



Would you be happier if you moved more? Physical activity focusing illusion

Lukasz D. Kaczmarek¹ · Maciej Behnke¹ · Jolanta Enko¹ · Agnieszka Hoffman¹ · Marcin Kiciński¹ · Jakub Paruszewski¹ · Michał Szabat¹ · Stephan U. Dombrowski²

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Abstract

Research shows that individuals who are more physically active also report greater happiness. However, subjective well-being is prone to cognitive biases. For instance, people overrate the influence of single factors (e.g., money) on their happiness; a phenomenon termed the focusing illusion. In this study, we examined whether the relationship between physical activity and subjective well-being is stronger when individuals focus on physical activity explicitly compared to individuals with no specific focus. We experimentally manipulated the physical activity focus by varying the order of scales administration. Participants ($N = 200$) completed questionnaires that measured physical activity and subjective well-being placed in separate envelopes and provided in a random order. We found that individuals with higher levels of vigorous physical activity were more satisfied with life regardless of the order of scale presentation (no focusing effect). However, we found evidence of a possible focusing illusion for moderate-intensity physical activity. Individuals with higher levels of moderate-intensity physical activity reported higher subjective well-being when they were asked about physical activity first but not when they reported their well-being unaware of the upcoming physical activity questions. Thus, subjective well-being judgments can be biased by a prior focus on moderate-intensity physical activity. The order of scale administration when assessing subjective well-being should be carefully considered.

Keywords Physical activity · Satisfaction with life · Positive emotions · Negative emotions · Focusing illusion · Happiness

Introduction

Individuals tend to overrate the influence of any single factor on their well-being; a phenomenon termed ‘focusing illusion’ (Schkade and Kahneman 1998). Evidence shows that people can be biased in their estimations of the extent to which their well-being is determined by income (Aknin et al. 2009; Kahneman et al. 2006), romantic relationships (Schwarz et al. 1991), health (Smith et al. 2006), or physical appearance (Kaczmarek et al. 2016). This bias may impact the decisions that people make to increase their well-being. For instance, individuals may pursue activities which fail to maximize their

well-being, such as choosing a highly paid job over a self-concordant job (Al-Zoubi 2012). However, not all domains of life are prone to the focusing illusion (Oishi et al. 2003) and some factors induce partial focusing illusion, i.e., the individuals overrate the importance of otherwise significant factors (Kaczmarek et al. 2016). As focusing illusions can potentially have an impact on people’s lives, it is vital to identify which factors trigger focusing illusion.

In this study, we examined the focusing effects of physical activity ratings on subjective well-being assessments. Physical activity has often been presented as a precursor to a happy life (e.g., Brown et al. 2015; Hogan et al. 2015). Yet, little is known to what extent physically active people report higher well-being which might be biased by focusing effects. Regardless of whether physical activity promotes well-being or not, people who are more physically active are healthier (Kyu et al. 2016) and live longer (Arem et al. 2015). However, identifying whether a focusing illusion regarding physical activity exists may be important. Individuals who prioritize increases in well-being might pursue more effective happiness-boosting cognitive activities (Bolier et al. 2013).

✉ Lukasz D. Kaczmarek
Lkacz@amu.edu.pl

¹ Institute of Psychology, Adam Mickiewicz University, 89
Szamarzewskiego Street, PL-60-568 Poznan, Poland

² University of New Brunswick, Fredericton, Canada

Due to the focusing illusion, individuals who initiate physical activity to enhance their subjective well-being rather than fitness can be less likely to pursue other potentially more effective happiness-boosting interventions.

Moreover, some people may have unrealistic expectations about the extent to which physical activity increases their well-being and give up once they notice that these expectations are not met. New more nuanced insights on the relationship between physical activity and well-being are imperative to inform individual lifestyle decisions and interventions as well as to support public health policies (e.g., World Health Organization 2010). Additionally, some approaches to the study of focusing illusion are also critical from the methodological standpoint (Schwarz 1999; Smith et al. 2006). The focusing illusion can, for instance, explain some questionnaire order effects (Schwarz et al. 1991) thereby informing our understanding of cognitive aspects of survey design.

Focusing Illusion

Brief and broad evaluations of well-being (e.g., overall satisfaction with life or the number of emotions experienced during the last days) depend on information that comes to mind when individuals think about their life (Schwarz and Strack 2016). The speed and ease of these evaluations can come at the cost of their accuracy. When individuals focus their attention on a specific life domain, they may overestimate its importance other relevant information might be missed to form an accurate judgment (Schwarz and Strack 2016; Oishi et al. 2003). From a happiness perspective, human information processing produces can lead to overestimated ratings of the importance of any single factor on well-being (Schkade and Kahneman 1998). The focusing illusion is an instance of biased judgment because an entire object (such as one's life) is evaluated with attention focused on a specific subset of this category, e.g., physical appearance (Kaczmarek et al. 2016).

Focusing effects have been evidenced using a variety of methodologies. For instance, in one study people were asked to report how much time they spent in a bad mood as well as how much time people in different circumstances, such as with high or low income, spent in a bad mood (Kahneman et al. 2006). Participants overestimated bad mood for individuals in unfavorable life circumstances compared to real-life reports. Similarly, in another study participants reported their income, their life satisfaction and predicted satisfaction of other individuals covering a wide range of income (Aknin et al. 2009). The results suggested that wealthier individuals tended to overestimate dissatisfaction with life among less wealthy individuals compared to the actual self-reports provided by these individuals. In a well-being survey among patients diagnosed with Parkinson's disease, Smith et al. (2006) informed half of the participants that the survey was conducted by a medical center and its topic was related to Parkinson's

disease. The other group was asked the same questions but was informed that they participated in a general population survey conducted by the university. The patients that explicitly focused on their health showed a higher correlation between health and well-being measures compared to the group with no explicit focus on health. Furthermore, when both groups received health-related questions first, the correlation between health and well-being was high regardless of the study context presented in the introduction. In a similar study, the order of scales measuring body satisfaction and life satisfaction was manipulated (Kaczmarek et al. 2016). In the focusing group that reported their body satisfaction first, there was a higher correlation between body satisfaction and life satisfaction than in the group that reported their life satisfaction first; unaware of the upcoming body satisfaction questions. This suggests that a momentary focus on the body can influence subsequent judgments of well-being.

Subjective Well-Being and Physical Activity

There are several approaches to the conceptualization and the measurement of well-being (Kaczmarek 2018). Of these approaches, subjective well-being has been among the most popular due to its versatility and ability to cover a wide range of experience and evaluations in different contexts (Diener et al. 2018). The subjective well-being theory is particularly relevant to the study of the focusing illusion because it covers the evaluations of the quality of a person's life from that person's perspective. Subjective well-being consists of three components: positive emotions, negative emotions, and satisfaction with life (Diener 2000). Emotions are short-lived psychological-physiological phenomena that facilitate adaptation to changing environmental demands (Levenson 2003). Positive emotions are associated with pleasure whereas negative emotions are associated with displeasure or pain (Gable and Harmon-Jones 2010). Furthermore, positive emotions pull individuals toward specific objects, actions, and ideas, whereas negative emotions push away from others. Positive and negative emotions are distinct at a functional level with negative emotions facilitating efficient use of psycho-social coping resources and positive emotions helping to build new resources (Fredrickson 2001). A happy individual has an abundance of positive emotions and little negative emotions. Emotions, in turn, influence global evaluations of life and determine whether individuals endorse their life (Kim-Prieto et al. 2005). These global evaluations form satisfaction with life which is a cognitive, judgmental process of life as a whole according to individual criteria of what is desirable.

The link between physical activity and various facets of well-being such as satisfaction with life or positive emotions has been established in the literature. Physical activity has been related to life satisfaction and positive emotions among employees (Edmunds et al. 2013), satisfaction with life among

adolescents (Valois et al. 2004), or personal well-being in cyclists (Lovretic et al. 2013). Individuals who participate in sports also report higher life satisfaction compared to individuals who prefer sedentary leisure activities predictive (Brown et al. 2015). Physical activity has also been related to positive affect (Mata et al. 2012). The relationship between physical activity and well-being is bi-directional as indicated by studies where baseline psychological well-being (a compound of pleasure and positive functioning) predicted future long-term physical activity outcomes (Kim et al. 2016).

Some findings regarding physical activity and well-being have been inconsistent. Maher et al. (2012) found that although satisfaction with life was influenced by daily variations in physical activity, there was no relationship between satisfaction with life and trait-like physical activity. Physical activity was also unrelated to satisfaction with life among student nurses (Hawker 2012). There are also inconsistent results regarding physical activity and negative affect with no effect in some studies (e.g., Mata et al. 2012), whereas others find significant (e.g., Petruzzello et al. 1991), or mixed results (e.g., Hogan et al. 2015). No research has examined whether focusing effects exist in the domain of physical activity which may contribute towards explaining the inconsistent evidence on the link between physical activity and various facets of well-being.

The Present Study

Building upon prior work on the focusing illusion (Kaczmarek et al. 2016; Schkade and Kahneman 1998; Smith et al. 2006) we hypothesized that the relationship between physical activity and subjective well-being would be stronger for individuals explicitly focused on physical activity compared to individuals with no specific focus. Specifically, we hypothesized that when physical activity is measured before well-being, the correlation between physical activity and well-being would be stronger compared to the reverse order. Thus, the order of the administration of scales measuring both constructs would moderate the physical activity and well-being link.

Method

Participants

Participants were 200 undergraduate students aged 18 to 45 years ($M = 23.55$, $SD = 5.00$). There was a similar number of women ($n = 104$; 52.0%) and men ($n = 93$; 46.5%) in the sample. Three participants who did not report their gender were excluded from the analyses as gender was one of the predictors in the model. Recruitment included researchers inviting students before classes to participate in a psychology study. The experimental group and control group included 98 and 102

participants, respectively. Based on prior research on focusing illusion testing similar models (Kaczmarek et al. 2016), we expected small effect sizes for the focusing effects. Given that outcome variables in the model were planned to regress upon eight predictors (including the interaction terms), power analyses with G*Power 3.1.9.2 suggested that a total sample size of 159 would be the minimum required to detect effects of $f^2 = 0.10$ with an $\alpha = .05$ and power of .80. Missing data (0.2%) were determined to be random via Little's (1988) test, $\chi^2(95) = 91.88$, $p = .57$, and were imputed using Expectation-Maximization algorithm in SPSS 21. The study was conducted by the guidelines of the Institutional Ethics Committee. Participation in the study was voluntary, and each participant signed informed consent. Participants remained anonymous and received no incentives for taking part in this study.

Measures

We measured subjective well-being using a three-factor approach that accounted for positive emotions, negative emotions, and satisfaction with life (Kim-Prieto et al. 2005).

Life satisfaction was measured with the 5-item *Satisfaction with Life Scale* (SWLS; Diener et al. 1985). The SWLS includes items such as 'The conditions of my life are excellent.' The answering scale ranges from 1 'strongly disagree' to 7 'strongly agree.' The scale was internally consistent with Cronbach's $\alpha = .85$.

Emotions were measured with *The Scale of Positive and Negative Experience* (Diener et al. 2010). This scale measures positive feelings (e.g., happy) and negative feelings (e.g., sad) with six items for each subscale. Participants reported how often they had been experiencing each of these feelings over the last 7 days using a scale from 1 'very rarely or never' to 5 'very often or always' (Cronbach's $\alpha = .87$ for positive feelings and $\alpha = .85$ for negative feelings).

Physical activity was measured with the short version of the *International Physical Activity Questionnaire* (IPAQ, Craig et al. 2003). This questionnaire asks four groups of items regarding vigorous physical activity, moderate physical activity, walking, and sitting during the last 7 days at work, as part of house and yard work, to get from place to place, and for recreation, exercise, or sport. Vigorous activity is defined as taking hard physical effort that makes someone breathe much harder than normal such as heavy lifting, digging, aerobics, or fast bicycling for at least 10 min at a time. Moderate physical activity is defined as a physical effort that makes someone breathe somewhat harder than normal such as carrying light loads, bicycling at a regular pace for at least 10 min, etc., and does not include walking. For each level of physical activity (e.g., vigorous) participants report how many days they did this type of activities, and how much time they usually spend doing this type of activity on one of those days. Participants also reported if they were not able to provide a reliable

estimate of this type of activity. The index of physical activity in each intensity is calculated as the product of the number of days and the average daily time. This product is further weighted by estimated metabolic equivalent energy expenditure ($\times 8$ for vigorous activity and $\times 4$ for moderate activity). Items regarding vigorous and moderate physical activity were used in the analyses. Items regarding walking and sitting were not examined as 25.5% participants reported that they were not able to estimate their walking and sitting time compared to only 3% and 4.5% for moderate and vigorous physical activity respectively. The self-report IPAQ has excellent test-retest reliability and correlates with objective measures of physical activity via accelerometry (Craig et al. 2003). Log transformation of each physical activity metric was used in the analyses to adjust the positive skew of the initial data.

Procedure

We placed questionnaires for physical activity, and well-being in separate envelopes marked A or B. For a random half of the participants, we placed the well-being questionnaires into the envelope A and the physical activity questionnaire in the envelope B (no focus group). For the other half of participants, we placed the physical activity questionnaire into envelope A, and the well-being questionnaires into envelope B (focusing group). We asked participants to complete the questionnaire placed in the envelope A first, place it back into the envelope, open envelope B, and complete the other questionnaire.

Analytical Strategy

We performed multiple regression analyses using SPSS 23.0 (Armonk, NY) and PROCESS 2.16 macro (Hayes 2013) with two physical activity outcomes, gender, scale order, and their interactions as predictors and three well-being components as outcome variables. In testing this hypothesis, we controlled for gender as physical activity differs between women and men. Gender (0 = man, 1 = woman) and scale order (0 = well-being first, 1 = physical activity first) were entered as binary predictors. We used R^2 coefficient to calculate the amount of variance in outcome variables explained by the predictors.

Results

We presented descriptive statistics and correlations between study variables in Table 1. On average, participants were neither satisfied nor dissatisfied with their lives, experienced positive emotions often, and negative emotions rarely. Correlations showed that individuals who reported their well-being first (no focus condition), reported higher levels of positive affect and higher estimates of vigorous physical activity compared to those who reported their physical activity first.

Individuals with higher levels of vigorous physical activity reported higher levels of satisfaction with life as indicated by a main effect of vigorous activity on satisfaction with life (Table 2). Furthermore, a significant interaction term (moderate physical activity \times scale order) revealed that moderate physical activity had a stronger relationship with life satisfaction when individuals were asked about physical activity first (Fig. 1). The interaction of moderate physical activity with the scale order showed a significant relationship between moderate physical activity and satisfaction with life when physical activity was reported first, $b = .28$, $SE\ b = .12$, $p < .05$ for men and $b = .34$, $SE\ b = .13$, $p < .01$ for women, and a non-significant relationship when participants were asked about their life first, $b = -.09$, $SE\ b = .14$, $p > .05$ for men and $b = -.03$, $SE\ b = .14$, $p > .05$ for women. This model explained 11.1% of the variance in satisfaction with life, $R^2 = .111$, $F(8, 177) = 2.77$, $p < .01$. The interaction representing the focusing illusion explained additional 3.2% of the variance, $\Delta R^2 = .032$, $F(1, 177) = 6.33$, $p < .05$.

We found a similar focusing effect regarding moderate physical activity and positive emotions. There was a significant interaction between scale order and moderate physical activity in respect to positive emotions. This interaction comprised a significant relationship between moderate physical activity and positive emotions when physical activity was reported first, $b = .40$, $SE\ b = .12$, $p < .01$ for men and $b = .44$, $SE\ b = .13$, $p < .01$ for women, and a non-significant relationship when participants were asked about their life first, $b = .05$, $SE\ b = .14$, $p > .05$ for men and $b = .09$, $SE\ b = .12$, $p > .05$ for women. This model explained 16.3% of the variance in positive emotions, $R^2 = .163$, $F(8, 177) = 4.31$, $p < .001$. The interaction representing focusing illusion explained additional 2.6% of the variance, $\Delta R^2 = .026$, $F(1, 177) = 5.59$, $p < .05$.

Finally, we found no focusing effects for physical activity regarding negative emotions. We also did not observe any significant gender differences.

Discussion

In the present study, we examined whether the link between physical activity and subjective well-being is affected by a focusing illusion. We tested if a temporal evaluative focus (experimentally induced) on physical activity influenced judgments regarding three components of subjective well-being. We found that the positive relationship between vigorous physical activity and satisfaction with life was significant and showed no evidence of any focusing effect. However, we found evidence of a focusing effect for moderate-intensity physical activity regarding satisfaction with life and positive but not negative affect.

Table 1 Descriptive statistics and correlations among study variables

	1	2	3	4	5	6
1. Vigorous PA						
2. Moderate PA	.29**					
3. Satisfaction with life	.17*	.14				
4. Positive affect	.11	.21**	.68**			
5. Negative affect	.03	-.03	-.40**	-.56**		
6. Age	-.05	.13	-.01	-.02	-.21**	
7. Gender	-.01	.05	-.05	-.14	.23**	-.19**
8. Scale order	-.21**	-.08	-.05	.17*	-.12	-.12
<i>M</i>	1433.50	614.43	4.06	3.62	2.34	23.55
<i>SD</i>	2714.46	1010.24	1.13	0.79	0.80	5.00
<i>M_{Ln}</i>	5.03	4.85	—	—	—	—
<i>SD_{Ln}</i>	2.64	2.16	—	—	—	—

Scale order coded as 0 = well-being first (no focusing), 1 = physical activity first (focusing). Gender coded as 0 = man, 1 = women. *PA* Physical activity. *Ln* Log transformed data

* $p < .05$. ** $p < .01$

Individuals who self-reported higher levels of vigorous physical activity were more likely to report higher levels of life satisfaction regardless of the scale order administration. We found that the psychological effects of vigorous activity were present even when individuals did not focus their attention explicitly on this sphere of life. Moreover, there were no additional benefits or losses for subjective well-being when individuals were encouraged to focus on their past intense physical output. This observation indicates an unbiased relationship between vigorous physical activity and satisfaction with life that is free from focusing illusions. A partial focusing illusion occurs when an explicit focus enhances a weaker, yet significant, relationship between a factor and well-being (Kaczmarek et al. 2016). This finding means that individuals who are physically active in the range of high intensities are

also more satisfied with their life. It corroborates previous research regarding life-enhancing outcomes of physical activity (e.g., Edmunds et al. 2013). Yet, we found no relationship between vigorous physical activity and positive or negative affect. The absence of a relationship of physical activity with negative affect is also congruent with some previous studies (Mata et al. 2012). However, no relationship between physical activity and positive affect was not in line with our hypotheses. A possible explanation for this finding is that satisfaction with life is a more reliable overarching construct that forms global judgments based on cognitive as well as affective information (Kim-Prieto et al. 2005). The unique effects of high-intensity physical activity may result from endorphins secretion that is higher for high-intensity activities such as running or weight lifting (McGowan et al. 1991).

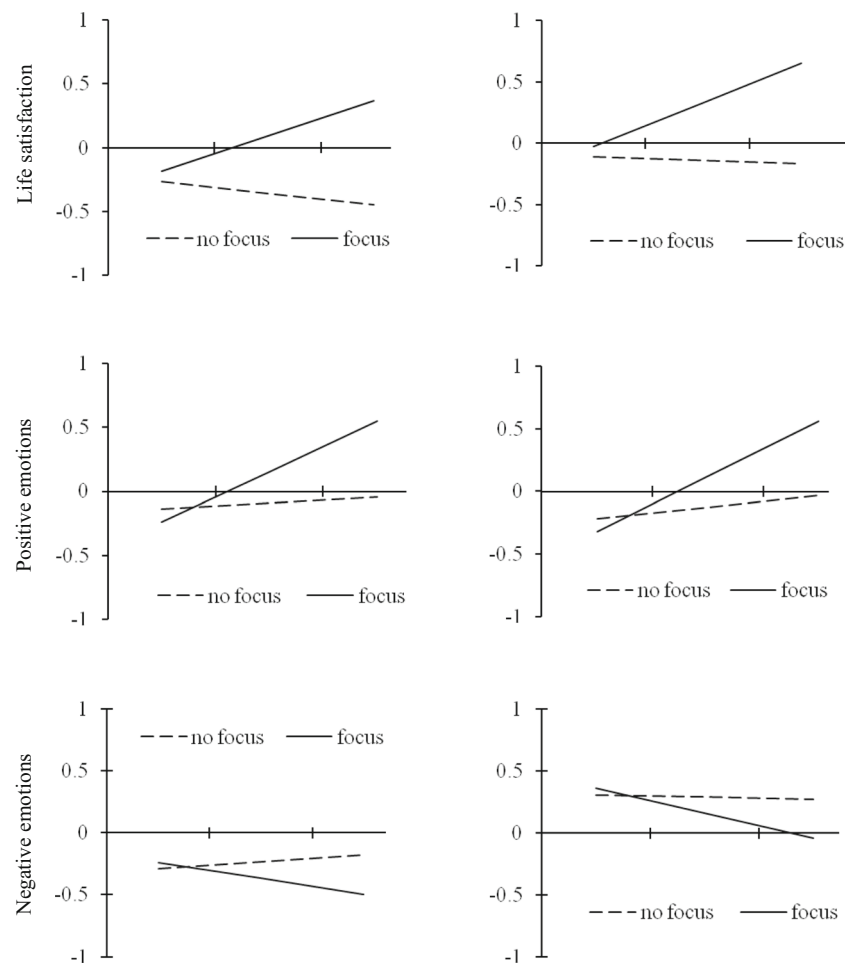
Table 2 Physical activity, subjective well-being, and focusing effects

	Life satisfaction		Positive emotions		Negative emotions	
	β	SE β	β	SE β	β	SE β
Vigorous PA	.41**	.13	.15	.13	.04	.14
Moderate PA	-.09	.14	.05	.14	.06	.14
Scale order	.46	.32	.25	.32	-.14	.33
Gender	.22	.31	-.03	.31	.53	.32
Vigorous PA \times Scale order	-.09	.06	.04	.06	-.02	.06
Vigorous PA \times Gender	-.08	.06	-.05	.06	-.01	.06
Moderate PA \times Scale order	.37*	.15	.35*	.15	-.19	.15
Moderate PA \times Gender	.06	.15	.05	.15	-.07	.15

Scale order coded as 0 = well-being first (no focusing), 1 = physical activity first (focusing). Gender coded as 0 = man, 1 = women. *PA* Physical activity

* $p < .05$. ** $p < .01$

Fig. 1 Focusing effects regarding the relationship between moderate-intensity physical activity (Y) and subjective well-being in men (*left*) and women (*right*)



We found that moderate-intensity physical activity produced the focusing effects for satisfaction with life and positive emotions. Men and women who self-reported greater moderate physical activity were more likely to also reported greater satisfaction with life and positive emotions only when they were asked about physical activity first. In contrast, there was no relationship between moderate physical activity and satisfaction with life or positive emotions, when subjective participants reported their well-being before reporting their physical activity. This phenomenon suggests a full focusing illusion that suggests that people are likely to overrate the role of moderate physical activity in their well-being estimates. These findings add to the literature on the prevalence of biases in well-being judgments (Schkade and Kahneman 1998; Smith et al. 2006).

Finally, we observed that the scale order influenced reported levels of vigorous physical activity and positive emotions. Individuals who reported their well-being first had higher levels of positive affect and higher estimates of vigorous physical activity compared to those who

reported their physical activity first. This effect suggests that reflecting on physical activity decreased positive affect; a variable reported later. Our ad hoc hypothesis would be that this difference might result from participants low on physical activity who might dampen their enthusiasm after reflecting their physical inactivity. Moreover, participants who reported their well-being first reported more physical activity. One ad hoc hypothesis explaining this effect would be that well-being primed less critical or less accurate behavioral judgments. In summary, these scale order effects serve as a new example which is worthwhile to control for within future surveys to minimize the bias in subjective estimates of affective experience and behavior (Schwarz 1999).

This study has several potential practical implications. First, vigorous and moderate physical activity is of primary interest to the public health agencies due to its well-documented impact on health (World Health Organization 2010). The current study provides new evidence that vigorous and moderate activity are related differently to psychological

outcomes. These two physical activity intensities were weakly correlated suggesting that individuals who report vigorous exercises are only slightly more likely to report moderate exercises and vice versa. Based on this behavioral distinction, we found that vigorous physical activity had a stable link to satisfaction with life, whereas the link between moderate physical activity and satisfaction with life was prone to the focusing illusion. This differential effect suggests that compound measures of physical activity are likely to omit more nuanced psychological phenomena that are present when researchers study these intensities as separate predictors within one model. The evidence presented in this study suggests that individuals who report higher levels of vigorous physical activity are happier than their less vigorous peers. Health interventionists can capitalize on this finding as a persuasive argument to facilitate positive attitudes towards intense physical training (Michie et al. 2011). Second, we found that the effects of moderate-intensity physical activity on well-being were prone to the focusing illusion. Thus, individuals who engage in physical activity as a subjective well-being regulation method should be aware that moderate-intensity activity might not be sufficient to obtain the expected effect for well-being. This finding is meaningful, because in the recommendations for physical health, high- and moderate-intensities are exchangeable (World Health Organization 2010). These recommendations suggest that longer periods of moderate-intensity physical activity are the equivalent for shorter periods of high-intensity physical activity. We found that this is not the case for well-being, where high- and moderate-intensity physical activity is not exchangeable. Vigorous physical activity provides a superior contribution to well-being after controlling for moderate-intensity physical activity. However, adverse psychological effects are likely to occur in the case of overtraining (Pearce 2002). Furthermore, high-intensity trainers are at the risk of addiction to exercises (or exercise dependence syndrome) that occurs when exercise becomes an obligation, is excessive, and interferes with work and family responsibilities (Hausenblas et al. 2017). This problem affects c.a. 0.3% to 0.5% of the general population (Mónok et al. 2012). Finally, our findings are a caveat for researchers who aim to minimize measurement bias. Despite extensive literature which indicates that the order of scales presentation matters (Schwarz 1999), it is still not a standard procedure to present questionnaires in a counterbalanced order across participants. Studies such as this one, where the order of scales was controlled and entered into the multiple regression equations, provide suggestive evidence that order effects are likely to occur and researchers should employ solutions (e.g., counterbalancing) to minimize the order effects.

This study has several limitations. First, we accounted for subjective well-being, yet other approaches to well-being (e.g., eudaimonic) might yield different results (Kaczmarek 2018). Theorists have argued that satisfaction and positive

experience result from hedonia as well as eudaimonia (Waterman 1990). Yet, a question remains open how physical activity is related to eudaimonic pursuits, that is the fulfillment of one's best potentials and enhanced personal expressiveness (Waterman et al. 2010) and whether focusing illusion is likely to bias eudaimonic well-being judgments. Second, the mean values for well-being and physical activity in this study suggest that the participants were neither unhappy nor very happy and were physically active. Further studies might investigate if the same pattern of results holds for clinical groups, such as depressed or physically passive groups where more effective interventions are needed (e.g., Mata et al. 2012). Third, other methods of testing focusing illusion are feasible. Further studies might capitalize on other methods (such as longitudinal designs or intra-individuals comparisons) to provide a more robust picture of the focusing effects in physical activity.

This study has several strengths. We used an experimental approach that provided novel causal evidence for the focusing effects regarding physical activity. Furthermore, we studied vigorous and moderate activity as separate constructs within the same statistical model revealing how these two aspects of physical activity contribute to well-being independently producing stable (vigorous intensity) as well as illusory (moderate intensity) effects. Our findings have the potential to produce stimulate further research into the order effects in well-being and physical activity self-report instruments.

In conclusion, our research has revealed that vigorous activity may be necessary to obtain stable well-being benefits. Yet, a focus on moderate physical activity may be sufficient to elicit a transient increase in satisfaction with life and positive emotions. These findings are relevant to researchers and interventionists within the field of well-being and health domains as well as lay people who are seeking new scientific evidence to inform their life-enhancing decisions.

Author's Contribution L.K., A.H., M.K., J.P., M.S. study design; A.H., M.K., J.P., M.S. data collection; L.K., M.B., J.E., S.D. manuscript writing; L.K., M.B. statistical analysis; L.K. project supervision.

Compliance with Ethical Standards

Conflict of Interest On behalf of all authors, the corresponding author states that there is no conflict of interest.

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed consent was obtained from all individual participants included in the study.

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