

PSYCHOLOGICAL NEEDS AND THE PREDICTION OF EXERCISE-RELATED COGNITIONS AND AFFECT AMONG AN ETHNICALLY DIVERSE COHORT OF ADULT WOMEN

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ABSTRACT

The current study explored the utility of Self-Determination Theory (SDT; Deci & Ryan, 1985) and Optimal Distinctiveness Theory (ODT; Brewer, 1991, 1993) in predicting motivational, cognitive, and affective responses to group-based exercise. Female exercise class participants ($N = 260$) of White (W; 38%), Asian/Asian British (A/AB; 33%), and Black/Black British (B/BB; 29%) ethnic origin completed measures of group exercise-specific psychological need satisfaction, motivational regulations, cognitions, and affect. Supporting SDT and ODT, hierarchical regression analyses revealed that psychological need satisfaction and autonomous motivation predicted exercise-related outcomes for W and B/BB participants but not for A/AB participants. Partial support was provided for the propositions of SDT and ODT for W and B/BB female exercise class participants. Further research is needed to delineate the psychological determinants of exercise-related motivation, cognitions, and affect for A/AB exercisers.

Key words: physical activity, Self-Determination Theory, Optimal Distinctiveness Theory, motivational regulations, individualistic and collectivistic cultures

To reduce the prevalence of sedentary behavior, the psychological determinants of active exercise engagement must be delineated. Psychological needs theories offer one potential avenue for such an exploration; however, despite recent theoretical developments suggesting that psychological needs/need theories are useful in predicting motivational processes, behavioral engagement, and cognitive and affective responses in the exercise domain, limited research has explored whether these constructs are relevant to group exercise environments. Furthermore, considering that participation rates in regular physical activity are even lower for many ethnic groups than those observed among the

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population as a whole (U.S. Department of Health and Human Services, 2003), limited exercise related research has been conducted to determine whether the core theoretical tenets embedded within these frameworks are applicable across diverse ethnic groups.

SELF-DETERMINATION THEORY

One contemporary theoretical framework pointing to the significance of three psychological needs is Self-Determination Theory (SDT; Deci & Ryan, 1985). *Competence* refers to a desire to interact effectively with the environment, to experience a sense of effectiveness in producing valued outcomes, and to prevent unwanted events (Deci & Ryan, 1985). *Autonomy* refers to freedom to choose one's own behavior and the perception that one's behavior emanates from one's core sense of self (DeCharms, 1968). *Relatedness* refers to a feeling of meaningful connection to others within a specified domain (Deci & Ryan, 1985).

In addition, SDT proffers that there are three distinct types of motivation that may guide behavior—namely amotivation,¹ extrinsic motivation, and intrinsic motivation—each of which lies along a continuum from low to high self-determination. Extrinsic motivation is itself comprised of four separate regulations. *External regulation* is the least self-determined form of extrinsic motivation, whereby a person acts only to obtain external rewards or to avoid punishment (Ryan & Deci, 2000). *Introjected regulation*, which is slightly more self-determined, involves feeling coerced into taking part in a given behavior in an attempt to escape negative feelings (e.g., guilt) or to support conditional self-worth (Ryan & Deci, 2002). In the case of *identified regulation*, behavior is undertaken because one values its personal significance and importance (Ryan & Deci, 2000). *Integrated regulation* is the most autonomous form of extrinsic motivation and occurs when identified regulations are fully assimilated into the self and are brought into congruence with one's other values and needs (Deci & Ryan, 2000). *Intrinsic motivation* refers to behaviors that are undertaken volitionally—solely for the pleasure, satisfaction, and interest derived from the activity (Ryan & Deci, 2002).

In addition to the aforementioned propositions, it is also important to note that the three levels of motivation proposed by SDT (i.e., intrinsic and extrinsic motivation and amotivation) exist at three levels of generality: the situational level, the contextual level, and the global level (Vallerand, 2001). Situational motivation refers to the motivation that individuals experience when they are currently engaging in an activity (e.g., a specific exercise class). Motivation at the contextual level is one's usual motivational orientation toward a specific context (i.e., exercise). Finally, motivation at the global level is a general motivational orientation to interact across a variety of contexts in an intrinsic, extrinsic, or amotivated way.

SDT suggests that satisfaction of the basic psychological needs will lead to the most autonomous forms of regulation, as well as—directly and indirectly via autonomous motivation—more adaptive, behavioral, cognitive, and affective outcomes. On the other hand, thwarting of the needs is assumed to lead to the least autonomous forms of motivational regulation and less adaptive outcomes (Ryan & Deci, 2000; Vallerand, 1997).

OPTIMAL DISTINCTIVENESS THEORY

Another contemporary psychological needs theory, centered on group involvement specifically, is Optimal Distinctiveness Theory (ODT; Brewer, 1991, 1993). ODT proposes two motivational principles applicable to individuals within groups, namely, assimilation and differentiation. Assimilation refers to a desire to feel included within larger collectives, whereas differentiation refers to a desire to distinguish oneself from any other persons in the social context (Brewer, 1991). ODT further argues that these social drives or motives are met at different levels of the group experience. Specifically, within-group experiences allow for assimilation, and between-group experiences allow for differentiation.

Based on these distinctions, ODT holds that three psychological needs will be salient within any social group context, namely, *group inclusion* and *personal distinctiveness*, which are satisfied via within-group comparisons, and *group distinctiveness*, which will be satisfied via between-group comparisons (Sheldon & Bettencourt, 2002). ODT further assumes that, in any given social context, an individual can be categorized along a dimension of social distinctiveness that ranges from uniqueness at one end (i.e., features that distinguish the individual from any other persons in the social context) to total submersion or deindividuation at the other. Each point along this inclusiveness dimension is associated with a particular level of activation of the assimilation and differentiation needs. Optimal distinctiveness is achieved through identification with groups in which the degree of activation of the needs for assimilation and differentiation are exactly equal. Positive psychological consequences are hypothesized to accompany optimal distinctiveness, when the degree of activation of the need for differentiation and the need for assimilation are equivalent (Brewer, 1991). In contrast, feelings of extreme similarity or distinctiveness are believed to be associated with negative affect (Brewer, 1991, 1993; Fromkin, 1972).

AIMS AND HYPOTHESES

Sheldon and Bettencourt (2002) explored the five self- and socially oriented needs embedded in SDT (i.e., autonomy and relatedness) and ODT (i.e., personal distinctiveness, group inclusion and group distinctiveness), respectively, as predictors of group-related mood, intrinsic motivation, and commitment among a sample of 134 undergraduate psychology students. Participants were asked to think of formal or informal groups to which they belonged. Participants rated the extent to which each of the self- and socially orientated needs proposed by SDT and ODT was satisfied when participating in their specified group, as well as their motivational, affective, and cognitive responses to their engagement within this group. Results revealed that satisfaction of all five needs was related to, and predicted, positive motivational, affective, and cognitive outcomes.

Although the findings of Sheldon and Bettencourt (2002) are theoretically and practically important, it is not known if they are generalizable to group exercise specifically. Moreover, the Sheldon and Bettencourt study did not consider potential ethnic differences in the relationships of the psychological need constructs proposed by SDT and

ODT and motivational, cognitive, and affective outcomes. Both SDT (Deci and Ryan, 1985) and ODT (Brewer, 1991) propose that their psychological need constructs are applicable to all humans; that is, they are universal motives that are relevant to the quality of human engagement in diverse activities, regardless of culture. However, based on the observation that cultures may vary with regard to the degree of individualism–collectivism manifested in their values, attitudes, and behaviors (Triandis, 1995), some authors would question this assumed cross-cultural invariance (i.e., in individualistic Western cultures, such as North American and European, the views, needs, and goals of the self are considered more important than those of the social group, whereas in collectivistic cultures, such as in Southeast Asia and much of South America and Africa, the views, needs, and goals of some collective are considered more important than those of the individual; Triandis, 1994).

Pulling from the work of Sheldon and Bettencourt (2002) and the theoretical propositions of SDT and ODT and extending previous work in the exercise domain, we explored the utility of SDT and ODT variables in predicting motivational, cognitive (i.e., commitment² and behavioral intention), and affective (i.e., positive/ negative affect and subjective vitality) responses to group-based exercise among three ethnic groups.

METHOD

PARTICIPANTS

The current study included 260 female exercise class participants of mixed ethnic origin—White (W; $n = 100$), Asian/Asian British (A/AB; $n = 85$), and Black/Black British (B/BB; $n = 75$)—defined using the United Kingdom Census of the population survey classification system. Based on the distinctions of Markus and Kitayama (1991) and Triandis (1994), it is assumed that the W group would traditionally be considered individualistic, whereas the A/AB and the B/BB groups would be considered more collectivistic in their values and attitudes.

MEASURES

All measures included in this study were designed to assess motivational, cognitive, and affective variables at the situational level—that is, in reference to the exercise class in which participants had just partaken.

Psychological need satisfaction. A measure developed by Sheldon and Bettencourt (2002) was used to assess each of the needs proposed by ODT (Brewer, 1991, 1993), as well as the self- and socially oriented needs (i.e., autonomy and relatedness) proposed by SDT (Deci & Ryan, 1985).³ Three items, amended slightly to make them more relevant to the exercise class setting, measured each of the candidate needs. Examples of the various items are as follows: “How included do you feel in this group?” (group inclusion item), “How much do you feel that you stand out within this group?” (personal distinctiveness item), “How different is this group from other exercise groups?” (group distinctiveness item), “How free and choiceful do you feel as you participate in this group?”

(autonomy item), and "How close and connected do you feel with other members of the group?" (relatedness item). Following the stem "considering the exercise class in which you have just taken part," participants responded to each item on a 1 (*not at all*) to 5 (*very much*) scale. Sheldon and Bettencourt (2002) have shown each of the five need subscales included in this measure to possess satisfactory internal consistency (α s ranged from .71 to .83).

Motivational regulations for exercise. Participants completed the Behavioral Regulation in Exercise Questionnaire (BREQ; Mullan et al., 1997). The BREQ includes scales assessing external (four items, e.g., "I take part in exercise because other people say I should"), introjected (three items, e.g., "I feel guilty when I don't take part in exercise"), and identified (four items, e.g., "I value the benefits of taking part in exercise") regulations and intrinsic motivation (four items, e.g., "I take part in exercise because it is fun"). Following the stem "Why do you take part in this exercise class?", participants responded to each item (amended slightly to make them relevant to the exercise class in which they had just partaken; e.g., "I take part in this exercise class because it is fun") on a 5-point scale ranging from 1 (*not true for me*) to 5 (*very true for me*). Previous research provides support for the BREQ's factorial validity, the invariance of its factor structure across gender, and the internal consistency of each subscale (α s ranged from .76 to .90; Mullan & Markland, 1997; Mullan et al., 1997).

In addition, participants also responded to the integrated regulation scale of Li's (1999) Exercise Motivation Scale (using the same 5-point scale described earlier). Again, this scale was amended slightly to make it relevant to the exercise class in which participants had just partaken. An example of an amended item from this subscale is "Because taking part in this exercise class is an important aspect of how I perceive myself." Past research has shown the integrated regulation subscale to have adequate internal reliability (i.e., α s > .75; Li, 1999).

Positive and negative affect. Using a 1 (*not at all*) to 5 (*extremely*) scale, the Positive and Negative Affect Scale (PANAS; Watson, Clark, & Tellegen, 1988) was used to measure the positive and negative affect that exercise class participants felt while exercising in the class in which they had just participated. This scale consists of 10 items that tap positive affect (e.g., "interested," "excited," "strong") and 10 items tap negative affect (e.g., "distressed," "upset," "ashamed"). Previous studies have shown the scale to possess acceptable internal consistencies (i.e., α s ranged from .86 to .90), good test-retest reliability, and factorial and convergent validity (Watson et al., 1988).

Subjective vitality. Subjective vitality during the exercise class was measured using the state version of Ryan and Frederick's (1997) Subjective Vitality Scale. A 6-item version of the scale (as validated by Bostic, Rubio, & Hood, 2000) was used in the current investigation. Following the stem "Please rate the extent to which each of the following items is true for you when exercising in this class," participants responded to each item (e.g., "Whilst participating in my exercise class I felt alive and vital") on a 1 (*not at all true*) to 7 (*very true*) scale. Previous studies have shown this 6-item scale to possess acceptable internal reliability (i.e., α s ranged from .80 to .89; Bostic et al., 2000).

Commitment to the class. Participants' commitment to the current exercise class was measured using an amended version of the commitment subscale from Scanlan, Carpenter, Schmidt, Simons, and Keeler's (1993) Athletes' Opinion Survey. Following the stem "Considering the exercise class in which you have just taken part," participants were asked to "rate the extent to which the following items (e.g., "How determined are you to keep taking part in this class?") apply to you." Participants responded to each item on a 1 (*not at all*) to 5 (*very much*) scale. Previous research (Scanlan et al., 1993) has shown the scale to possess adequate internal consistency ($\alpha = .85$).

Intent to continue. Behavioral intention to continue exercising in the current exercise class was measured utilizing a methodology reported by Wilson and Rodgers (2004). Considering the next 4 months, and in reference to their participation in the exercise class in which they had just taken part, the participants were asked to respond to three items that reflected both general ("I intend to exercise in this class regularly during the next 4 months" and "I intend to participate in this exercise class as often as I can during the next 4 months") and specific ("I intend to exercise in this class every week over the next 4 months") exercise intentions. Responses were given on a scale of 1 (*strongly disagree*) to 7 (*strongly agree*). Previous researchers have reported an internal consistency of .89 for this scale (Wilson & Rodgers, 2004).

PROCEDURES

The current study was approved by the ethics subcommittee of a large university in the United Kingdom. All participants gave informed consent to take part in the current study and were recruited from exercise classes run in a number of public leisure facilities in a large, ethnically diverse city in the West Midlands, United Kingdom. Participants were asked to complete a questionnaire packet (which took approximately 15–20 min) in reference to the class in which they had just exercised and to return it to the first author upon completion.

RESULTS

PRELIMINARY DATA ANALYSES

Two hundred and sixty females participated in the current study. Participants' ages ranged from 16–77 years of age ($M = 32.24$, $SD = 11.37$). One hundred participants (38%) classified themselves as W, 85 (33%) classified themselves as A/AB, and 75 (29%) classified themselves as B/BB. The mean ages were 37.25 years ($SD = 13.74$) for W participants, 27.59 years ($SD = 7.35$) for A/AB participants, and 33.18 years ($SD = 9.21$) for B/BB participants. W and B/BB participants were significantly older than A/AB participants.

RELIABILITY ANALYSIS AND DESCRIPTIVE STATISTICS

Internal consistency estimates (Cronbach's coefficient alphas) and descriptive statistics were computed for all variables (see Table 1). In the majority of cases, internal

Table 1. Descriptive Statistics and Internal Consistency Estimates for Psychological Needs, Motivational Regulations and Affective and Cognitive Outcome Variables for all Ethnic Groups.

Variable	Range	White (n = 100)			Asian/Asian British (n = 85)			Black/Black British (n = 75)		
		M	SD	α	M	SD	α	M	SD	α
Group inclusion	1–5	3.88	0.98	.84	3.80	0.93	.72	3.87	0.94	.80
Personal distinctiveness	1–5	2.87	0.96	.65	2.83	0.69	.46	2.85	0.95	.61
Group distinctiveness	1–5	2.59	1.12	.82	2.44	0.82	.56	2.62	1.17	.85
Autonomy	1–5	3.11	1.03	.67	3.23	0.81	.51	3.23	0.87	.68
Relatedness	1–5	3.13	1.08	.87	3.36	0.97	.81	3.23	1.10	.89
External regulation	1–5	1.20	1.50	.88	1.34	0.52	.71	1.32	0.55	.77
Introjected regulation	1–5	2.14	1.09	.79	2.11	0.95	.63	2.12	1.04	.73
Identified regulation	1–5	3.98	0.94	.73	3.82	0.77	.71	3.90	0.74	.72
Integrated regulation	1–5	3.53	0.95	.78	3.50	0.88	.77	3.55	0.94	.77
Intrinsic motivation	1–5	4.10	0.84	.90	3.95	0.80	.81	4.00	0.97	.93
Positive affect	1–5	3.80	0.72	.88	3.73	0.77	.89	3.78	0.67	.89
Negative affect	1–5	1.20	0.35	.79	1.35	0.46	.84	1.26	0.40	.81
Subjective vitality	1–7	5.00	1.40	.94	4.85	1.41	.92	5.15	1.13	.92
Commitment	1–5	3.93	0.83	.77	3.93	0.84	.86	3.74	0.80	.79
Behavioral intention	1–7	5.87	1.44	.84	5.79	1.20	.78	5.83	1.34	.82

consistency coefficients were greater than .70. However, for some subscales, the Cronbach's coefficient alpha values were marginal (and removal of any of the items constituting each of these subscales did not markedly improve these alpha values). Consequently, results based on these subscales, for the specified ethnic group(s), should be interpreted with caution.

HIERARCHICAL REGRESSION ANALYSES

Separate hierarchical regression analyses were used to explore which of the psychological needs and motivational regulations predicted the targeted motivational, cognitive, and affective outcomes for each ethnic group. Due to the significant age differences among groups, age was entered in the first step of each regression. In an attempt to control for the influence of familiarity with the exercise or exercise class, the length of time participants had belonged to their exercise group was also entered into the first step of the analysis. For each ethnic group, the two self- and socially oriented needs proposed

by SDT were entered in the next step, followed by the three needs proposed by ODT in the third step of the regression analysis.⁴ Results from significant regression models only are presented.

PSYCHOLOGICAL NEEDS AS PREDICTORS OF MOTIVATIONAL REGULATIONS

Among W participants, relatedness emerged as a significant positive predictor of intrinsic motivation, whereas for B/BB participants, relatedness and group distinctiveness emerged as significant positive predictors. For B/BB participants, time in group and relatedness were significant positive predictors of identified regulation. See Table 2.

PSYCHOLOGICAL NEEDS AND MOTIVATIONAL REGULATIONS AS PREDICTORS OF COGNITIVE AND AFFECTIVE OUTCOMES

For commitment, intrinsic motivation emerged as a significant positive predictor among W participants and group inclusion emerged as a significant positive predictor among A/AB participants. Also, for those participants classifying themselves as B/BB, external regulation emerged as a significant negative predictor and introjected regulation, intrinsic motivation, and personal distinctiveness emerged as significant positive predictors. For positive affect, intrinsic motivation emerged as a significant positive predictor for W and B/BB participants. For negative affect, integrated regulation emerged as a positive predictor, and intrinsic motivation and group inclusion emerged as negative predictors among W participants. For subjective vitality, intrinsic motivation emerged as a significant positive predictor among the B/BB participants. See Table 3.

COMPARISON OF PREDICTORS ACROSS GROUPS

To compare the relative importance of each of the psychological constructs as predictors of motivational, cognitive, and affective outcomes across W, A/AB, and B/BB women participants, differences between the unstandardized regression coefficients were explored. In each instance that a variable demonstrated a significant slope for at least one of ethnic groups, we followed the procedures outlined by Howell (2002, pp. 276–277) and tested for differences in the magnitude of the slopes between groups (i.e., conducted *t* tests between each of the unstandardized regression coefficients). Given the number of comparisons conducted, we divided the alpha level of .05 by the number of variables that had been entered in each regression equation to set a more stringent alpha level (i.e., $p = .007$ for the motivational regulations and $p = .004$ for the cognitive and affective outcomes). For these two *p* values, we calculated the corresponding *t* values for a two-tail test. When these *t* values were smaller than the *t* values obtained using Howell's (2002) procedure, the slope differences were deemed to be significant (as indicated by subscripts in Tables 2 and 3).

Table 2. Summary of Separate Hierarchical Multiple Regression Analyses Predicting Intrinsic Motivation, Integrated Regulation, and Identified Regulation from SDT and ODT Psychological Needs.

Dependent variable	Independent variable	White (n = 100)		Asian/ Asian British (n = 85)		Black/ Black British (n = 75)	
		Unst. <i>b</i>	St. β	Unst. <i>b</i>	St. β	Unst. <i>b</i>	St. β
Intrinsic motivation	Step 3	Adj. $R^2 = .24^{**}$		Adj. $R^2 = .01$		Adj. $R^2 = .27^{**}$	
	Age	.00	-.06	-.01	-.05	-.01	-.12
	Time in group	.01	.02	.07	.14	.11	.17
	Autonomy	.00	.01	-.09	-.09	-.11	-.10
	Relatedness	.29 ^a	.37 [*]	.15 ^b	.18	.32 ^a	.36 [*]
	Group inclusion	.17	.20	.05	.05	.12	.12
	Personal distinctiveness	.13	.15	.25	.22	-.08	-.08
	Group distinctiveness	-.12 ^a	-.17	.00 ^b	.00	.28 ^c	.33 [*]
Integrated regulation	Step 3	Adj. $R^2 = .17^{**}$		Adj. $R^2 = .05$		Adj. $R^2 = .24^{**}$	
	Age	.00	.02	.00	.03	.01	.06
	Time in group	.00	.00	.14	.27 [*]	.04	.06
	Autonomy	.03	.04	-.14	-.13	.00	.00
	Relatedness	.07	.08	.16	.17	.19	.23
	Group inclusion	.21	.21	.03	.03	.25	.25
	Personal distinctiveness	.26	.26	.22	.17	.09	.10
	Group distinctiveness	-.05	-.06	.15	.14	.08	.10
Identified regulation	Step 3	Adj. $R^2 = .15^{**}$		Adj. $R^2 = .01$		Adj. $R^2 = .22^{**}$	
	Age	.00	-.02	.00	.03	-.02	-.19
	Time in group	.01	.02	.06	.13	.14	.28 [*]
	Autonomy	.05	.07	-.07	-.08	.03	.03
	Relatedness	.11 ^a	.16	.05 ^b	.06	.32 ^c	.46 [*]
	Group inclusion	.18	.24	.00	.00	-.01	-.01
	Personal distinctiveness	.15	.19	.38	.34	-.10	-.12
	Group distinctiveness	-.14	-.21	-.02	-.02	.08	.12

Note: Unstandardized *bs* in the same row that do not share the same subscripts differ at $p = .014$. Unst. *b* = unstandardized *b*; St. β = standardized β . ^{*} $p \leq .05$. ^{**} $p \leq .01$.

Table 3. Summary of Separate Hierarchical Multiple Regression Analyses Predicting Positive Affect, Negative Affect, Subjective Vitality, Commitment, and Behavioral Intention from Age, Time in Group, SDT Psychological Needs, Motivational Regulations, and ODT Psychological Needs.

Dependent variable	Independent variable	White (n = 100)		Asian/Asian British (n = 85)		Black/Black British (n = 75)	
		Unst. b	St. β	Unst. b	St. β	Unst. b	St. β
Commitment		Adj. R ² = .50**		Adj. R ² = .59**		Adj. R ² = .59**	
	Age	.00	.03	.01	.06	.01	.08
	Time in group	-.03	-.07	.11	.22	-.06	-.11
	Autonomy	.12	.14	-.17	-.16	-.07	-.07
	Relatedness	.05	.07	-.06	-.06	-.06	-.08
	External regulation	-.22a	-.13	.21b	.13	-.41c	-.28*
	Introjected regulation	.05a	.06	-.04b	-.04	.27c	.35*
	Identified regulation	-.05	-.04	.36	.33	.06	.06
	Integrated regulation	.18	.20	.30	.32	.11	.12
	Intrinsic motivation	.31a	.31*	.15b	.14	.43c	.53**
	Group inclusion	.13a	.15	.23b	.25*	-.06c	-.07
	Personal distinctiveness	-.04a	-.05	.05b	.04	.28c	.34*
	Group distinctiveness	.12	.16	-.12	-.12	.07	.10
Behavioral intention		Adj. R ² = .07		Adj. R ² = .18*		Adj. R ² = .10	
	Age	-.01	-.05	.00	-.02	.00	.02
	Time in group	.05	.06	.15	.20	-.03	-.03
	Autonomy	.29	.21	.25	.17	.03	.02
	Relatedness	.12	.09	.25	.20	-.15	-.12
	External regulation	-.11	-.04	.31	.13	-.77	-.32
	Introjected regulation	-.05	-.04	.00	.00	.20	.15
	Identified regulation	.61	.32	.44	.29	.14	.08
	Integrated regulation	-.14	-.09	.11	.08	.40	.28
	Intrinsic motivation	.23	.14	.20	.13	.05	.04
	Group inclusion	-.05	-.04	-.16	-.12	-.30	-.21
	Personal distinctiveness	-.15a	-.10	-.16a	-.09	.62b	.44*
	Group distinctiveness	-.20	-.16	.03	.02	-.05	-.04

Table 3. Continued.

Dependent variable	Independent variable	White (<i>n</i> = 100)		Asian/Asian British (<i>n</i> = 85)		Black/Black British (<i>n</i> = 75)	
		Unst. <i>b</i>	St. β	Unst. <i>b</i>	St. β	Unst. <i>b</i>	St. β
Positive affect		Adj. $R^2 = .56^{**}$		Adj. $R^2 = .32^{**}$		Adj. $R^2 = .43^{**}$	
	Age	.01	.10	-.01	-.08	.00	-.01
	Time in group	-.05	-.12	.00	.00	.02	.05
	Autonomy	.11	.17	-.08	-.08	.18	.23
	Relatedness	-.08	-.12	-.04	-.05	.01	-.02
	External regulation	.05	.04	-.23	-.15	-.14	-.12
	Introjected regulation	.00	-.01	.06	.08	.03	.04
	Identified regulation	-.01	-.01	.09	.09	-.04	-.05
	Integrated regulation	.10	.14	.16	.18	.03	.05
	Intrinsic motivation	.48 ^a	.56 ^{**}	.31 ^b	.32	.37 ^b	.53 ^{**}
	Group inclusion	.12	.17	.19	.22	.03	.05
	Personal distinctiveness	.07	.09	.02	.02	.01	.01
Group distinctiveness	-.04	.00	.09	.09	.04	.07	
Negative affect		Adj. $R^2 = .20^*$		Adj. $R^2 = .04$		Adj. $R^2 = .10$	
	Age	.00	-.10	.00	-.01	-.01	-.18
	Time in group	.01	.06	-.03	-.12	.05	.16
	Autonomy	-.04	-.13	.11	.18	-.04	-.08
	Relatedness	.04	.13	.08	.17	.13	.35
	External regulation	.09	.13	-.01	-.01	-.03	-.04
	Introjected regulation	-.02	-.06	.04	.07	.08	.20
	Identified regulation	.03	.06	-.24	-.40	.08	.15
	Integrated regulation	.12 ^a	.33 [*]	.05 ^b	.10	-.17 ^c	-.40 [*]
	Intrinsic motivation	-.17 ^a	-.41 [*]	-.06 ^b	-.10	-.13 ^c	-.30
	Group inclusion	-.16 ^a	-.43 ^{**}	-.09 ^b	-.18	-.05 ^c	-.12
	Personal distinctiveness	.05	.14	.04	.07	-.08	-.19
Group distinctiveness	.04	.19	.04	.07	.09	.25	

Table 3. Continued.

Dependent variable	Independent variable	White (n = 100)		Asian/Asian British (n = 85)		Black/Black British (n = 75)	
		Unst. <i>b</i>	St. β	Unst. <i>b</i>	St. β	Unst. <i>b</i>	St. β
Subjective vitality		Adj. $R^2 = .53^{**}$		Adj. $R^2 = .24^{**}$		Adj. $R^2 = .39^{**}$	
	Age	.00	.04	-.03	-.16	.00	.01
	Time in group	-.07	-.09	.01	.01	-.13	-.14
	Autonomy	.21	.15	-.15	-.09	.24	.16
	Relatedness	.12	.09	-.15	.10	-.05	-.05
	External regulation	-.34	-.12	-.11	-.04	.18	.07
	Introjected regulation	.00	.00	.30	.21	-.06	-.04
	Identified regulation	.36	.19	.24	.13	.07	.04
	Integrated regulation	.50 _a	.34 ^{**}	.24 _b	.15	.03 _c	.02
	Intrinsic motivation	.24 _a	.15	.53 _b	.30	.72 _c	.53 ^{**}
	Group inclusion	-.14	-.10	.14	.09	.19	.13
	Personal distinctiveness	.04	.03	-.25	-.12	.05	.03
	Group distinctiveness	.08	.06	-.30	-.17	.13	.11

Note: Unstandardized *bs* in the same row that do not share the same subscripts differ at $p = .008$. SDT = Self-Determination Theory; ODT = Optimal Distinctiveness Theory; Unst. *b* = unstandardized *b*; St. β = standardized β . * $p \leq .05$. ** $p \leq .01$.

SUMMARY

In summary, the results of the hierarchical regression analyses demonstrate that relatedness need satisfaction from SDT and group distinctiveness from ODT were significant predictors of more self-determined forms of motivation among W and B/BB exercise class participants. For W and B/BB exercise class participants, more self-determined forms of motivational regulation were also central in positively predicting adaptive cognitive and affective outcomes, whereas less self-determined forms of regulation, in the main, emerged as negative predictors of the same outcome variables. Personal distinctiveness and group inclusion also emerged as predictors of commitment to the exercise class among B/BB participants and A/AB participants, respectively.

DISCUSSION

The current study explored two contemporary psychological need theories, namely SDT (Deci & Ryan, 1985) and ODT (Brewer, 1991, 1993), in terms of their relevance to the quality of the group exercise experience, for exercise class participants of W, A/AB, and B/BB origin.

Examining which of the psychological needs emerged as significant predictors of motivational regulations among W and B/BB female exercise class participants provided some support for SDT's propositions. That is, relatedness need satisfaction predicted two of the most self-determined forms of regulation (i.e., intrinsic motivation and identified regulation). These findings suggest that exercise instructors attempting to foster self-determined motivation in female exercise class participants should ensure that their behavior in class is conducive to the fulfillment of this socially oriented need. Group distinctiveness from ODT also emerged as a positive predictor of intrinsic motivation among B/BB participants. For these women, it appears that being able to distinguish one's group from other groups is an important factor in ensuring that exercise engagement is a fun and enjoyable endeavor.

In terms of the targeted cognitive and affective outcomes, the present findings also provide some preliminary support for the theoretical propositions of SDT and ODT. For W and B/BB participants, the most self-determined forms of motivational regulation embedded in SDT (i.e., intrinsic motivation and integrated regulation) positively predicted adaptive cognitive and affective outcomes. Drawing from SDT, these findings suggest that exercise instructors should focus on creating autonomy supportive environments conducive to the promotion of self-determined forms of motivation in order to enhance the quality of the exercise experience for W and B/BB female exercise class participants (Deci & Ryan, 1985).

The current study also provided support for the propositions of ODT with respect to the cognitive and affective aspects of the exercise experience. Group inclusion predicted commitment for A/AB participants and negatively predicted negative affect for W participants. Again these findings add support to claims that exercise instructors should attempt to support socially oriented needs when trying to foster adaptive exercise outcomes. Furthermore, personal distinctiveness predicted commitment for B/BB participants. This finding suggests that emphasizing uniqueness, or dissimilarity from others (Fromkin, 1972; Vignoles, Chryssochoou, & Breakwell, 2000), would be beneficial in fostering B/BB exercise class participants' dedication to the group.

CONSIDERING THE UNIVERSALITY OF THE PSYCHOLOGICAL NEEDS ACROSS ETHNIC GROUPS

When considering the aforementioned findings and the cross-cultural applicability of SDT and ODT, it is important to bear in mind that the majority of the findings providing support for the theoretical propositions of these models emerged for W and B/BB participants only. None of the needs proposed by SDT and ODT predicted any of the motivational regulations for females of A/AB origin. Similarly, with respect to the targeted cognitive and affective responses, only commitment was predicted by reported need satisfaction (i.e., the ODT-based need for group inclusion). These findings suggest that the propositions of SDT and ODT add little to our understanding of the motivational, cognitive, and affective aspects of the exercise experience for A/AB women.

With respect to possible explanations for these results, it has been suggested that

current conceptualizations of motivation predominant in contemporary psychological research are applicable to North American and Western cultures only (Markus & Kitayama, 1991). In such cultures, the individual and his or her thoughts, choices, and feelings are considered most essential to the regulation of behavior and affect (Diener, 2000). For members of more collectivistic cultures, particularly those of East Asian cultures (Markus & Kitayama, 1991), conformity to one's in-group may be a more important motive. That is, it is assumed that people from collectivistic cultures prefer to submit to the choices expressed by others if the situation enables them to fulfill the superordinate cultural goal of belongingness (Iyengar & Lepper, 1999). Thus, people with an interdependent view of the self are expected to be motivated by actions that enhance their relatedness and connection to others. Supporting these assertions, group inclusion was the only variable to emerge as an independent significant predictor of commitment for the A/AB group and was significantly more important in the prediction of being committed to the exercise class than it was for the W and B/BB participants. Moreover, external regulation emerged as a positive, and significantly more important, predictor of commitment for A/AB participants than it was for W and B/BB participants. Among the latter two groups, external regulation was a negative predictor of commitment. For the A/AB group, it appears that being told to exercise was a positive motivational force (in terms of reported dedication to participation in one's group-based exercise class) and may indeed have reflected a desire to submit to the desires of others in an attempt to enhance feelings of belongingness (Iyengar & Lepper, 1999).

In line with the aforementioned findings, and as alluded to earlier, Ryan and Deci (2000) acknowledge that the way in which individuals from different cultures satisfy the three basic psychological needs may vary. The finding that external regulation positively predicted important cognitive outcomes among A/AB women exercisers, whereas relatedness need satisfaction (considered by some, such as Triandis, 1994, to be of particular relevance to those of A/AB origin) did not, may intimate that relatedness need satisfaction is derived in a different manner for individuals of A/AB origin. That is, relatedness, or a connectivity with significant others, may be satisfied when individuals from this ethnic group are being told what to do by someone they value. In contrast, for W and B/BB participants, relatedness need satisfaction may be derived in a manner more consistent with the items measuring relatedness need satisfaction utilized in the current study. Specifically, the conceptualization of relatedness in this case corresponded to the feeling that the group as a whole accepted and supported the individual.

In terms of the prediction of behavioral intention, positive affect, and subjective vitality, none of the theoretical constructs embedded in SDT and ODT emerged as significant predictors for the A/AB group, although the model as a whole was significant in each case. The model was not significant with respect to the prediction of negative affect amongst this ethnic group. Considering these results, it appears important to also consider arguments suggesting that the type of emotion experienced, and its intensity and frequency, may also vary dramatically as a function of culture (Markus & Kitayama, 1991). It has been suggested that ego-focused emotions, such as guilt and pride (which are included in the PANAS) will be more frequently experienced by those

with independent selves. In contrast, other-focused emotions (such as sympathy, which is not included in the PANAS) will be more frequently experienced among those with interdependent selves (Markus & Kitayama, 1991). It is thus possible that the measures used to tap the affective response to the group exercise experience in the current study may not have been relevant to the A/AB participants. Indeed, Diener (2000) presented evidence from a number of studies suggesting that variables that have typically been viewed as crucial to mental health, including positive and negative affect (Watson et al., 1998) and subjective vitality (Ryan & Frederick, 1997), may be more culture bound than originally believed (e.g., Diener & Diener, 1995). Moreover, it has been suggested that many interdependent cultures have well-developed strategies that will help them avoid the expression of negative emotions (Markus & Kitayama, 1991). Such considerations may help to explain why the model for negative affect was only significant for those female exercisers who identified themselves as White. Future studies may benefit from utilizing measures of affect that measure positive emotions/well-being from a collectivistic perspective.

Before we firmly assert that the basic psychological needs are not universally applicable across cultures, it should be noted that the current study does suggest that autonomous regulation operates in accordance with SDT's propositions for those of B/BB origin, who, akin to A/AB participants, would typically be classified as collectivistic. Thus, there is partial support for Deci and Ryan's (1985) arguments concerning the universality of autonomy. In any debate of whether autonomous regulations are universally pertinent and valued, consideration should be given to the way in which autonomy is defined. In some studies (e.g., Miller, 1999; Oishi, 2000), autonomy is equated with independence or individualism (Chirkov, Ryan, & Willness, 2005). Whereas independence relates to being separate from and not reliant on others, individualism is concerned with giving priority to the needs, goals, and preferences of an individual as opposed to those of the group. These definitions may well be more pertinent in Western society. In contrast, Deci and Ryan (1985) would stipulate that autonomy refers to being volitional or endorsing one's own goals and actions, and thus one can be autonomously collectivistic or autonomously individualistic (Chirkov et al., 2005), both of which contribute to positive well-being. Indeed, our findings support suggestions that autonomous regulation in B/BB participants is positively related to psychological well-being.

LIMITATIONS

It is important to note a number of limitations with the current study. First, we should note that some degree of variation was observed in the psychometric properties of the constructs measured in the current study, with the alpha values of the need constructs appearing particularly problematic for A/AB participants (e.g., personal and group distinctiveness, autonomy, and introjected regulation). It is possible that these low alpha values reduced the magnitude of the observed regression coefficients, and thus, prevented the constructs embedded in SDT and ODT from emerging as significant predictors. Moreover, we should note that participants did not actually complete a measure

of individualism–collectivism in the current study, and thus, we are unable to delineate whether the three racial categories actually differed in this important characteristic. Rather, we simply relied upon the distinctions of Markus and Kitayama (1991) and Triandis (1994), hypothesizing that the W group should be classified as individualistic whereas the A/AB and the B/BB groups would be more collectivistic. Future studies should include a measure of individualism–collectivism to determine whether exercise class participants of W, B/BB, and A/AB origin do actually differ in this important variable. This would further enhance our understanding of why different motivational variables may play a differential role in underpinning the exercise experiences of different racial groups. Finally, we should also note that the current study does not consider the role of amotivation, as this construct was not included within the motivational regulation scale used in the current study (i.e., the BREQ; Mullan et al., 1997). Future studies may also consider exploring whether amotivation further contributes to our understanding of the exercise experiences of different ethnic groups.

CONCLUSIONS

The aim of this study was to explore the utility of SDT (Deci & Ryan, 1985) and ODT (Brewer, 1991, 1993) in predicting motivational, cognitive and affective responses to group-based exercise. Although further research is needed to determine the psychological variables underpinning exercise-related motivation, cognitions, and affect for A/AB exercisers, the results of this study provide partial support for SDT and ODT among W and B/BB female exercise class participants.

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NOTES

¹ As described subsequently, to assess the role of the different forms of motivational regulation embedded in SDT in predicting exercise related cognitions and affect, participants in this study completed the Behavioral Regulation in Exercise Questionnaire (BREQ; Mullan, Markland, & Ingledew, 1997). This measure does not include the construct of amotivation, and thus it will not be considered further in the current study.

² As the measure of commitment utilized in the current investigation was not concerned with previous exercise behavior, but instead focused upon continued or future engagement, commitment is considered to be a cognitive, as opposed to behavioral, variable in this study.

³ Following the lead of Sheldon and Bettencourt (2002), competence need satisfaction was not measured in the present study.

⁴ Entering the psychological needs in this order allowed us to determine if any of the needs proposed by ODT added to the prediction of the motivational regulations over and above the prediction made by the two SDT needs, for which support has already been gleaned in the exercise domain.