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Associations Between Motivational Orientations and Chronically Accessible Outcomes in Leisure-Time Physical Activity: Are Appearance-Related Outcomes Controlling in Nature?

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Research has indicated that physical inactivity is a cause in the rise in chronic health problems, such as obesity, diabetes mellitus, and coronary heart disease (Lee & Skerritt, 2001). Researchers in physical activity have used motivational theories to increase understanding of this behavior. Self-determination theory (SDT; Deci & Ryan, 1985, 2000) is a social psychological motivational theory that has been extensively applied to identify motivational correlates of physical activity behavior.

SDT has successfully predicted behavioral persistence and well being in various contexts (Deci & Ryan, 2000). SDT advocates that qualitatively different forms of motivation can be elicited from interactions between the individual and the environment. Deci and Ryan (1985) argued that motivated behaviors differ in the degree to which they are self-determined or *autonomous* versus non-self-determined or *controlled*. Six qualitatively different forms of motivational or *regulatory* style have been identified within the theory, which vary in their degree of relative autonomy: intrinsic regulation, integrated regulation, identified regulation, introjected regulation, external regulation, and amotivation. These styles are proposed to lie on a continuum, known as the perceived locus of causality (PLOC), ranging from intrinsic motivation at

one extreme to amotivation at the other. Intrinsic motivation represents the prototypic instance of self-determined motivation (Deci & Ryan, 2000) and reflects engaging in behaviors for no external reinforcement, a sense of choice and personal investment. Intrinsic motivation is related to high levels of interest, enjoyment, and persistence with tasks (Deci & Ryan, 2000) and maintaining a self-regulatory capacity for health-related behavior (Hagger, Wood, Stiff, & Chatzisarantis, 2009). Integrated regulation is the most autonomous form of extrinsic motivation, as it refers to a process in which individuals convert externally referenced requests or pressures into personally endorsed reasons congruous with their true self. Identified regulation lies adjacent to integrated regulation and represents engagement in a behavior to attain valued behavioral outcomes. Introjected regulation is next to identified regulation and describes behavioral participation to obtain feelings of self-worth or avoid negative emotions, such as guilt and shame. External regulation is the prototypical form of non-self-determined motivation, with behavior perceived as emanating entirely from external contingencies. Amotivation lies at the far end of the continuum and is characterized as participating in a behavior for no discernable reason or intention.

Research has shown that autonomous motivation from the PLOC is related to physical activity engagement and persistence. Ryan, Frederick, Lepes, Rubio, and Sheldon (1997) demonstrated that autonomous motivation facilitates long-term adherence to physical activity, and autonomous motives are strongly associated with intentions and effort regarding physical activity participation (Chatzisarantis, Hagger, Biddle, & Karageorghis, 2002). Further, Ekkekakis and Lind (2006) found that imposing exercise intensity in overweight individuals led to

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decreased exercise enjoyment relative to self-selected intensity. Imposed exercise intensity is likely to represent a controlling regulation and may diminish autonomous motivation, which could have significant consequences for behavioral persistence.

A recent development in research on self-determination theory was the distinction between intrinsic and extrinsic motivation and intrinsic and extrinsic goal contents. The content of the intrinsic or extrinsic goals people pursue has been shown to be distinct from motives for performing behaviors (Vansteenkiste, Soenens, & Lens, 2007). Although the pursuit of intrinsic goals frequently results from autonomous motives and pursuit of extrinsic goals is often based on controlling regulations, goal contents and underlying regulations are distinct (Vansteenkiste et al., 2007). Vansteenkiste, Simons, Lens, Sheldon, and Deci (2004) reported that an experimental manipulation of goals, by framing them as intrinsic or extrinsic, resulted in reliable differences in depth of processing, test performance, and persistence for learning both text material and physical exercise. Intrinsic goal framing resulted in positive effects on all learning outcomes. Therefore, the goal content and motivational orientations are separate but related concepts and can be influenced by the social context that may support or thwart autonomous motivation and goal pursuit.

Deci and Ryan (2000) also asserted that the content, or *what*, of goal pursuits can influence behavior and well being. Research has shown that autonomous aspirations exhibit positive relationships with self-actualization and vitality, while controlled aspirations are negatively associated with well being and social functioning (Kasser & Ryan, 1993). Therefore, it is important to determine whether desired behavioral outcomes in a physical activity context are autonomous or controlled to understand behavioral persistence and well being and aid the development of interventions to improve health outcomes.

Using the example of a weight loss outcome, Hagger, Chatziantonis et al. (2009) outlined the problem of identifying the motivational basis for desired outcomes in physical activity. They argued that the weight loss outcome (i.e., "I exercise to lose weight") could be interpreted as either autonomous or controlled. For some individuals, such an assertion may represent an autonomous outcome, because they want to be healthy, whereas for others it may be a desire to look good for others, which indicates a controlling motivational basis. Similarly, Vansteenkiste and colleagues (2007) highlighted that people may focus on one outcome for different reasons: while some individuals pursue physical attractiveness because they want to conform to society's appearance ideals, others pursue it because they personally value being attractive. It is important to clarify the motivational basis of such outcomes in physical activity because of the implications for behavioral persistence and well being.

To identify the motivation for desired behavioral outcomes, it is necessary to examine associations between these outcomes and the underlying regulatory styles postulated by SDT. Sheldon and Kasser (1995), for example, showed that extrinsic goal striving was positively correlated with controlled self-regulation. Similarly, Ingledew and Markland (2007) showed that appearance/weight motives in exercise participation were significantly related to introjected and external regulations; external regulation mediated the negative association between appearance/weight motives and exercise participation, while health/fitness motives were related to identified regulation, which mediated effects on exercise participation. These findings highlight the importance of considering both goal contents and motives when attempting to understand motivated behavior, particularly because both are related to behavioral persistence and well being.

To date, research examining relations among goal pursuit and motivational styles in SDT focused on self-reported motives from traditional inventories such as the Exercise Motivations Inventory version 2 (EMI-2; Markland & Ingledew, 1997). Studies neglected to investigate relations between conventional self-reported motivational orientations and chronically accessible motivations. While conventional self-report measures of motivational orientations serve as direct measures of motivation, chronically accessible motivations can be accessed indirectly, consistent with Fazio and Olsen's (2003) distinction between direct and indirect measures. Research in the construct and attitude accessibility literature has suggested that chronically accessible constructs and attitudes (i.e., those most readily spontaneously generated and, therefore, with high activation potential) are most likely to guide social judgment and behavior (Fazio, Chen, McDonel, & Sherman, 1982; Higgins, King, & Mavin, 1982). This principle has been applied to motivation research, in which chronically accessible motivations (i.e., those most readily accessible and, therefore, with the greatest activation potential) represent the forces most likely to motivate behavioral engagement.

Recent research adopted this approach to study the effects of SDT motives on intrinsic motivation and behavior. Levesque and Pelletier (2003) used techniques derived from the attitude accessibility literature to examine the effects of accessible autonomous and heteronomous (controlled) motivations in an academic context, using a free-response measure. This measure required participants to list up to 10 reasons they had for attending a university. The first two reasons served as a proxy measure for their most chronically accessible motivations and were coded as autonomous or heteronomous, consistent with Higgins and colleagues' (1982) assertion that output primacy reflects chronic accessibility. This indicator has been used in the attitude accessibility literature, in which the ease and speed with which attitudes are expressed

reflect their accessibility (Bizer & Krosnick, 2001). Importantly, this literature also showed that the attitudes accessed most readily are the most strongly related to behavior (Kokkinaki & Lunt, 1997). Furthermore, Bizer and Krosnick (2001) showed that attitude importance can cause heightened accessibility, supporting the notion that readily expressed attitudes are the most salient.

Levesque and Pelletier (2003) found that chronically accessible autonomous motivations predicted long-term behavior beyond traditional scaled measures of motivational orientations. Further, despite some correspondence between the chronically accessible measure of motivation and scaled self-report measures, some discrepancies existed, suggesting that participants accessed different information for each measure. Chronically accessible motivation has also been shown to moderate the effects of planning on physical activity behavior (McLachlan & Hagger, in press). It is important to determine the motivational basis underlying individuals' reported outcomes in physical activity to understand their behavior, as traditional scaled motivational measures alone may not sufficiently explain motives. By adopting methods from construct and attitude accessibility research and applying them to the present study, we suggest that desired outcomes in physical activity with the greatest activation potential will be the most chronically accessible (Higgins, 1996). These outcomes will likely be those the individual pursues when engaging in physical activity and should, therefore, represent their general motivational orientations toward that behavior. The chronically accessible measure also serves as an indirect measure of motivational orientations; participants are not aware of what the measure taps, thus likely reducing self-report bias.

Our study aimed to explore relations between chronically accessible outcomes in physical activity and scaled measures of motivational orientations from a self-determination perspective. Methods from construct and attitude accessibility research and the Levesque and Pelletier (2003) study were used to identify participants' chronically accessible desired physical activity outcomes. We hypothesized that chronically accessible appearance-related outcomes in physical activity, such as weight loss and toning up, would be related to controlling motivational orientations (indicated by a scaled measure), while chronically accessible outcomes unrelated to appearance (e.g., health improvement and enjoyment) would be associated with autonomous motivational orientations. The chronically accessible outcomes measure was used as a proxy for chronically accessible motivations, because desired outcomes drive behavioral engagement and represent the types of motivation people experience while pursuing behavior. The study will make a unique contribution to the social and health psychology literature by exploring the regulatory basis of the chronically accessible outcomes people pursue in their leisure-time physical activity (LTPA) behavior.

Method

Participants

Participants ($N = 276$; M age = 29.39 years, $SD = 12.25$) were recruited from universities and employers in southeastern England. Of the original 276 participants, 142 provided data on all study variables. There were 29 men and 113 women in this final sample. Participants who did not provide complete data were significantly older, $t(274) = -11.74$, $p < .001$, and consisted of more men, $\chi^2(1) = 12.95$, $p < .001$. Of this final sample, 14.1% had not participated in any physical activity over the previous 6 months, while 26.1% had not participated in any physical activity during the previous 2 weeks. The mean rating on the self-report physical activity scale was 2.99 ($SD = 1.37$) for the previous 6 months and 2.85 ($SD = 1.58$) for the previous 2 weeks, where 1 = no participation in physical activity, 2 = participation once per week, 3 = participation 2 days per week, 4 = participation several days per week, 5 = participation many days per week, and 6 = participation most days per week.

Design

Using a cross-sectional design, participants completed the behavioral regulation in exercise questionnaire (BREQ; Mullan, Markland, & Ingledew, 1997), containing measures of motivational regulations. They also completed an open-ended measure of physical activity outcomes they aimed to attain. Before completing the measures, participants received a definition of LTPA and were asked to consider the vigorous and active physical activities they might do in their leisure-time, such as jogging, swimming, and sports training. Participants gave their informed consent prior to completing the questionnaires and were informed of their rights to confidentiality and to withdraw from the study at any time. The University of Nottingham School of Psychology provided ethical approval for the study.

Measures

Chronically Accessible Physical Activity Outcomes Measure. Participants listed up to three important outcomes they aimed to achieve over the following 3 weeks. The outcomes could be anything they hoped to accomplish through leisure-time active sports and/or vigorous physical activities. The measure was phrased such that those who did not currently participate in physical activity could respond hypothetically. The frequency of primary outcomes is shown in Table 1. For subsequent analyses, primary outcomes were coded dichotomously; participants reporting an appearance-related primary outcome were allocated a code of 0, while those reporting a primary

outcome unrelated to appearance were coded 1. The first (primary) outcome for each participant was coded, as it was believed to best represent participants' chronically accessible motivations (Levesque & Pelletier, 2003).

Perceived Locus of Causality. The BREQ (Mullan et al., 1997) was used to measure perceived locus of causality for LTPA. The questionnaire contains 19 items with four items for each type of motivational regulation, except for the introjection measure which contains three items: intrinsic motivation (e.g., "I enjoy exercise," $\alpha = .81$), identified regulation (e.g., "I participate in exercise, because I gain a lot of benefits that are important to me;" $\alpha = .97$), introjected regulation (e.g., "I will feel bad with myself if I do not exercise;" $\alpha = .84$), and external regulation (e.g., "I do it because significant others want me to exercise;" $\alpha = .86$). Participants responded to each item on a 4-point scale anchored by 1 = not true at all and 4 = very true. The BREQ subscales have exhibited satisfactory internal reliabilities and construct and discriminant validity in confirmatory factor analyses (Mullan et al., 1997). A subscale was added to the BREQ to measure integrated regulation (e.g., "I exercise because it is part of my true self;" $\alpha = .85$) developed by Mallett, Kawabata, Newcombe, Otero-Forero, and Jackson (2007).

Results

Main Analyses

Correlation Analysis. Point biserial correlations were computed between study variables, as the chronically accessible physical activity outcomes measure was dichotomous. The measure was positively and significantly correlated with external regulation ($r = .20, p < .01$) from the BREQ and negatively associated with intrinsic motivation ($r = -.13, p < .01$). This suggests that reporting appearance-related outcomes is linked with lower levels of autonomous or self-determined regulation and higher levels of controlled or heteronomous regulation in physical activity. There were no other significant correlations.

Logistic Regression Analysis. Using logistic regression analysis, the appearance-related outcomes variable was regressed on intrinsic motivation and integrated, identified, introjected, and external regulations. Results of the analysis are provided in Table 2¹. The analysis yielded a significant equation, $\chi^2(5, N = 142) = 7.48, p < .05$, Nagelkerke $R^2 = .08$, indicating acceptable model fit with the data. Introjected regulation emerged as the only significant independent predictor of primary outcome type (odds ratio = 1.87, $p < .05$; 95% confidence interval [CI95] lower bound of odds ratio = 1.01; CI95 upper bound = 3.43). People who rated introjected regulation highly were nearly twice as likely to specify an appearance-related primary physical activity outcome.

Discussion

The present study explored associations between traditional scaled measures of motivational orientations and chronically accessible appearance-related outcomes in LTPA. We hypothesized that citing an appearance-related outcome as the most chronically accessible reason for participating in LTPA would be associated with a control-

Table 1. The frequency of primary chronically accessible outcomes cited by participants

Outcome	Frequency
Get fit/improve fitness ^a	65
Lose weight	23
Improve skills/performance ^b	13
Release stress	1
Maintain/improve health ^c	23
Shape/tone up	7
Improve mood	1
Increase self-confidence	2
Enjoyment	6
Socializing	1

Note. Primary chronically accessible outcomes were collapsed into the above categories.

^aIncluded outcomes relating to maintaining or improving fitness levels, building upper body strength, cardiovascular exercise, easier breathing, regaining preinjury fitness, increasing walking speed, establishing an exercise routine, and increasing stamina.

^bIncluded outcomes relating to improving speed, skill level, technique, and learning a routine in sport of physical activity.

^cIncluded outcomes relating to maintaining or improving physical or mental health, increasing energy and enhancing one's sense of well being.

Table 2. Results of the logistic regression analysis predicting primary outcome type from explicit regulatory variables

Regulation	B	SE	Exp B	CI95 LB	Exp β UB
Constant	-1.17	1.26	.31	—	—
Introjected	.62	0.31*	1.87	1.01	3.43
External	.32	0.34	1.36	.70	2.63
Integrated	.01	0.40	1.01	.46	2.21
Identified	-.28	0.55	.76	.26	2.23
Intrinsic	-.45	0.50	.64	.24	1.70

Note. SE = standard error; Exp B = expected beta coefficient also known as odds ratio; CI95 Exp β = 95% confidence intervals for expected beta coefficient; LB = lower bound; UB = upper bound.

* $p < .05$

ling motivational style on a scaled measure of behavioral regulation. Findings supported this hypothesis. Analyses showed that participants who spontaneously reported an appearance outcome as their most accessible desired physical activity outcome tended to report higher levels of extrinsic motivation on the BREQ. Correlations also indicated that striving for an appearance-related primary outcome in physical activity was significantly related to lower intrinsic regulation for physical activity, further supporting the hypothesis that appearance outcomes are controlling in nature. In addition, a logistic regression analysis indicated a significantly higher probability of reporting an appearance-related primary outcome among those who rated introjected regulation highly. This supports the hypothesis that appearance-related primary outcomes in LTPA are controlling and suggests that engaging in physical activity for appearance-related reasons is likely prompted by the desire to avoid feelings of guilt and shame.

To our knowledge, the present study is the first to examine the associations between chronically accessible outcomes and a conventional measure of motivation in a health context. A unique contribution of the study is the finding that a chronically accessible appearance-related primary outcome/goal for engaging in LTPA is significantly associated with a controlling motivation orientation. While Ingledew and Markland (2007) reported similar findings in their study of the regulatory underpinnings of exercise motives, they used only a conventional scaled measure of exercise participation motives. In contrast, the present study used (a) an open-ended measure to indirectly tap chronically accessible motivations, and (b) a conventional direct measure of motives.

The findings have important implications for understanding physical activity behavior. As striving for appearance-related outcomes in physical activity appears to be associated with external behavioral regulation, participating in physical activity to attain an appearance-related outcome may be associated with less behavioral persistence and lower well being than participating in physical activity for more autonomous reasons. Preoccupation with appearance outcomes may go some way to explain the high dropout rates in exercise programs. Therefore, it is important to ensure that interventions to increase LTPA levels resist an exclusive focus on appearance-related outcomes and frame outcomes in terms of autonomous motivation. This could be achieved by emphasizing health, enjoyment, and skill-development as potential LTPA goals. However, it is important to avoid denigration of appearance and weight motives in physical activity, as this may also threaten autonomy. Individual motives should be acknowledged and respected (Ingledew & Markland, 2007) to prevent loss of autonomy and dropout from exercise participation, while simultaneously promoting autonomous reasons. Further, appearance-related goals

may not be invariably extrinsically motivated, as they may be internalized and assimilated with the self, rather than contingent on others' evaluations. When appearance-related goals are governed by noncontingent self-worth (Deci & Ryan, 1995), underlying motivational orientations will not necessarily be controlling. Sheldon (2004) supported this notion, arguing that self-esteem goals are often rated as enjoyable.

Conclusions and Directions for Future Research

Several limitations of the present study necessitate further investigation. First, the study design was cross-sectional which prohibited the inference of causality (Hagger & Chatzisarantis, 2009). Second, the correlations represented associations between variables, which provided only an indication of the motivational orientations governing chronically accessible physical activity outcomes. Future research needs an experimental design in which motivational orientations are manipulated and effects on desired physical activity outcomes observed. Third, no behavioral measure was used, which limits the findings when drawing conclusions about the effect of striving for appearance-related outcomes on physical activity behavior. It would be valuable to explore the differential impact of chronically accessible appearance-related outcomes and traditional self-reported motives on prospective physical activity behavior. Despite methodological limitations, this study provides preliminary support for the hypothesis that chronically accessible appearance-related outcomes in physical activity are associated with controlling motivational orientations and suggests routes for further exploration of this issue.

References

- Bizer, G. Y., & Krosnick, J. A. (2001). Exploring the structure of strength-related attitude features: The relation between attitude importance and attitude accessibility. *Journal of Personality and Social Psychology*, *81*, 566–586.
- Chatzisarantis, N. L. D., Hagger, M. S., Biddle, S. J. H., & Karageorghis, C. (2002). The cognitive processes by which perceived locus of causality predicts participation of physical activity. *Journal of Health Psychology*, *7*, 685–699.
- Deci, E. L., & Ryan, R. M. (1985). *Intrinsic motivation and self-determination in human behavior*. New York: Plenum Press.
- Deci, E. L., & Ryan, R. M. (1995). Human autonomy: The basis for true self-esteem. In M. A. Kernis (Ed.), *Efficacy, agency, and self-esteem* (pp. 31–49). New York: Plenum Press.
- Deci, E. L., & Ryan, R. M. (2000). The “what” and “why” of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry*, *11*, 227–268.
- Ekkekakis, P., & Lind, E. (2006). Exercise does not feel the same when you are overweight: The impact of self-selected and imposed intensity on affect and exertion. *International Journal of Obesity*, *30*, 652–660.

- Fazio, R. H., Chen, J., McDonel, E. C., & Sherman, S. J. (1982). Attitude accessibility, attitude-behavior consistency, and the strength of the object-evaluation association. *Journal of Experimental Social Psychology, 18*, 339–357.
- Fazio, R. H., & Olson, M. A. (2003). Implicit measures in social cognition research: Their meaning and use. *Annual Review of Psychology, 54*, 297–327.
- Fidell, L. S., & Tabachnick, B. G. (2003). Preparatory data analysis. In J. A. Schinka, W. F. Velicer, & I. B. Weiner (Eds.), *Handbook of psychology. Volume 2. Research methods in psychology* (pp. 115–141). New York: Wiley.
- Hagger, M. S., & Chatzisarantis, N. L. D. (2009). Assumptions in research in sport and exercise psychology. *Psychology of Sport and Exercise, 10*, 511–519.
- Hagger, M. S., Chatzisarantis, N. L. D., Hein, V., Soos, I., Karsai, I., Lintunen, T., & Leemans, S. (2009). Teacher, peer, and parent autonomy support in physical education and leisure-time physical activity: A trans-contextual model of motivation in four nations. *Psychology and Health, 24*, 689–711.
- Hagger, M. S., Wood, C., Stiff, C., & Chatzisarantis, N. L. D. (2009). The strength model of self-regulation failure and health-related behavior. *Health Psychology Review, 3*, 208–238.
- Higgins, E. T. (1996). Knowledge activation: Accessibility, applicability, and salience. In E. T. Higgins & A. W. Kruglanski (Eds.), *Social psychology: Handbook of basic principles* (pp. 133–168). New York: Guilford Press.
- Higgins, E. T., King, G. A., & Mavin, G. H. (1982). Individual construct accessibility and subjective impressions and recall. *Journal of Personality and Social Psychology, 43*, 35–47.
- Ingledew, D. K., & Markland, D. (2007). The role of motives in exercise participation. *Psychology and Health, 1–22*.
- Kasser, T., & Ryan, R. M. (1993). A dark side of the American dream: Correlates of financial success as a central life aspiration. *Journal of Personality and Social Psychology, 65*, 410–422.
- Kokkinaki, F., & Lunt, P. (1997). The relationship between involvement, attitude accessibility and attitude-behavior consistency. *British Journal of Social Psychology, 36*, 497–509.
- Lee, I. M., & Skerrett, P. J. (2001). Physical activity and all-cause mortality: What is the dose-response relation? *Medicine & Science in Sports & Exercise, 33*(Suppl.), S459–S471.
- Levesque, C., & Pelletier, L. G. (2003). On the investigation of primed and chronic autonomous and heteronomous motivational orientations. *Personality and Social Psychology Bulletin, 29*, 1570–1584.
- Mallett, C., Kawabata, M., Newcombe, P., Otero-Forero, A., & Jackson, S. (2007). Sport motivation scale-6 (SMS-6): A revised six-factor sport motivation scale. *Psychology of Sport and Exercise, 8*, 600–614.
- Markland, D., & Ingledew, D. K. (1997). The measurement of exercise motives: Factorial validity and invariance across gender or a revised exercise motivations inventory. *British Journal of Health Psychology, 2*, 361–376.
- McLachlan, S., & Hagger, M. S. (in press). The influence of chronically accessible autonomous and controlling motives on physical activity within an extended theory of planned behavior. *Journal of Applied Social Psychology*.
- Mullan, E., Markland, D., & Ingledew, D. K. (1997). A graded conceptualisation of self-determination in the regulation of exercise behavior: Development of a measure using confirmatory factor analytic procedures. *Personality and Individual Differences, 23*, 745–752.
- Ryan, R. M., Frederick, C. M., Lepes, D., Rubio, N., & Sheldon, K. M. (1997). Intrinsic motivation and exercise adherence. *International Journal of Sport Psychology, 28*, 335–354.
- Sheldon, K. M. (2004). The benefits of a sidelong approach to self-esteem need-satisfaction: A comment on Crocker and Park (2004). *Psychological Bulletin, 130*, 421–424.
- Sheldon, K. M., & Kasser, T. (1995). Coherence and congruence: Two aspects of personality integration. *Journal of Personality and Social Psychology, 68*, 531–543.
- Vansteenkiste, M., Simons, J., Lens, W., Sheldon, K. M., & Deci, E. L. (2004). Motivated learning, performance, and persistence: The synergistic effects of intrinsic goal contents and autonomy-supportive contexts. *Journal of Personality and Social Psychology, 87*, 246–260.
- Vansteenkiste, M., Soenens, B., & Lens, W. (2007). Intrinsic versus extrinsic goal promotion in exercise and sport. Understanding the differential impacts on performance and persistence. In M. S. Hagger & N. L. D. Chatzisarantis (Eds.), *Intrinsic motivation and self-determination in exercise and sport* (pp. 167–180). Champaign, IL: Human Kinetics.

Note

1. The intrinsic, identified, and extrinsic scales from the modified behavioral regulation in exercise questionnaire exhibited significant skewness and/or kurtosis estimates. To check whether these departures from normality affected results, the skewed and/or kurtotic scales were transformed using a natural logarithmic function by Fidell and Tabachnick (2003). Repeating the analysis with the log-transformed variables revealed virtually identical results. Thus, we are confident that the results were unaffected by departures from normality.

Authors' Notes

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