writings (e.g., vitae, book chapters, and a focus group interview). This presentation will focus primarily on data from the focus group interview with seven of these women. The principal questions asked

in this group interview were, (a) what were the most important, yet largely unrecognized, contributions of each woman in the study? and (b) why do you think these contributions were overlooked in our written history? Three major themes about their contributions emerged: competence, commitment, and professionalism. Each of these women engaged in quality mentoring, teaching, research, and service to the profession. They also engaged a multitude of leadership positions in which many “behind the scenes” contributions were made. Based on these findings, we will highlight why we consider each of these women as trailblazers as well as what lessons for the future can be gained from their experiences.

Don't hate me because I'm beautiful: Physical activity, physical attractiveness efficacy, and perceived social acceptance

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Baumeister and Tice's (1990) social exclusion theory posits that one of the major processes by which individuals experience anxiety is in response to the threat of exclusion from important social groups. The authors suggest that much of human behavior reflects the attempt to avoid social exclusion and that the perception of exclusion can contribute to other negative affective states, including loneliness, depression, and low self-esteem. The goal of the present study was to examine physical activity as a mechanism for the avoidance of social exclusion. It was hypothesized that there would be a significant positive relationship between physical activity and perceived social acceptance and that this relationship would be mediated by physical attractiveness self-efficacy. Specifically, it was thought that physical activity participation would be positively related to perceived social acceptance but the source of this influence would be the effect that physical activity has on one's perception of their ability to appear physically attractive in a variety of social situations. Participants in the study were 427 college-aged individuals (mean age 21.9 years) recruited from undergraduate courses at a large Midwestern university. Participants completed a packet of inventories assessing their history of recent physical activity participation in addition to physical, social, and global self-perceptions. Consistent with hypotheses, a significant relationship was revealed between physical activity participation and perceived social acceptance. Furthermore, this relationship was mediated by physical attractiveness self-efficacy. Future research efforts may find value in examining the other sources of social acceptance with reference to physical activity participation. It has become abundantly clear that physical activity is often a socially motivated activity. It will be interesting to examine whether these social motivations have anxieties relating to social exclusion as their source.

Support versus control: Parent and adolescent views of social influences following a physical activity lapse

Wilson, Kathleen S., Kevin S. Spink, Carly S. Whittaker; University of Saskatchewan

Social influences have been conceptualized as being forms of either social control or social support. Further, there has been overlap in their measurement with identical social influences, sometimes identified as control and at other times as support (Duncan et al., 2005; Lewis et al., 2004). Given that perceptions of control and support might have different influences on behavior, understanding the meaning of influences becomes important. The present purpose was to examine whether parents and adolescents view parental influences provided following an activity lapse as control or support. In Study 1, parents ($N = 149$) were provided with a scenario describing a lapse in their child's activity, as well as 13 influences they might

use, and asked the extent to which each influence would be used as control or support. EFA results revealed that the influences could be grouped into positive, negative, and modeling types. A MANOVA revealed significant differences in parents' views of the influence types ($p < .001$). Positive and modeling influences were viewed more as support than control ($p < .001$), whereas no support versus control differences emerged for negative influences. A second study examined adolescents' ($N = 34$) views of the intent of parental influences during a previous lapse. Participants were provided with 13 influences that parents might use and asked whether they viewed them as forms of support or control. Influences were grouped into positive, negative, or modeling types. Results from a MANOVA revealed a significant difference in perceptions of support versus control ($p < .001$). Similar to parents, adolescents viewed positive and modeling influences more as support than control ($p < .001$), with no difference emerging for negative influences. These findings suggest that while positive and modeling influences are generally viewed more as support than control, negative influences may be viewed as either support or control. Future research should explore how these differences in perceptions, especially for negative influences, impact subsequent behavior change.

To nag or not to nag? When do negative parental influences predict adolescent activity behavior?

Wilson, Kathleen S.; Kevin S. Spink, Carly S. Whittaker, University of Saskatchewan

Social influences can be conceptualized in a number of ways including social control and social support. Previous research (Wilson, Spink, & Whittaker, 2008) has revealed that adolescents may perceive negative social influences (e.g., nagging as either control or support). Given that social support is typically associated with physical activity positively (Sallis et al., 2000) and social control can be either positively or negatively associated with behavior (Tucker & Anders, 2001), suggests that how a social influence is interpreted becomes important to understanding possible behavior change. The purpose of this study was to explore how perceptions of negative social influences as either control or support impact behavior change and affect. Adolescents ($n = 34$) were asked to recall a time when their activity had lapsed, provided with negative influences that a parent might use to influence them, asked whether their parents used these influences, and whether the influences used were perceived as control or support. Participants were then asked how much their behavior changed and the affect they felt as a result of the influences received. Separate hierarchical regressions were conducted predicting behavior change and affect with use of negative influences entered on the first step, followed by perceptions of the influence as control or support on the second step. Results for behavior change revealed that the use of influences did not predict behavior change ($p > .5$), whereas perceptions of the influence as control/support did ($p < .05$). Examination of the individual predictors revealed that those influences associated with greater support predicted more positive behavior change ($p < .01$). In terms of affect, results revealed that only the perceptions of support and control predicted affect ($p < .001$). Similar to behavior change, perceiving the negative influence as supportive was associated with more positive affect ($p < .001$). It appears that the negative social influences provided by parents, when viewed as support by adolescents, may positively impact behavior and affect.

An imagery intervention with young figure skaters

Wiman, Melissa; Craig Hall, University of Western Ontario

Most of the imagery research in sport has focused on adult athletes. Recently, imagery use by young athletes has received some attention. Munroe-Chandler, Hall, Fishburne, and Strachan (2007) sought to gain insight into imagery usage in young athletes in a variety of sport between the ages of 7 and 14 years. Results indicated that females between 7 and 14 years engaged in motivational general-mastery (MG-M) imagery. To further investigate MG-M imagery use in young female athletes, an intervention was given to a group of six figure skaters between the ages of 10 and 15 via a single-subject, multiple baseline design. The skaters were split into two groups based on skating level. All six participants underwent three weeks of baseline testing, completing the CSAI-2- C, SEQ-C, TSCI to measure confidence, and SIQ-C and IUQ-R Figure Skating to measure imagery use. Following the baseline period, Group 1 received the MG-M intervention for four weeks while Group 2 continued with the baseline phase. At the end of these 4 weeks, Group 2 started the MG-M intervention, which was another 4 weeks in duration. During the intervention period, the co-investigator met with the participants weekly after or before practice to administer the aforementioned questionnaires and lead the participants in an imagery session. The skaters were required to read a script that focused on confidence. The participants were asked to read the script daily on their own. Results indicated an improvement in confidence scores for five of six participants as evidenced by an increase in their scores on the confidence measures from baseline. Imagery usage, as measured by the SIQ (MG-M subscale), increased over the course of the intervention, indicating a positive relationship between imagery usage and increased confidence. That is, a larger increase in MG-M imagery use was associated with a larger improvement in confidence scores.

No evidence of relative age effects among Canadian figure skaters and artistic gymnasts

Wong, Harmonie R.; York University; Stephen Cobley, Leeds Metropolitan University; Joe Baker, York University

Sports use cutoff dates in an attempt to provide fair competition by controlling for the effects of developmental differences. However, extensive research shows that developmental differences within age groups can be substantial. Consequences resulting from these differences are referred to as relative age effects and can predispose athletes to higher levels of achievement. Previous evidence has shown a repeated over-representations of players born in the first three months of a sport's selection year (i.e., after a sport's cutoff date) in many sports. However, further research needs to explore relative age effects in aesthetic sports where the role of maturational factors may be atypical. In figure skating, the cutoff date is July 1st, whereas, in gymnastics, the cutoff date is January 1st. Research (St. Marie et al., 2000) has suggested that in gymnastics, being early born (i.e., being relatively older) produces a performance disadvantage, as height and mass gain can impede flexibility, rotational speed and strength to mass ratio. As a result, their data showed a flip-flop birth date pattern compared to other sports. The purpose of this study was to examine relative age as it relates to the development of Canadian figure skaters and artistic gymnasts at the junior and senior national levels. Data were obtained from official sources and resulted in birth date information for 378 figure skaters and 144 artistic gymnasts. Results revealed no significant patterns between relative age and higher levels of competition among both artistic gymnasts and figure skaters. The lack of consistency in relative age patterns suggests the social factors underpinning performance in aesthetic sports may be different from nonaesthetic sports.

Further research is necessary to confirm these results; however, they provide additional evidence regarding the complexity of relative age effects.

Physical activity, brain function, and the role of the apolipoprotein E4 allele in young adults

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The beneficial effect of exercise on cognitive function has been established in normal aging and even in children. Particularly, the benefit of exercise was of greatest magnitude for executive processes. However, the link between exercise and brain function is modified by genetic factors in older adults. Specifically, physical activity in carriers of the apolipoprotein E4 allele, a genetic risk factor for Alzheimer's disease, was highly protective against cognitive decline. However, it is unclear if physical activity would compensate for the negative impact of the e4 allele in young healthy adults. Therefore, the purpose of this study was to investigate the interactive relationship between physical activity and genotype to brain function in college age males and females during executive and nonexecutive challenge. Participants were 41 young ($M = 20.6$ years) healthy e4 carriers ($N = 12$) and noncarriers ($N = 29$) who underwent fitness testing to estimate aerobic capacity VO_{2max} . Brain function was assessed by a neuroelectric measurement, the event-related potential. P300 amplitude and latency for each of the electrodes at Fz, F3, F4, Cz, C3, C4, Pz, P3, P4, O1, and O2 during oddball and no-go tasks were regressed separately in a series of a hierarchical regression on the following predictor variables: (1) genotype, (2) aerobic capacity, and (3) the interaction of genotype and aerobic capacity. In no-go task, VO_{2max} was positively associated with P300 amplitude in the parietal region, $\Delta R^2 = 0.25, p = 0.05$ in e4 carriers; $\Delta R^2 = 0.02, p = 0.22$ for noncarrier and negatively related to P300 latency in the frontal region in e4 carriers $\Delta R^2 = 0.27, p = 0.04$ for e4 carriers; $\Delta R^2 = 0.05, p = 0.30$ for noncarrier. As reported, no such significant effects were observed in noncarriers. The current finding revealed that there is genetic specificity in the relationship between exercise and brain function in young healthy adults. Therefore, the neurobiological benefit of exercise is apparent in those who are at risk of dementia even during adolescence.

Effects of self-regulatory strength depletion on muscular performance in older adults

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The limited strength model of self-regulation (Schmeichel & Baumeister, 2004) has generated a considerable body of evidence consistent with the view that acute depletion of people's self-regulatory capacities imparts negative effects on subsequent tasks requiring self-regulation. However, virtually all the evidence established thus far has been derived from studies involving undergraduate students. In the present study, we aimed to extend previous work investigating the after-effects of a self-regulatory depletion task on physical stamina in a sample of older adults. A convenience sample of older adults ($N = 41$; M age = 71.64 ± 7.27) were stratified by gender and randomized to either a cognitive depletion condition (modified Stroop task) or a control (color word) group and completed two maximal isometric exercise endurance trials separated by the cognitive task. A one-way ANOVA was computed to compare the residualized change scores across the two endurance trials between the experimental and control conditions. Results showed a significant difference

between groups, $F(1, 39) = 5.72, p < .05$, in which the experimental group's performance declined ($M_{\text{exp.}} = -6.47 \pm 19.64$ s) whereas the control group's performance increased ($M_{\text{control}} = +7.59 \pm 17.91$ s) after the cognitive manipulation task. Results lend broader support to Baumeister's limited strength model and its generalizability to older adults. Findings are contrasted with similar studies involving younger adults and interpreted in light of biological aging processes. Implications for self-regulatory challenges faced by many older adults and potentially severe consequences of self-regulatory failures are discussed along with recommendations based on recent work examining self-regulatory training and dietary supplementation interventions.