



Well-being self-efficacy and complier average causal effect estimation: A substantive-methodological synergy[☆]



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ABSTRACT

Objectives: The purpose of this manuscript was to provide a substantive (i.e., well-being self-efficacy) – methodological (i.e., complier average causal effect estimation) synergy of potential importance to future research in the psychology of sport and exercise with secondary data analyses from the Fun For Wellness intervention. Fun For Wellness is a new on-line intervention designed to promote growth in well-being. Well-being self-efficacy is a proposed mechanism by which the effect of Fun For Wellness on well-being may be transmitted. Complier average causal effect estimation is a methodology that estimates the effect of complying with an intervention.

Design: The study design was a prospective, double-blind, parallel group randomized controlled trial (RCT) detailed in Myers, Prilleltensky, et al. (2016). Data were collected at baseline, 30 days- and 60 days-post baseline. A total of 479 adult employees at a major university in the southeast of the United States of America were enrolled.

Method: A two-class linear regression model with complier average causal effect estimation was fitted to well-being self-efficacy scores at 30- and 60-days.

Results: The adjusted mean difference in well-being self-efficacy scores for participants who complied with the intervention, as compared to potential compliers in the Usual Care group, was equal to 0.21, $p = 0.061$, Cohen's $d = 0.36$ at 30-days and 0.28, $p = 0.050$, Cohen's $d = 0.49$ at 60-days.

Conclusion: Complier average causal effect estimation may be a useful approach for RCTs in sport and exercise psychology when at least some of the participants do not comply with the intervention.

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The purpose of this manuscript was to provide a substantive–methodological synergy of potential importance to future research in the psychology of sport and exercise with secondary data analyses from the Fun For Wellness intervention. The substantive focus of this manuscript was well-being self-efficacy, which we defined as the extent to which a person believes that he or she has the ability to achieve a positive state of affairs in important areas of his or her life. The methodological focus of this manuscript was complier average causal effect estimation, which is designed to estimate the effect of complying with – and not merely just the effect of being assigned to – an intervention. Fun For

Wellness is a new on-line universal intervention designed to promote growth in subjective well-being by providing capability-enhancing learning opportunities to participants. The theoretical framework upon which the Fun For Wellness intervention was conceptualized was self-efficacy theory (Bandura, 1997). Compliance with the Fun For Wellness intervention was viewed as a source of well-being self-efficacy information that directly influenced well-being self-efficacy beliefs. A scale tailored to the Fun For Wellness intervention was developed to measure well-being self-efficacy. From this point forward the structure of this manuscript will follow that of a substantive-methodological synergy (e.g., Myers, 2013).

1. Intervention and original research

1.1. Fun For Wellness (FFW)

Fun For Wellness (FFW) is a new on-line universal intervention designed to promote growth in subjective well-being by providing

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capability-enhancing learning opportunities to participants (Myers, Prilleltensky, et al., 2016). Within the FFW intervention, the conceptualization of subjective well-being was based on the seven-dimension factor structure proposed by Prilleltensky et al. (2015) in the development of the I COPPE Scale. Prilleltensky et al. labeled these dimensions of subjective well-being as follows: Interpersonal, Community, Occupational, Physical, Psychological, Economic and overall. There is evidence that each of the dimensions of subjective well-being (except for economic) purportedly measured by the I COPPE Scale is relevant within the study of exercise science (Myers, Park, et al., 2016). From this point forward, we generally omit the term “subjective” from the expression “subjective well-being” for textual parsimony.

Myers, Prilleltensky, et al. (2016) provided an initial evaluation of the efficacy of the FFW intervention to increase well-being in an adult population. Measures of well-being were constructed based on responses to the I COPPE Scale. Participants who complied with the FFW intervention had significantly higher well-being, as compared to compliers in the Usual Care group, in the following dimensions: interpersonal at 60-days, community at 30- and 60-days, psychological at 60-days and economic at 30- and 60-days post baseline. Although promoting growth in well-being was the main purpose of the FFW intervention (see Myers, Prilleltensky, et al. for a detailed explanation) the intervention may also have increased participants' self-efficacy beliefs because the capability-enhancing learning opportunities provided to participants in the FFW intervention were created based on Bandura's (1997) self-efficacy theory.¹

Self-efficacy has been defined as “beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments” (Bandura, 1997, p. 3). The capability-enhancing learning opportunities that the FFW intervention provided to participants came in the form of 152 interactive and scenario-based challenges organized in the on-line environment by the acronym BET I CAN (Myers, Prilleltensky, et al., 2016). The behavior-focused challenges were intended to increase a participant's capabilities to set a goal and to create positive habits (e.g., Watson & Tharp, 2014). The emotion-focused challenges were intended to increase a participant's capabilities to cope with negative emotions and to collect positive emotions (e.g., Seligman, 2011). The thought-focused challenges were intended to increase a participant's capabilities to challenge negative assumptions and to create a new narrative for their life (e.g., Hays, 2014). The interaction-focused challenges were intended to increase a participant's capabilities to communicate and connect with others (e.g., Gander, Proyer, Ruch, & Wyss, 2013). The context-focused challenges were intended to increase a participant's capabilities to read cues and to change cues in the environment (e.g., Dolan, 2014). The awareness-focused challenges were intended to increase a participant's capabilities to know their self and to know the issue (e.g., Brown & Ryan, 2003). The next steps-focused challenges were intended to increase a participant's capabilities to make a plan and to stick with a plan (e.g., Norcross, 2012). In summary, the BET I CAN challenges in the FFW intervention provided opportunities for a participant to increase his or her capabilities to organize and execute actions required to increase his or her well-being.

The capability-enhancing learning opportunity within each of the BET I CAN challenges in the FFW intervention was designed in such a way as to provide a participant with exposure to one or more

of Bandura (1997) potential sources of self-efficacy information. More specifically, each of the BET I CAN challenges created by Myers, Prilleltensky, et al. (2016) required participants to do one of the following activities: (a) play an interactive game (conceptualized as an enactive mastery experience); (b) watch vignettes performed by professional actors (conceptualized as a vicarious experience); (c) listen and/or read mini-lectures narrated by a coach (conceptualized as verbal persuasion); and (d) engage in self-reflection exercises and chat rooms (conceptualized as an opportunity to assess relevant physiological and/or emotional states). There is a rich extant literature on sources of self-efficacy information in sport and exercise psychology (see Feltz, Short, & Sullivan, 2008; for a review). The efficacy of the FFW intervention to increase self-efficacy was not tested by Myers, Prilleltensky, et al. (2016). Myers, Prilleltensky, et al. did, however, speculate that participants in their FFW intervention may have experienced increased self-efficacy and that future research in this area was warranted.

1.2. Original research with some secondary data analyses

The self-efficacy data reported in subsequent sections of this manuscript were collected as a pilot project within the large-scale RCT detailed by Myers, Prilleltensky, et al. (2016). All procedures performed involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. An institutional review board provided necessary permission to conduct this study.

Consistent with the publication manual of the American Psychological Association ([APA], 2010), the results reported in subsequent sections of this manuscript were viewed by the authors of this manuscript as an empirical study of original research because such studies include “secondary analyses that test hypotheses by presenting novel analyses of data not considered or addressed in previous reports” (p. 10). The self-efficacy data reported in subsequent sections of this manuscript were not considered in the Myers, Prilleltensky, et al. manuscript. The covariates and compliance data briefly reported in subsequent sections of this manuscript were considered in the Myers, Prilleltensky, et al. manuscript. Because, however, all of the aforementioned data within this paragraph were collected within the same RCT we provide only a summary of the study design and methods because “it is not necessary to repeat the description of the design and methods of a longitudinal or large-scale project in its entirety” (APA, 2010, p. 14). Readers are referred to Myers, Prilleltensky, et al. for a full description of the design, methods and data collection details (e.g., participant flow from screening to randomization to retention).

1.2.1. Procedures and participants

The study design was a prospective, double-blind, parallel group randomized controlled trial (RCT). Recruitment, eligibility verification and data collection were conducted on-line. Data were collected at baseline (T1), 30 days-post baseline (T2) and 60 days-post baseline (T3). Upon completion of the battery, each participant received an Amazon electronic gift card worth \$10 at T1, an additional \$15 at T2 and an additional \$25 at T3. Eligible employees at a major research university in the southeast of the United States of America were randomly assigned to the intervention (FFW) or usual care (UC) groups by computer software that was specified to achieve a 1:1 group (i.e., FFW:UC) assignment. Participants who were randomly assigned to the UC group were provided with 30 days (i.e., from T1 to T2) of 24 h access to a webpage that provided links to several well-established websites that focused on well-being. Participants who were randomly assigned to the FFW

¹ Other theoretical approaches (e.g., positive psychology etc.) influenced the creation of some of the specific content in some of the capability-enhancing learning opportunities but self-efficacy theory was the theoretical framework within which the FFW intervention was constructed.

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