



Motivational Coaching Improves Intrinsic Motivation in Adult Fitness Program Participants

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ABSTRACT

International Journal of Exercise Science 13(5): 1167-1178, 2020. The purpose of this study was to measure intrinsic motivation following the implementation of motivational coaching strategies in a semester long personalized adult fitness program. Sixty individuals (40 female/ 20 male, age= 48 ± 15 yrs) participated as clients in an undergraduate exercise training program led by student trainers at Taylor University. The program took place during two consecutive semesters, therefore subject participation ranged from one to two semesters. In addition to personalized exercise prescription, student trainers implemented motivational strategies using a motivational coaching guide aimed at increasing individuals' overall intrinsic motivation. Trainers utilized a coaching checklist to record the motivational strategies used with their client each session. Intrinsic motivation was assessed before and after each program semester using an Intrinsic Motivation Inventory (IMI) and Motivational Client Scale (MCS). Clients' scores on the IMI increased from 3.38 ± 0.37 to 3.58 ± 0.31 ($p < 0.001$; $d = 0.587$). Particularly, perceived competence increased from 3.01 ± 0.52 to 3.41 ± 0.49 ($p < 0.001$; $d = 0.793$). Correspondingly, MCS scores also increased from 3.47 ± 0.72 to 3.87 ± 0.60 ($p < 0.001$; $d = 0.608$). Specifically, clients' response to challenge increased from 3.48 ± 0.98 to 4.15 ± 0.65 ($p < 0.001$; $d = 0.809$). Our data indicate that it is possible to improve intrinsic motivation by implementing motivational strategies into a supervised adult fitness program. This finding suggests motivational coaching may be an important part of a standard training protocol for fitness trainers to help combat a public health concern: initiation and adherence to exercise.

KEY WORDS: Motive, health, behavior, psychology, workout, well-being, coach, performance

INTRODUCTION

Regular physical activity is widely promoted to enhance quality of life and combat chronic health conditions (28, 60, 32, 10). Despite the personal benefits physical activity offers, survey results and objective measures of physical activity with accelerometers suggest 70% to 95% of the population is not active enough to achieve health benefits (52). In addition, while 60.9 million U.S. citizens annually purchase a gym membership (53) or start an exercise program, current data suggests 50% of the population will drop out after 6 months (37, 35, 59). Consequently, both

initiation and adherence to exercise are a public health concern (19, 48, 60). Exploring the role of intrinsic motives in initiating and sustaining exercise behavior may provide further insight into regulating the behavior (41, 43, 60).

The self-determination theory (SDT), proposed by Edward Deci and Richard Ryan, is a collection of sub-theories pertaining to the motives regulating behaviors (41). According to the SDT, both the nature and the function of motives are valuable in predicting behaviors (41, 60). Specifically, 2 general forms of motivation exist and differ most basically in their intrinsic and extrinsic orientations (41, 43, 19, 48). Extrinsic motivation is doing something in pursuit of a goal separate from the engagement of the activity (41). Extrinsic motives may be useful in initiating physical activity and are appealing because they often involve tangible rewards such as weight loss, but may be significantly related to poor psychological well-being and may be related to poor adherence (43, 19, 28). For example, according to Thomson Reuter's NPR Health Poll (2011), 35% of the American population reported setting a resolution to lose weight in the last 5 years. Of those 35%, half of the weight-loss resolutions were broken after 1 month (39). In contrast, intrinsic motivation is doing something for the attainment of a goal derived from the inherent satisfaction received from engaging in the activity itself (41) and may predict sustained physical activity (42, 19, 28, 60). Consequently, its promotion in an exercise setting may increase participant adherence to regular exercise.

A considerable amount of research exists aimed at understanding why people initiate, persist, or withdraw from exercise (19, 60). While various research links exercise motives to personality traits, goal content, and gender (60) the preeminent theory of motivation, the SDT, accounts for psychological needs as an explanation for motivated behavior (57, 55). Thus, personal motivation is constructed in a manner which fulfills an individual's perceived psychological needs, specifically, competence, relatedness, and autonomy (57). Figure 1 presents a Venn diagram comprised of the 3 psychological needs identified by the SDT. When all 3 sectors intersect and psychological needs are met, the SDT claims individuals achieve a state of motivation recognized as self-determined (intrinsic). However, oftentimes when psychological needs are not met, extrinsic goals are first constructed to compensate for the lack of psychological need satisfaction (54).

According to the SDT, modifying extrinsic motives relies on promoting an autonomous environment (38, 46). The use of interpersonal relationships in "motivational interviewing" may affectively promote autonomy-supporting social environments and reframe individuals' thought patterns about a behavior they are struggling to participate in (8, 29, 15). Oftentimes, a variety of specific strategies created within the framework of the SDT are used in motivational interviewing to promote an autonomy-supportive context. Motivational interviewing has led to successful thought pattern modification in a variety of life domains. For example, task-intrinsic and task-extrinsic parental motivational practices were tested longitudinally on the academic intrinsic motivation of children ages 9-17, and task-intrinsic practices were shown to positively impact intrinsic motivation and enhance academic performance (16). Like motivational interviewing, similar task-intrinsic practices also have positively affected thought patterns among various addictive behaviors, such as cannabis and alcohol addictions (44). While

motivational interviewing has demonstrated efficacy in behavior modification across multiple life domains, such as personal addictive behaviors and academic performance, little research has applied the technique in the context of physical activity performance and persistence. Therefore, this study aimed to explore the potential role of motivational coaching as part of a training protocol for fitness trainers to enhance exercise participation. Specifically, the purpose of this investigation was to examine whether or not the implementation of motivational interviewing in an adult fitness program elicited motivation modification.

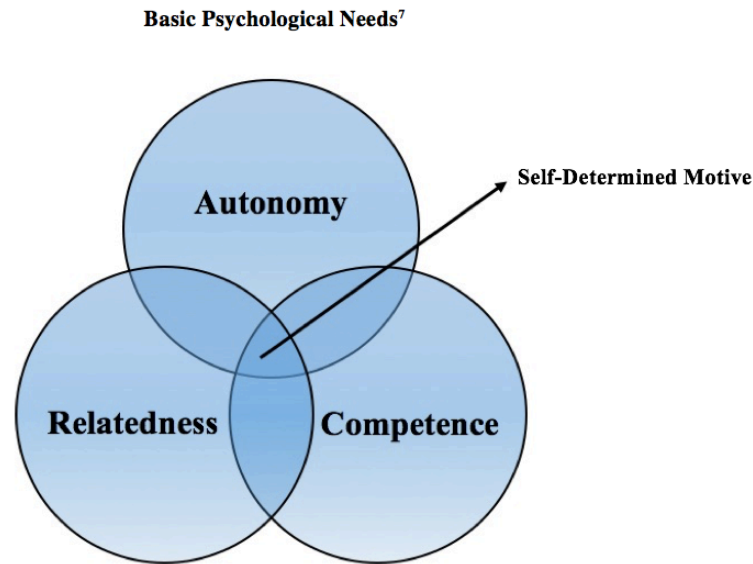


Figure 1. Description of the role of autonomy, relatedness, competence, and self-determined motive in one's basic psychological needs.

METHODS

Participants

Eighty people were recruited through a university sponsored exercise and wellness training program administered by undergraduate exercise science student trainers. Any participant with signs or symptoms of cardiovascular disease was required to obtain physician's clearance prior to beginning the program. As such, the only inclusion criteria for the current investigation was admittance into the exercise and wellness program. Participants who attended less than 16 sessions were excluded from the study due to a lack of compliance to the motivational protocol. Ultimately, 60 participants (40 female/ 20 male, age= 48 ± 15 yrs) completed the study and were included in the final data analyses. Posteriori power calculations were conducted using the DSS Research Statistical Power Calculator to determine the statistical power of our data, given the sample size (51). The calculation revealed that overall IMI and MCS scores yield statistical powers of 89.5% and 91.4%, respectively, with an $\alpha = 0.05$. The study was approved by Taylor University's Institutional Review Board and written informed consent was obtained from each participant prior to participation in the study. This research was carried out fully in accordance to the ethical standards of the International Journal of Exercise Science (31).

Protocol

The exercise and wellness training program matched 46 (21 male and 25 female) trainers to participants based on available schedules and lasted up to 14 weeks during a normal college semester. Participants were screened for cardiovascular disease (CVD) risk, and basic assessments of cardiorespiratory and muscular strength/endurance were performed with each participant. Trainers worked with participants to establish personalized exercise and dietary goals for the course of the program. In addition to this, the current investigation looked to implement motivational coaching strategies in each training session. Student trainers were given bi-weekly education on the use of motivational constructs and the IMI and MCS were administered to the participant pre and post program to assess their level of intrinsic motivation towards exercise.

Instrumentation: The survey was built using a modified version of the IMI (Cronbach's $\alpha = 0.715$) (42), and MCS (Cronbach's $\alpha = 0.953$). The MCS was constructed according to the following motivational models and reliable inventories with their respective Cronbach's alpha levels: Self-Determination Theory (SDT) (46), PERMA (Positive Emotion, Engagement, Relationships, Meaning, Achievement) ($\alpha > 0.70$) (47), and State-Trait Anxiety Inventory ($\alpha > 0.80$) (50). Additionally, because this study took place at a faith-based institution, we developed a scale, GIP (Grace perceiver and extender, Integrity, Practicing the presence of God) ($\alpha > 0.70$) (49), to measure variables related to spiritual wellness. We developed the scale based on literature examining fundamental principles of spiritual health (9, 20, 23, 24, 36). The survey consists of 56 items and was used to assess intrinsic motivation towards exercise. The first 24 items included questions from the IMI which determined the intrinsic motivation of the client by asking questions referencing 6 subscales: enjoyment, perceived competence, importance, choice, usefulness, and relatedness. There were 4 questions for each of these 6 subscales (61). The next 32 questions reflected the MCS and addressed the 9 constructs taught in the small group lessons: challenge, charity, cheerfulness, completeness, contextualization, control, conviction, cooperation, and curiosity. These concepts are supported by research from various sources (5, 7, 12, 18, 21, 22, 26, 30, 40). Each of these constructs had 3 or 4 questions for the participant to answer. For each of the 56 questions, a 5-point Likert scale was used for participants to indicate how much they agreed with a particular statement.

Training Timeline: Before the first training session, participants completed the survey to assess their level of intrinsic motivation towards exercise. After completing the survey, participants entered the training portion of the study where they completed exercise sessions with their trainers for a period of 9-14 weeks ($\mu = 12$). Participants attended between 16 and 42 ($\mu = 25$) training sessions throughout the course of the training period. Following the last exercise session, participants took the survey to assess motivational development.

Personal Trainers: Four of the 46 student trainers were selected by the head researcher for their knowledge of intrinsic motivation and personal training, having completed a course in motivational psychology and having participated as a trainer in previous semesters. These coaches were required to attend biweekly small group meetings with the researcher to develop

their ability to use motivational constructs (MC) and instruct the other trainers. The topics for each small group were based on 9 basic categories of intrinsic motivation to develop interest and insight into the topic. These basic concepts were challenge (7), charity (26), cheerfulness (12), completeness (5), contextualization (18), control (30), conviction (22), cooperation (40), and curiosity (21). Directly following these meetings with the researcher, the coaches led small groups for the other trainers. Trainer attendance was mandatory as it was vital to the development of introducing MC into the training sessions. If trainers were not able to attend the small group, the researcher met with the trainer individually to teach the materials talked about in the small group. Every 2 weeks, a different motivation category was emphasized in the small group session. The trainers spent time in these small groups learning from the ways that other trainers implement MC as well as practicing the MC for the current category of motivation with motivational case studies. The trainers were instructed to implement the constructs within the motivational category in all client training sessions until the next biweekly small group meeting.

Table 1. Excerpt from coaching guide: description of motivational constructs (MC).

Construct	Definition	Example Strategies	Questions to Ask
Challenge (1,6,7,14,17,25,27,34, 41,58)	A call to a person to a meaningful task that requires special effort and dedication	Goal setting, feedback, FLOW, support balance, and deeper learning strategies	What do you need to change to reach your goal? How much effort are you putting forth in this activity?
Cheerfulness (3,33,56,11,12,13)	A process of thanksgiving that occurs in all life events	Guided thankfulness, stones of remembrance, thankfulness log, timely laughter, cognitive control method, and uplifting music	What symbolizes the things you find most important in life? What do you typically think about during the day?
Control (2,45,30)	A person's ability to manage their passions and desires	Attribution control, behavioral control, cognitive control, decision control, information control, and secondary control	How do you feel while you exercise? How can you redirect thoughts about exercise to be positive?

Motivational Constructs: Before every session, trainers prepared a personalized motivation plan for the client. This plan implemented constructs from the most recent small group meeting. Trainers selected each construct based on their client's motivational needs, and the selection of the constructs aimed to improve weak areas of motivation while encouraging the participant's strengths. For example, if a trainer noticed that a participant talked of exercise in a negative manner, s/he might look at the coaching guide given to him/her to see which construct of motivation and strategies would be helpful to develop intrinsic motivation (Table 1). After looking through example questions s/he might decide to ask the participant, "How do you feel while you exercise?" The participant might share how they tend to view exercise negatively which would allow them to see their negative tendencies towards exercise. In future exercise sessions, the trainer may want to ask, "How can you redirect thoughts about exercise to be

positive?" These questions are found in the MC of 'Control' and the specific strategy is 'Cognitive Control'. After the session, the trainers would record the current date on a chart (Table 2) similar to the one given below next to 'Cognitive Control' to show that they had used this strategy in their session. This allowed the researchers to know which strategies were used for each participant and how many times they were used during the course of the semester.

Table 2. Excerpt from coaching guide: motivational constructs (MC) and strategies.

Challenge	Cheerfulness	Control
1. Goal Setting	6. Guided Thankfulness	12. Attribution Control
2. Feedback	7. Stones of Remembrance	13. Behavioral Control
3. FLOW	8. Thankfulness Log	14. Cognitive Control
4. Support Balance	9. Timely Laughter	15. Decision Control
5. Deeper Learning Strategies	10. Cognitive Control Method	16. Information Control
	11. Uplifting Music	17. Secondary Control

Statistical Analysis

Survey data was entered by a researcher into SPSS (version 22.0). A Paired Sample T-Test was used to test differences in the composite intrinsic motivation and subscale scores from pre- to post-tests. Statistical significance was set at an alpha level of $p < 0.05$. Additionally, Cohen's d was used to calculate and report effect sizes (Tables 3 and 4) (4).

RESULTS

Intrinsic Motivation: Paired sample t-tests were utilized to compare the effect of motivational coaching on clients' intrinsic motivation from the beginning to the end of the exercise program (≈ 14 weeks). Results revealed a statistically significant growth within clients' overall intrinsic motivation ($p < 0.001$), indicating a significant increase in their perceived competence ($p < 0.001$), interest ($p < 0.01$), choice ($p < 0.01$), and value of exercise ($p < 0.05$). Clients experienced the greatest growth in their perceived competence ($p < 0.001$) from week 1 to week 14 of the exercise program. Changes in clients' overall intrinsic motivation had a practical significance ($d = 0.587$; $0.206 \leq y \leq 0.793$), with perceived competence in exercise showing the greatest practical change ($d = 0.793$) (Table 3).

Motivational Constructs: Results convey a significant increase in clients' perceived value of the MCs while exercising from the beginning (week 1) to the end (week 14) of the exercise program ($p < 0.001$). Clients' perceived sense of charity ($p < 0.001$), cheerfulness ($p < 0.001$), challenge ($p < 0.001$), responsible control ($p < 0.001$), completeness ($p < 0.001$), contextualization ($p < 0.001$), curiosity ($p < 0.01$), and conviction ($p < 0.01$) significantly increased from the beginning to the end of the exercise program. Overall, the constructs produced a medium effect size ($d = 0.608$; $0.279 \leq y \leq 0.809$). Among the constructs, challenge ($d = 0.809$) presented the highest practical significance.

Table 3. Clients' Growth in Intrinsic Motivation.

Intrinsic Motivation	Pre-Test <i>n</i> = 60		Post-Test <i>n</i> = 60		<i>t</i>	<i>p</i>	<i>df</i>	Cohen's <i>d</i>	Cronbach's Alpha	Statistical Power
	M	SD	M	SD						
Overall	3.38	.370	3.58	.309	-5.91	.000	59	.587	.715	89.5%
Interest	2.90	.655	3.12	.531	-3.15	.003	59	.369	.343	52.4%
Perceived Competence	3.01	.517	3.41	.491	-6.33	.000	59	.793	.363	99.1%
Effort	2.90	.332	2.98	.397	-1.51	.136	59	.219	-.802	22.4%
Choice	3.53	.555	3.80	.626	-3.65	.001	59	.456	.286	70.5%
Usefulness/ Value	4.52	.567	4.67	.532	-2.58	.012	59	.273	.755	32.1%
Relatedness	3.40	.549	3.51	.519	-1.68	.099	59	.206	.298	20.4%

Table 4. Clients' Growth in Motivational Constructs (MC).

Motivational Constructs	Pre-Test <i>n</i> = 60		Post-Test <i>n</i> = 60		<i>t</i>	<i>p</i>	<i>df</i>	Cohen's <i>d</i>	Cronbach's Alpha	Statistical Power
	M	SD	M	SD						
Overall	3.47	.716	3.87	.595	-6.67	.000	59	.608	.953	91.4%
Charity	3.36	.869	3.81	.802	-5.07	.000	59	.538	.714	83.8%
Cheerfulness	3.31	.835	3.69	.740	-4.44	.000	59	.482	.697	75.1%
Challenge	3.48	.977	4.15	.647	-6.26	.000	59	.809	.858	99.3%
Curiosity	3.30	.847	3.60	.763	-3.13	.003	59	.372	.753	53.1%
Contextualization	3.36	.783	3.75	.811	-4.68	.000	59	.489	.798	76.4%
Conviction	3.67	.916	3.97	.891	-3.21	.002	59	.332	.874	44.4%
Cooperation	3.41	1.060	3.70	1.016	-2.00	.051	59	.279	.810	33.4%
Responsible Control	3.48	.860	3.92	.724	-4.63	.000	59	.554	.827	85.8%
Completeness	3.77	.890	4.23	.786	-4.59	.000	59	.548	.900	85.1%

Extraneous Variables Considered: Due to the lack of a control group, additional variables causing confounding effects to data validity were tested to support the conclusion that motivational coaching increased clients' perceived intrinsic motivation. A One-Way ANCOVA was conducted on the following factors: length of clients' previous experience in the exercise program, program season (fall 2015 versus spring 2016), variation of motivational strategies implemented by trainers, varying skill levels of the trainers, and gender. For length of exposure, tests rendered no statistical or practical significance for any of the defined variables within the IMI or MCS ($p > 0.05$). Therefore, the length of time clients previously spent in the exercise program did not significantly affect their ability to grow in their intrinsic motivation. Tests conducted on the experience of the trainers revealed no statistical ($p > 0.05$) or practical significance, supporting the conclusion that the experience of the trainer did not significantly

impact clients' growth in intrinsic motivation. It should be noted that all trainers were being trained throughout the investigation. The exercise program spanned across two semesters, with data collected during both. The effect of program semester was tested and revealed the semester clients participated in the exercise program held no relevance in their ability to grow in their perceived intrinsic motivation ($p>0.05$). Within the program, the strategies trainers implemented to encourage intrinsic motivation growth varied based on the personality and needs of the clients. Tests were conducted measuring the effect of the variation of strategies used by the trainers and revealed that neither the amount nor the diversity of strategies increased the likelihood of clients' perceived intrinsic motivation growth ($p>0.05$). Lastly, client gender also did not reveal any practical or statistical significance ($p>0.05$), indicating that it did not impact their ability to grow in their intrinsic motivation.

DISCUSSION

The primary purpose of this study was to determine if adults' intrinsic motivation could increase with the use of a motivational coaching guide in a 14-week fitness program. Our results confirm our hypothesis and indicate it is possible to raise adults' intrinsic motivation towards exercise within 14 weeks. This finding is important as it provides a practical tool which may help combat a public health concern: initiation and adherence to exercise (19, 48, 60).

The intrinsic motivation categories of perceived competence (IMI) and challenge (MC) were most positively affected by the program. Challenge boasted a high level of practical significance ($d= 0.809$), indicating great strength in the statistical significance achieved ($p< 0.001$). Perceived competence displayed a medium effect size ($d= 0.793$), conveying nearly the same strength as challenge in its overall significance ($p < 0.001$). All of the changes in IMI and MC categories attained at least a small level of practical significance. Although the categories of effort and relatedness (IMI), and cooperation (MC), were not statistically significant, their small level of practical significance ($d= 0.206; 0.219; 0.279$) suggests they still have a slight relationship with intrinsic motivation. The multiple areas of statistical and practical change indicate the clients learned a variety of intrinsic motivation strategies, which may have helped them attain practical tools to self-motivate after finishing the program.

Results collected from this study correspond with assertions developed in the Self-Determination Theory, proposed by Edward Deci and Richard Ryan (57, 55). The distinguished theory of motivation credits the psychological needs met by the use of the motivational coaching guide as an explanation for motivated behavior (57, 55). In particular, the psychological need for competence, relatedness, and autonomy informs personal motivation (57). Data collected by our study confirms motivational coaching as a viable method to fulfill these psychological needs, hence enhancing clients' intrinsic motivation (Table 3).

Although many variables were controlled for in the investigation, the lack of a true experimental design allows for multiple sources of internal and external validity concerns. The investigation used a pre-posttest design, permitting uncontrolled history, maturation, the Hawthorne effect, and multiple treatment effects. Additionally, because the subjects used in the study belonged to

a pre-existing program and randomization of the subjects was not obtained, potential selection biases and interaction effects exist. Due to the lack of a control group, it is possible the exercise program itself, rather than the motivational coaching, caused change in the subjects' motivation. Therefore, the results of this study should be viewed as tentative. However, it should be noted that the pre-test scores of the 48 subjects who had participated in the exercise program, prior to the implementation of motivational coaching, were not significantly different than the new subjects' pre-test scores (IM $\mu = 3.36, 3.43, p > 0.05$; MCS $\mu = 3.28, 3.57, p > 0.05$). Therefore, this suggests the exercise program alone is not sufficient to increase intrinsic motivation.

Notwithstanding limitations, the motivational protocol used in this study boasts a unique, practical, and highly generalizable method of increasing intrinsic motivation. A One-Way ANCOVA revealed that the length of clients' previous experience in the exercise program, program season (fall 2015 versus spring 2016), variation of motivational strategies implemented by trainers, gender, and the varying skill levels of the trainers did not affect the instruments' effectiveness to alter intrinsic motivation. This suggests that the motivational protocol may offer widespread use and be personally applied to clients, rather than standardized.

Given intrinsic motivation is linked to exercise adherence (43, 19, 28, 48), our data suggests the implementation of motivational strategies may be an important part of a standard training protocol for fitness trainers. Although our research lacks a true experimental design, the data aligns with current literature on motivation modification and therefore warrants further investigation. Future research should aim to assess if exercise alone increases intrinsic motivation. Furthermore, a follow-up study with the participants, examining if their increase in intrinsic motivation positively affected their adherence to exercise, may be a beneficial future direction. It may also be instructive to look at the impact of having a personal trainer without motivational coaching on intrinsic motivation and track what types of exercise have a synergistic effect with the motivational coaching guide.

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