



Assessment

Development and practical implications of the Exercise Resourcefulness Inventory



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ABSTRACT

Objective: To determine the validity and reliability of the Exercise Resourcefulness Inventory (ERI) designed to assess the self-regulatory strategies used to promote regular exercise.

Methods: In Study 1, the inventory's relationship with other established scales in the exercise behavior change field was examined. In Study 2, the test–retest reliability and predictive validity of the ERI was established by having participants from Study 1 complete the inventory a second time.

Results: Internal consistency, and convergent, discriminant, and concurrent validity were supported in both studies. The test–retest correlation of the ERI was .80. As well, participants scoring higher on the ERI in Study 1 were more likely to be at a higher stage of change in Study 2, and greater increases in exercise resourcefulness over time were predictive of advancement to higher stages of change.

Conclusions: ERI is a reliable and valid measure to assess the self-regulatory strategies used to promote regular exercise.

Practical implications: Facilitators may want to tailor exercise programs for individuals scoring lower in resourcefulness to prevent them from relapsing.

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1. Introduction

The benefits of regular exercise on physical and psychological health have been well established. Evidence shows that several months of regular physical activity reduces the risk of coronary heart disease, diabetes, various cancers, and other life-threatening diseases [1,2], as well as reduces chronic stress and anxiety, and improves mood [3–5]. Despite initiatives to get people of all ages active [6–9], many people wanting to exercise regularly fail to do so, often because obstacles interfere with their intent to become active [10,11]. Few questionnaires, however, exist to measure how people deal with these obstacles. The current investigation utilized data from a mixed methods study with undergraduate students who were regular and non-regular exercisers to generate items forming the Exercise Resourcefulness Inventory (ERI) assessing the self-regulatory strategies needed for exercise. It also built on the self-control model for exercise proposed by Kennett et al. [12].

Several theoretical models have been used to explain exercise behavior change, including the transtheoretical model [13], theory of planned behavior [10], and self-determination theory [14]. Our

study relied on Kennett et al.'s [12] adaptation of Rosenbaum's model of self-control [15,16] to understand why some people wanting to exercise regularly are unable to attain this goal. A key component of this model is general learned resourcefulness, which are the cognitive and behavioral skills acquired early in life, and include the use of positive self-statements to regulate emotions and discomforts, the use of problem-solving strategies (such as planning, and anticipating consequences), and delaying immediate gratification, to help guide behaviors and change bad habits. Over the past several decades, research shows that people higher in resourcefulness are better able to maintain healthy lifestyle practices, and follow instructions that improve their health compared to less resourceful people [17–21].

Highly resourceful people are not immune to stressors or developing bad habits; however, when they decide to change they are generally more successful than those with lower resourcefulness [15,18,22–24]. Thus, contrary to the other aforementioned models, the desire to change behavior is of fundamental importance to Rosenbaum's model, and, because of this, individuals who have no interest in changing (in precontemplation), are not included. For individuals wanting to change, their level of general learned resourcefulness skills along with cognitions such as self-efficacy (believing they are capable of change), reasons for change, and the pros and cons of change determine their ability to utilize the necessary self-regulatory

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strategies to initiate and maintain the new behavior (for example, maintaining regular exercise).

Generalizing this model to exercise, Kennett et al. [12] asked university students who ranged from contemplating exercise to maintaining a regular exercise program to complete questionnaires assessing learned resourcefulness, self-efficacy for exercise, personal reasons for exercise, and the processes of change. The Processes of Change Questionnaire (PCQ) [25] was used to tap the specific self-control strategies for exercise, and it consists of two components: the experiential (e.g., read about exercise, and realize the connection between exercise and emotion) and the behavioral (e.g., substituting exercise for inactivity, and making a commitment to change) processes.

As predicted, Kennett et al. [12] found that individuals higher in resourcefulness were more likely to be in the maintenance stage of change than less resourceful individuals. These individuals were also more likely to report having higher task, coping and scheduling self-efficacy, and using the behavioral processes over any experiential ones. Equally important was the finding that lower resourceful individuals in the contemplation stage of change were less likely to use the behavioral processes compared to the more highly resourceful individuals in the same stage, as well individuals at the higher stages. The authors concluded that the challenge remaining is helping less resourceful individuals in the contemplation stage with the strategies that support activity. Otherwise, it may be more difficult for them to advance to higher stages of change compared to individuals with higher learned resourcefulness. Moreover, they cautioned that the widely used PCQ failed to monitor many elements of the self-regulatory repertoire, including the use of positive self-talk to deal with overexertion, goal setting, planning, and they encouraged researchers to address this issue.

To understand the self-regulatory strategies facilitating exercise behavior, we used a mixed methods approach to generate items for the ERI. Undergraduate students ($N = 33$) wanting to become or who were already regular exercisers were interviewed about how they dealt with obstacles to exercise. Rosenbaum's [26] Self-Control Schedule, assessing general learned resourcefulness, was completed before each interview, and scores were used as the lens to shape the analysis of the qualitative text-based data. The analysis used the constant comparative method with progressive coding from open to axial to selective coding [27], contrasting first participants who had extremely low and high resourcefulness scores and moving toward individuals with more moderate scores. Five major themes were identified. In Theme 1 (use of social support), less resourceful participants relied heavily on social support to get them moving, whereas the more highly resourceful participants were able to maintain regular exercise without it. In Theme 2 (lifestyle integration, or lack thereof), participants scoring higher in resourcefulness viewed exercise as an important part of a balanced, healthy lifestyle, whereas lower resourceful participants viewed it as being something "extra" in their day. In Theme 3 (benefits of exercise), higher resourceful participants realized exercise's benefits to health, using this to motivate them to remain active, whereas lack of this realization reduced lower resourceful participants' motivation to remain active. In Theme 4 (overcoming obstacles to exercise), higher resourceful participants used a wide array of strategies to overcome the same obstacles described by those scoring lower in resourcefulness but who were having limited success overcoming them. Lastly, in Theme 5 (dealing with scheduling issues), highly resourceful participants, unlike their lower resourceful counterparts, consistently scheduled exercise and followed through with their plans.

Interestingly, the use of the experiential processes to becoming active was not described in our pilot study. For example, no

one discussed reading about exercise to learn more, how their exercising affected others, and about the type of person they would be if they exercised. Regarding the behavioral processes, the more highly resourceful participants readily substituted exercise for inactivity, made a commitment to change and controlled stimuli that supported change. And, although all of our participants discussed the use of social support, the description of this support differed depending on one's learned resourcefulness score. As suspected [12], our moderately and highly resourceful participants used other salient strategies not addressed by the PCQ, namely, goal setting (e.g., selecting activities one enjoys), problem-solving (e.g., having a variety of activities to fall back on), and time management (e.g., exercising at a particular time of the day).

From the thematic-based analysis of our interviews, the 30-item ERI was created, as shown in Table 1. Features of the ERI are also synonymous with Rosenbaum's Self-Control Schedule, assessing general learned resourcefulness, and include positive self-talk, delaying immediate gratification and employing problem-solving strategies. Fourteen out of thirty total items are reversed scored items, reflecting the stories told by the lower resourceful participants.

2. Introduction of Study 1

This study investigated the internal consistency and validity of the ERI using the exercise self-control model as its foundation. The Self-Control Schedule assessing general learned resourcefulness [26] and the PCQ [25] were used to provide convergent and

Table 1
Exercise Resourcefulness Inventory items.

1. If I don't feel like exercising, I tell myself to just do it.
2. With classes and other commitments, I don't have the energy to exercise.
3. On a regular basis, I use exercise to solve problems or to think about things.
4. If my friends are busy, I still make time to exercise on my own.
5. Scheduling exercise into my daily routine allows me to stick with it.
6. If there were a pill that would replicate the benefits of exercise, I would take it.
7. Procrastination is a huge barrier to my regular exercise routine.
8. I balance exercise with other daily activities I have to do.
9. If it weren't for my friends encouraging me, I would rarely exercise.
10. When I get busy academically, I select exercises that can be readily incorporated in my day.
11. My poor time management skills do not allow me to incorporate exercise into my routine.
12. I use exercise as a break from school work.
13. I tend to make excuses, when attempting to regularly exercise.
14. Thinking about all the negative consequences of an inactive lifestyle gets me physically active.
15. I would avoid exercising if I injured myself.
16. I find a time that works for me to exercise and I stick to it.
17. Seeing unhealthy people reinforces me to remain active.
18. I select activities I enjoy, to maintain a regular exercise program.
19. I am more likely to exercise regularly in the summer than winter months.
20. Often, other commitments get in the way of my exercise routine.
21. Knowing how energized I feel after a work-out, gets me physically active.
22. When I'm reluctant to exercise, I tell myself to get active because I know I will feel better.
23. I need others to push me to exercise regularly.
24. Even when I have the time to exercise, for some reason, I am unable to make it happen.
25. My definition of regular exercise includes a variety of activities other than going to the gym.
26. If I didn't know how to use a fitness machine, I would be reluctant to ask a staff member for help.
27. Even when I'm tired, I'm able to convince myself to exercise.
28. Bad weather stops me from exercising.
29. Exercise is easy to push aside, as there are no immediate results.
30. When I have to, I organize exercise activities to do at home.

Note. Items 2, 6, 7, 9, 11, 13, 15, 19, 20, 23, 24, 26, 28 and 29 are reversed scored.

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