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# The effects of basic psychological need satisfaction during leisure and paid work on global life satisfaction\*

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## ABSTRACT

We investigated whether satisfaction of employees' basic psychological needs for autonomy, competence, and/or relatedness during leisure positively impacted their leisure domain satisfaction (LSAT) and, in turn, whether LSAT positively influenced their global life satisfaction (GLS). To better understand the above, we simultaneously examined these same relationships in the paid work domain. Useable data were collected from 395 adults employed at least 20 h per week. Structural equation modeling indicated that satisfaction of all three needs positively affected LSAT; with autonomy having the greatest effect. In comparison, although autonomy and relatedness need satisfaction positively affected work domain satisfaction (WSAT), competence's effect was not significant. LSAT and WSAT positively, and age negatively, affected GLS; collectively explaining 48.6% of the total variance. Our findings largely support basic psychological needs theory in both the leisure and work domains and, furthermore, suggest these two contexts are equally effectual in regard to GLS.

## ARTICLE HISTORY

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## KEYWORDS

Autonomy; basic psychological need theory; competence; domain; leisure; paid work; relatedness; structural equation modeling; well-being

Happiness is thought to depend on leisure; for we are busy that we may have leisure.

Aristotle, *Nicomachean Ethics*, 1177b5-6 (as cited in Maynard, 2010, p. 26)

Rozin (2006) held that, because psychology is primarily organized in terms of mental processes or entities, it 'pays little attention to the normal flow of life, that is, what people actually do' (p. 365). Consequently, he contended, psychological research focusing on key life domains – such as leisure and paid work – was rare, and thus 'domain-specific and domain-general regularities' remained unidentified (p. 375).

Arguably, this 'domain denigration' may be diminishing. In terms of positive psychology, for instance, Newman, Tay, and Diener (2014) recently theorized about how leisure participation and leisure satisfaction might influence global subjective well-being. Subsequently, Kuykendall, Tay, and Ng (2015) conducted a meta-analysis that examined many of these same relationships. Importantly, this is not a one-way street. At the same time psychologists are 'recognizing the potential contributions of leisure to a better understanding of positive psychology'; 'leisure scholars are beginning to draw on [positive psychology] theories and measures' (Mock, Mannell, & Guttentag, 2016, p. 45).

Thus, the purpose of our study was to investigate whether satisfaction of employees' basic psychological

needs for autonomy, competence, and/or relatedness during leisure positively impacted their leisure domain satisfaction and, in turn, whether leisure domain satisfaction positively influenced their global life satisfaction. To better identify domain-specific and domain-general regularities (Rozin, 2006) we simultaneously examined these same relationships in the paid work domain. In doing so, we address a perceived gap in the comparative research on need satisfaction in the leisure and paid work domains, and each domain's subsequent effect on well-being.

## Literature review

We begin our review by describing four approaches to understand and examine leisure. We then discuss two psychological concepts – basic needs and subjective well-being – followed by an overview of studies that have jointly examined these concepts during leisure, during paid work, and/or in regard to overall quality of life. We conclude our review with a list of our study's hypotheses.

## Leisure

'From a social psychological perspective, there is no single way to conceptualize and define leisure' (Kleiber, Walker, &

Mannell, 2011, p. 54). Kleiber et al. added, however, that it is possible to categorize the different approaches commonly used to define, observe, and measure leisure using two principal dimensions. Categorization can occur based on the type of: (a) *phenomena*, either objective (e.g. certain types of activities or time periods) or subjective (e.g. certain kinds of meanings, mental states, or basic need satisfactions); and (b) *definitional vantage points*, either external (i.e. from the researcher's perspective) or internal (i.e. from the participant's perspective). The result is a two-by-two matrix with, for instance, the 'experiential-participant' tactic being taken when subjective phenomena are appraised from an internal perspective (Kleiber et al., 2011). It is this approach that we employ; as we construe leisure to be a subjective phenomenon and we allow our participants to decide what constitutes leisure.

### **Basic need satisfaction**

According to basic psychological needs theory (BPNT; Deci & Ryan, 2000), there are three innate human needs: *autonomy*, which is concerned with the extent to which a person believes her or his goals and activities are self-chosen and self-endorsed; *competence*, which focuses on the degree to which an individual deems she or he can act effectively and achieve her or his goals; and interpersonal *relatedness*, which entails the extent to which a person feels she or he is loved by and connected to others. Deci and Ryan (2000) maintained that satisfaction of the needs for autonomy, competence, and relatedness is essential for everyone's quality of life. Importantly, because domains 'vary in their psychological nutriment [i.e. ambient supports for experiencing the three basic psychological needs]' (Ryan, 1995, p. 412), so too could the manner in, and degree to, which they affect a person's quality of life.

### **Subjective well-being**

'Subjective well-being (SWB) is a broad category of phenomena that includes people's emotional responses, domain satisfactions, and global judgements of life satisfaction' (Diener, Suh, Lucas, & Smith, 1999, p. 277). The first facet is sub-divided into positive (e.g. excited, relaxed) and negative (e.g. bored, angry) affect. The second facet involves various life domains – with work, leisure, and family/relationships being deemed the three most important (Pinquart & Silbereisen, 2010). SWB at this level includes both an affective component (e.g. excitement experienced during one's leisure) and a cognitive component (e.g. how satisfied one is with her or his leisure, overall). The third facet focuses on a person's entire life, with global subjective wellbeing (GSWB) including both an affective component (e.g. excitement experienced overall) and a

cognitive component (i.e. life satisfaction overall). The relationship between these two levels has been hypothesized to be either 'bottom-up' (i.e. domain SWB impacts GSWB), or 'top-down' (i.e. GSWB influences domain SWB) (Feist, Bodner, Jacobs, Miles, & Tan, 1995).

### **Basic need satisfaction and subjective wellbeing, during leisure**

Founded upon a comprehensive review of the leisure literature, Newman et al. (2014) proposed a 'bottom-up' (Feist et al., 1995) framework in which: (a) leisure engagement led to satisfaction of five psychological mechanisms that, in turn, impacted (b) leisure domain satisfaction (LSAT) and leisure-based affect that, in turn, influenced (c) GSWB. Newman and associates noted that three of their five psychological mechanisms – autonomy, mastery, and affiliation – were coherent with BPNT's needs for autonomy, competence, and relatedness (Deci & Ryan, 2000), respectively. The researchers identified 24 articles that 'mentioned' self-determination theory (SDT; of which BPNT is a sub-theory). After reviewing these articles, as well as the post-2014 SDT literature, we did not identify any empirical studies that utilized BPNT to investigate whether satisfaction of the needs for autonomy, competence, and/or relatedness during leisure affect LSAT. Notable here is that both leisure scholars and positive psychologists have acknowledged the merit in using need theories to better understand leisure and quality of life (e.g. Kuykendall et al., 2015; Nawijn & Veenhoven, 2013).

### **Basic need satisfaction and leisure domain, work domain, and global subjective wellbeing**

Kuykendall and colleagues (2015) conducted a meta-analysis of leisure and subjective well-being studies. They found, for instance, that the correlation between LSAT and GLS was  $r = .30$  for a sub-sample of workers. For comparative purposes, Kuykendall et al. cited a meta-analysis that discovered the correlation between paid work satisfaction (WSAT) and GLS was considerably higher ( $r = .40$ ; Bowling, Eschleman, & Wang, 2010). Despite this disparity, Kuykendall et al. counseled that the leisure domain could have greater import for enhancing GSWB than other domains – such as work – because leisure experiences are typically much more malleable. Importantly, their findings also led them to state that: 'although not minimizing top-down influences, results are consistent with bottom-up models of SWB' (p. 364).

Ryan, Bernstein, and Brown (2010) conducted an experience sampling method study that examined the effects of basic need satisfaction on positive and negative affect during work and non-work time. Ryan et al. (2010) found

that: (a) work was associated with, as hypothesized, lower autonomy and relatedness satisfaction and, unexpectedly, lower competence satisfaction, than non-work; and (b) in turn, satisfaction of all three basic needs positively influenced pleasant affect and negatively impacted unpleasant affect, with competence exerting the weakest effect in both instances. After acknowledging that their non-work category may have been overly broad – as it included both leisure and self-maintenance activities – Ryan et al. concluded that their findings highlighted leisure's potential importance as a conduit for satisfying people's basic psychological needs.

Howell, Chenot, Hill, and Howell's (2011) time diary study had similar findings. Specifically, autonomy and relatedness need satisfaction were associated positively with well-being indicators (i.e. happiness) and negatively with ill-being indicators (i.e. stress), whereas competence, unexpectedly, was negatively associated with happiness. Howell et al. speculated that their participants' competence-promoting behaviors were primarily school and work-related activities and, therefore, not chosen by them. Non-work and non-school domain studies, they added, might find different results.

Two survey studies examined overall need satisfaction in multiple domains, including leisure, and their effects on SWB. First, Milyavskaya and Koestner (2011) investigated basic need satisfaction in six domains as well as aggregate SWB (i.e. vitality and positive and negative affect) in each domain. Hierarchical linear modeling results indicated that need satisfaction overall played a similar facilitative role in the family, school, relationships, and work domains, and a lesser role in the friendship and activities/leisure domains. Noteworthy here, however, is that the majority (58%) of these researchers' participants listed their occupation as student. Second, Lalande et al. (2015) examined basic need satisfaction at work and during a specific leisure activity (i.e. playing a musical instrument), as well as GSAT. Need satisfaction at work and in music were moderately correlated with each other ( $r = .48$ ), and near equally associated with GSAT ( $r = .21$  and  $r = .23$ , respectively).

Non-need based research on the concurrent effects of leisure and work domain SWB on GSWB began in the early 1970s. In a Finnish study (Haavio-Mannila, 1971): (a) unmarried working men indicated that LSAT was more highly correlated with GLS than was WSAT ( $r = .53$  and  $r = .30$ , respectively); and (b) both married and unmarried working women indicated that LSAT was significantly correlated with GLS ( $r = .29$  and  $r = .19$ , respectively) while WSAT and GLS were not. In a national sample of American employees, Rodgers and Converse (1975) discovered, using stepwise regression, that satisfaction with the non-work/spare time domain best predicted GSWB, followed by family life, standard of living, work, marriage, health, and community

( $b$ 's = .25, .23, .17, .16, .14, .13, .10, respectively). London, Crandall, and Seals's (1977) study of American workers focused on the effects of two domains – leisure and work satisfaction – on GSWB. Their regression results indicated that LSAT uniquely accounted for 13.6% of the variance in GSWB vs. 4.3% for WSAT. Conversely, a third study of American employees in the 1970s (Rice, Frone, & McFarlin, 1992) found that family satisfaction ( $b = .43$ ) best predicted GLS, followed by WSAT and then LSAT ( $b = .34$  and  $b = .18$ , respectively).

Pearson (1998) examined the effects of LSAT and WSAT on American workers' psychological health, operationalized as a combination of GSWB and other variables such as behavioral/emotional control. A stepwise regression revealed that, whereas WSAT alone predicted psychological health ( $R^2 = .29$ ), predictive ability improved when LSAT was added ( $R^2 = .35$ ). These results should be viewed with caution, however, given the study's atheoretical nature as well as stepwise regression's inherent limitations (Tabachnick & Fidell, 2013).

Lastly, van Praag (2004) used panel data of West German and British employees during the mid-1990s to assess how various domain satisfactions impacted aggregate life satisfaction. In the German case, the effects of financial, health, and work domain satisfaction were all much greater than leisure-amount/leisure-use satisfaction ( $b$ 's = .36, .26, .20, and .08, respectively). However, in the British case, the effects of social-life, work, leisure-use, and health domain satisfaction were all near equal ( $b$ 's = .12, .11, .11, and .10, respectively).

## Conclusion

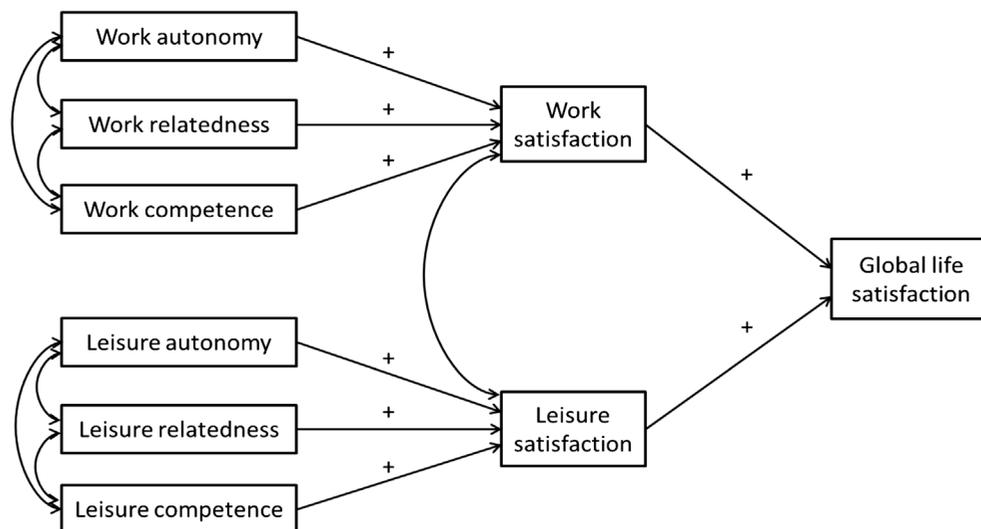
There have only been a handful of studies that have simultaneously examined the effects of autonomy, competence, and relatedness need satisfaction, in the leisure and work domains, on LSAT and WSAT, respectively. Furthermore, there have only been a handful of studies that have concurrently examined the effects of LSAT and WSAT on GLS (or GSWB more broadly). To the best of our knowledge, no direct comparison of LSAT's and WSAT's effects on GLS has yet been conducted. Therefore, our study has three hypotheses:

*Hypothesis 1:* Satisfaction of employees' needs for (a) autonomy, (b) competence, and (c) relatedness, during leisure, will positively affect their leisure satisfaction.

*Hypothesis 2:* Satisfaction of employees' needs for (a) autonomy, (b) competence, and (c) relatedness, during paid work, will positively affect their work satisfaction.

*Hypothesis 3:* (a) Leisure satisfaction and (b) paid work satisfaction will positively affect employees' global life satisfaction.

Figure 1 illustrates our hypothesized model.



**Figure 1.** Psychological need satisfaction during leisure and work, domain life satisfaction, and global life satisfaction, hypothesized model.

## Method

### Participants

Participants' ( $N = 395$ ) demographic characteristics are reported in Table 1. The majority were male ( $n = 202$ ; 51.1%), and in either the 35- to 49-year old ( $n = 151$ ; 38.2%) or 50- to 64-year old ( $n = 149$ ; 37.7%) age categories. For descriptive purposes, those who provided detailed occupational information were categorized according to Florida's (2012) social class scheme. This framework was selected for two reasons: first, it reflects the social and economic transformation taking place in today's workforce; and second, unlike others who have posited similar class shifts (e.g. Reich, 1991) Florida discusses in detail what such a sea change may mean for the leisure domain. Of those we could categorize, participants were near equally divided between creative employees (e.g. artists, lawyers:  $n = 186$ ; 53.9%) and sales/service and working class employees (e.g. retail clerks:  $n = 103$ ; 29.9%; plumbers:  $n = 56$ ; 16.2%, respectively). Overall, they worked on average 38.93 h ( $SD = 9.86$ ) per week.

### Procedure

The target population consisted of individuals living in a major Canadian metropolitan area. The criteria for participating in this observational study were that the individual must have been 18 years of age or older and employed at least 20 h per week in one job. By initially prioritizing male participants we ensured a near equal number of each sex upon study completion.

After university ethics approval was obtained, data were collected by the institution's Population Research Lab using computer-assisted telephone interviewing.

**Table 1.** A summary of demographic characteristics of the final sample.

		<i>n</i>	%
Sex	Female	193	48.9
	Male	202	51.1
Age	18–24 years old	14	3.5
	25–34 years old	62	15.7
	35–49 years old	151	38.2
	50–64 years old	149	37.7
	65 years old or older	19	4.8
Social class	Creative	186	47.1
	Working	56	14.2
	Sales/service	103	26.1
	Missing	50	12.7
		<i>M</i>	<i>SD</i>
Work hours (per week)		38.9 (Median: 40)	9.9 (Range: 20 to 84)

Note:  $N = 395$ .

Random-digit dialing was used to ensure that all landlines and cellphones had an equal chance of being contacted. Interviewing took place between April and June, 2012. Five thousand telephone numbers were allocated, with 401 interviews being completed. The overall response rate was 30%. No incentives were provided.

### Measures

Trained interviewers asked participants how much they (dis)agreed, using 5-point Likert scales, with nine items appraising: (a) autonomy satisfaction during work (e.g. 'The activities I do at my paid job are in line with what I really want to do'), (b) competence satisfaction during work (e.g. 'I feel competent in my paid job'), and (c) relatedness satisfaction during work (e.g. 'I really feel connected with other people at my paid job'). These nine items had among the

highest item-total correlations on the work-related basic need satisfaction scale (W-BNS; Broeck, Vansteenkiste, Witte, Soenens, & Lens, 2010; see also Van den Broeck, Ferris, Chang, & Rosen, 2016). Participants also reported how much they (dis)agreed, using 5-point Likert scales, with the same autonomy, competence, and relatedness items after each was modified by replacing 'paid job' with 'leisure'. GLS was measured using a single item (i.e. 'How satisfied are you, all in all, with your life as a whole?'; slightly modified from Andrews & Withey, 1974), measured on a 10-point bipolar scale (1 = completely dissatisfied to 10 = completely satisfied). The reliability and validity of single-item life satisfaction scales have been shown to be very similar to their multiple-item counterparts (Cheung & Lucas, 2014; Lucas & Brent Donnellan, 2012). The word 'life' in our GLS item was replaced with either 'leisure' or 'paid job' to measure LSAT and WSAT, respectively. The same 10-point bipolar scale was used for both of these items. Participants also reported their leisure activity participation, motivations for leisure and work, etc.; however, only their socio-demographic characteristics are discussed further here.

### **Data screening and analyses**

Data were screened using IBM SPSS version 23 and following Tabachnik and Fidell's (2013) recommendations. After deletion of one potential multivariate outlier, and five cases that contained more than 10% of main variables missing, 395 participants remained.

Data analysis was comprised of four stages: (a) computing descriptive statistics, (b) performing structural equation modeling (SEM) to test the proposed model (Figure 1), (c) performing bootstrap procedures to test the indirect effects, and (d) running 'phantom models' (Macho & Ledermann, 2011) to inspect the contrast of WSAT and LSAT's effects on GLS.

In terms of descriptive statistics, we computed standardized Cronbach's  $\alpha$  for all six need satisfaction constructs. Then, composite scores for each construct were obtained through mean aggregation as has been used with similar BPNT scales (e.g. Gagné, 2003). Though the three basic need satisfaction measures are often combined into an omnibus scale, we chose not to do so for both theoretical (i.e. according to BPNT, autonomy, competence, and relatedness are discrete 'nutriments'; Deci & Ryan, 2000) and explanatory (i.e. important distinctive outcomes of each need can be overlooked; Sheldon, Zhaoyang, & Williams, 2013) reasons. Lastly, the nine main variables in our model, and three control variables (i.e. sex, age, and age-squared) identified in the literature (e.g. van Praag, 2004), were submitted to a zero-order correlation.<sup>1</sup>

Main analyses were conducted using SEM, IBM SPSS Amos version 23 software (Arbuckle, 2014), and the maximum likelihood estimation method. All variables were identified as observed variables.

Model fit was evaluated based on the following five indices and Hu and Bentler's (1999) recommended criteria: (a) the model chi-square; (b) a goodness-of-fit index (GFI) of .95 or greater; (c) a comparative fit index (CFI) of 'close to .95' or greater; (d) a root mean square error of approximation (RMSEA) of 'close to .06' or less with a confidence interval; and (e) a standardized root mean squared residual (SRMR) of 'close to .08' or less.

SEM analysis was conducted, first, with each of sex, age, and age-squared being linked to: (a) LSAT, WSAT, and GLS through structural paths; and (b) the other control variables and the six need satisfaction variables through correlations (Becker et al., 2016). Doing so, however, boosted the number of parameter estimations. To focus model fit inspection on our main variables and their relationships, non-significant control parameters were then dropped from the analysis. Because deletion did not substantially change our results, we only report findings with such 'impotent control' (Becker et al., 2016).

Model modifications were made based on theoretical considerations (Kline, 2016); that is, we closely evaluated whether the addition of any structural path or correlation link made theoretical sense. We relied on modification indices in Amos based on the Lagrange Multiplier test (Arbuckle, 2014); thus, the impacts of deleting parameters were not directly examined.

The indirect effects of the need satisfaction during leisure and work through LSAT and WSAT on GLS were analyzed using bootstrap functions in Amos. This tactic is recommended over traditional approaches, such as the Sobel's test (Cheung & Lau, 2008). Following emerging consensus in the mediation literature (e.g. Zhao, Lynch, & Chen, 2010), we tested indirect effects before examining total effects.

To further explore the contrast between WSAT's and LSAT's effect on GLS, the phantom model approach (Macho & Ledermann, 2011) was employed. This is a programming, rather than statistical, technique that forces Amos to: (a) recognize a targeted contrast as a total effect, (b) apply bootstrapping procedures to the contrast, and (c) generate significance test results in an output.

## **Results**

### **Descriptive statistics and bivariate correlations**

Table 2 summarizes means, standard deviations, Cronbach's  $\alpha$ 's, and zero-order correlation coefficients among the nine main variables and three control variables.

**Table 2.** A matrix of means (*M*), standard deviations (*SD*), reliability indicators, and zero-order correlation coefficients among the main variables.

Variables	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9	10
1. Sex	–	–	–									
2. Age	–	–	.02									
3. WA	3.71	.78	.07	.16**	(.58)							
4. WR	3.72	.85	.07	.06	.46**	(.70)						
5. WC	4.38	.49	–.02	.11*	.31**	.31**	(.71)					
6. LA	4.19	.54	.09	–.01	.27**	.29**	.30**	(.39)				
7. LR	3.87	.75	.13*	–.14**	.18**	.35**	.18**	.27**	(.63)			
8. LC	4.08	.61	.04	–.05	.06	.15**	.38**	.45**	.33**	(.71)		
9. WSAT	6.96	1.93	–.01	.17**	.60**	.46**	.28**	.18**	.21**	.10*		
10. LSAT	7.16	1.74	.02	.04	.22**	.15**	.25**	.44**	.29**	.41**	.35**	
11. GLS	7.46	1.64	.02	.00	.34**	.28**	.24**	.29**	.27**	.21**	.57**	.60**

Notes: *N* = 395. WA = work autonomy; WR = work relatedness; WC = work competence; LA = leisure autonomy; LR = leisure relatedness; LC = leisure competence; WSAT = work domain life satisfaction; LSAT = leisure domain life satisfaction; and GLS = global life satisfaction. For sex, male = 1 and female = 2. Values in parentheses are the standardized Cronbach  $\alpha$ 's.

\* $p < .05$ ; \*\* $p < .01$ .

Participants reported higher levels of autonomy and relatedness need satisfaction during leisure than during work. However, their competence was satisfied to a greater degree during work than leisure. Participants were on average relatively highly satisfied with their lives (i.e. WSAT, LSAT, and GLS), which is consistent with previous research (e.g. London et al., 1977).

Standardized Cronbach's  $\alpha$ 's were: .58 for work domain autonomy (WA), .70 for work domain relatedness (WR), .71 for work domain competence (WC), .39 for leisure domain autonomy (LA), .63 for leisure domain relatedness (LR), and .71 for leisure domain competence (LC). These reliabilities levels, with the exception of that of LA, were deemed acceptable (Schmitt, 1996). In terms of LA, it is worth noting that SPSS did not indicate that deletion of any of its items would increase internal consistency. Considering the three LA items captured conceptually distinct aspects of autonomy satisfaction (i.e. content validity; DeVellis, 2012), all were retained.

The zero-order correlation matrix indicated support for our model specifications. First, the need satisfaction indicators were significantly correlated to one another within each domain (e.g. LA, LR, and LC) and between the two domains (e.g. WA and LA). Moderate size correlation coefficients (Cohen, 1992) indicate that participants were able to distinguish among the three needs in each domain, as well as between the same need in the two domains. Second, the correlations between need satisfaction in each domain and a given domain life satisfaction were all significant, ranging from .28 (WC and WSAT) to .62 (WA and WSAT). Third, the inter-relationships among WSAT, LSAT, and GLS were significant and positive, with their effect sizes ranging from medium to large (Cohen, 1992).

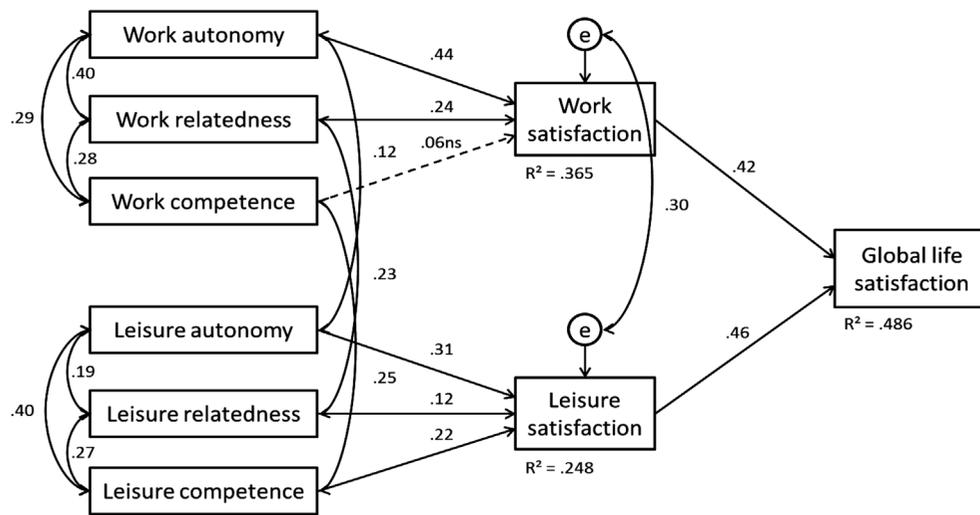
### Main analyses

Results of our SEM analysis are shown in Figure 2 and Table 3.

Initial findings, especially the RMSEA value greater than .10 (Kline, 2016), suggested a poor fit of the proposed model (see Table 3, left column). Modification indices indicated that model fit could be improved by adding correlation links between identical needs (e.g. WA and LA). A *post hoc* review of the literature found theoretical and empirical support for this modification (e.g. Ryan & Deci, 2017). Adding these correlations increased the model fit indices to acceptable levels (i.e.  $\chi^2(32) = 96.40$ ,  $p < .000$ ; GFI = .96; CFI = .94; RMSEA = .07, CI 10% [.055; .088]; SRMR = .09). Modification indices also suggested adding correlations among non-identical need satisfaction variables across the two domains (e.g. WA and LR). Scrutiny of the standardized residual covariance matrix, sample covariance matrix, and implied covariance matrix triggered by the significant model chi-square test (Kline, 2016) indicated the same modification possibility. However, because we did not have a theoretical rationale to do so, we stopped model-modification at this point.

Our first hypothesis was that satisfaction of employees' needs for (a) autonomy, (b) competence, and (c) relatedness, during leisure, would positively affect their leisure satisfaction. In our modified model, all three need satisfaction variables had positive effects on LSAT; thus *H1(a)*, *H1(b)*, and *H1(c)* were supported. Autonomy satisfaction had the largest effect on leisure domain satisfaction. Need satisfaction during leisure collectively explained 24.8% of the variance in LSAT.

Our second hypothesis was that satisfaction of employees' needs for (a) autonomy, (b) competence, and (c) relatedness, during paid work, would positively affect their work satisfaction. In our modified model, two need satisfaction variables – WA and WB – had positive effects on WSAT; therefore *H2(a)* and *H2(c)* were supported. The path from WC to WSAT was non-significant; thus *H2(b)* was not supported. Autonomy satisfaction had the largest effect on work domain satisfaction. Need satisfaction during work collectively explained 36.5% of the variance in WSAT.



**Figure 2.** The modified model and standardized parameters. All parameters in the model and in this note were significant at the .01 level unless otherwise noted. Sex and age as the control variables and links related to them are omitted for parsimony's sake. Sex was not correlated with any main or control variables at the .05 level. Age (mean-centered) had a negative effect on GLS ( $b = -.09$ ,  $p = .013$ ) and was correlated with WA ( $r = .17$ ), WC ( $r = .11$ ), and LR ( $r = -.17$ ). Other links related to the control variables were non-significant and dropped as 'impotent' control (Becker et al., 2016).

Note: ns = non-significant.

**Table 3.** A summary of fit indices for initial and modified models.

Model Fit Indices	Initial model	Modified model
$\chi^2$ ; df; $p$ level	173.28; 35; .000	96.40; 32; .000
GFI	.93	.96
CFI	.88	.94
RMSEA	.10 CI 10% [.086; .115]	.07 CI 10% [.055; .088]
SRMR	.12	.09

Notes: We examined the model fit indices based on the recommended cutoff points of: (a) GFI of close to or larger than .95; (b) CFI of close to or greater than .95; (c) RMSEA of close to or less than .06; and (d) SRMR of close to or less than .08 (Hu & Bentler, 1999). Both models were first ran with full statistical control with sex, age, and age-squared, and then non-significant or 'impotent' parameters related to the control variables were dropped in the models reported in this table (Becker et al., 2016).

Bootstrap procedures were applied to the modified model in Amos (using a significance level of .05 and 5000 subsamples) to inspect indirect effects. Results are summarized in Table 4 (i.e. Relationships 1–6).

All indirect effects were significant except for WC's effect on GLS through WSAT. This is consistent with the omnibus SEM results. As per Zhao et al. (2010), after establishing these indirect effects, we ran the modified model again with six direct paths from each need satisfaction to GLS (e.g. from LA to GLS). None of the direct effects were significant. Thus, we concluded that the significant indirect effects were all 'indirect-only' mediation and completely mediated by the respective domain life satisfaction (Zhao et al., 2010, p. 201).

Our third hypothesis was that (a) leisure satisfaction and (b) paid work satisfaction would positively affect employees' global life satisfaction. In our modified model, WSAT and LSAT had positive effects on GLS ( $b = .42$  and  $.46$ ,

respectively). Thus,  $H3(a)$  and  $H3(b)$  were both supported. These two predictors, along with age ( $b = -.09$ ), explained 48.6% of the variance in GLS.

The phantom model approach (Macho & Ledermann, 2011) was adopted to test the contrast between LSAT and WSAT's effects on GLS. With a significance level of .05 and 5000 bootstrap subsamples, the test indicated a non-significant difference (see Table 4, Relationship 7). When this model was extended to include the indirect effects of need satisfaction in each domain, the contrast remained non-significant (see Table 4, Relationship 8).

## Discussion

### **Hypothesis one: Basic need satisfaction and leisure domain satisfaction**

Our first hypothesis was that satisfaction of employees' needs for (a) autonomy, (b) competence, and (c) relatedness, during leisure, would positively affect their leisure satisfaction. We found that satisfaction of each basic need did significantly positively influence LSAT (i.e.  $H1(a)$ ,  $H1(b)$ , and  $H1(c)$  were all supported). This finding substantiates the proposition that these three psychological mechanisms are activated during leisure (Newman et al., 2014). Moreover, it also coheres with BPNT's tenet that satisfaction of all three needs is essential for well-being (Deci & Ryan, 2000).

Autonomy satisfaction's effect on LSAT was greatest, which is in line with many leisure scholars' (e.g. Iso-Ahola, 1999; Neulinger, 1981) contention that it is *the* defining

**Table 4.** A summary of the analyses of specific indirect effects and contrasts.

Relationship	Indirect effect (Standardized)	Point estimate (Unstandardized)	Standard error	Bias-corrected		Percentile method	
				Lower boundary	Upper boundary	Lower boundary	Upper boundary
1. WA→WSAT→GLS	.19	.39	.06	.274	.526	.266	.517
2. WR→WSAT→GLS	.10	.19	.05	.111	.301	.109	.298
3. WC→WSAT→GLS	.03	.09	.06	-.029	.210	-.035	.201
4. LA→LSAT→GLS	.15	.43	.09	.290	.623	.276	.606
5. LR→LSAT→GLS	.06	.12	.05	.023	.231	.019	.227
6. LC→LSAT→GLS	.10	.28	.06	.165	.406	.162	.402
7. WSAT→GLS vs. LSAT→GLS		-.07	.07	-.222	.061	-.219	.065
8. WA, WR, & WC→WSAT→GLS vs. LA, LR, & LC→LSAT→GLS		-.162	.155	-.502	.112	-.482	.124

Notes: All of the analyses were conducted in the context of the modified model (Figure 2). Both the bias-corrected percentile method and percentile method were performed with the significance level of .05 and 5,000 bootstrap samples. The contrasts between the effects of leisure and work domains on GLS were performed with the phantom model approach (Macho & Ledermann, 2011).

characteristic of leisure. Comparably, in Deci and Ryan's (2000) discussion of the evolutionary origins of their three innate needs, they noted that: 'hardly unique to humans, the basic tendency towards integrated functioning is perhaps *the most fundamental* characteristic of living things (Jacob, 1973). Autonomy, as a human characteristic, is an extension of this ...' (p. 253; italics added). If correct, it follows that when this specific need is highly satisfied in a given domain, then satisfaction with that domain would increase accordingly.

Competence satisfaction's effect on LSAT was smaller than that of LA. This may indicate that, as Howell et al. (2011) asserted, competence-promoting activities are often stressful and initially unsatisfying even in the leisure domain. Although Howell et al. found negative effects of competence satisfaction on happiness across various domains, in our study LC had a positive effect on LSAT. This suggests that leisure is a context where people can try challenging activities and strive for competence while experiencing a negative (initial) effect on their well-being. Another possible explanation for this finding is that there may be an inherent tension between competence and another psychological mechanism: detachment-recovery (i.e. recuperation from work-based stressors through leisure; Newman et al., 2014). For instance, an ESM study (Kleiber, Larson, & Csikszentmihalyi, 1986) composed of adolescents identified two distinct categories: (a) demanding and challenging leisure, which often occurs during sports, games, and hobbies (p. 472) – all activities closely associated with 'mastery' (cf. Newman et al., 2014); and (b) '... relaxed leisure, a type of experience that may restore one's energy and spirit', which often occurs during reading, socializing, and watching television (p. 472). Thus, though certain leisure activities (e.g. wilderness canoeing) could involve both psychological mechanisms, it may be that for working adults such as those in our study, competence satisfaction may be less pertinent and/or possible than detachment-recovery (cf. Petrou & Bakker, 2016).

Relatedness satisfaction's effect was smallest. Potentially, this may have been because this need could act as a 'distal support' during, for example, certain types of leisure activities (e.g. solo hiking, playing solitaire; Deci & Ryan, 2000).

### **Hypothesis two: Basic need satisfaction and work domain satisfaction**

Our second hypothesis was that satisfaction of employees' needs for (a) autonomy, (b) competence, and (c) relatedness, during paid work, would positively affect their work satisfaction. We found that while satisfaction of the needs for autonomy and relatedness did do so [thus supporting *H2(a)* and *H2(c)*], satisfaction of the need for competence did not [thus *H2(b)* was not supported]. Autonomy satisfaction's effect on WSAT was greatest. This result appears consistent with Howell et al. (2011) finding that the correlation between autonomy satisfaction and happiness was largest. It is also congruent with our earlier proposition that, for evolutionary reasons, if the need for autonomy, in particular, is highly satisfied in a given domain, then satisfaction with that domain will increase considerably.

Competence satisfaction's non-significant effect on WSAT was unexpected; however, it is consistent with the results of a study of factory workers that found WC's effect on general job satisfaction was also null (Ilardi, Leone, Kasser, & Ryan, 1993). On the other hand, our finding is inconsistent with research that identified significant negative effects. In Howell et al.'s (2011) study, for instance, this may have been because they examined affective well-being, whereas we focused on life satisfaction: the cognitive aspect of SWB. In all three mentioned cases, it is also possible that there was an untested interaction between autonomy and competence (Ryan & Deci, 2017). Howell et al. hinted at this possibility when they speculated that their participants' competence-promoting behaviors may have been associated with lower levels of happiness because

these activities were work- and school-related and, thus, not self-selected.

Lastly, based on our model's standardized coefficients, the effects of WA and WR on WSAT appear larger than the effects of LA and LR on LSAT (Figure 2). This may be because, although satisfaction of the needs for autonomy and relatedness is lower during paid work than leisure (see Table 2), employees' *expectations* that these needs will be satisfied during work may also be lower. Thus, in the work domain, lower expected need satisfaction in conjunction with lower actual need satisfaction may lead to 'relative need satiation' and, as a result, work satisfaction.<sup>2</sup>

### ***Hypothesis three: Leisure satisfaction, work satisfaction, and global life satisfaction***

Our third hypothesis was that (a) leisure satisfaction and (b) paid work satisfaction would positively impact employees' global life satisfaction. We found that both LSAT and WSAT significantly positively influenced GLS; thus supporting both *H3(a)* and *H3(b)*. This finding is consistent with a small number of past studies that conducted multi-domain analyses (e.g. van Praag, 2004).

To the best of our knowledge, this is the first study to statistically test for potential differences in the magnitude of the effects of leisure and work domain satisfaction on GLS. The non-significant finding is initially surprising, as meta-analyses in the leisure (Kuykendall et al., 2015) and work (Bowling et al., 2010) fields indicated that WSAT had a stronger effect than LSAT. One potential explanation is that, because value-congruent domain satisfaction is more conducive to increased GLS than value-incongruent domain satisfaction (Oishi, Diener, Suh, & Lucas, 1999), earlier studies' participants may have valued work over leisure whereas our study's participants valued work and leisure near equally. There is some evidence for such a societal shift. In a 1996 Alberta-wide survey, 48% of respondents reported that work was more important than leisure while 27% said the opposite. In 2007, when the same survey was repeated, 47% of respondents reported that leisure was more important than work while 32% said the opposite (Harper, 2008). A second possible explanation is that many of the studies reviewed by Kuykendall et al. used Beard and Ragheb's (1980) Leisure Satisfaction Scale (LSS) to measure LSAT. The LSS has six dimensions (e.g. psychological, physiological, aesthetic), which means these narrow constructs are utilized to predict a global concept. In contrast, consistent with the compatibility principle (Ajzen, 2005), in our study LSAT and GLS were assessed at the same level of specificity. In summary, our findings suggest that the leisure and work domains are equally effectual in regard to global life satisfaction.

## **Conclusion**

Our study sought to address a perceived gap in the comparative research on need satisfaction in the leisure and paid work domains, and each domain's subsequent effect on well-being. In doing so, both domain-specific and domain-general regularities (Rozin, 2006) were identified. We conclude with a brief discussion of our study's practical implications and inherent limitations, and then outline some possible avenues future researchers may want to investigate.

### ***Practical implications***

We concur with Kuykendall et al. (2015), who held that leisure has great potential for enhancing SWB because the experiences that occur within this domain are commonly more malleable than those that occur in other domains, such as work. Rather than repeat Kuykendall and colleagues' practical implications, we add two more from a leisure studies perspective.

First, although BPNT posits that one can optimally pursue well-being when ambient supports for satisfying basic needs are present, it also maintains that the optimal pursuit of well-being may depend on 'the extent that the individual has sufficient inner resources to find or construct the necessary nourishment' (Deci & Ryan, 2000, p. 229). The latter is clearly in line with 'leisure education': a multifaceted process that, among its many goals, helps people learn how to satisfy their needs for autonomy, competence, and relatedness through leisure participation (Dattilo, 2016). Greater provision of leisure education – in schools, universities, workplaces, etc. – could enhance a person's ability to discover and/or develop a more 'nutrient-full' leisure domain and, potentially, this heightened capacity could be transferable to other life domains.

Second, leisure programming is provided by numerous public, private, and not-for-profit organizations. To date, however, BPNT has rarely been employed in the development, delivery, or evaluation of these agencies' recreational offerings. Walker (2016) outlined how front-line staff could adapt existing BPNT scales to facilitate satisfaction of clients' needs for autonomy, competence, and relatedness before, during, and after participating in recreation programs. Based on our findings, implementation of such an autonomy-supportive (Deci & Ryan, 2000) programming approach could result in recreationists experiencing higher levels of LSAT and, ultimately, GLS.

Having stated the above, at the suggestion of a reviewer we compared and contrasted the extant research on the creation of autonomy supportive environments (Ryan & Deci, 2017) in the paid work and leisure domains. In the former case, a review (Dagenais-Desmarais, Forest, Girouard,

& Crevier-Braud, 2014) identified three key factors: (a) a positive relationship with one's immediate supervisor; (b) certain job design characteristics; and (c) a fair and equitable compensation system. Unfortunately, very little comparable research has been conducted in the latter domain; although one can envision how some of these same factors could be applicable to leisure (e.g. a positive relationship with one's primary instructor) whereas others would be much less so if at all (i.e. compensation).

The sole study we found that directly compared these two domains employed qualitative interviews with German adults who engaged in video gameplay both as leisure and paid work (e.g. game designers, e-sports professionals). Deterding's (2016) participants identified various properties that led them to be more likely to deem an experience as leisure than work. Of these, the following attributes were considered particularly autonomy supportive during leisure: (a) 'social license' to choose whether, when, what, how long, and how to gameplay; (b) a relaxed spatial field (i.e. being shielded from social obligations and/or public observation, often through how one configured her or his space); and (c) minimal social and material consequences (i.e. no social sanctions if one did not show up, and/or no prize money if one played poorly). In summary, the above findings suggest that domain-specific and domain-general regularities (Rozin, 2006) may exist in terms of autonomy support.

### Study limitations and future research

Our study has both inherent strengths (e.g. random sampling, working adult participants) and limitations. In terms of the latter, although we adopted the bottom-up model based on recent theoretical development (Newman et al., 2014) and meta-analytic findings (Kuykendall et al., 2015), our study is cross-sectional and thus its' causal inference is limited. Additionally, our need scales are relatively brief and, especially in the case of LA, this may have influenced its' internal consistency. On the other hand, we find it interesting that this issue did not extend to the WA items, which had the identical wording except for the domain name. This intimates that some of the WA items may not be directly applicable to other contexts, such as leisure.

Future research could address the aforementioned concerns by, respectively, conducting longitudinal research and developing and testing domain (and leisure) specific basic need items. Future researchers should also consider investigating whether: (a) our findings are similar and/or different in non-Western cultures; (b) LA, LC, and/or LR influence leisure domain positive and negative affect and, in turn, global positive and negative affect; (c) meaning-making and/or detachment-recovery (Newman et al., 2014), as well as nature relatedness (Zelenski & Nisbet, 2014) during leisure further explains LSWB and, in turn, GSWB; and (d) LA, LC, and/or LR,

and LSWB, also affect eudaimonic well-being (e.g. meaning in life). Additionally, the potential effect of need frustration as well as the relationship between need expectations and actual satisfaction of needs, in different domains, should be investigated. Finally, to address potential multicollinearity issues, we recommend future researchers consider using different types of needs satisfaction measures (e.g. Van den Broeck et al., 2016) to ensure a higher level of internal consistency, and a different statistical method to minimize inter-factor correlations by estimating cross-loadings (e.g. exploratory SEM; Marsh, Morin, Parker, & Kaur, 2014).

In conclusion, Mock et al. (2016) contended that positive psychologists and leisure scholars had begun to realize that, by sharing information and working together, a great deal more could be learned about how leisure contributes to well-being. We hold that our article, in conjunction with this special issue of the *Journal of Positive Psychology*, provides further credence to their contention.

### Notes

1. A reviewer suggested that work hours could also be a pertinent variable. Consequently, we examined the Pearson correlation coefficients between the number of hours of work per week participants reported and their: (a) leisure domain satisfaction ( $r = -.08; p > .10$ ); (b) paid work domain satisfaction ( $r = .00; p > .10$ ); and (c) global life satisfaction ( $r = -.07; p > .10$ ). Given these results, we did not include this variable in our main analyses.
2. We would like to thank one of the reviewers for pointing out this possibility.

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