Self-Presentation and Physical Activity in Breast Cancer Survivors: The Moderating Effect of Social Cognitive Constructs

Jennifer Brunet and Catherine M. Sabiston
McGill University

This study examined (1) the relationships between self-presentation processes (i.e., impression motivation and impression construction) and moderate-to-vigorous physical activity (MVPA) among breast cancer survivors, and (2) whether social cognitive constructs (i.e., self-presentational efficacy expectancy [SPEE]; self-presentational outcome expectancy [SPOE]; self-presentational outcome value [SPOV]) moderate these relationships. Breast cancer survivors (N = 169; M\text{age} = 55.06, SD = 10.67 years) completed self-report measures. Hierarchical regression analysis, controlling for age and body mass index, indicated that impression motivation was a significant correlate of MVPA (β = .25). Furthermore, SPEE (β = .21) and SPOV (β = .27) were moderators of this relationship. The final models accounted for 12–24% of the variance in MVPA. The findings of this study suggest that self-presentation processes (i.e., impression motivation) may indeed relate to breast cancer survivors’ MVPA. In addition, social cognitive constructs (i.e., SPEE, SPOV) moderated the relationship between impression motivation and MVPA. It may be effective to target impression motivation, SPEE, and SPOV in interventions aimed at increasing MVPA among breast cancer survivors.

Keywords: cancer survivors, health behavior, impression management

Early detection and improved treatments for breast cancer have led to an increase in survival rates, resulting in a growing population of breast cancer survivors (Canadian Cancer Society, 2011). Although advancements in treatment options offer a positive outlook for surviving the disease, breast cancer treatments are associated with a number of notable physical and mental side effects such as fatigue, weight changes, muscle loss/weakness, depression, anxiety, and decreased well-being (Burstein & Winer, 2000). Breast cancer survivors are also at greater risk for developing second malignancies and other diseases (Jemal, Siegel, Xu, & Ward, 2010).
Physical activity may help prevent or minimize these negative cancer-related sequelae and comorbidities among cancer survivors (Demark-Wahnefried & Jones, 2008). Physical activity at moderate and vigorous intensities can also provide a variety of physiological and psychosocial benefits for breast cancer survivors (McNeely et al., 2006; Sabiston & Brunet, 2011). In addition, increasing physical activity levels after a cancer diagnosis is more strongly linked to quality of life outcomes compared with lifetime activity (Blanchard et al., 2003), underscoring the need to encourage physical activity in the immediate period after cancer treatment. As part of an effort to improve cancer survivors’ health, the American College of Sports Medicine has recommended that cancer survivors adopt a physically active lifestyle (Schmitz et al., 2010). As such, physical activity is increasingly being promoted as a safe, feasible, and complementary therapy for individuals following the completion of primary treatment for cancer. Unfortunately, although cancer survivors are capable of increasing their physical activity levels soon after treatment (Rabin, 2009), the majority are inactive (Littman, Tang, & Rossing, 2010). Thus, targeted efforts are needed to address the state of physical inactivity in this population to promote optimal health and well-being.

It is important to time the delivery of interventions aimed at promoting physical activity. Researchers have shown that individuals diagnosed with cancer show interest in modifying their health behaviors posttreatment to prevent recurrence (Demark-Wahnefried & Jones, 2008). As such, the period after completion of primary treatment (i.e., surgery, chemotherapy, radiation) may represent a “teachable moment” (Rabin, 2009) and, thus, a good time to implement such interventions in this population. To intervene at this level, it is important to identify modifiable factors that may influence breast cancer survivors’ physical activity participation during this critical time period to develop tailored interventions.

**Self-Presentation**

Adopting a self-presentation perspective may be helpful when examining modifiable factors related to physical activity behavior (Hausenblas, Brewer, & Van Raalte, 2004; Leary, 1992) since some breast cancer survivors may engage in physical activity for self-presentation motives (e.g., improve/maintain physical appearance, obtain/preserve a desired social identity; Leary, 1992). Self-presentation, also referred to as impression management, is defined as a goal-directed process individuals engage in an attempt to monitor and/or control the impressions other people form of them (Leary & Kowalski, 1990). The model of self-presentation (Leary & Kowalski, 1990) highlights two key components, namely impression motivation and impression construction. Impression motivation refers to an individual’s motivation to control how he or she is perceived by others. Impression construction involves deciding which impression to convey to others and the degree to which particular strategies, either implicit or explicit, are used to create this impression (Leary & Kowalski, 1990). The distinction between impression motivation and impression construction is that the former deals with the motivation behind making an impression and the latter deals with the content and extent to which actions are taken to make that impression. Self-presentation processes were initially conceptualized at the global level; however, researchers have studied these constructs in the physical activity domain.
To assess self-presentation tendencies in the physical activity domain, Conroy, Motl, and Hall (1998) developed the Self-Presentation in Exercise Questionnaire (SPEQ). The SPEQ is the only measure available in the physical activity domain that assesses both facets of self-presentation. Using the SPEQ, researchers have found positive associations between self-presentation processes and physical activity behavior (Conroy, Motl, & Hall, 2000; Lindwall, 2005). For instance, Conroy et al. (2000) showed that impression motivation was positively associated with self-reported number of days per week of exercise, and impression construction was positively associated with the percentage of time spent exercising among college students. Similarly, Lindwall (2005) indicated that both impression motivation and impression construction were positively related to exercise frequency and duration for university students. However, findings are limited to healthy college and/or university student samples. The rationale for focusing on this segment of the population is often rooted in the premise that there is a paradox between the socially prescribed ideal physique and the development of the female body that occurs at the onset of puberty. In other words, the natural changes of the growing adolescent female body (e.g., increased body fat and weight, widened hips) are inconsistent with the social standard of physical attractiveness (e.g., being toned, thin, shapely). Yet, other life events (e.g., diseases) can result in physical changes that may also move people further away from the sociocultural ideal of beauty. Accordingly, self-presentation concerns may not be an area of concern restricted only to young adults, but may also be pertinent to individuals who experience disease-related changes in appearance and be an important correlate of physical activity in these populations.

An important shortcoming of the literature in this area is that researchers testing the psychometric properties of the SPEQ have raised concerns regarding the scale composition and have limited psychometric assessments to college and/or university student samples (Conroy & Motl, 2003; Conroy et al., 2000; Gammage, Hall, Prapavessis, et al., 2004; Lindwall, 2005). Whereas the underlying two-factor structure of this measure has been confirmed across studies, different truncated versions of the scale have been developed to include between 8–14 items. Thus, it is not clear which version of the SPEQ should be used. An important step in testing the association between self-presentation processes and physical activity behavior among breast cancer survivors is therefore to test and confirm the psychometric properties of the original SPEQ in this population.

**Breast Cancer, Self-Presentation, and Physical Activity**

Women who have been diagnosed and treated for breast cancer have endured many treatments that may place them at risk for self-presentational concerns and subsequent low levels of physical activity. For example, over 50% of women treated for breast cancer gain weight and report unfavorable changes in body composition (Irwin et al., 2005)—changes that are inconsistent with society’s emphasis on being thin, toned, and shapely (Bordo, 1993). Other undesired physical changes, such as deformities or loss of the breast(s), tissue damage, alopecia, decreased range of motion, and lymphedema, have also been reported (Ward, Kuta, Sanborn, & Burt,
As a result, breast cancer survivors’ preoccupation with the way others perceive them may increase since appearance and weight are predominant concerns for women in general (Cash, Melnyk, & Hrabosky, 2004). These concerns may increase women’s desire to monitor and/or control the impressions other people form of them, and in turn their participation in physical activity. Breast cancer survivors may engage in physical activity based on the belief that it may help them to convey their desired image and influence how others perceive them by regulating their weight, improving their body tone, and/or developing a social image of someone who is fit. There is evidence that breast cancer survivors engage in exercise to appear athletic and increase their muscle mass (McDonough, Sabiston, & Crocker, 2008; Sabiston, McDonough, & Crocker, 2007). Viewed from a self-presentation perspective, it is possible that this reflects survivors’ desire to enhance their public image and create a particular impression in the eyes of others (i.e., attempts to self-present). However, the relationship between self-presentation processes and breast cancer survivors’ physical activity behavior is not well understood, and therefore, further research into this association is needed.

Although breast cancer survivors may engage in physical activity for self-presentation reasons, some may avoid it for the same reasons if they are concerned about their ability to convey an attractive image in front of others (Hausenblas et al., 2004; Leary, 1992). Some women experience body-related anxiety as a result of the changes associated with breast cancer treatment and perceive that others negatively evaluate them as “lopsided,” “mis-shaped,” or “disfigured” (McDonough et al., 2008). These women may worry that others will negatively evaluate them, and therefore avoid engaging in activities where their physique is on display (i.e., physical activity). In fact, Leary (1992) has suggested that individuals who are concerned about being perceived as incompetent, unfit, and/or unskilled may not engage in physical activity, as this may highlight these undesirable characteristics. Similarly, McAuley et al. (1995) contended that the main reason why overweight female exercisers avoided exercising in public was their apprehension associated with being observed and evaluated by others. This suggests self-presentation processes may be positively or negatively associated with physical activity.

Moderators of the Link Between Self-Presentation and Physical Activity

Since self-presentation processes may either promote or hinder physical activity participation, research aimed at identifying potential moderator variables is warranted (Gammage, Hall, & Martin Ginis, 2004; Gammage, Hall, Prapavessis, et al., 2004; McAuley et al., 1995; Woodgate, Martin Ginis, & Sinden, 2003). Social cognitive constructs may help explain why some people who are highly motivated to impression manage engage in physical activity, whereas others avoid it (Gammage, Hall, & Martin Ginis, 2004; Woodgate et al., 2003). Based on social cognitive models (e.g., Bandura, 1986, 1997), self-efficacy and outcome expectations may moderate associations between self-presentation processes and behavioral outcomes such as physical activity. Self-efficacy refers to the belief one has regarding his or her ability to perform a task to produce the desired outcome, whereas outcome expectation is the belief one has regarding the outcomes that will result from performing a specific task. Based on outcome-expectancy theories (e.g., Bandura, 1997) and social learn-
Moderating Effect of Social Cognitive Constructs

Outcome value may also be a potential social cognitive moderator. Outcome value refers to the importance individuals place on an expected outcome. Researchers have operationalized these social cognitive constructs from a self-presentation perspective (Maddux, Norton, & Leary, 1988). From this perspective, self-efficacy (or self-presentational efficacy expectancy; SPEE), refers to the perceived probability of successfully conveying one’s desired impressions to others, outcome expectation (or self-presentational outcome expectancy; SPOE) refers to the degree to which one perceives certain behaviors will lead to a desired impression, and outcome value (or self-presentational outcome value; SPOV) reflects the importance placed on making a desired impression (Maddux et al., 1988).

Empirical studies have provided evidence that self-presentation processes and these three social cognitive moderators may interact to determine people’s tendency to engage in or avoid physical activity (Gammage, Hall, & Martin Ginis, 2004; Woodgate et al., 2003). Based on findings from these studies, it is plausible that among breast cancer survivors who want to monitor and/or control the impressions other people form of them, only women who are optimistic about their ability to make their desired impressions to others (i.e., SPEE), believe that physical activity will help them make their desired impression (i.e., SPOE), and/or value making a desired impression (i.e., SPOV) will likely participate in physical activity. In contrast, women who are pessimistic about these beliefs will likely avoid participating in physical activity. Thus, integrating self-presentation theory and social cognitive constructs may provide insight into the equivocal links between self-presentation processes and physical activity.

Purpose, Objectives, and Hypotheses

This study examined the associations between self-presentation processes (i.e., impression motivation and impression construction) and moderate-to-vigorous physical activity behavior among breast cancer survivors. The specific objectives of this study were to (1) evaluate the psychometric properties of the SPEQ; (2) examine the relationships between self-presentation processes and moderate-to-vigorous physical activity behavior; and (3) determine whether SPEE, SPOE, and SPOV moderate the relationships in Objective 2. It was hypothesized that an oblique two-factor model, representing impression motivation and impression construction as two distinct, yet related constructs, would be supported by confirmatory factor analysis (CFA). It was also hypothesized that SPEE, SPOE, and SPOV would moderate the relationships between self-presentation processes and physical activity behavior, such that participants reporting high levels of impression motivation or impression construction coupled with high levels of SPEE, SPOE, or SPOV will be more active than participants reporting high levels of impression motivation or impression construction coupled with low levels of SPEE, SPOE, or SPOV.

Methods

Participants and Procedures

This study represents a baseline cross-sectional analysis from an on-going prospective longitudinal study examining the impact of physical activity on breast cancer
survivors’ physical and mental health. Baseline data were collected in 2009–2010. Following university and hospital ethics approval, participants were recruited through advertisements and oncologist referrals from various local medical clinics and hospitals. Interested participants were asked to contact the research team by phone to obtain additional details on the study and were screened for eligibility. Women were eligible to participate in the study if they met the following criteria: (a) women of 18 years of age or older, (b) 0–20 weeks after primary treatment (i.e., surgery, chemotherapy, radiation), (c) diagnosed with Stage I–III breast cancer, (d) able to provide written informed consent, read and speak in English or French, and (e) report no health concerns that prevent them from engaging in physical activity. One hundred sixty-nine women met the eligibility criteria, provided written consent, and completed a self-administered survey.

**Measures**

**Demographics.** Personal (i.e., age, height, weight, education, self-identified ethnicity, menopausal status) and disease-related characteristics (i.e., stage of breast cancer, treatment history, and time since diagnosis) were assessed and used for descriptive purposes (see Table 1).

**Self-Presentation Processes.** The 20-item version of the SPEQ (Conroy et al., 1998) was used to assess self-presentation processes. The SPEQ includes an 11-item impression motivation subscale that assesses an individual’s motivation to be perceived as an exerciser (e.g., “I want to be thought of as a person who exercises”) and a 9-item impression construction subscale that assesses the degree to which strategies are used to convey such impressions (e.g., “I emphasize my athletic ability around those who do not yet know that I am an exercise nut”). Each item was scored on a 6-point Likert scale anchored at the extremes by *strongly disagree* and *strongly agree*. After reverse-coding Item 6 (“appearing fit or healthy to others is not important to me”), mean impression motivation and impression construction scores were calculated by summing the respective items and dividing by the total number of responses for each subscale. Although researchers have raised concerns regarding the validity, factor structure, and composition of the SPEQ (Conroy & Motl, 2003; Conroy et al., 2000; Gammage, Hall, Prapavessis, et al., 2004; Lindwall, 2005), this questionnaire remains the only measure currently available in the physical activity domain that is based on Leary and Kowalski’s (1990) two-component model of self-presentation and has allowed research on self-presentation and physical activity to progress. Nonetheless, it is important to note that various versions of the SPEQ have been used (e.g., 8, 9, 11, or 14 items; Conroy & Motl, 2003; Gammage, Hall, Prapavessis, et al., 2004). These versions were derived based on studies with college and/or university students. Thus, the SPEQ merits psychometric testing in this sample of breast cancer survivors.

**Social Cognitive Constructs.** The Self-Presentation Efficacy Scale (SPES; Gammage, Hall, & Martin Ginis, 2004) was used to assess SPEE, SPOE, and SPOV. The SPEE subscale asked participants to indicate the degree to which they are confident in performing behaviors and presenting images that would lead to specific self-presentation outcomes (five items; e.g., “How confident are you that other people will think that you are in good shape”) using a 100-point scale ranging from
not at all confident to completely confident. The SPOE and SPOV subscales asked participants to rate the extent to which they believe that specific self-presentation outcomes will result from exercising (five items; e.g., “By exercising regularly, other people will that my body looks fit and toned”) and the value they place on achieving these outcomes (five items; e.g., “I place a lot of value of being known as someone who is in good shape”), respectively. These items were rated on a 6-point Likert scale ranging from strongly disagree to strongly agree. A mean score for each subscale was calculated by summing the respective items and dividing by the total number of responses for each subscale. The internal consistency coefficients for the SPEE, SPOE, and SPOV scores exceeded Nunnally’s (1978) suggested criteria
of .70 in previous research in the physical activity domain with young and older adult samples (Gammage, Hall, & Martin Ginis, 2004; Lamarche & Gammage, 2010; Woodgate et al., 2003) and in the current study (see Table 2).

**Physical Activity Behavior.** Physical activity was assessed using the first item from the two-item 7-day recall Leisure Time Exercise Questionnaire (LTEQ; Godin & Shephard, 1985). The item, which was modified from the original scale, asked participants to report the frequency per week and average duration of strenuous, moderate, and mild physical activity sessions. The modification, to ask women to report on the average length of time for each session rather than capping it at 15 min or more, was identical to previous studies assessing physical activity among breast cancer survivors (e.g., Andrykowski, Beacham, & Jacobsen, 2007; Courneya et al., 2009; Vallance, Plotnikoff, Karvinen, Mackey, & Courneya, 2010). This modification was made both to capture more information on physical activity in this population as well as to enable meaningful comparisons across studies. Scores were transformed into weekly metabolic equivalents (METs) by multiplying weekly minutes of strenuous, moderate, and mild physical activity by 9, 5, and 3, respectively (Andrykowski et al., 2007). A moderate-to-vigorous physical activity score was calculated by summing strenuous and moderate METs. Researchers have reported acceptable reliability coefficients (i.e., 2-week test–retest reliability $r = .74$), as well as evidence for the construct validity of the LTEQ scores by showing moderate positive correlations with subjective and objective measures of physical activity (e.g., accelerometer $r \geq .32$) and fitness in various populations (e.g., VO$_2$max $r \geq .24$; Godin & Shephard, 1985; Jacobs, Ainsworth, Hartman, & Leon, 1993; Kowalski, Crocker, & Kowalski, 1997; Motl, McAuley, & DiStefano, 2005).

**Data Analysis**

The data were examined for missing data. Multiple imputation (expectation-maximization algorithm; Dempster, Laird, & Rubin, 1977) was used to estimate and replace missing observations since less than 2% of the scores were missing at random. First, CFA for ordered-categorical data were conducted in LISREL using robust maximum likelihood estimation methods to test the hypothesized two-factor model of the SPEQ in this study. Model fit was assessed using robust estimates including root mean square error of approximation (RMSEA, values close to .06 indicate acceptable fit), standardized room mean squared residual (SRMR, values close to .08 indicate acceptable fit), and comparative fit index (CFI, values close to .95 indicate acceptable fit; Hu & Bentler, 1999). If fit indices were below suggested values, modification indices were examined to see where improvements could be made. Then, descriptive statistics (e.g., means, standard deviations, Cronbach alpha coefficients) for measured variables were computed. Whereas the observed variables were treated as ordinal in the CFA analyses, impression motivation and impression construction mean scores were treated as continuous in the descriptive and regression analyses because these scores reflect continuous-level data.

Main analyses involved hierarchical multivariate linear regression analysis to examine the associations between self-presentation processes (i.e., impression motivation, impression construction) and physical activity behavior, and whether SPEE, SPOE, and SPOV moderate these relationships. Before these analyses, study variables were examined for violations of the assumptions of multivariate
Table 2  Mean Scores, Standard Deviations, Score Ranges, and Reliability Coefficients for Study Variables (N = 169)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Range</th>
<th>Mean (SD)</th>
<th>Skewness</th>
<th>Kurtosis</th>
<th>( \alpha )</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>IM</td>
<td>1–6</td>
<td>3.18 (.91)</td>
<td>-.44</td>
<td>-.27</td>
<td>.85</td>
<td>—</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IC</td>
<td>1–6</td>
<td>2.02 (.77)</td>
<td>.27</td>
<td>-1.21</td>
<td>.90</td>
<td>.66**</td>
<td>—</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SPEE</td>
<td>0–100</td>
<td>55.83 (22.33)</td>
<td>-.60</td>
<td>-.21</td>
<td>94</td>
<td>.32**</td>
<td>.18*</td>
<td>—</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SPOE</td>
<td>1–6</td>
<td>3.45 (1.19)</td>
<td>-.52</td>
<td>.001</td>
<td>94</td>
<td>.46**</td>
<td>.39**</td>
<td>.35**</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>SPOV</td>
<td>1–6</td>
<td>3.47 (1.21)</td>
<td>-.41</td>
<td>-.01</td>
<td>93</td>
<td>.63**</td>
<td>.45**</td>
<td>.35**</td>
<td>.62**</td>
<td>—</td>
</tr>
<tr>
<td>MVPA (METs)</td>
<td>0–860</td>
<td>200.75 (187.41)</td>
<td>1.27</td>
<td>1.76</td>
<td>—</td>
<td>.22**</td>
<td>.12</td>
<td>.30**</td>
<td>.18*</td>
<td>.28**</td>
</tr>
</tbody>
</table>

Note. IM = impression motivation. IC = impression construction. SPEE = self-presentational efficacy expectancy. SPOE = self-presentational outcome expectancy. SPOV = self-presentational outcome value. MVPA (METs) = mean sum of weekly moderate and strenuous metabolic equivalents.

Cronbach alpha coefficients.

\*p < .05. **p < .001.
analysis. Separate models were conducted for each potential moderator to maintain parsimony of models. Each model controlled for age and body mass index (BMI = weight in kilograms/height in meters squared) since they were significantly related to self-presentation processes and/or physical activity. Of note, disease related characteristics were also initially entered as covariates. This did not change the pattern or statistical significance of any of the results. Therefore, these additional covariates were not included in any of the analyses reported here. Before the analyses, impression motivation, impression construction and social cognitive moderator scores were centered (Aiken & West, 1991). Entry was specified a priori where age and BMI were included in the first step of the regression model as covariates. Impression motivation and impression construction were entered in the second step. SPEE was entered in the third step and the interaction terms between impression motivation and SPEE and between impression construction and SPEE were included in the final step to test moderation. These analyses were repeated to test the moderating effects of SPOE and SPOV. A moderating effect was supported when the interaction term was significant and the variance accounted for in the regression equation significantly increased when the moderator term was added to the equation. To analyze the significant interactions, these were graphed and a simple slopes analysis was conducted (Aiken & West, 1991).

**Results**

**Preliminary Results**

Sociodemographic and disease characteristics of the sample (N = 169) are presented in Table 1. Previously established models of the SPEQ (i.e., 14-item; 11-item; 9-item; 8-item) were initially tested to see if one of these models resulted in a good-fitting model. Because none of these models provided an acceptable fit to the data in this sample, an iterative process using the original 20-item SPEQ was followed to obtain a good-fitting model. Only the CFI value for the CFA revealed the 20-item model had acceptable fit (Satorra-Bentler scaled $\chi^2 = 338.97$, $df = 169$, RMSEA = .09, CFI = .97, SRMR = .11). The LISREL modification indices indicated that allowing the measurement errors between Item 10 and Items 8 and 14 to correlate would significantly improve the fit of the model. The measurement errors between these items were allowed to correlate. In addition, the factor loadings were low for Items 5 (i.e., .23; “I try to appear toned or fit to others”) and 6 (i.e., .11; “appearing fit or healthy to others is not important to me”). These items were deleted one at a time, followed by reestimation of the model. This iterative process resulted in the deletion of Item 6 because of the considerable improvement in model fit. Deletion of Item 5 did not result in a change of fit indices and was therefore retained. Reestimation of the 19-item model was found to have acceptable fit indices (Satorra-Bentler Scaled $\chi^2 = 234.97$, $df = 149$, RMSEA = .06, CFI = .98, SRMR = .08) and all items loaded significantly on their respective factor ($p < .001$). At this point, the modification indices did not suggest any further changes in the model that could be interpreted in a substantive manner. Thus, an oblique two-factor model which consisted of 19 items (excluding Item 6), allowed the measurement errors between Item 10 and Items 8 and 14 to correlate, and represented impression motivation and impression construction as two distinct, yet related constructs was supported and used in the remaining analyses.
Means, standard deviations, score ranges, bivariate correlations, and reliability coefficients for study variables are reported in Table 2. In general, participants reported moderate levels of impression motivation and low levels of impression construction relative to the scale range. The distributional properties of each variable suggested that the assumptions of normality, homoscedasticity, and linearity required for the multivariate regression analyses were met. In addition, there was no evidence of multicollinearity based on the correlations and variation inflation factor indices in the preliminary regression analyses.

**Main Results**

Table 3 contains a summary of the hierarchical regression analyses. Age and BMI (Step 1) accounted for 5% of the variation in physical activity. Impression motivation and impression construction (Step 2) contributed to a further 5% of the variance, with impression motivation making a significant independent contribution. SPEE, SPOE, and SPOV explained an additional 4%, 1%, and 3% of the variance in physical activity, respectively, when entered on Step 3 in the separate regression models. The addition of the impression motivation $\times$ SPEE and impression construction $\times$ SPEE interaction terms (Step 4) explained an additional 10% of the variance in physical activity, with the impression motivation $\times$ SPEE interaction term making a significant independent contribution. As can be seen in Figure 1, participants who had high levels of impression motivation coupled with high levels of SPEE reported highest levels of physical activity, whereas participants who had high levels of impression motivation but low levels of SPEE reported the lowest levels of physical activity. Furthermore, the simple slopes analysis demonstrated

![Figure 1](image.png)

**Figure 1** — Graph of the interaction effect of impression motivation and self-presentational efficacy expectancy on moderate-to-vigorous physical activity (MVPA). IM = impression motivation. SPEE = self-presentational efficacy expectancy. MVPA (METs) = mean sum of weekly moderate and strenuous metabolic equivalents.
that impression motivation was significantly related to physical activity when participants reported high levels of SPEE ($\beta = .34, p < .01$), but not when SPEE was low ($\beta = -.18, p > .05$). A similar pattern was observed for SPOV (see Figure 2), where impression motivation was significantly related to physical activity when participants reported high levels of SPOV ($\beta = .29, p < .01$), but not when SPOV was low ($\beta = -.07, p > .05$). The interaction terms involving SPOE did not significantly increase the variance explained in physical activity.

![Figure 2](image)

**Figure 2** — Graph of the interaction effect of impression motivation and self-presentational outcome value on moderate-to-vigorous physical activity (MVPA). IM = impression motivation. SPOV = self-presentational outcome value. MVPA (METs) = mean sum of weekly moderate and strenuous metabolic equivalents.

**Discussion**

The current study extended previous research focused on self-presentation in the physical activity domain by examining the associations between self-presentation processes and physical activity among an under-represented population in self-presentation research (i.e., breast cancer survivors). An important first step was to test the psychometric properties of the SPEQ with this sample. An oblique two-factor model that included 19 items from the original SPEQ and that estimated impression motivation and impression construction as two distinct, yet related constructs, while specifying the measurement errors between Item 10 and Items 8 and 14 to correlate, was found to be an adequate measure of self-presentation processes in this sample. It could therefore be used to examine of the associations between self-presentation processes and physical activity in this study. Impression motivation was a significant positive correlate of physical activity, and SPEE and SPOV were moderators of this relationship. These findings provide insight into the theoretical relationships suggested to exist among self-presentation processes and
<table>
<thead>
<tr>
<th>Variables</th>
<th>SPEE Moderation Model</th>
<th>SPOE Moderation Model</th>
<th>SPOV Moderation Model</th>
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<td></td>
<td>F</td>
<td>R²</td>
<td>ΔR²</td>
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<tr>
<td>Step 1:</td>
<td>4.57*</td>
<td>.05</td>
<td>.05</td>
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<tr>
<td>BMI</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td></td>
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<td>Step 2:</td>
<td>4.58*</td>
<td>.10</td>
<td>.05</td>
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<tr>
<td>IM</td>
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<td></td>
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<tr>
<td>IC</td>
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<tr>
<td>Step 3:</td>
<td>5.05*</td>
<td>.14</td>
<td>.04</td>
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<tr>
<td>SPEE</td>
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<td>SPOE</td>
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<tr>
<td>SPOV</td>
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<td>Step 4:</td>
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<td>.24</td>
<td>.10</td>
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<td>IM×SPEE</td>
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<tr>
<td>IC×SPEE</td>
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Note. IM = impression motivation. IC = impression construction. SPEE = self-presentational efficacy expectancy. SPOE = self-presentational outcome expectancy. SPOV = self-presentational outcome value. MVPA (METs) = mean sum of weekly moderate-to-vigorous physical activity.

*p < .05.
physical activity in a population of breast cancer survivors. Taken together, these findings indicate that there is considerable scope for examining self-presentation processes and social cognitive constructs in future research that seeks to understand participation in moderate-to-vigorous physical activity in this population.

Confirming the psychometric properties of the SPEQ is important because inadequate measures confound the interpretation of research results. Although researchers (Conroy & Motl, 2003; Conroy et al., 1998, 2000; Gammage, Hall, Prapavessis, et al., 2004) have devoted attention to these issues, most of this work was conducted with young adult samples and may not be generalizable across different samples. Similar to past work (Conroy & Motl, 2003; Conroy et al., 1998, 2000; Gammage, Hall, Prapavessis, et al., 2004), the SPEQ was best represented as a two-factor oblique model with impression motivation and impression construction factors. However, slight modifications were necessary to obtain an acceptable fit of the CFA model in the current study. Given that incorrect specification of measurement error can affect estimates of parameters in the model (Reddy, 1992), the measurement errors between two pairs of items in the SPEQ were allowed to correlate. Correlated errors were likely observed in this study since these items were worded similarly and asked about clothing (i.e., “I often wear exercise clothing even when I am not exercising to ensure that others know I am an exerciser”; “I wear exercise/athletic clothing so other people will see me as an exerciser”; “I wear exercise clothes that are flattering or revealing so others can tell that I am fit and/or attractive”). In addition, one item (i.e., “appearing fit or healthy to others is not important to me”) was deleted. This was the only negatively worded and therefore reverse-coded item. There is evidence suggesting the negatively worded items provide different factor structures than positively worded items (Schriesheim & Eisenbach, 1996). In addition, previous work on the SPEQ has also suggested that this item does not perform well (Conroy et al., 1998, 2000). Notwithstanding these observations, the current study represents the first attempt to assess self-presentation processes among breast cancer survivors. Based on the results, the 19-item SPEQ scale could be used to examine self-presentation processes (i.e., impression motivation and impression construction) and their influence on physical activity among breast cancer survivors in this study. It should be noted that the resulting SPEQ model in current study differs from models reported in previous studies in that previous studies have deleted more items than in the current study (Conroy & Motl, 2003; Conroy et al., 1998, 2000; Gammage, Hall, Prapavessis, et al., 2004). Furthermore, these results are limited to the current sample and the scale should be validated with a separate sample. This would increase the likelihood that the model obtained in the current study holds across different samples of breast cancer survivors. Moreover, research is needed to determine whether it is possible to obtain a consistent measure of self-presentation processes across studies and populations or whether the lack of consistency is indicative of different conceptualization of these constructs for different populations.

In addition to testing the psychometric properties of the SPEQ, this study is the first to examine levels of and associations between self-presentation processes and physical activity among breast cancer survivors. Using the 19-item SPEQ, this study adds to the literature by showing that moderate levels of impression motivation and low levels of impression construction were reported by women in the early stages of cancer survivorship. The lack of research on these constructs in this population makes it difficult to compare the current data with other studies.
and draw conclusions about the levels of impression motivation and impression construction among breast cancer survivors. Direct comparison with studies in other populations is also difficult because different versions of the SPEQ were used across studies. Nonetheless, it appears that reported means in the current study are comparable to previous research with young adults reporting moderate levels of impression motivation (Conroy & Motl, 2003; Conroy et al., 2000; Cumming & Thøgersen-Ntoumani, 2011; Gamage, Hall, Prapavessis, et al., 2004) and low levels of impression construction (Conroy & Motl, 2003; Conroy et al., 2000; Gamage, Hall, Prapavessis, et al., 2004). This suggests self-presentation concerns are not restricted to young adults, but may also be pertinent to breast cancer survivors.

Moreover, this study adds to the literature by demonstrating that impression motivation was significantly and positively associated with physical activity in a sample of breast cancer survivors. This is consistent with findings from previous studies (Conroy et al., 2000; Cumming & Thøgersen-Ntoumani, 2011; Lindwall, 2005). For example, Lindwall (2005) found that impression motivation was positively associated with frequency and duration of physical activity. Similarly, Conroy et al. (2000) found that the number of days per week individuals participated in physical activity, but not the number of hours per week, was higher among individuals who were motivated to create the impression of being fit and an exerciser than among those who were less motivated to create these impressions. Collectively, these findings support and extend theoretical perspectives (Leary, 1992) that people’s motives to engage in physical activity often mirror self-presentation motives. Accordingly, these findings provide a basis for integrating impression motivation into theories designed to explain and predict physical activity behavior in breast cancer survivors. In spite of finding that impression motivation may be a driving force that motivates breast cancer survivors to engage in physical activity, it is important to note that theories of motivation (e.g., self-determination theory; Deci & Ryan, 1985) outline the importance of engaging in a behavior for intrinsic reasons (e.g., positive health benefits, enjoyment, and fun), rather than extrinsic reasons (e.g., guilt, pressure, obtain an outcome that is separable from the activity itself, pleasing others). Indeed, the former has been shown to be a better predictor of long-term physical activity (Mullan & Markland, 1997). Based on goal content perspectives (Vansteenkiste, Lens, & Deci, 2006), it could be reasoned that impression motivation is an extrinsic reason because people are motivated to engage in the activity to obtain an outcome that is separable from the activity itself. Researchers have provided initial support for the notion that self-presentation motives may be similar to a controlled orientation toward behaviors (Lewis & Neighbors, 2005; Paternoster, Brame, Mazerolle, & Piquero, 1998), which in turn may lead people to the pursuit of behaviors for extrinsic reasons. Thus, interventions promoting enjoyable activities and intrinsic motivation are needed to promote the maintenance of a physically active lifestyle in this population.

Contrary to the current hypothesis and findings reported by Lindwall (2005), impression construction was not significantly related to physical activity. This finding is in line with findings from Conroy et al.’s (2000) study and suggests that delineating impression motivation and impression construction is valuable because they appear to have different links with physical activity. Speculatively, self-regulation depletion may explain why impression construction was not related to physical activity. Vohs, Baumeister, and Ciarocco (2005) provided evidence that engaging in self-presentation actions that defy one’s view of him- or herself
depletes self-regulatory resources. This is because impression construction, contrary to impression motivation, which does not involve actions per se, requires effortful planning and altering of one’s behavior to convey the intended self-image, which may consequently impair one’s behavior. Based on this view, the treatment side effects of cancer (e.g., hair loss, weight gain, loss of muscle mass, fatigue) may make breast cancer survivors’ desired image even more distant from their perceived current image. This would mean that they need to use considerable effort (i.e., self-regulation) to engage in the process of creating a desired image (i.e., impression construction) because it may be hard to make a desired impression under such conditions. Thus, impression construction may deplete self-regulation and this may help explain why impression construction was not related to physical activity in this population. Researchers should consider integrating both self process theories, and examine whether SPEE and SPOV counteract self-regulation depletion.

The final hypothesis of this study was partially supported in that SPEE and SPOV, but not SPOE, were found to be significant moderators of the relationship between impression motivation and physical activity. Examination of the interaction terms indicated that women who wanted to create the impression of being athletic, lean and fit and believed that they could successfully do so (i.e., SPEE), or place a lot of importance on making this impression (i.e., SPOV), were more active. In contrast, women who wanted to create this impression but doubted their ability, or did not place a lot of importance on making this impression, were less active. These findings are consistent with those reported by Gammage, Hall, and Martin Ginis (2004). Specifically, the authors reported that low- (physically active ≤ 2 days/week) and high- (≥ 3 days/week) frequency exercisers reported similar levels of impression motivation; however, high-frequency exercisers reported higher perceptions in their ability to convey a desired impression (i.e., SPEE) and placed more importance on portraying the desired impression (i.e., SPOV) than low-frequency exercisers. Furthermore, Woodgate et al. (2003) found that SPEE was a moderator such that older women with high SPEE and low social physique anxiety (SPA; a construct closely related to self-presentation processes), were more likely to exercise than women with low SPA and low SPEE. Collectively, these findings partially support theoretical perspectives (Bandura, 1986, 1997; Rotter, 1954), and demonstrate the importance of considering social cognitive variables, namely SPEE and SPOV, since they may help explain whether women reporting high impression motivation will engage in or avoid physical activity.

There are limitations pertaining to this study. It should be noted that results are based on a convenience sample of breast cancer survivors. In addition, this cross-sectional study design prevents conclusions regarding causality. Furthermore, Item 5 on the SPEQ was retained in the analyses since it did not compromise the fit of the CFA model. The low factor loading for this item suggests it may not be salient to the assessment of impression motivation in this sample of breast cancer survivors. Future research is needed to understand why this item exhibited a low factor loading in this population. A related limitation is the fact that the SPEQ assesses a subset of strategies used for constructing desired images (Conroy & Motl, 2003; Gammage, Hall, Prapalessis, et al., 2004). Thus, although the current findings provided support for the internal consistency and validity (i.e., factor structure, composition) of the SPEQ scores in this study, an important next step in this regard would be to test the scale in an independent sample of breast cancer survivors, and develop and test
additional items to enable the exploration of a greater range of strategies used to create impressions. This may help improve the measurement of self-presentation processes within this population and help explain a greater proportion of the variance in physical activity behavior. Finally, the use of a self-report measure to assess physical activity behavior may have inherent limitations (e.g., inability to recall activities, intensity and duration, social desirability). Researchers should consider using a combination of self-report questionnaires and objective assessments (e.g., accelerometers, heart-rate monitors or pedometers) to obtain accurate estimates of energy expenditure.

Despite these limitations, the findings from this study make a contribution to theory and research. First, they provide new insight on the relationships between self-presentation processes, social cognitive constructs, and physical activity among breast cancer survivors. Accordingly, this study provides support for the integration of self-presentation processes and social cognitive variables into theories used to study physical activity behavior among breast cancer survivors. Second, women who had recently completed treatment for cancer were targeted. It has been suggested that the completion of primary treatment for breast cancer is a “teachable moment” for promoting health behaviors such as physical activity (Demark-Wahnefried & Jones, 2008), yet many studies that have focused on elucidating correlates of physical activity among breast cancer survivors have included long-term survivors. As such, this study provides novel insight into the associations between psychosocial variables and physical activity during this key time when women may be coping with their altered physical selves and general inactivity (Irwin et al., 2004). These findings are unique since studies adopting a self-presentation framework in exercise psychology have focused on young adult samples and little is known about modifiable factors related to physical activity among breast cancer survivors. Thus, this preliminary exploration may also help guide future practice in this area. Based on the current findings, researchers should examine whether interventions targeting impression motivation, self-presentational efficacy expectancy and outcome value effectively increase physical activity in this population.

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References


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