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The Interaction of Goal Orientation and Stage of Change on Exercise Behavior in College Students

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The purpose of this study was to develop and examine the reliability and validity of the Perceptions of Success Questionnaire for Exercise (POSQ-E), and to link goal orientations to self-reported physical activity patterns and perceptions. The final sample consisted of 569 recreation center participants who utilized the facility 3.77 days a week (SD = 1.94) and were active for an average of 70.18 minutes (SD = 33.3) per session. Sixty-three percent of respondents (n = 358) self-reported meeting adult guidelines for regular exercise (150 minutes per week). Using a single-item ladder, participants were assigned across the five stages of exercise readiness respectively: precontemplation (6.8%); contemplation (4.9%); preparation (26.2%); action (23.8%); and maintenance (38.3%). Task scores were shown to increase across the stages of change while ego scores decreased slightly. An extreme median split of the goal orientation scores yielded a sub-sample of 235 participants with 76 (32.3%) in the high task/high ego, 49 (20.9%) in the high task/low ego, 47 (20%) in the high ego/low task, and 63 (26.8%) in the low ego/low task group. The POSQ-E was shown to have good internal reliability, factor validity and convergent validity. Convergent validity linking the transtheoretical model and self-reported physical activity behavior with goal orientation theory may provide a new direction for applied research in exercise behavior.

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Previous research has conceptualized ideas of achievement motivation into task and ego orientations (Nicholls, 1989; Roberts, Treasure, & Balague, 1998). The composition of goal orientation influences individual motivation toward an activity as well as interpretation of success and failure in that activity. Knowing how individuals approach an activity and determine success can be used to tailor feedback, enhance motivation, or increase participation (Christodoulidis, Papaioannou, & Digelidis, 2001; Duda, Chi, Newton, Walling, & Catley, 1995). Previous research has thoroughly explored goal orientations in sport (e.g., Duda et al., 1995; Duda & Nicholls, 1992; Harwood, Wilson, & Hardy, 2003; Kim, Williams, & Gill, 2003; Roberts et al., 1998), but there is limited literature in exercise settings (Bar-Eli et al., 1997; Digelidis, Papaioannou, Laparidis, & Christodoulidis, 2003; Kilpatrick, Bartholomew, & Riemer, 2003; Raudsepp, Viira, & Liblik, 1999). Further, the need for a specific measure for exercise goal orientation has been suggested (Kilpatrick et al.). It would be inappropriate, for example, to use sport-specific measures of goal orientation to assess exercise behavior. The implicit goals of “winning” and “improving performance” in sport may not translate perfectly into exercise settings, thus additional research will need to explore the construct validity of these goal orientations with physically active adults.

To be task-oriented means that one has a goal of learning or mastering an activity while having an ego-orientation means striving to be better than others. Success is perceived to be attained if these respective goals have been achieved. The two orientations are independent of one another (i.e. orthogonal) in that someone can be high in ego orientation and high in task orientation, high in one and low in the other, or low in both (Roberts, Treasure, & Kavussanu, 1996). Since those with high ego orientations define success as how competent they are relative to others, tasks are often only approached if success is eminent. High ego orientations are most adaptive when held by individuals who perceive they have a high level of competence. They can also help individuals maintain self-worth by avoiding situations that might lead to perceptions of incompetence, and enhance motivation to strive for success (Duda & Treasure, 2000; Dweck, 1999). Those with high task orientation focus on mastery, so challenging tasks will be approached and high levels of effort and persistence will be exerted across many situations (Nicholls, 1989). In other words, orientations influence such factors as approaching a task, persistence, effort, and eventual assessment of satisfaction or success. These key factors could be quite important when applied in exercise settings. For example, since high task orientations have been previously correlated with intrinsic motivation (Duda et al., 1995), these links may assist physical activity leaders in directing their intervention approaches to help people adopt and persist in physical activity behaviors. Researchers, however, have just begun to link these “adaptive” goal orientations to exercise behavior.

Objective measurements of goal orientations have been developed for the area of sport including the Task and Ego Orientation in Sport Questionnaire (TEOSQ; Duda, 1989; Duda & Nicholls, 1992) and the Perceptions of Success Questionnaire (POSQ; Roberts et al., 1998). With use of the TEOSQ, satisfaction in sport was found to be related to perceived ability (Duda & Nicholls, 1992) and higher task orientations were positively related to intrinsic motivation in physical activity classes (Duda et al., 1995). The TEOSQ has also been used to demonstrate support for relatively consistent goal orientations across the lifespan (Steinberg, Grieve, & Glass, 2001), and differences across culture (Kim et al., 2003). The TEOSQ, however, was adapted from a measure intended for orientation in schools. Subsequently, Roberts and colleagues (1998) developed the POSQ to create an orientation measure that was explicitly intended for sport and based on the idea that task and ego orientations are orthogonal.

As mentioned previously, goal orientations can be related to such things as sport motivation, persistence, effort, and satisfaction. If goal orientations in exercise are related to how individuals can be motivated to start, persist, and be satisfied in exercise programs, this could aid those professionals involved in improving exercise adherence. The relationship between the stages of the transtheoretical model and the adoption and maintenance of exercise has been well documented (Marcus et al., 1992; Marcus, Selby, Niaura, & Rossi, 1992; Prochaska et al., 1994). A substantial amount of research evidence has demonstrated that self-efficacy, decisional balance, and physical activity behaviors show a consistent pattern across the stages of change for exercise (Prochaska & Velicer, 1997) and that individualizing or stage-matching interventions can improve outcomes (e.g., foster adoption and maintenance of desired behaviors). If goal orientations are found to be related to the stages of change in the transtheoretical model, future assessment and intervention programs might also include a measure of goal orientation. For instance, some authors have argued that future research studying individual health behaviors should work to establish links across theoretical models to add greater clarity to the meaning of results (King, Stokols, Talen, Brassington, & Killingsworth, 2002).

Raudsepp, Viira, and Liblik (1999) found a relationship among task orientations, recalled physical activity and perceived sport competence. Further, an adapted version of the TEOSQ for Greek physical education was used to measure goal orientation in a year long intervention to change motivation, orientation, and attitudes towards exercise and nutrition (Christodoulidis et al., 2001). An emphasis on task involvement was related to enjoyment, effort, intentions to exercise, and time spent exercising both before and after the intervention. Thus, goal orientation assessment may indeed be linked to exercise behavior and adherence in a useful manner. Kilpatrick et al. (2003) recognized the potential benefits of a goal orientation approach to exercise research and modified the TEOSQ to create the Goal Orientation in Exercise Scale

(GOES). Preliminary analysis of physical activity classes revealed that males were more ego-oriented than females and females were more task oriented than males. Further, task orientation was related to enjoyment, intensity, and exercise history. The authors did caution that statistical procedures used in this initial testing of the GOES were less than ideal, therefore any future research examining exercise-specific goal orientations may need to develop and validate a measure of exercise-specific goal orientation as a first step.

The purpose of this study was to develop and examine the reliability and validity of the Perceptions of Success Questionnaire for Exercise (POSQ-E), and to link goal orientations to self-reported physical activity patterns and perceptions. We hypothesized that the POSQ-E would demonstrate the same factor structure as its' sport counterpart and prove to be internally stable. It was also hypothesized that men would report higher ego orientation than women (Kilpatrick et al., 2003; Raudsepp et al., 1999). Further, we expected task orientation to increase across the stages of change in a linear fashion from precontemplation to maintenance since recalled physical activity (Raudsepp et al.,) and years of exercise experience (Kilpatrick et al.) have been previously related. We also expected that task oriented individuals would be more likely to be currently meeting recommended guidelines for adult physical activity and would report higher exercise-related benefits.

Methods

Participants and Sampling

Student recreation center (SRC) users at a large mid-Atlantic university were asked to complete a brief survey. To be eligible for the survey, participants were required to be a part-time or full-time student at the university. SRC users were surveyed inside the facility during peak usage periods over a two week period with survey administration taking place on four weekdays, one Saturday, and one Sunday. To encourage participation, a bottle of water or sports drink was provided upon completion of the survey. Less than 10% of potential participants refused to complete the survey.

The final sample consisted of 569 participants that included 57% men, 78% Caucasians, with 91.5% ($n = 521$) under the age of 28. In the month prior to survey collection, participants utilized the SRC an average of 3.77 days a week ($SD = 1.94$) and were active for an average of 70.18 minutes ($SD = 33.3$) per session. Sixty-three percent of respondents ($n = 358$) reported meeting current guidelines for regular exercise (5 or more sessions per week for a total of 30 minutes each time). Using a single-item ladder, participants were assigned across the five stages of exercise readiness respectively: precontemplation (6.8%); contemplation (4.9%); preparation (26.2%); action (23.8%); and maintenance (38.3%).

Instrumentation

This project used a modified version of a previously published survey that has been used successfully in a college recreation center environment (Zizzi, Ayers, Watson, & Keeler, 2004). Modifications to the published survey included adding questions related to physical activity patterns, alcohol use, exercise benefits, and exercise-specific goal orientations. These additional items (including the POSQ-E) were imbedded within the previous survey structure to create a uniform instrument. The survey was piloted with a small sample of college students prior to data collection to ensure readability and ease of administration. The final SRC-specific survey included 95 items addressing facility usage patterns, physical activity patterns, exercise benefits, stage of change, goal orientation, alcohol and tobacco use, and demographics. Stage of change was assessed via a single item, as recommended by Marcus and Forsyth (2003). A copy of the SRC survey is available from the lead author.

Development of the POSQ-E. The authors of the POSQ utilized a sentence stem of "In sport, I feel successful when..." and initially drew 48 questions from previous literature and used experts' opinions to make the list more concise. A principle components factor analysis with varimax rotation on a sample of undergraduate students yielded two factors, ego and task. The POSQ was eventually reduced to 12 items with a .98 alpha coefficient for task, a .97 for ego orientation and a subsequent intercorrelation of .08. Construct validity has been demonstrated by correlational relationships between goal orientations and individuals' purposes of sport, causes of success, and satisfaction in sport and has been used with youth, adult, and elite athletes (Roberts et al., 1998). This final version of the POSQ was used as the basis for the exercise-specific modifications.

The minor modifications made to create the POSQ-E included changing the initial sentence prompt, modifying one question to fit an exercise setting, and dropping one question from the ego orientation subsection. The initial response prompt was modified from "When playing sport, I feel most successful when:" to "When exercising, I feel most successful when:". The first question was modified from "I beat other people" to "I exercise longer than other people." Lastly, the question "I out perform my opponents" was dropped from the questionnaire due to redundancy with other items.

Procedures

After institutional review board approval, surveys and scantron sheets were coded to allow them to be linked without the use of identifying information. Trained research assistants recruited students as they entered the facility. Potential participants read a brief letter regarding the purpose of the study, and those who chose to participate completed the survey at nearby tables. Survey administration took approximately 10-15 minutes. The scan sheets were

entered into a computer reader (SR-600, Scanning Systems) and saved as an SPSS file. Research assistants entered and verified the open-ended responses in an SPSS database with the corresponding scanned data for each participant. In the results section, effect size estimates are reported as Cohen's *d* for mean differences and phi or the contingency coefficient for chi-square analyses.

Results

POSQ-E Factor Validity and Reliability

The means and standard deviations for men, women, and the overall sample for individual POSQ-E items can be found in Table 1. Principle axis factoring with varimax orthogonal rotation was performed with the original 11 items of the POSQ-E to identify item factors. The following criteria were used to determine the number of factors to rotate: (a) eigenvalues of at least 1.0; (b) the scree test; (c) the percentage of variance accounted for by each retained factor; and (d) the number of interpretable factors. These criteria were based on suggestions provided by Bryant and Yarnold (1995) and Fabrigar, Wegener, MacCallum, and Strahan (1999). Items were considered for retention if their loadings were greater than .40 and their crossloadings were less than .40.

The exploratory factor analyses revealed a two-factor simple structure solution accounting for 65% of the total response variance. Factor 1 (task orientation) contributed 39% and Factor 2 (ego orientation) contributed 25.5% of the variance in the POSQ-E. All of the items were retained with six items assigned to task orientation and five items assigned to ego orientation, with the same structure as the original scale. Coefficient alphas of .87 (task orientation) and .88 (ego orientation) showed similar estimates as those found in the POSQ (Roberts et al., 1998). The inter-factor correlation was weak ($r = .20$), thus supporting the orthogonal structure of the factors. In sum, validity and reliability estimates demonstrated good initial support for the POSQ-E although additional research across samples is needed. Table 2 represents the factor structure of the POSQ-E, including eigenvalues, percentage of variance for each factor, and factor internal reliability.

Convergent Validity

To compare goal orientation profiles to other assessed variables, we performed an extreme group split of plus or minus a half of a standard deviation from the median score on each of the orientation scales of the POSQ-E (task $MD = 23$, $SD = 3.41$; ego $MD = 15$, $SD = 5.09$). This method has been used successfully in previous research with the POSQ (Harwood, 2002; Roberts et al., 1996). The reason for this split is to examine the variance across variables for individuals that represent the highest and lowest of each orientation. The result of this split

yielded a sub-sample of 235 participants with 76 (32.3%) in the high task/high ego, 49 (20.9%) in the high task/low ego, 47 (20%) in the high ego/low task, and 63 (26.8%) in the low ego/low task group.

Two-way chi-square analyses were conducted to examine differences in frequencies of those found in each orientation group across gender and meeting physical activity guidelines. Gender [$\chi^2(3, N=231)=16.64, p=.001, cc=.26$] and meeting physical activity guidelines [$\chi^2(3, N=231)=12.68, p=.005, cc=.23$] were related to orientation grouping. Women were more likely (37.4%) than men (18.3%) to be in the low task/low ego group and men were more likely (40.5%) than women (23.5%) to be in the high task/high ego group. Supporting our hypotheses, those who rated themselves as regular exercisers were more likely (37.3%) to be in the high task/high ego group than non-regular exercisers (24.7%). The largest sub-group of those who did not regularly exercise (40.7%) was found in the low task/low ego group.

Nine one-way between-groups analysis of variance (ANOVAs) were conducted to examine differences across orientation grouping on the perceived benefits of exercise. These analyses used an adjusted probability value of $p = .005$ to reduce risk of Type I error. The results indicated that those with high task orientation (i.e. either high task/high ego or high task/low ego) reported greater agreement with six of the perceived benefits than those with high ego orientations (all means $p < .001$). Those in the high task groups were more likely than those in the low task groups to endorse the ideas that exercise makes them feel better physically, helps them feel less tired, is an activity they enjoy, gives them a sense of personal accomplishment, makes them more mentally alert, and helps build self-esteem/self-confidence.

A limited sub-sample of precontemplators and contemplators prevented the use of a chi-square analysis between orientation and stages of change groups. However, descriptive analysis revealed those with high task orientations to be over-represented in the later stages with 68% of high task/high ego individuals and 76% of high task/low ego individuals in either the action or maintenance stages. Conversely, 60% of those in the high ego/low task group categorized themselves in the beginning stages of precontemplation, contemplation, or preparation.

To assess the interaction of goal orientation and readiness for exercise, task and ego mean scores were examined for the full sample across participant stages of change using 2x5 repeated measures ANOVA (goal type X stage of change). Goal type was a repeated measures variable in this analysis (2 levels) and stage of change was a between group variable (5 levels). As can be seen in Figure 1, the interaction of stage and goal type was significant, $F(4, 552) = 9.33, p < .001, ES = .063$. The main effects for goal and stage respectively were also significant, $F(1, 552) = 264.24, p < .001, ES = .324$, and $F(4, 552) = 5.81, p < .001, ES = .04$. The large main effect for goal suggests that, overall, participants reported higher average task scores ($M = 4.10$; SD

= .65) compared to ego scores ($M = 3.09$; $SD = 1.02$). However, the significant interaction suggests a different trend in scores across stages. Specifically, as individuals progressed towards maintenance of physical activity, they sustained or increased their task focus, while relying less on ego referenced cues.

Table 1
POSQ-E Descriptive Data for Men and Women and Overall Sample

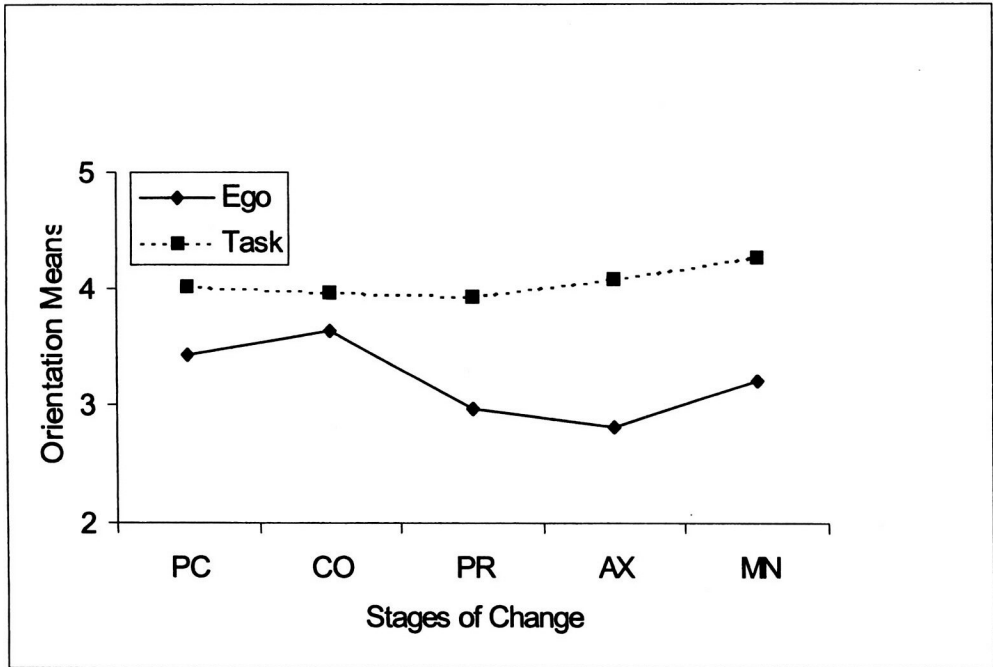
	Women (n = 240)		Men (n = 329)		ES	Overall Sample (n = 569)	
	M	SD	M	SD		M	SD
1. I exercise longer than other people	3.14	1.17	3.28	1.17		3.22	1.17
2. I am clearly superior	2.48	1.22	2.99	1.23	.42	2.78	1.25
3. I am the best	2.64	1.25	3.10	1.28	.36	2.91	1.29
4. I work hard	4.35	.81	4.40	.87		4.38	.85
5. I show clear personal improvement	4.25	.95	4.44	.81	.22	4.35	.89
6. I accomplish something others cannot do	3.40	1.28	3.74	1.14	.28	3.60	1.22
7. I reach a goal	4.41	.89	4.45	.80		4.43	.84
8. I overcome difficulties	4.25	.92	4.31	.85		4.28	.88
9. I master something I couldn't do before	4.23	1.01	4.29	.94		4.26	.98
10. I show other people I am the best	2.64	1.27	3.13	1.28	.38	2.92	1.30
11. I perform to the best of my ability	4.33	.91	4.43	.82		4.38	.87
Average Task Item Score	4.02	.69	4.16	.62	.21	4.10	.65
Average Ego Item Score	2.86	1.00	3.25	1.00	.39	3.08	1.02

Note: Effect size estimates (Cohen's d) reported for all significant ($p < .005$) mean differences between men and women. All other pairwise comparisons were non-significant.

Table 2
Varimax Rotation of the Two Factor Solution for POSQ-E Items

	Factor 1	Factor 2
Item	Task Orientation	Ego Orientation
Item 8	.789	.071
Item 7	.760	.067
Item 9	.730	.124
Item 4	.721	.091
Item 5	.707	.096
Item 11	.666	.087
Item 2	.040	.891
Item 3	.052	.863
Item 10	.042	.794
Item 6	.226	.640
Item 1	.113	.633
Eigenvalues	4.302	2.801
% of variance explained	39.11%	25.46%
Alpha Coefficients	.87	.88

Figure 1. Task and ego orientation mean scores across stages of change (N=557)



Note: PC = pre-contemplation; CO = contemplation; PR = preparation; AX = action; MN = maintenance

This study attempted to provide psychometric support for an exercise specific measure of goal orientations with both factorial and convergent validity. Overall, the POSQ-E has been shown to have good internal reliability, factor validity and convergent validity. Convergent validity linking the transtheoretical model and self-reported physical activity behavior with goal orientation theory may provide a new direction for applied research in exercise behavior. The link between high task orientation scores and regular physical activity behavior (e.g., meeting recommended guidelines and advanced stages of exercise readiness) suggests a viable direction for future transtheoretical research. However, the study was not without limitations. The external validity of the results may be limited due to a large majority of Caucasian participants, only one college setting was represented, and self-report measures of physical activity were used.

The psychometric properties of the POSQ-E were initially sound with very good factorial validity and internal consistency and some support for convergent validity. These data suggest that with further study, the POSQ-E may be a viable assessment tool for the exercise-specific goal orientations of young adults. The links established between high task orientations and self-reported physical activity perceptions and patterns supports some of the recent research in the area involving the relationship between adaptive goal orientations and exercise beliefs and behavior (Christodoulidis et al., 2001; Raudsepp et al., 1999). Additionally, the gender effect was similar to that found by Kilpatrick et al. (2003), with men being more ego-oriented than women. Although the initial results are encouraging, the current study was limited to college age users of a recreation facility at one university. Further research on the psychometric properties across locations, age groups, and various physical activities is certainly warranted.

The sample used in the current study involved fairly active college students, with 63% meeting recommendations for weekly physical activity. Among this young adult sample, task-oriented profiles (accompanied by either high or low ego scores) were associated with the adoption and persistence of physical activity behavior (maintenance) and the endorsement of exercise-related benefits, thus supporting the value of these "adaptive orientations" in sport and exercise settings (Christodoulidis et al., 2001; Duda et al., 1995; Raudsepp et al., 1999). Further, gender predictably emerged as a meaningful variable with more men reporting high ego/high task profiles than women. Future research may consider comparing goal orientation profiles within larger samples of less active adults. It is interesting, however, that all derivations of orientation grouping were well represented among this active sample.

Ego scores decreased across the stages of change from contemplation to maintenance in

the current sample (see Figure 1). Although there is no specific literature to compare to regarding exercise behavior, previous research in sport would probably suggest that as individuals persist in an activity over time toward maintenance that they would increase in both task and ego orientations (Duda & Hall, 2001). Ego orientations were highest in this sample among contemplators, suggesting that ego cues may be most relevant during this stage but become less meaningful over time. For example, the need to improve body image or to lose weight may be a relevant goal orientation while contemplating the initiation of an exercise program, but perhaps task goals are more effective at motivating behavior during later stages. This suggestion is also supported by the finding that the perceived benefits of exercise were higher across all task groups compared to ego groups. At the onset of exercise programs, tuning new exercisers into task-specific benefits in addition to health benefits might be one way of increasing task orientation and transitioning exercisers from contemplation towards action and maintenance. If new exercisers pay close attention to the task-specific benefits of exercise instead of concerning themselves with weight loss or comparisons to others, they may increase their enjoyment of each activity session. This increase in enjoyment and intrinsic motivation may subsequently help them persist long enough to adopt their new behavior and proceed towards maintenance.

Future research will need to explore the efficacy of various cognitive and behavioral interventions on increasing task orientation for exercise. Increasing task orientation in new exercisers may facilitate a smoother stage progression in the transtheoretical model. One approach might be to use a decisional balance exercise to prepare new exercisers for the challenge of regular physical activity. This concept has already been integrated thoroughly into previous transtheoretical research (Prochaska et al., 1994), however, using this approach to positively impact a person's exercise-specific task orientation may present a new way of tailoring interventions.

Another approach for increasing the task orientation of exercisers would be to modify the motivational climate of the exercise facility. Situational factors such as the environment can have a strong effect upon the goal orientation of those who participate in a setting (Ames, 1992; Nicholls, 1989) and environmental factors can have considerable impact on individual physical activity behavior (King et al., 2002). Future research in this area would be aided by including an exercise-specific measure of the goal climate such as the one developed by Walling, Duda, and Chi (1993). Exercise psychology professionals can help increase task orientation in new exercisers by utilizing the TARGET system (Ames, 1992). Suggested changes revolve around the task, authority, recognition, grouping, evaluation and timing of the situational structures within the environment. Examples of such environmental changes that could help to create a more task-oriented environment include helping exercise course instructors

become less evaluative in their teaching, creating separate weight areas for individuals who are concerned about weight and another for those who are just interested in fitness improvements, decreasing the visibility of cardiovascular and strength machines by non-participating observers, and the use of posters and other decorations that encourage people to exercise for their own personal benefits. Developers of new exercise facilities may want to consider building these factors into their plans as well to provide a solid foundation for regular physical activity. Overall, these individual and environmental strategies would be designed to increase task orientations to help individuals adopt and persist in their physical activity pursuits.

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