
THE EFFECT OF SELF-LEADERSHIP AND PHYSICAL VITALITY ON LIFE AND WORK SATISFACTION

Sibylle Georgianna, Ph.D¹, Günter F. Müller, Ph.D², Karin Schermelleh-Engel, Ph.D.³ and Daniela Lohaus, Ph.D.⁴

¹Vanguard University of Southern California*

²University of Koblenz-Landau, Germany

³University of Frankfurt, Germany

⁴University of Darmstadt, Germany

Correspondence should be addressed via e-mail to: Sibylle Georgianna, Ph.D. sgeorgianna@gmail.com | (917) 620 0481 | The Leadership Practice, Psychology Consultations Inc. | 25411 Cabot Road Suite 102 | Laguna Hills, CA 92653

*During the time of the research study, Sibylle Georgianna served as full-time faculty member at Vanguard University, Department of Graduate Organizational Psychology, 55 Fair Drive, Costa Mesa, CA 92627.

ABSTRACT

What role does self-leadership play for individuals' physical vitality and subjective well-being? The authors examined the data from 177 job incumbents and 165 students. Nonlinear structural equation modeling revealed a latent moderator effect of self-leadership on physical vitality and well-being. For individuals with low self-leadership, more physical vitality led to increased well-being, while for those with high self-leadership, no effect was detected. Understanding the role of high vs. low self-leadership in current and future physical vitality and well-being adds insight as to how health-related interventions should be structured to optimize well-being and accompanying positive working behaviors.

KEYWORDS: Physical vitality, subjective well-being, self-leadership, health-related interventions, nonlinear structural equation modeling.

INTRODUCTION

Work-related stress and its effects, in terms of both physical and psychological health, influences today's workforce around the globe. For example, in 2005, the European Agency for Safety and Health at Work reported that 22% of workers in the European Union experience high levels of stress (Alexopoulos et al., 2014).

In recent years, the influence of physical vitality for stress reduction and successful performance has received the attention of researchers (e.g., Dishman et al., 2005; Neck et al., 2017). Neck et al. (2016) reported from interviews conducted with CEOs that the reduction of stress can be achieved by using physical exercise and the pursuit of a healthy diet. Dishman et al. (2005) provided empirical evidence of how one's awareness of bodily states and cognitions can stimulate engagement in physical activity and the pursuit of a healthy diet. The benefits of physical vitality have mostly been studied with regard to their positive impact on mental health and stress management. The current study focuses on the

impact of self-leadership on physical vitality and its relationship to stress reduction (as measured by individuals' well-being).

The Relevance of Subjective Well-being in The Workplace

Diener (1984) first conceptualized one's subjective well-being as consisting of cognitive (i.e., one's life satisfaction) and emotional (i.e., one's positive and negative emotions) experiences. Life satisfaction and job satisfaction were regarded as indicators of the construct "well-being" (see Diener, 1994; Wright, 2014). Life satisfaction is based on the perception that a person has about his/her life in several domains (Diener, 1984; Diener & Tay, 2012). Life satisfaction seems to be one of the most extended construct for assessing subjective well-being (Helliwell et al., 2013). Work satisfaction is one of the most common ways to conceptualize and measure well-being in the workplace (Jiménez et al., 2014). Most definitions of work satisfaction tend to focus on how employees feel and think about their work (Locke, 1969; Smith et al. 1969; Weiss, 2002; Drafke, 2009). Measures of work satisfaction resemble measures of life satisfaction as they involve self-ratings of emotional states, feelings, affective responses, and cognitions (Unanue et al., 2017). Existing studies identified the positive relationship of individuals' work satisfaction and job performance, organizational citizenship behavior, and life satisfaction. Furthermore, individuals' work satisfaction was negatively correlated to absenteeism (Heller et al., 2002; Erdogan et al., 2012). The relationship of physical vitality and well-being at work has not yet been explored.

Three Components of Physical Vitality

(1) Physical Exercise

The first component of physical vitality is the use of physical exercise. Physical exercise seemed to buffer the negative effects associated with stress (Gerber & Pühse, 2009). Specifically, physical exercise seems to act as a coping mechanism to deal with critical life events and demands placed on an individual in today's complex work and personal environments (Cooper & Berwick 2001; Gerber et al., 2010). Crone et al. (2005) reported that individuals who exercised more frequently exhibited enhanced coping with all aspects of their life, especially critical life events occurring on the job and at home. Sonnentag and Bayer (2005) found that employees who moderately exercised in the evening reported enhanced positive mood and general well-being. Meta-analyses by Crews and Landers (1987) and Wipfli et al. (2008) showed that physically fit individuals reacted less psychosocially aversive to stressful events compared to control groups. Individuals who exercised interpreted stressful events differently and reported a greater sense of control of their lives than individuals who did not exercise (e.g., Buckaloo et al., 2009; Ritvanen et al., 2007; Norris et al., 1990). While the aforementioned research may have sufficiently explored the relationship of physical exercise and stress management, the impact of physical vitality on one's well-being (i.e., one's job satisfaction and life satisfaction (Diener, 1994; Wright, 2014)) has received less attention (e.g., Alexopoulos et al. 2014; Frew & Bruning, 1988; Ruffieux et al., 2014).

(2) The Pursuit of a Healthy Diet

The second component of physical vitality is the pursuit and maintenance of a healthy diet. Employees' access to healthy nutrition is frequently addressed by organizations' comprehensive wellness programs. Such wellness programs tend to be evaluated by whether or not they increase employees' job satisfaction and performance (Parks & Steelman, 2008). Comprehensive wellness programs ordinarily consist of interventions to increase employees' engagement in physical activity and provide information about healthy dieting and nutrition. A meta-analysis of wellness programs revealed that employees who engaged in physical vitality activities showed a decreased level of absenteeism and increased level of job satisfaction (Parks & Steelman, 2008). Due to the lack of empirical studies one can only speculate about the outcomes of dietary interventions, such as the sustainability of physical exercise and/or healthy food intake, or the impact of (un)successful healthy dieting on well-being.

(3) Physical Relaxation through Tension Release

A third component of physical vitality is the effective release of physical tension. Strategies that facilitate the release of tension are mindful breathing, progressive muscle relaxation, meditation, or yoga. Applying these techniques seems to decrease employees' stress levels as well as to improve employees' sleep quality and inner balance (Wolever et al., 2012). One can only speculate that effective tension release may contribute to greater well-being (as measured through increases in one's job satisfaction and life satisfaction) as studies have yet to address the impact of tension release on well-being.

Although the exact mechanisms may be unclear, there is ample evidence that exercise, healthy nutrition, and effective tension release may buffer the negative effects of stress on a variety of outcomes (e.g., Buckaloo et al., 2009; Ritvanen et al., 2007; Norris et al., 1990; Parks & Steelman, 2008; Wolever et al., 2012; Alexopoulos et al. 2014; Frew & Bruning, 1988; Ruffieux et al., 2014). Neck et al., (2017) speculated that individuals' ability to lead themselves ("self-leadership") was a crucial mechanism to promote exercise and the pursuit of a healthy diet, and, hence, should be used to improve employees' fitness on the job. Müller, Georgianna and Roux (2010) empirically identified individuals' use of self-leadership strategies as the mechanism by which individuals effectively used physical vitality strategies.

The Importance of Self-leadership for Vitality and Well-being

The ability to lead oneself consists of "a self-influence process through which people achieve the self-direction and self-motivation necessary to perform" (Neck & Houghton, 2006, p. 271). Questionnaire studies identified three major categories of self-leadership strategies: strategies to create (1) constructive thoughts, (2) naturally rewarding circumstances, and (3) effective behaviors (Houghton

& Neck, 2002; Müller, 2006; Georgianna, 2009; Prussia et al., 1998). Research on self-leadership highlighted the benefit of these strategies on work performance (e.g., Carr et al., 1989), self-awareness (Müller & Braun, 2009), self-efficacy (Landman & Schmitz, 2007), problem solving (Meichenbaum, 1994; Müller et al., 2010), health and well-being (Neck et al., 2017), occupational change (Neck & Manz, 1996), and entrepreneurial orientation (Müller & Gappisch, 2005).

Three Components of Self-leadership

(1) Strategies to create constructive thoughts. Constructive thought strategies consist of using self-dialogue (i.e., encouraging oneself with positive self-talk), mental imagery (i.e., mentally imagining a desired behavior and its successful outcomes prior to engaging in the behavior), and non-judgmentally reflecting on one's beliefs, attitudes and convictions (e.g., Neck & Houghton 2006; Neck & Manz, 2013). Using constructive thought strategies helped individuals' in effectively coping with occupational stress (Houghton et al., 2012).

(2) Strategies to create natural rewards. Natural reward strategies range from discovering and adding pleasant features to a given activity so that the activity itself becomes more attractive and enjoyable (Manz & Neck, 2004; Manz & Sims, 2001) to re-interpreting physiological arousal in positive terms (e.g., excitement, challenge) and utilizing its proactive effects (Müller & Braun, 2009). D'Intino et al. (2012) speculated that using natural reward strategies may create a work environment that leads to more satisfaction on the job.

(3) Strategies to induce effective behaviors. Previous research identified the systematic self-observation during goal striving and after goal attainment (e.g., by keeping a diary or behavior log) as an effective behavioral self-leadership strategy (Georgianna, 2007a, 2007b; Manz & Neck, 2004; Manz & Sims, 1980, 2001). Other behavioral strategies of self-leadership are the observation and imitation of role-models who show successful problem solving (Manz & Neck, 2004) or coping with situational change and challenges (Müller, 2006).

The Influence of Self-leadership on Well-being

What is the effect of self-leadership on the relationship of participants' use of physical vitality and their well-being? Does self-leadership moderate the relationship of physical vitality and well-being? To find answers to these questions, the current study derived the following hypotheses:

H 1: Individuals' use of physical vitality strategies (i.e., exercise, nutrition, and physical relaxation) and their use of self-leadership (i.e., constructive thought strategies, strategies to create rewarding circumstances, and effective behavior strategies) correlates positively.

H 2: The use of self-leadership strategies and well-being (i.e., job satisfaction and life satisfaction) is

positively correlated.

H 3: The relationship of physical vitality and well-being is moderated by self-leadership.

METHOD

Participants and Data Collection

Three-hundred-forty-two individuals participated in the study. As there are less resources needed to conduct the typical cross-sectional design than those needed to investigate the robustness of findings over time, we began the investigation of a potential causal link by establishing the existence of covariation between variables.

This sample consisted of 209 females (61.1%), 130 males (38.0%), and three participants with “other biological sex” (0.9%). Forty-eight percent of the participants were students (48.2%), fifty-two percent were full- or part-time employees. The sample consisted of 154 participants who were 25 years and younger (45%), 95 participants between 26 and 40 years old (27.8%), and 93 participants who were 41 years and older (27.2%). One-hundred-sixty-seven participants were students and 174 participants had completed a degree or had gone through job training certified by a local chamber of commerce or trade association. The majority of the sample (79.8%) was recruited via internet by using university mailing lists, social-media-networks, and news groups. Interested participants could follow a link leading to an online questionnaire. A smaller portion of the sample (20.1%) was recruited by personal contacts on the university campus and the city of Darmstadt, Germany.

Measures

Demographics. Participants’ sex, age, degree completion (student vs. employee), and years of work experience was captured via four items.

Physical Vitality. Based on studies by Dishman et al. (2005), Müller et al. (2010), and other sources (Neck & Cooper, 2000; Müller, 2014), a questionnaire was developed to measure physical vitality using the following three subscales: (1) the use of physical exercise; (2) healthy food intake; and (3) tension reduction techniques.

The construction of scales occurred in three steps. In step 1, 161 features were collected that represented a broad variety of physical vitality related activities. In step 2, these features were formulated in terms of concrete behavioral descriptions. A content-analytical item selection was performed in step 3. This selection resulted in a reduced version of 54 items, i.e., 18 items for each type of activity. For item selection, several criteria were taken into account: non-overlapping contents, behavioral specificity, assumed discriminatory power, and unambiguity of meaning. Independent raters reviewed and discussed each item according to the aforementioned criteria. To ensure that

respondents would not disengage from the survey due to its length, the item pool was further reduced to 30 items through random selection of ten items per sub-scale, e.g., “Engaging in sports and physical activities contribute much to my ability to perform well.”, “My diet is balanced and rich of vegetables, fruit, and fiber.” or “I am using relaxation strategies when I am nervous or stressed.”

All items were rated on a 4-point Likert-type scale ranging from 1 (“does not describe me at all”) to 4 (“describes me very much”). Internal consistencies, i.e., Guttman’s lambda(2) and composite reliability (McDonald’s omega) of the three scales were sufficiently high (use of physical exercise: $\lambda(2) = 0.89$; $\omega = .90$; pursuit of a healthy diet: $\lambda(2) = 0.85$; $\omega = .85$; use of physical relaxation: $\lambda(2) = 0.72$; $\omega = .71$).

Self-leadership Strategies. The use of self-leadership strategies was measured by an 8-item short version of the German Self-Leadership-Questionnaire ((GSLQ-Short) Müller, 2006). The eight items were selected based on theory as well as on statistical criteria, i.e., factor loadings of a confirmatory factor analysis as well as item difficulty. Sample items were, e.g., “Even when I engage in routing tasks I can find pleasant aspects in doing such tasks.”, and “I continuously strive to increase my task performance.” Participants responded to all items on a 4-point Likert-type scale ranging from 1 (“does not describe me at all”) to 4 (“describes me very much”). Internal consistencies, i.e., Guttman’s lambda (2) and composite reliability (McDonald’s omega) of the scale were sufficiently high with $\lambda (2) = 0.70$ and $\omega = .72$.

Subjective Well-being: (1) Life Satisfaction and (2) Work Satisfaction.

(1) Life satisfaction. Life satisfaction was measured with the Satisfaction with Life Scale (SWLS; Diener et al., 1985; Pavot & Diener, 1993; Pavot et al., 1991). Sample items were “Overall I am satisfied with my life” and “Setbacks do influence my satisfaction with life only temporarily.” Participants’ responses to the items were on a 4-point Likert-type rating scale, ranging from 1 (“does not apply”) to 4 (“does fully apply”). The SWLS showed favorable psychometric properties, including a high internal consistency of $\alpha > .80$ (Pavot & Diener, 1993) and high consistency as well as low specificity (Eid & Diener, 2004). Internal consistency of life satisfaction in this study was $\alpha = .82$.

(2) Work satisfaction. Job satisfaction was measured using adapted items of the Profile Analysis of Job Satisfaction (PAZ) (Jiménez, 2008). Respondents of the PAZ evaluate different work-rated conditions such as working environment, payment, colleagues, career opportunities, supervision, organizational politics, and satisfaction with work in general. The five items used in this study were selected and reformulated with reference to work conditions applicable to employees as well as students. Sample items were, e.g., “I am overall satisfied with my work.” and “I am satisfied with the conditions of my work.”

Response options were on a 4-point Likert-type rating scale, ranging from 1 (“does not apply”) to 4 (“does fully apply”). Internal consistency of job satisfaction in this study was $\alpha = .79$. The PAZ showed favorable psychometric properties (Jiménez, 2003).

Data Analysis

Descriptive statistics. Means, standard deviations, and zero-order correlations of scales measuring physical vitality, self-leadership, life satisfaction, and job satisfaction were computed using the Statistical Program for Social Sciences (SPSS) Version 22.0 for Windows (IBM 2014).

A multivariate analysis of variance (MANOVA) was used to investigate mean differences between sex, age, degree completion, years of work experience, and method of data collection groups in physical vitality activities, self-leadership, job satisfaction, and life satisfaction. Group variables for age and years of work experience were created by calculating the median (age: med = 27.33; years of work and educational experience: med = 17.33) and subsequently creating a categorical group variable for each, splitting low vs. high scores at the median. As to sex, individuals who chose “other” as the answer option were excluded from the analyses as the number of participants with this answer option was less than 25. The results of the 2 (sex: male vs. female) by 2 (age: young vs. older) by 2 (degree completion: student vs. employee) by 2 (years of work experience: low vs. high) by 2 (method of data collection: online vs. paper-pencil format) MANOVA revealed no significant multivariate and univariate differences between these groups (all Pillai’s Trace yielded $p > .37$). Therefore, the combined sample of participants was used for all subsequent analyses.

Structural equation modeling. Confirmatory factor analysis (CFA) was used to investigate the measurement models of the latent constructs physical vitality, well-being, and self-leadership. Indicator variables of physical vitality were physical exercise, nutrition, and physical relaxation, and indicator variables of well-being were life satisfaction and job satisfaction. Parcels of items were used as indicators of the unidimensional construct self-leadership ability. Two parcels were created by taking the mean of four items each using heterogeneous parceling (Cole et al., 2016) so that each parcel represented all facets of self-leadership. As the CFA revealed a good model fit, we extended this model to a latent moderator model with physical vitality as the predictor variable, self-leadership as the moderator variable, and well-being as the criterion variable. Introducing degree completion (employee vs. student) as a covariate into the model, the effect on well-being is also insignificant ($p = 0.64$).

To account for non-normality in the data, the robust maximum likelihood (MLR) estimator of the Mplus program, version 8, was used (Muthén & Muthén, 1998-2017) for both models. The MLR method takes violations of the assumption of multivariate normality into account by adjusting standard errors and chi-square values accordingly (see also Yuan & Bentler, 2000a, 2000b).

Model fit of the CFA was evaluated by several fit indices provided by the Mplus program: the chi-square value and its associated p-value, the root mean-square error of approximation (RMSEA), the comparative fit index (CFI), and the standardized root mean square residual (SRMR). Good model fit is indicated by a non-significant chi-square-value, $RMSEA \leq .05$, $CFI \geq .95$, and $SRMR \leq .08$ (Hu & Bentler, 1999; Schermelleh-Engel et al., 2003).

RESULTS

Common Method variance

The use of similar questionnaires formats (i.e. 4-point rating scales) may contribute to bias results due to common method variance. To control for methodological artifacts and exclude common method bias it is suggested to subject all items to exploratory factor analysis und screen the variance being explained by the first factor. If the first factor accounts for less than 50 % of common variance, the results may be interpreted as unbiased by common method variance (Harman test) (Harman, 1976). The amount of common variance due questionnaires being used was 18.7 %, revealing a neglectable methodological threat to evidence provided by the appointed measurement approach.

Correlations

Means, standard deviations and correlations of all scale measures are listed in Table 1.

Table 1

Means of Scales, Standard Deviations, and Zero-Order Correlations of Scales Measuring Physical Vitality Activities, Self-leadership Ability, Job Satisfaction, and Life Satisfaction (N = 342)

		<i>M</i>	<i>SD</i>	1	2	3	4	5	6
1	Exer	17.04	5.18	1.00					
2	Nutr	20.14	5.05	.51**	1.00				
3	Relax	24.84	4.93	.36**	.58**	1.00			
4	SelfL	42.07	5.24	.27**	.40**	.39**	1.00		
5	JS	15.46	2.91	.20**	.23**	.24**	.50**	1.00	
6	LS	14.31	3.40	.25**	.21**	.23**	.36**	.56**	1.00

Note. Exer = Physical Exercise; Nutr = Nutrition; Relax = Relaxation; SelfL = Self-leadership Ability, JS = Job satisfaction; LS = Life Satisfaction.

** p < .01 (two-tailed)

As seen in Table 1, all correlation coefficients were positive and significant ($p < .01$). As expected according to Hypothesis 1, physical vitality activities, i.e. exercise, nutrition, and relaxation, were correlated positively with self-leadership ability ($r = .27$ to $r = .40$). The more the participants performed physical vitality activities, the higher they scored on self-leadership ability.

According to Hypothesis 2, positive correlations were expected between use of self-leadership strategies, job satisfaction, and life satisfaction. This hypothesis was also supported. The results indicated a stronger relationship between self-leadership and job satisfaction ($r = 0.50$) than between self-leadership and life satisfaction ($r = 0.36$). This finding is well in line with studies that showed positive correlations between individuals' self-leadership and their job satisfaction (Neck et al., 2016).

Structural Equation Modeling

In order to test the moderator hypothesis (Hypothesis 3), we first analyzed a CFA because a moderator model does not yet provide any model fit criteria. Therefore, we used the scales listed in Table 1 as indicators of three common factors. Nutrition, exercise, and relaxation were indicators of the latent variable physical vitality, job satisfaction and life satisfaction were indicators of well-being. As self-leadership was measured by one scale only, two parcels were formed, each consisting of four items. The path diagram of the factor model is depicted in Figure 1.

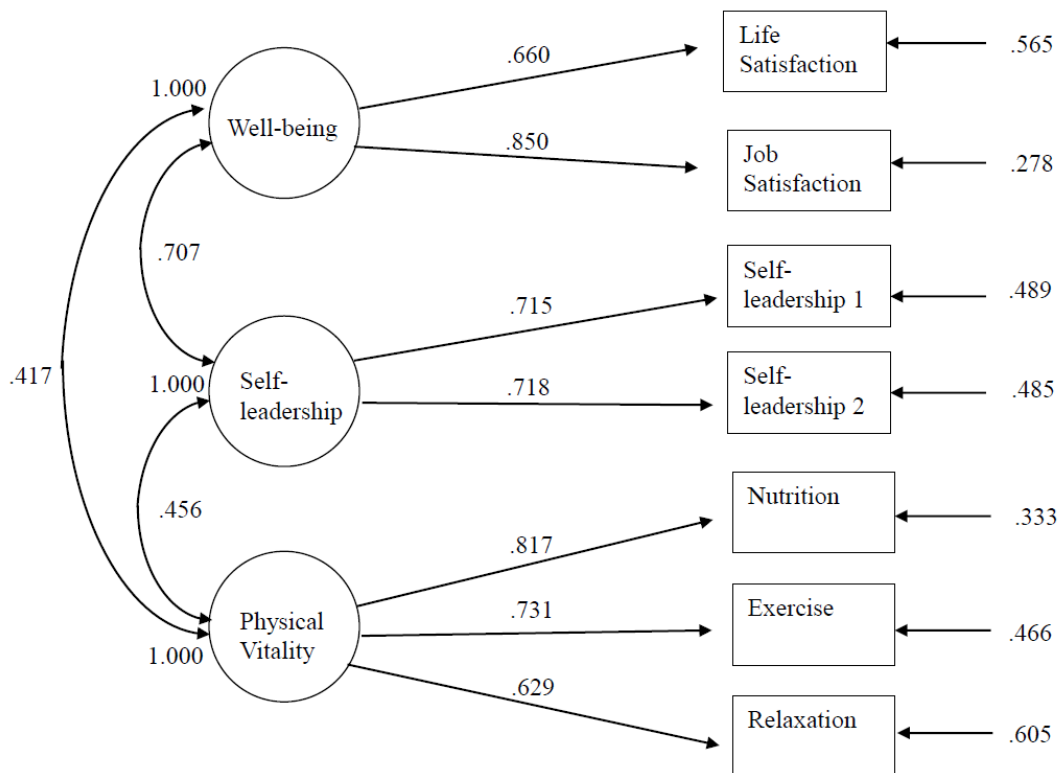


Figure 1. Confirmatory factor model with correlated latent variables well-being, self-leadership, and physical vitality.

The model fit was good with Chi Square χ^2 (11df) = 11.53, $p = .40$, RMSEA = .012, CFI = .999, and SRMR = .021. In this model, physical vitality activities and well-being ($r = .42$) as well as self-leadership ($r = .46$) were moderately correlated ($r = .42$), while the correlation between self-leadership and well-being was quite high ($r = .71$) indicating that both variables share a substantial amount of variance. Based on this model, the moderator hypothesis was tested. According to Hypothesis 3, a significant moderating effect of self-leadership on the relationship between physical vitality and well-being was detected. We expected the relationship between physical vitality activities and well-being to differ depending on the degree of self-leadership present. Figure 2 shows the path diagram of the latent moderator model.

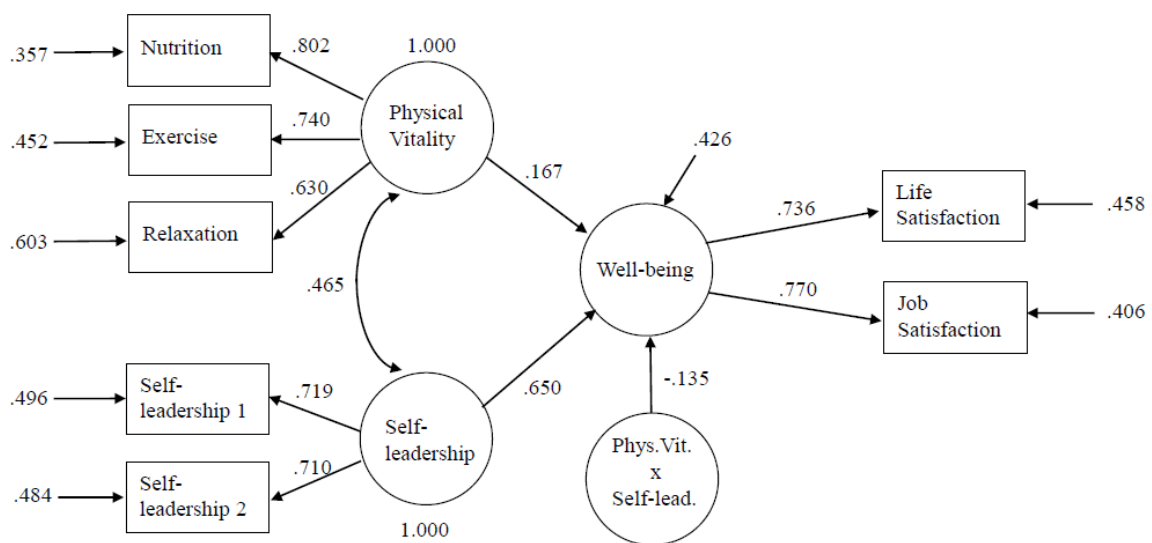


Figure 2. Path diagram of the latent moderator model with a negative moderator effect.

The effect of physical vitality on well-being was not significant. The path-coefficients indicate that there was a strong direct effect of self-leadership on satisfaction (.65) but no direct effect of the use of physical vitality strategies on well-being (.17, $p > .05$). However, there is an interaction effect (-.14, $p < .05$) indicating that the effect of physical vitality on well-being differs across the values of self-leadership. Simple slopes representing the interaction effect are depicted in Figure 3.

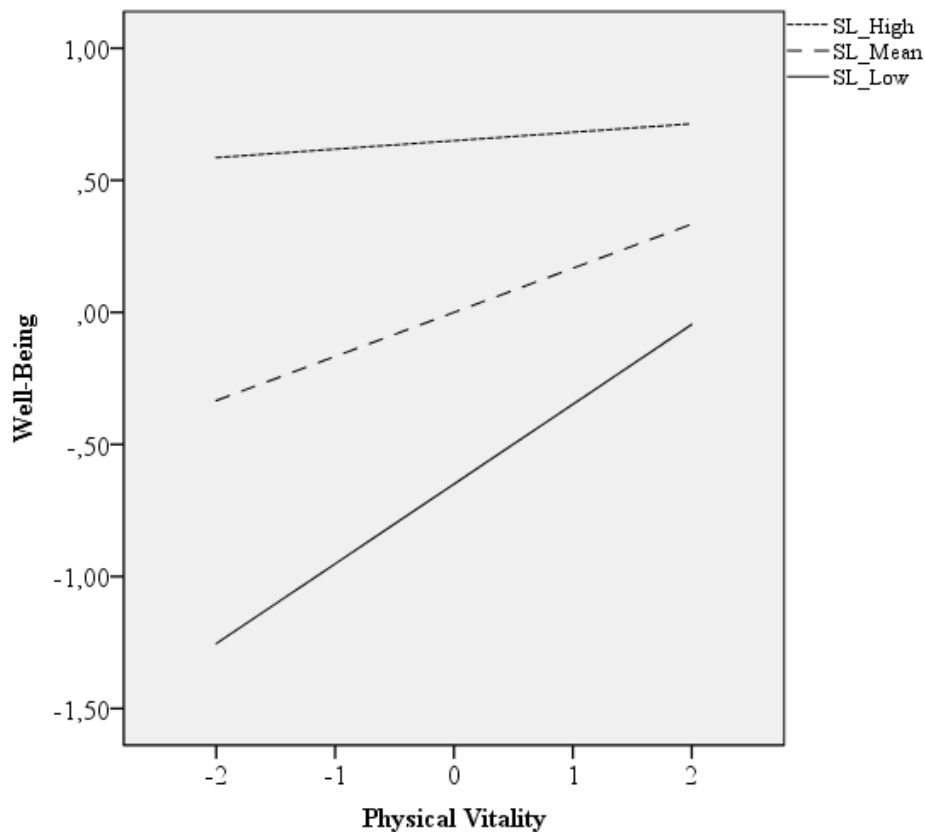


Figure 3. Simple slopes for the relationship of use of physical vitality strategies and well-being are depicted for high (SL-High: +1SD), mean (SL-Mean), and low values of Self-leadership (SL-Low: -1SD).

Figure 3 shows that, if participants used self-leadership strategies to a lesser extent, participants' well-being increased as they increased their use of physical vitality strategies. If participants used self-leadership strategies to a greater degree, their well-being did not seem to hinge on their use of physical vitality strategies.

DISCUSSION

Our study's design was chosen to establish an item pool for the construct of physical vitality and to explore covariation among measures of physical vitality, self-leadership, and subjective well-being. We established relationships between these variables, which, in line with recommendations for data explorations (e.g., Spector, 2019), served as a starting point to examine the influences on current (and future) employees' well-being. Since our research is in its early stages, our study's cross-sectional

design provided a snapshot of the extent to which our variables of interest are present in a sample of the European workforce. Given the fact that participants' use of vitality and use of self-leadership had already occurred (as they reported on to what extent they engaged in physical vitality, and use of self-leadership in the last four weeks- in other words, equilibration of participants' physical vitality and self-leadership had already been achieved), what we studied consisted of the final -settled- state of the system whereby individuals who reported low use of self-leadership tended to require a greater use of physical vitality to experience a greater degree of subjective well-being.

Participants who reported low use of self-leadership strategies and used physical vitality strategies experienced an increase in well-being. When participants used self-leadership strategies to a moderate or higher degree, the effect of physical vitality on well-being decreased. The results suggest a more differentiated relationship between physical vitality and self-leadership than previously proposed by Müller et al. (2010). Neck et al. (2017) argued that beneficial effects of health-related behaviors on physical and psychological well-being needed constant input via use of self-leadership strategies to ensure that health related behaviors are maintained long-term. Neck et al.'s (2017) argument received empirical support in the current study from individuals who reported high levels of self-leadership.

Practical Applications

Positive effects of health-related interventions on one's well-being seem to depend on simultaneously using strategies of physical exercise, healthy dieting, physical relaxation and strategies to lead oneself. To enhance the effectiveness of wellness-programs, participants' current use of physical vitality strategies and self-leadership strategies should be assessed and strengthened by customizing the intervention to participants' reported degree of self-leadership.

Limitations

The current study has some limitations due to external validity of results, methodology, and conceptual scope of evidence. One limitation is that the study's external validity may be limited due to non-random sampling of employees and students. The sample consisted of participants from different occupations and disciplines. Younger and female participants were represented to a greater degree than older and male participants. However, since no significant differences were found with regard to the participants' age, gender, degree completion, and work experience, the study may at least offer some evidence as to the relationship of participants' use of physical vitality strategies, their degree of self-leadership, and well-being. Future studies should be carried out with more randomized samples to replicate the obtained findings.

Another limitation was that all measures were collected via self-reports ("within-subject measures"). As in other non-experimental predictive survey designs, within-subject measures examining the relationships between latent variables may be biased due to social desirability, or a positive self-

presentation by survey respondents. Future studies could address this limitation via a different design, e.g., an experimental design, or by including measures of physical vitality that supplement self-reports, e.g., observational data of the individuals' actual vitality related activities, company records of absenteeism.

Now that the current study could derive an item pool to measure physical vitality items, a future longitudinal investigation of relationships between physical vitality, self-leadership, and well-being could explore the sustainability of the examined effects. At the same time, longitudinal designs are not automatically superior to cross-sectional designs as erroneous inferences, e.g., due to the timing of a measurement, can occur (for a detailed discussion, see e.g., Spector, 2019).

CONCLUSION

The current study found that participants' self-leadership ability had a significant impact on the relationship of physical vitality activities and well-being. The moderating effect of self-leadership highlights the importance of using constructive thoughts, creating natural rewards, and successful behavior to augment one's well-being.

REFERENCES

- Alexopoulos, E. C., Palatsidi, V., Tigani, X., & Darviri, C. (2014). Exploring stress levels, job satisfaction, and quality of life in a sample of police officers in Greece. *Safety and Health at Work*, 5(4), 210–215. <https://doi.org/10.1016/j.shaw.2014.07.004>
- Buckaloo, B. J., Krug, K. S., & Nelson, K. B. (2009). Exercise and the Low-Security Inmate: Changes in Depression, Stress, and Anxiety. *The Prison Journal*, 89(3), 328–343. <https://doi.org/10.1177/0032885509339508>
- Carr, M., Kurtz, B. E., Schneider, W., Turner, L. A., & Borkowski, J. G. (1989). Strategy Acquisition and Transfer Among American and German Children: Environmental Influences on Metacognitive Development. *Developmental Psychology*, 25(5), 765–771. <https://doi.org/10.1037/0012-1649.25.5.765>
- Cole, D. A., Perkins, C. E., & Zelkowitz, R. L. (2016). Impact of homogeneous and heterogeneous parceling strategies when latent variables represent multidimensional constructs. *Psychological Methods*, 21, 164–174. <https://doi.org/10.1037/met0000047>
- Cooper, C., & Berwick, S. (2001). Factors affecting psychological well-being of three groups of suicide-prone prisoners. *Current Psychology*, 20, 169–182. <https://doi.org/10.1007/s12144-001-1025-0>
- Crews, D. J., & Landers, D. M. (1987). A meta-analytic review of aerobic fitness and reactivity to psychosocial stressors. *Medicine & Science in Sports & Exercise*, 19(5), 114–120. <https://doi.org/10.1249/00005768-198710001-00004>
- Crone, E. A., Bunge, S. A., Latenstein, H., & van der Molen, M. W. (2005). Characterization of

- children's decision making: sensitivity to punishment frequency, not task complexity. *Child Neuropsychology*, 11(3), 245–263. <https://doi.org/10.1080/092970490911261>
- Diener, E. (1984). Subjective well-being. *Psychological Bulletin*, 95, 542–575.
- Diener, E. (1994). Assessing subjective well-being: Progress and opportunities. *Social Indicators Research*, 31, 103–157. <https://doi.org/10.1007/BF01207052>
- Diener, E., Emmons, R. A., Larsen, R., & Griffin, S. (1985). The Satisfaction with Life Scale. *Journal of Personality Assessment*, 49, 71–75. https://doi.org/10.1207/s15327752jpa4901_13
- D'Intino, R. S., Goldsby, M. G., Houghton, J. D., & Neck, C. P. (2012). Self-leadership: A process for Entrepreneurial Success. *Journal of Leadership and Organizational Studies*, 13, 105–120. <https://doi.org/10.1177/10717919070130040101>
- Dishman, R. K., Motl, R. W., Sallis, J. F., Dunn, A. L., Birnbaum, A. S., Welk, G. J., ... Jobe, J. L. (2005). Self-management strategies mediate self-efficacy and physical activity. *American Journal of Preventive Medicine*, 29(1), 10–18. <https://doi.org/10.1016/j.amepre.2005.03.012>
- Diener, E., & Tay, L. (2012). A Scientific Review of the Remarkable Benefits of Happiness for Successful and Healthy Living. Report of the Well-Being Working Group, Royal Government of Bhutan, Report to the United Nations General Assembly, United Nations, NY.
- Drafke, M. (2009). *The Human Side of Organizations* (10th ed.). Upper Saddle River, NJ: Pearson Education.
- Eid, M., & Diener, E. (2004). Global judgments of subjective well-being: Situational variability and long-term stability. *Social Indicators Research*, 65(3), 245–277. <https://doi.org/10.1023/B:SOCI.00000003801.89195.bc>
- Frew, D. R., & Bruning, N. S. (1988). Improved productivity and job satisfaction through employee exercise programs. *Hospital Materiel Management Quarterly*, 9(4), 62–69.
- Georgianna, S. (2007a). *Self-leadership and Goal-striving across Cultures: A Comparison of United States and Chinese Undergraduate Students*. New York, NY: Mellen Press.
- Georgianna, S. (2007b). Self-leadership: A cross-cultural perspective. *Journal of Managerial Psychology*, 22(6), 569–589. <https://doi.org/10.1108/02683940710778440>
- Georgianna, S. (2009). Fostering Student Success: An exploratory study in English writing classes. *Journal of Applied Research in Community Colleges*, 17(1), 17–26.
- Gerber, M., & Pühse, U. (2009). Review article: do exercise and fitness protect against stress-induced health complaints? A review of the literature. *Scandinavian Journal of Public Health*, 37(8), 801–819. <https://doi.org/10.1177/1403494809350522>
- Gerber, M., Kellmann, Hartmann, T., & Pühse, U. (2010). Do exercise and fitness buffer against stress among Swiss police and emergency response service officers?. *Psychology of Sport and Exercise*, 11(4), 286–294. <https://doi.org/10.1016/j.psychsport.2010.02.004>
- Harman, H. H. (1976). *Modern Factor Analysis*. Chicago, IL: The University of Chicago Press.
- Helliwell, J. F., Layard, R., & Sachs, J. (2013). *World Happiness Report 2013*. Earth Institute, Columbia University, New York, NY.

- Houghton, J. D., Dawley, D., & DiLiello, T. C. (2012). The abbreviated Self-Leadership Questionnaire (ASLQ): A more concise measure of self-leadership. *International Journal of Leadership Studies*, 7(2), 216–232.
- Houghton, J. D., & Neck, C. P. (2002). The Revised self-leadership questionnaire: Testing a hierarchical factor structure for self-leadership. *Journal of Managerial Psychology*, 17(8), 672–691. <https://doi.org/10.1108/02683940210450484>
- Hu, L.-T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, 6(1), 1–55. <https://doi.org/10.1080/10705519909540118>
- Jiménez, P. (2003). The Profile Analysis of Job Satisfaction – Reliability, Validity and Benefits of a new Measurement. Paper presented at the 8th European Congress of Psychology, 6–11 July 2003, Vienna.
- Jiménez, P. (2008). Profilanalyse der Arbeitszufriedenheit (PAZ). Manual Wiener Testsystem [Profile Analysis of Job Satisfaction. Test Manual in Vienna Test System]. Mödling: Schuhfried GmbH.
- Jiménez, P., Dunkl, A., & Stolz, R. (2015). Anticipation of the development of job satisfaction—construct and validation results of an indicator for well-being at the workplace. *Psychology*, 6, 856–866. <https://doi.org/10.4236/psych.2015.67084>
- Landman, M., & Schmitz, B. (2007). Selbstregulation erfolgreich foerdern. Praxisnahe Trainingsprogramme für effektives Lernen [Successful Promotion of Self-regulation. Practice Based Training Programs for Effective Learning]. Stuttgart: Kohlhammer.
- Locke, E. A. (1969). What is Job Satisfaction?, *Organizational Behavior and Human Performance*, 4(4), 309–336. [https://doi.org/10.1016/0030-5073\(69\)90013-0](https://doi.org/10.1016/0030-5073(69)90013-0)
- Manz, C. C., & Neck, C. P. (2004). *Mastering self-leadership: Empowering yourself for personal excellence* (3rd ed.). Upper Saddle River, NJ: Prentice Hall.
- Manz, C. C., & Sims, H. P. (1980). Self-management as a substitute for leadership: A social learning theory perspective. *Academy of Management Review*, 5(3), 361–367. <https://doi.org/10.5465/amr.1980.4288845>
- Manz, C. C., & Sims, H. P. (2001). *The new Super Leadership: Leading others to lead themselves*. San Francisco, CA: Berrett-Koehler.
- Meichenbaum, D. (1994). *A clinical handbook/practical therapist manual for assessing and treating adults with post-traumatic stress disorder*. Ontario, Canada: Institute Press.
- Müller, G. F. (2003). Selbstführung – Strategien zur Erhöhung innerer Transparenz und äußerer Wirksamkeit für mehr berufliche Selbstverwirklichung [Self-leadership –Strategies to improve internal transparency and external efficiency to achieve selfdetermination in working environments]. In G. F. Müller, *Selbstverwirklichung im Arbeitsleben [Self-actualization at work]* (pp. 171–202). Lengerich, Germany: Pabst Publishers.
- Müller, G. F. (2006). Dimensions of self-leadership: A German replication and extension. *Psychological Reports*, 99(2), 357–362. <https://doi.org/10.2466/pr0.99.2.357-362>

- Müller, G. F. (2014). Landauer Selbstführungsanalyse, Modul 1 [Self-leadership analysis, module 1]. Landau: Umbra.
- Müller, G. F., & Braun, W. (2009). Selbstführung [Self-leadership]. Bern: Huber.
- Müller, G. F., & Gappisch, C. (2005). Personality types of entrepreneurs. *Psychological Reports*, 96(3), 737–746. <https://doi.org/10.2466/pr0.96.3.737-746>
- Müller, G. F., Georgianna, S., & Roux, G. (2010). Self-leadership and Physical Vitality. *Psychological Reports*, 107(2), 383–392. <https://doi.org/10.2466/06.10.15.20.PR0.107.5.383-392>
- Muthén, L. K., & Muthén, B. O. (1998–2017). *Mplus User's Guide* (8th ed.). Los Angeles, CA: Muthén & Muthén.
- Neck, C. P., & Cooper, K. H. (2000). The fit Executive: Exercise and diet guidelines for enhanced performance. *Academy of Management Executive*, 14(2), 72–83. <https://doi.org/10.5465/ame.2000.3819307>
- Neck, C. P., & Houghton, J. D. (2006). Two decades of self-leadership theory and research: Past developments, present trends, and future possibilities. *Journal of Managerial Psychology*, 21(4), 270–295. <https://doi.org/10.1108/02683940610663097>
- Neck, C. P., & Manz, C. C. (1996). Thought Self-leadership: The Impact of mental strategies training on employee behavior, Cognition and Emotion. *Journal of Organizational Behavior*, 17, 445–467. [https://doi.org/10.1002/\(SICI\)1099-1379\(199609\)17:5<445::AID-JOB770>3.0.CO;2-N](https://doi.org/10.1002/(SICI)1099-1379(199609)17:5<445::AID-JOB770>3.0.CO;2-N)
- Neck, C. P., & Manz, C. C. (2013). *Mastering Self-Leadership. Empowering yourself for personal excellence* (6th ed.). Upper Saddle River, NJ: Pearson Education.
- Neck, C. P., Manz, C. C., & Houghton, J. D. (2017). *Self-leadership. The definitive guide to personal excellence*. Thousand Oaks, CA: Sage Publishing.
- Norris, R., Carroll, D., & Cochrane, R. (1990). The effects of aerobic and anaerobic training on fitness, blood pressure, and psychological stress and well-being. *Journal of Psychosomatic Research*, 34(4), 367–375. [https://doi.org/10.1016/0022-3999\(90\)90060-H](https://doi.org/10.1016/0022-3999(90)90060-H)
- Parks, K. M., & Steelman, L. A. (2008). Organizational wellness programs: A meta-analysis. *Journal of Occupational Health Psychology*, 13(1), 58–68. <https://doi.org/10.1037/1076-8998.13.1.58>
- Pavot, W., & Diener, E. (1993). The affective and cognitive context of reported measures of subjective well-being. *Social Indicators Research*, 28, 1–20. <https://doi.org/10.1007/BF01086714>
- Pavot, W., Diener, E., Colvin, C. R., & Sandvik, E. (1991). Further validation of the Satisfaction With Life Scale: Evidence for the cross-method convergence of well-being measures. *Journal of Personality Assessment*, 57, 149–161. https://doi.org/10.1207/s15327752jpa5701_17
- Prussia, G. E., Anderson, J. S., & Manz, C. C. (1998). Self-leadership and performance outcomes: The mediating influence of self-efficacy. *Journal of Organizational Behavior*, 19, 523–538. [https://doi.org/10.1002/\(SICI\)1099-1379\(199809\)19:5<523::AID-JOB860>3.0.CO;2-I](https://doi.org/10.1002/(SICI)1099-1379(199809)19:5<523::AID-JOB860>3.0.CO;2-I)
- Ritvanen, T., Louhevaara, V., Helin, P., Halonen, T., & Hänninen, O. (2007). Effect of aerobic fitness on the physiological stress responses at work. *International Journal of Occupational Medicine and Environmental Health*, 20(1), 1–8. <https://doi.org/10.2478/v10001-007-0005-5>

- Ruffieux, M., Nussbeck, F. W., & Bodenmann, G. (2014). Long-term prediction of relationship satisfaction and stability by stress, coping, communication, and well-being. *Journal of Divorce & Remarriage*, 55(6), 485–501. <https://doi.org/10.1080/10502556.2014.931767>
- Schermelleh-Engel, K., Moosbrugger, H., & Müller, H. (2003). Evaluating the fit of structural equation models: Tests of significance and descriptive goodness-of-fit measures. *Methods of Psychological Research-Online*, 8, 23–74.
- Smith, P. C., Kendall, L. M., & Hulin, C. L. (1969). *The Measurement of Satisfaction in Work and Retirement: A Strategy for the Study of Attitudes*. Chicago, IL: Rand McNally.
- Sonnentag, S., & Bayer, U. V. (2005). Switching off mentally: predictors and consequences of psychological detachment from work during off-job time. *Journal of Occupational Health Psychology*, 10(4), 393–414. <https://doi.org/10.1037/1076-8998.10.4.393>
- Spector, P. E. (2019). Do Not Cross Me: Optimizing the Use of Cross-Sectional Designs. *Journal of Business and Psychology*, 34(2), 125–137.
- Victorian Government (2019). Work related stress. A paper published on Victoria's Better Health Channel (betterhealth.vic.gov.au). Retrieved 11-09-2019, from <https://www.betterhealth.vic.gov.au/health/healthyliving/work-related-stress>
- Weiss, H. M. (2002). Deconstructing job satisfaction: separating evaluations, beliefs and affective experiences. *Human Resources Management Review*, 12(2), 173–194. [https://doi.org/10.1016/S1053-4822\(02\)00045-1](https://doi.org/10.1016/S1053-4822(02)00045-1)
- Wipfli, B. M., Rethorst, C. D., & Landers, D. M. (2008). The anxiolytic effects of exercise: A meta-analysis of randomized trials and dose-response analysis. *Journal of Sport and Exercise Psychology*, 30(4), 392–410. <https://doi.org/10.1123/jsep.30.4.392>
- Wolever, R. Q., Bobinet, K. J., McCabe, K., Mackenzie, E. R., Fekete, E., Kusnick, C. A., & Baime, M. (2012). Effective and viable mind-body stress reduction in the workplace: A randomized controlled trial. *Journal of Occupational Health Psychology*, 17(2), 246–258. <https://doi.org/10.1037/a0027278>
- Wright, T. A. (2014). Putting your best “face” forward: The role of emotion-based well-being in organizational research. *Journal of Organizational Behavior*, 35, 1153–1168. <https://doi.org/10.1002/job.1967>
- Yuan, K., & Bentler, P. M. (2000a). Inferences on Correlation Coefficients in Some Classes of Nonnormal Distributions. *Journal of Multivariate Analysis*, 72(2), 230–248. <https://doi.org/10.1006/jmva.1999.1858>
- Yuan, K., & Bentler, P.M. (2000b). Three Likelihood-Based Methods for Mean and Covariance Structure Analysis with Nonnormal Missing Data. *Sociological Methodology*, 30, 165–200. <https://doi.org/10.1111/0081-1750.00078>