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RESEARCH PAPER

Flow Support at Work: Examining the Relationship Between Strengths Use and Flow at Work Among School Staff over a Three-Year Period

Cedomir Ignjatovic[1] · **Margaret L. Kern**[1] · **Lindsay G. Oades**[1]

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Abstract
Flow at work is thought to be a dynamic and contextually bounded experience. Its relevance to optimal human functioning is well documented. Although flow theory suggests a mutually reinforcing association between flow and strengths use, with support by cross-sectional and short-term studies, the inter-relationship of flow at work and strengths use prospectively over long time periods is unknown. Using data collected from a panel of school staff ($N=253$) across five measurement occasions over a three-year period, the current study investigated the extent to which flow at work and strength use were mutually supportive cross-sectionally and prospectively. Although flow and strengths were correlated within each time point, flow was not predictive of strength use nor was strength use predictive of flow at subsequent time points. Results point to the complexities of understanding dynamic psychological processes over time, which may differ from short-term relationships. Implications for measuring and supporting wellbeing at work, while taking into account its dynamic nature, are considered.

Keywords Flow at work · Cross-lag design · Strengths use · Human functioning · Panel design · Secondary data analysis

1 Introduction

Flow is a dynamic experience involving affective (e.g., enjoyment), cognitive (e.g., absorption), motivational (e.g., intrinsic motivation), and volitional (e.g., positive activation and vitality) elements (Bassi & Delle Fave, 2012; Delle Fave et al., 2011). Its relevance to optimal human functioning is well-documented within the literature (e.g., Csikszentmihalyi, 1988, 1990, 1996, 2003; Delle Fave et al., 2011; Nakamura & Csikszentmihalyi, 2005; Seligman, 2002, 2011). As such, it is important to identify ways to foster and support flow.

Flow theory suggests that flow can arise from the "unforced expression of the person's reasoning and feelings, in harmony with the rest of her character and structured system of

✉ Cedomir Ignjatovic
c.ignjatovic@student.unimelb.edu.au

[1] Melbourne Graduate School of Education, The University of Melbourne, Melbourne, Australia

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goals" (Annas, 2008, p. 30). Moreover, emerging wellbeing literature has advocated for the value of harnessing personal strengths—or the best in one's self—to support flow experiences (e.g., Csikszentmihalyi & Robinson, 2014; Delle Fave et al., 2011; Nakamura et al., 2009; Rathunde & Isabella, 2017). However, empirical examinations of direct associations between flow and strengths are limited, particularly within work contexts and over multiple years. Delle Fave and Massimini (2003) argued that flow among school staff is well-suited to provide insights into the dynamic nature of optimal experience states, primarily because these workers experienced flow considerably more often than any other working adults surveyed (see also Delle Fave et al., 2011). The current study thus investigated a cohort of school staff followed over a three-year period to gain further insight into associations between flow at work and strength use over time.

1.1 Flow at Work

Whilst recognized as a deeply rewarding experience, flow has proven difficult to capture, define, and operationalize. Flow has been described as an experiential indicator of a balance between integrative and differentiated states of mind and behavior (Inghilleri, 2014; Rathunde & Csikszentmihalyi, 2006). As a dynamic construct, flow is a "relational activity par-excellence" (Massimini & Delle Fave, 2000, p. 335) between cultural, psychological, and biological aspects of a person. Developmentally, flow experiences are descriptive accounts that inform both child and adult development (Csikszentmihalyi et al., 1997; Rathunde, 2015; Rathunde & Csikszentmihalyi, 2006); a process of continuously balancing perceived challenges and personal skills, building a more complex self (Delle Fave et al., 2011), and a culturally beneficial personhood (Csikszentmihalyi & Rathunde, 2014). In this vein, the nature and direction of the association between flow and other positive constructs warrants consideration, particularly further empirical investigation related to the potential cyclical aspects (Tobert & Moneta, 2013); namely, the presence of one is thought to enhance the other in a mutually reinforcing manner (Salanova et al., 2006).

One of the most common conceptualizations of flow at work, or work-related flow (WRF; Bakker, 2005) is as "a short-term peak experience at work that is characterized by absorption, work enjoyment and intrinsic work motivation" (Bakker, 2008, p. 401). Absorbed working adults are said to have complete immersion due to intense concentration in tasks, losing themselves in their work to the complete exclusion of all else, and a distorted (quicker or slower) perception of time (cf. Csikszentmihalyi, 1990. High levels of enjoyment of work activities arise from the cognitive and affective elements of the flow experience (Csikszentmihalyi & LeFevre, 1989; Fullagar & Kelloway, 2009; Ilies et al., 2017). Employees with high levels of intrinsic motivation are more likely to be continuously interested in what they are involved in (Harackiewicz & Elliot, 1998), and persist with the tasks they perform, both in the short and longer term (Csikszentmihalyi, 2003; Gardner et al., 2001; Nakamura et al., 2009).

1.2 Flow Experiences Within Educational Contexts

Many educators around the world are committed to fostering the academic development of students, as well as instilling a love of learning, personal growth, and character development (Rathunde, 2015; Slemp et al., 2017). Teaching has been regarded as having significant individual and bio-cultural implications (Delle Fave & Massimini, 2003, p. 335). Through the process of attachment, modelling, and transmission of cultural information,

teachers (and school staff more broadly) can have a significant impact on the developmental trajectories of their students. Staff who embody and model their beliefs as to the relevance of identity development and continual expansion of unique personal capacities provide a valuable contribution to students, school, and community (Csikszentmihalyi & Schneider, 2000; Nakamura et al., 2009; Rathunde, 2015).

Flow may be a powerful contributor to this virtuous educational process. Delle Fave and Massimini (2003) demonstrated that successful teachers found meaning in their work, engaged in learning for its own sake, and experienced flow experiences during the process of teaching. Bakker (2005) suggested a contagious effect of flow, showing that flow experiences in teachers were predictive of optimal learning experiences in their students. Flow experiencing teachers appear to be powerful transmitters of information during the process of teaching (Bakker, 2005; Delle Fave et al., 2011; Rathunde, 2015). Moreover, teachers have shown the capacity for both autonomous and controlled regulation and can experience both extrinsic and intrinsic motivation for their work (Bassi & Delle Fave, 2012). Hence, schools provide fertile ground for attempts to help understand flow experiences and dynamic indicators of optimal person-environment fit.

Other studies have found that flow among teachers, combined with personal and organizational resources offered from the school environment can lead to dynamic positive relationships over time (Rodríguez-Sánchez et al., 2011; Salanova et al., 2006). For instance, personal and organizational resources were found to have a bidirectional impact on flow experiences over an eight-month period among a panel of Spanish teachers, such that flow was facilitated by self-efficacy and other key organizational resources over time, and vice versa (Rodríguez-Sánchez et al., 2011; Salanova et al., 2006). Other studies have demonstrated the importance of teacher self-efficacy cross-sectionally (Bakker, 2005; Llorens et al., 2013) and over a several month period (Rodríguez-Sánchez et al., 2011; Salanova et al., 2006). These studies point to the potential benefits for both teachers and their students when teachers have the psychological capabilities to experience flow, combined with a supportive school environment. In the current study, we focus on the cyclical processes of flow in combination with the active use of the unique capabilities of school staff, represented by their use of personal strengths.

1.3 Intersections of Flow and Strengths Use

Flow theory specifies an ongoing and dynamic relationship between using one's capacities and flow experiences over time (Csikszentmihalyi, 1990, 1996; Delle Fave et al., 2011). One's capabilities are manifested in part through individual strengths. A strength has been defined as "a natural capacity for behaving, thinking, or feeling in a way that allows for optimal functioning and performance" (Linley & Harrington, 2006, p. 88). Wood et al. (2011) further defined strengths as "characteristics that allow a person to do well or at their personal best" (p. 16). Strengths are personal resources (Hobfoll et al., 2003; Linley, 2008), which if harnessed, have the capacity to improve employee wellbeing (Korn et al., 2016). The use of one's strengths can allow a more successful negotiation of environmental challenges and opportunities and is positively related to work productivity and job satisfaction among employees (Datu & Mateo, 2015; Lavy & Littman-Ovadia, 2016; Olcar et al., 2017).

Importantly, dynamic processes underlie the cultivation and use of strengths over time (Rathunde & Csikszentmihalyi, 2006; Tse et al., 2019). The effective use of strengths involves different strengths being dialed up or down depending on the context and

circumstances (Linley, 2008; Nakamura & Condren, 2018; Peterson & Seligman, 2004). Strengths are capabilities that depend upon having knowledge of one's strengths, opportunities to use one's strengths, contexts that are supportive of one's strengths, and the felt experience of using one's strengths. For instance, Csikszentmihalyi et al. (1997) found that successful talent development occurred and was sustained over a three-year period when there were flow experiences *and* supportive contexts.

In turn, the use of one's strengths impacts upon one's perceptions and experiences. Evidence suggests that the capacity to harness strengths like conscientiousness (Demerouti, 2006), need for achievement (Eisenberger et al., 2005), creativity (Moneta, 2012), love of learning (Delle Fave & Massimini, 2003), and optimism (Colombo & Zito, 2014) has a positive impact on experiencing flow at work. Related research evidence exists showing that positive mindsets such as self-efficacy impact flow at work over time among educational employees (Salanova et al., 2006; Rodríguez-Sánchez et al., 2011). For instance, in a longitudinal study that followed 258 Spanish secondary teachers over an eight-month period, Salanova et al. (2006) found positive associations between self-efficacy beliefs and organizational resources and work-related flow (i.e., absorption, enjoyment, and intrinsic motivation) over time. Csikszentmihalyi (2003), in his interview-based study of successful leaders, showed that the ability to apply a number of different skills, strengths, and capacities across their working careers in response to the challenges they faced at the time in their careers had beneficial effects on leaders and followers at interpersonal, intrapersonal, and systemic levels. The implication here is that it is in fact more likely that the varied use and frequency of strengths was the most important (see also Seligman et al., 2005).

Both theoretically and empirically, this suggests that there may be bi-directional associations between strengths use and flow over time. For instance, Rodríguez-Sánchez et al. (2011) found bi-directional associations between work-related flow and self-efficacy and challenge-skill balance among educational personnel. Indeed, Delle Fave and colleagues suggested that flow experiences lead to a 'virtuous cycle' of positive effects on meaningful aspects of the self (Delle Fave, 2009; Delle Fave et al., 2011). The use of the word 'spiral' by the authors presumably denotes the idea that flow experiences catalyze development of the self, supporting the value of incorporating flow experiences into the workplace. This idea of an upward spiral has been defined as "*amplifying loops* in which cyclic reciprocal relationships among constructs build on each other positively over time" (Salanova et al., 2010, p. 260; see also Lindsley et al., 1995). Suggestions of these 'amplifying loops' appear in a number of prominent positively oriented psychological theories, such as Broaden and Build theory (Fredrickson, 2001), Conservation of Resources (COR; Hobfoll et al., 2003), and Social Cognitive theory (Bandura, 1997). These theories optimistically assume that success begets success and growth leads to growth.

1.4 The Current Study

While studies find support for reinforcing associations between strengths use and flow at work, to our knowledge, these studies have been cross-sectional or comprised a very short time frame – not over a period of years, nor among adult working populations. We note that Csikszentmihalyi et al. (1997) did find that strengths constellations involving achievement, endurance, inquisitiveness, and aestheticism sustained flow over a two-year period of later high school years. However, Rathunde and Isabella (2017) have called for more studies of flow states in middle adulthood years. Consequently, further empirical inquiry into the development trajectories of adults during working careers is

needed, as it offers insight into the positive impact of short-term positive experience (such as flow) over months and years. The present study offers one way of investigating how optimal functioning and experiences of working adults may be facilitated and encouraged.

Based on prior studies pointing to the benefit of strengths use on positive subjective experiences and outcomes, we hypothesized that strengths use among employees would have a positive influence on the experience of flow at work, both cross-sectionally and prospectively over time. A central tenet in flow theory is that when flow experiences are beneficial for the cultural context, these key innovations, and the individuals that create them, are enhanced and encouraged to great social influence. This implies that the experience of flow, when coupled with meaningful contribution, also provide greater scope for the use and development of an individuals' best self.

Studies also find that flow has positive impacts on various positive aspects of the individual. For instance, flow has been shown to be associated with adaptive behaviors such as communication effectiveness (Martin & Jackson, 2008; Trevino & Webster, 1992), a healthy passion for work (Lavigne et al., 2012), engagement with work tasks (Bakker, 2008; De Fraga & Moneta, 2016; Moneta, 2012), and self-efficacy (Rodríguez-Sánchez et al., 2011; Salanova et al., 2006). Thus, we hypothesized that the experience of work-related flow has a positive influence on strength use, both cross-sectionally and prospectively.

Together, these two hypotheses suggest that work-related flow and strengths use mutually influence each other over time in a reinforcing manner over time. Studies support this cross-sectionally and across short time periods, but have not directly tested these associations beyond two measurement occasions across a multi-year period. Thus, in the current study, we empirically investigate the specific nature, magnitude, and direction of inter-relationships over a three-year period.

As illustrated in Fig. 1, we expected that there would be evidence of cross-lagged effects repeatedly over time, above and beyond the cross-time effects of flow predicting subsequent flow and strengths use predicting subsequent strengths use. To test this model, we drew on an archival dataset that followed school over five time points across a three-year period. We aimed to empirically examine inter-relationships between flow experience and strength use over time, within the context of an organizational change process that occurred at the school during the course of the data collection period.

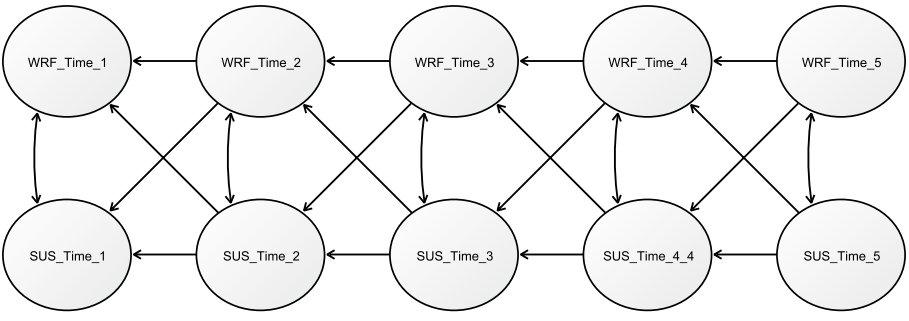

Fig. 1 Conceptual cross-lagged model, in which strengths use (SUS) and work-related flow (WRF) correlate with and reinforce one another cross-sectionally and prospectively across five measurement occasions

2 Method

2.1 Design Overview

The current study drew on data from a larger project that aimed to evaluate the implementation of a wellbeing program over a three-year period (Green et al., 2011; Weeks, 2013). Between 2011 and 2013, a private K-12 school in New South Wales, Australia purposely aimed to sustainably increase the wellbeing of students, staff, and parents through a series of programs and interventions. Briefly, after a period of disruption, school leadership intended to make student and staff wellbeing a priority. They worked with several consultants and researchers at the University of Wollongong. Through a series of professional development session, staff received training in positive psychology principles, including strategies to improve wellbeing in themselves and their students. The training included a focus on personal strengths, with a specific focus on the Values in Action approach to strengths (Peterson & Seligman, 2004). Staff members learned about their strengths and identified ways to put their strengths into action.

To assess impact over time, school staff were asked to complete surveys at five occasions. Participants were assessed twice per year for the first two years and once in the third year. Each occasion included measures of work-related flow and strengths use, which we focus on here (the larger study included additional measures, which are beyond the scope of the current study). Participants were informed about the details of the study and provided consent to be a part of the research. All procedures were approved by the University of Melbourne's ethic review board (protocol #1,750,027).

2.2 Participants

The current study included 253 staff who completed the work-related flow and strengths use measures at least once across the five occasions (time 1, $n=198$; time 2, $n=106$; time 3, $n=86$; time 4, $n=102$; time 5, $n=111$). As a whole, 31 staff completed all five occasions, 68 completed four occasions, 119 completed and 178 completed two occasions. To consider the impact of attrition, we compared individuals who completed three to five assessments with those who completed one or two, using independent sample t-tests for continuous variables and chi-square for categorical variables. No significant differences appeared between the two groups on levels of flow experience [$t(196)=0.92$, $p=0.36$], strengths use [$t(195)=0.23$, $p=0.08$], type of profession [$\chi^2(6)=6.81$, $p=0.34$], time of employment at the school [$\chi^2(6)=10.29$, $p=0.11$], gender [$\chi^2(1)=0.37$, $p=0.83$], or age group [$\chi^2(8)=12.08$, $p=0.15$].

2.3 Measures

Participants completed a self-report survey at each occasion, which included measures of work-related flow and strengths use. The Work-Related Flow scale (WRF; Bakker, 2008) includes 13 items that measure the frequency that employees experience flow at work (1 = never, 7 = always). The scale has three subscales: absorption (4 items; e.g., 'When I'm working, I forget everything else around me'), work enjoyment (4 items; e.g. 'I do my work with a lot of enjoyment'), and intrinsic work motivation (5 items; e.g., 'I get my motivation from the work itself, and not from the reward for it'). The Strengths Use Scale (SUS; Govindji & Linley, 2007) includes 14 items that measure the extent to which participants

use their strengths in various situations and challenges both on a daily basis and over time (1 = strongly disagree, 7 = strongly agree; e.g., 'I always play to my strengths').

2.4 Data Analysis

Our analyses focused on the WRF and SUS variables collected across the five measurement occasions, with the aim of using structural equation modeling (SEM) to test the hypothesized cross-lagged model. Analyses were conducted in R (version 4.0.2), using the psych (Revelle, 2015) and lavaan (Rosseel, 2012) packages. Preliminary analyses indicated that age and gender were not systematically related to the model variables and did not modify the results of the model testing. Thus, to facilitate model estimated and ease of presentation, subsequent analyses used the whole sample, without further consideration of demographic factors.

We first considered the measurement model. While the WRF and SUS are existing scales with some evidence of validation in other samples (e.g., Wood et al., 2011; Zito et al., 2015), it is important to consider the structure of the measures within the specific sample. We began with the Time 1 variables. We used exploratory factor analysis, with maximum likelihood estimation and direct oblimin rotation (i.e., allowing the factors to be correlated with one another), separately exploring the structure of the WRF and SUS variables. We then used confirmatory factor analysis to test the measurement model separately at each time point. We also calculated reliabilities for each factor, considering five estimates of internal consistency: Cronbach's α; Guttman's λ_6; and minimum (β), average, and maximum (λ_4) split half reliability; with 10,000 random draws across the data.

Next, we tested measurement invariance across the five time points. We used measurement occasion as the grouping variable, and fixed parameters to equality, constraining the factor loadings (for weak invariance), intercepts (for strong invariance), and residuals (for strict invariance), comparing models with the configural model. According to changes in CFI, where $\Delta CFI < 0.01$ implies that the invariance assumption holds (Cheung & Rensvold, 2002).

We then tested the structural model. As an initial examination of cross-sectional and cross-time relationships, we created composite measures of WRF and SUS at each time point, based on the average of the relevant items. We report the Pearson *r* correlations. Finally, we tested the cross-lagged model using SEM, with latent factors for WRF and SUS at each time point, comprised of the relevant observed variables. We evaluated model fit primarily based on the Root Mean Square Error of Approximation (RMSEA) and the Standardized Root Mean Residual (SRMR); Hu and Bentler (1999) suggest that adequate model fit is indicated by an $RMSEA \leq 0.06$ combined with $SRMR \leq 0.09$. We also report the Tucker Lewis Index (TLI), and the Comparative Fit Index (CFI), with values greater than 0.90 indicating adequate fit.

3 Results

3.1 Testing the Measurement Model

We first tested and refined the measurement model. For WRF, exploratory factor analyses supported the expected factor structure for the WRF, with three factors (absorption, enjoyment, and intrinsic motivation), and items aligning with the expected factor (see

Supplement). The exception was the item "I work because I enjoy it", which loaded on both the enjoyment and intrinsic motivation factors, most likely due to the word "enjoy" appearing it the item (but intended to represent intrinsic motivation). We opted to retain the original structure keeping the item on the intrinsic motivation factor. For SUS, while the scree plot supported a single factor, using the Meiningen criteria of eigenvalues less than 1, a second factor appeared (see Supplement). This factor was less reliable. Removing six questionable items did not change the reliability over the SUS factor and provides a more parsimonious model. Thus, we opted to remove these items, using the remaining 8 items for subsequent analyses (see Table 1 for the final included items).

We then used subsequent time points to confirm the factor model using confirmatory factor analysis. Building from the exploratory analysis, the measurement model at each time point included WRF as a second order latent factor, with absorption, enjoyment, and intrinsic motivation as first order latent factors, each with four or five observed variables. SUS was a first order latent factor, with eight observed variables (see Fig. 2). Table 1 summarizes the factor loadings and fit statistics across the five time points and Table 2 summarizes factor reliabilities. The model demonstrated good fit at Time 1. Fit was reduced at subsequent time points, impacted by the smaller sample sizes available. Factor loadings were consistent across the time points. Across the time points, WRF and SUS was strongly reliable.

Comparing the model across time points, weak invariance was supported (ΔCFI = 0.002), indicating that the factors structure is comparable across time points), but strong and strict invariance were not supported (indicating that the means at each time point are not directly comparable). As the hypothesized structural model relies on the factor structure rather than mean comparisons, we proceeded with testing the structural model.

3.2 Testing the Structural Model

Bivariate correlations for WRF and SUS across time points are summarized in Table 3. Cross-sectionally, WRF and SUS were strongly positively correlated, with correlations ranging from $r = 0.39$ to $r = 0.54$. While both WRF and SUS were strongly correlated with subsequent measures of WRF or SUS respectively, SUS correlations were consistently around $r = 0.70$, whereas WRF tended to be most strongly correlated with the subsequent time point, with weaker (albeit still very strong) correlations at subsequent time points.

Figure 3 summarizes estimates for the full cross-lag model (for simplicity, variances are not included). The model did not adequately fit the data (RMSEA = 0.128, 90% confidence interval = 0.127, 0.130), SRMR = 0.120, CFI = 0.328, TLI = 0.310), such that our hypothesis was not supported. WRF and SUS were correlated with one another at Times 1, 2, and 3, with weak correlations at Times 4 and 5. Prospectively, while WRF and SUS predicted subsequent WRF and SUS respectively, SUS did not prospectively predict WRF, whereas WRF inconsistently predicted strengths use, with Time 1 and Time 4 predicting Time 2 and Time 5 strengths use, respectively.

4 Discussion

The current study investigated bidirectional associations between work-related flow and strengths use in a panel of educational staff across five measurement occasions over a three-year period, using data collected during a change initiative at the school aiming to

Table 1 Latent factor loadings and fit indices in the confirmatory factor analysis for the work-related flow (WRF) and strengths use survey (SUS) measures across the 5 time points (see Fig. 2 for the estimated model)

Factor/Question	Measurement occasion				
	1	2	3	4	5
Absorption					
When I am working, I think about nothing else	.86	.72	.87	.81	.84
I get carried away by my work	.89	.88	.92	.83	.94
When I am working, I forget everything else around me	.85	.89	.80	.90	.93
I am totally immersed in my work	.89	.92	.90	.98	.92
Enjoyment					
My work gives me a good feeling	.89	.93	.86	.84	.88
I do my work with a lot of enjoyment	.93	.96	.97	.97	.96
I feel cheerful when I am working	.96	.97	.98	.95	.98
I feel happy during my work	.90	.93	.94	.89	.92
Intrinsic motivation					
I would still do this work, even if I received less pay	.54	.61	.60	.59	.54
I find that I also want to work in my free time	.57	.64	.55	.47	.50
I work because I enjoy it	.86	.91	.92	.87	.81
When I am working on something, I am doing it for myself	.50	.66	.47	.56	.28
I get my motivation from the work itself, and not from the reward for it	.71	.74	.67	.71	.78
Work related flow					
Absorption factor	.64	.62	.51	.60	.54
Enjoyment factor	.91	.89	.99	.85	.86
Intrinsic motivation factor	.92	.94	.67	.94	.99
Strengths use scale					
I always play to my strengths	.70	.79	.79	.78	.79
I always try to use my strengths	.72	.87	.84	.86	.89
I achieve what I want by using my strengths	.76	.85	.85	.80	.88
I use my strengths everyday	.73	.85	.80	.74	.80

Table 1 (continued)

Factor/Question	Measurement occasion				
	1	2	3	4	5
I use my strengths to get what I want out of life	.74	.84	.79	.79	.82
Using my strengths comes naturally to me	.84	.83	.85	.88	.60
I find it easy to use my strengths in the things I do	.88	.86	.86	.91	.65
Using my strengths is something I am familiar with	.85	.83	.86	.87	.93
Latent factor covariances					
Work-related flow & Strengths Use Covariance	.55	.56	.46	.46	.52
Model fit					
N	198	106	86	102	111
Root Mean Square Error of Approximation	.074	.113	.137	.108	.115
RMSEA 90% confidence interval	.063 .084	.099, .127	.122, .152	.094, .122	.102, .128
SRMR	.056	.072	.069	.072	.073
χ^2 (df = 185)	385.0	434.8	484.5	404.3	456.6
Comparative fit indicator	.938	.888	.840	.886	.879
Tucker Lewin Index	.929	.872	.819	.870	.863

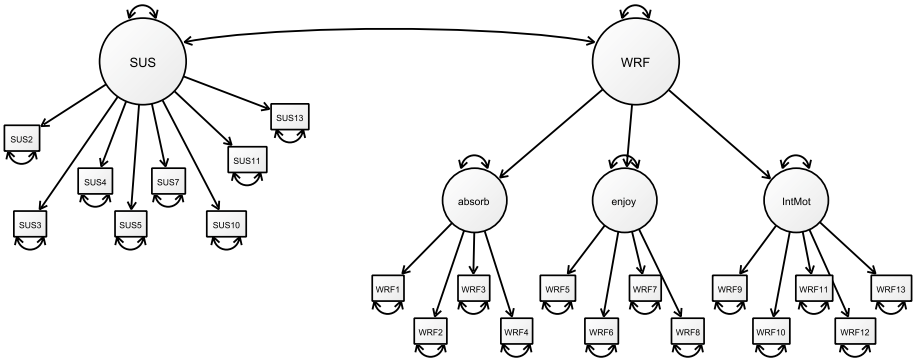

Fig. 2 Measurement model tested at each time point using confirmatory factor analysis. See Table 1 for factor loadings. WRF = work-related flow; SUS = strengths use scale, absorb = absorption, enjoy = enjoyment, intmot = intrinsic motivation

develop wellbeing in staff and students. Aligned with prior studies (Rodríguez-Sánchez et al., 2011; Salanova et al., 2006), we expected that a bidirectional relationship would exist between strengths use and flow at work, both cross-sectionally and prospectively supporting the idea of a positive reinforcing relationship between these two variables. However, despite the measurement model supporting the scale factor structures across time points, the hypothesized cross-lagged structural model poorly fit the data.

4.1 Measurement Model Considerations

We began by establishing the measurement model. For WRF, while all three factors loaded on the main WRF factor across the five time points, intrinsic motivation fit worse than absorption and enjoyment. Some authors have criticized the work-related work measure, strongly urging researchers to use alternative forms of measurement of flow at work. Others (e.g., Zito et al., 2015) find support for the three-factor model, which our exploratory factor analyses suggested did fit better than a two-factor model. Schiepe-Tiska and Engeser (2017) similarly described the benefits of flow measurement using Bakker's (2008) factor conceptualization of work-related flow. Furthermore, a systematic review and meta-analysis of flow at work (Ignjatovic, 2020) showed that the most commonly utilized tool for operationalizing flow at work for the past decade was the work-related flow measure (WOLF; Bakker, 2005, 2008), which we used here.

For SUS, exploratory analyses suggested that eight items sufficiently captured the construct, with high reliability. A possible second factor appeared, but the factor less reliable. As such, we opted to use a reduced version of the measure for subsequent analyses. The items of this modified measure focus on 'play', 'daily execution of strengths', and using strengths to getting valued ends. One way of interpreting this is that strengths use is a tendency of optimal balancing and 'playing with' the objective challenges that meet the individual (Rathunde & Csiskzentmihalyi, 2006).

While the factor structure was invariant across the five time points, strong invariance was not supported. This suggests that the factor structure itself is valid, but the means across time points are not directly comparable. This could be due in part to different participants completing measures at different time points. A benefit of maximum likelihood estimation is the ability to make use of all available data, which is useful for

Table 2 Reliability of the work-related flow, the three sub-facets of work-related flow (absorption, work enjoyment, and intrinsic motivation) and the reduced strengths use measure across the five measurement occasions

	Measurement occasion				
	1	2	3	4	5
Work-related flow (13 items)					
Cronbach's α	.92	.93	.92	.92	.92
Guttman's λ_6	.95	.96	.96	.95	.95
Minimum split half (β)	.77	.77	.73	..74	.68
Average split half	.92	.92	.92	.91	.91
Maximum split half (λ_4)	.96	.96	.97	.96	.96
Absorption sub-facet (4 items)					
Cronbach's α	.93	.91	.93	.93	.95
Guttman's λ_6	.91	.90	.92	.93	.94
Minimum split half (β)	.93	.90	.90	.90	.93
Average split half	.93	.90	.93	.93	.95
Maximum split half (λ_4)	.93	.92	.95	.95	.96
Work enjoyment sub-facet (4 items)					
Cronbach's α	.96	.97	.96	.95	.97
Guttman's λ_6	.95	.96	.96	.94	.96
Minimum split half (β)	.95	.97	.96	.94	.96
Average split half	.96	.97	.96	.95	.97
Maximum split half (λ_4)	.97	.97	.97	.95	.98
Intrinsic motivation sub-facets (5 items)					
Cronbach's α	.79	.86	.80	.79	.79
Guttman's λ_6	.76	.83	.78	.76	.71
Minimum split half (β)	.71	.77	.75	.69	.67
Average split half	.75	.82	.76	.76	.70
Maximum split half (λ_4)	.80	.85	.79	.83	.73
Strengths Use Scale (8 items)					
Cronbach's α	.92	.95	.95	.94	.93
Guttman's λ_6	.93	.96	.96	.95	.95
Minimum split half (β)	.86	.90	.86	.89	.87
Average split half	.92	.95	.95	.94	.93
Maximum split half (λ_4)	.94	.97	.98	.97	.97

Minimum, average, and maximum split halves are based on 10,000 random draws across the data, estimated with the psych package (Revelle, 2015) in R

longitudinal studies where participants inconsistently participate in the assessments. However, the incorporation of different sets of participants at different time points also means that descriptive statistics (e.g., mean, median, standard deviation) may not be directly comparable. For testing structural models, which rely upon the factor structure, this is less of a problem, but care should be taken in making direct comparisons about increases and decreases in average levels of WRF and SUS.

Table 3 Cross-sectional and cross-time correlations between work-related flow and strengths use

		T1 WRF	T1 SUS	T2 WRF	T2 SUS	T3 WRF	T3 SUS	T4 WRF	T4 SUS	T5 WRF	T5 SUS
T1 WRF	r										
	N	198									
T1 SUS	r	0.47***									
	N	197	197								
T2 WRF	r	0.78***	0.48***								
	N	97	96	106							
T2 SUS	r	0.39***	0.71***	0.54***							
	N	96	95	105	105						
T3 WRF	r	0.79***	0.46***	0.70***	0.48**						
	N	61	60	48	47	86					
T3 SUS	r	0.25	0.59***	0.22	0.72***	0.44					
	N	61	60	48	47	86	86				
T4 WRF	r	0.68***	0.44***	0.57***	0.44***	0.54***	0.39**				
	N	72	71	60	60	51	51	102			
T4 SUS	r	0.31**	0.67***	0.25	0.72***	0.44**	0.80	0.39***			
	N	71	70	60	60	51	51	100	100		
T5 WRF	r	0.67***	0.39***	0.62***	0.31*	0.72***	0.30*	0.69***	0.25*		
	N	84	83	62	62	51	51	66	66	111	
T5 SUS	r	0.37**	0.64***	0.32*	0.67***	0.32*	0.76***	0.54***	0.70***	0.46***	
	N	84	83	62	62	51	51	66	66	111	111

WRF, work-related flow; SUS, reduced strengths use survey (8 items); T, measurement occasion, r, Pearson r correlation, N, number of respondents

*$p < .05$, **$p < .01$, ***$p < .001$

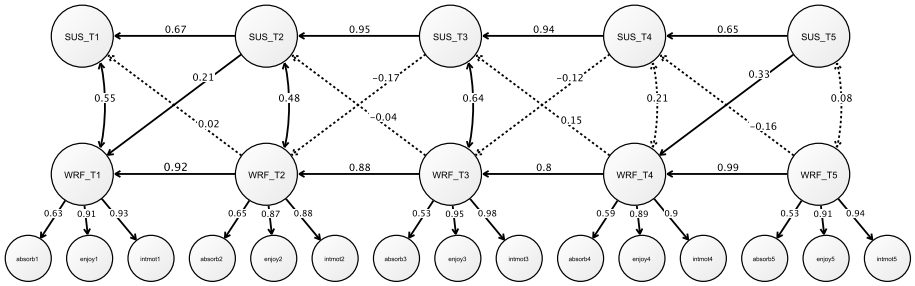

Fig. 3 Cross-lagged model, testing within and cross-time associations between work-related flow and strengths use (estimated as latent factors comprised of the observed variables indicated in Fig. 2 and Table 2). Standardized estimates are shown, with significant ($p < .05$) indicated as solid lines and non-significant paths as dotted lines. WRF = work related flow, SUS = strengths use survey, absorb = absorption, enjoy = work enjoyment, intmot = intrinsic motivation

4.2 Structural Model Considerations

In our analyses, we first considered first order correlations amongst WRF and SUS, within and across time, with the SEM model directly testing cross-sectional and prospective relationships using the latent variables. While SUS and WRF were both strongly correlated with subsequent SUS and WRF, as would be expected as individual difference variables, SUS was more stable over time than WRF. This suggests that strengths use is indeed an individual difference, such that school staff who understood the strengths use intervention of the school were able to consistently apply their strengths. Such individuals may be better able work to who they are and are able to craft strength use into their daily lives over months and years (c.f. Wrzesniewski et al., 1997).

In contrast, whereas WRF remained strongly correlated with subsequent time points, it was most strongly associated with the next immediate measurement occasion, with inconsistent correlations over subsequent time periods. This suggests that while there are individual differences in the extent to which an individual experiences WRF, other factors may be important for triggering whether WRF happens or not. That is, situational aspects are fundamentally relevant for flow to occur (Delle Fave et al., 2011; Nakamura & Csikszentmihalyi, 2005). As situational contingencies continuously fluctuate, on any given day or week, individuals must negotiate this fluctuation. Moreover, optimal experiences provide a central avenue to the transmission of information and learning (Rathunde & Csikszentmihalyi, 2006) and (optimal) psychological selection routinely occurs in flow experiences. In this vein, our results seem to suggest that some individuals that are recurrently choosing situations that fit their (strong) life themes and capacities are likely to keep creating a sense of flow in their workplace.

4.3 A Systems-Informed Perspective

Building upon prior studies, we expected that the cross-lagged model would be supported. However, despite an adequate measurement model at each time point the structural model was not supported. There could be a number of explanations for this. Dynamic relationships between strength use and flow might function differently across

different time scales, patterns, and (challenge) contexts (c.f. Ceja & Navarro, 2009, 2011, 2012). Prior studies have tested cross-lagged relationships occurred over very short periods, and short-term processes often have different trajectories and impacts than longer term processes (Dormann & Griffin, 2015). In describing the development process of adults throughout their working careers, Rathunde and Csikszentmihalyi (2006) conclude that there is a number of dialectic elements that successful individuals need to resolve to have increased flow experiences in their lives, which unfolds in a dynamic process as individuals attempt to balance challenge finding with skill building across the lifespan (see also Csikszentmihalyi, 1996; Delle Fave et al., 2011; Nakamura et al., 2009). Further, cross-lagged regression coefficients have been found to vary, depending on the respective time lags between measurement occasions (Dormann & Griffin, 2015). An inappropriate time lag could lead to inaccurate representations of dynamic relationship between the phenomena of interest. Future studies should consider how flow and strength relationships unfold across short and long periods, and what this looks like in the context of broader life development (cf. Tse et al., 2019).

While the idea of positive spirals might be beneficial over short periods, they may be maladaptive over time. From a systems perspective, in contrast to growth models, individuals and their environments balance one another (Csikszentmihalyi, 2014; Inghilleri, 2014; Meadows, 1972; Nakamura, 2011). There are limits to growth (e.g., Meadows, 1972), such that other factors (e.g., the socio-environmental context) may limit ongoing growth. Rather than 'gain spirals' a systems perspective on flow suggests that more complex processes are at play, which are dependent on both on agentic and contextual factors across the lifespan (Delle Fave et al., 2011; Nakamura, 2011, 2014; Tse et al., 2019), including middle adulthood (Rathunde & Isabella, 2017). This implies an interactional process characterized by *balance* rather than *growth* over time (cf. Nakamura & Csikszentmihalyi, 2005). If this is the case, strengths use and the experience of flow at work might indeed be expected to correlate within a short time period, but not over longer periods of time.

Indeed, optimal functioning is influenced by both individual characteristics as well as situational contingencies (c.f. Csikszentmihalyi & Robinson, 2014). Aligned with the *Inside-Out, Outside-In* model suggested by Williams et al. (2016), while there are individual differences in the likelihood that one experiences WRF, most likely, there are any number of situational and contextual aspects that impact whether individuals do indeed experience flow. Similarly, in a study with school staff who went through a positive psychology training over a several year period, Williams et al., (2015) found that despite professional development providing skills to individuals, when the environment was perceived to be unsupportive of these skills, there were negative impacts upon well-being (see also Moneta, 2012). Our findings support that idea that aligned with *Inside-Out*, staff go through training all the time, but if the environment is not supportive of the new information and learning (i.e., *Outside-In* forces), then individuals' functioning returns to baseline or worse.

Our findings could also simply be due to chance or dependent upon the staff members that chose to participate in the research at the various measurement occasions. Whilst we attempted to undertake an empirical examination of key flow processes over time, we acknowledge the need for qualitatively examine how these psychological processes were unfolding over time, in staff within a specific environment. In this vein, there have been calls for positive psychology research to become more contextually accurate (Ciarrochi et al., 2016), and hence greater incorporation of qualitative and mixed method approaches (Hefferon et al., 2017; Kern et al., 2020).

4.4 Limitations and Future Directions

Caution should be taken in generalizing and translating these findings into practice. Further studies are needed to test the nature of the relationship between flow at work and strengths use among employees. While we conceptually followed the Salanova et al. (2006) study, who tested a cross-lagged model of personal and organization variables and work-related flow among teachers across two time points, our study varied in terms of the number of measurement occasions, time between measurements, measures used, and the sample under study. Each of these factors should be investigated as possible reasons for non-replication.

We drew on self-reported measures included within a larger study, which focused on evaluating the impact of a positive change initiative at the school, rather than explicitly focusing on links between flow and strengths use. Secondary analysis of archival data makes it possible to study variable associations over longer periods of time, but also is limited by representing a selective sample, issues with attrition, and being constrained to the measures chosen by the original researchers (Tomlinson-Keasey, 1993).

Our study points to several key directions for future research. It would be interesting to examine the moderating impact of profession type and length of time having worked at the school. Qualitative research would be useful to understand the experiences and impact of staff members going through a change process. Future studies will benefit from incorporating multiple assessment methodologies, including both qualitative and quantitative approaches. Such studies would contribute to further knowledge on how flow processes unfold within the context of employee's unique perspective or place within this broader context.

Several positive psychology theories point to positive bi-directional processes. Yet our results find little support for this. Ceja and Navarro (2009, 2011, 2012) provide evidence that the experience of flow has a chaotic pattern; they also found that sudden changes in one's environment could result in shifts in optimal experiences such as flow. Their prescription of managing flow in an organization was to the development of authentic and dynamic goals, tasks, and bonds between employee and their superiors. Similarly, in reviewing the literature on work related flow, we found that supportive leadership was significantly influential in experiences (Ignjatovic, 2020). Hence, it is important to consider the employee within the process of change. Adding a simple intervention without consideration of contextual and ongoing dynamic processes may have little impact. Future studies should examine the impact of interventions across different contexts and shifting environments, and on other archival datasets.

5 Conclusion

Work related flow is a psychological process that occurs dynamically within an unfolding environment (in this case, a wellbeing initiative within a school). While both our study and others find that work related flow correlates with strengths use, it is unclear how strengths and the flow experience impact one another across time and shifting circumstances. The inconsistent results in this study have led us to postulate that situational and contextual factors intersect with associations between work-related flow and strengths use to achieve sustainable aspects of optimal functioning over time. While

results need to be replicated and additional work is needed to understand the processes at work, such investigations delve more deeply into how and under what conditions flow at work occurs.

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References

Annas, J. (2008). The phenomenology of virtue. *Phenomenology and the Cognitive Sciences, 7*, 21–34.

Bakker, A. (2005). Flow among music teachers and their students: The crossover of peak experiences. *Journal of Vocational Behavior, 66*, 26–44. https://doi.org/10.1016/j.jvb.2003.11.001

Bakker, A. (2008). The work-related flow inventory: Construction and initial validation of the WOLF. *Journal of Vocational Behavior, 72*, 400–414. https://doi.org/10.1016/j.jvb.2007.11.007

Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York, NY: Freeman.

Bassi, M., & Delle Fave, A. (2012). Optimal experience among teachers: New insights into the work paradox. *The Journal of Psychology, 146*, 533–557.

Ceja, L., & Navarro, J. (2009). Dynamics of flow: A nonlinear perspective. *Journal of Happiness Studies, 10*, 665–684. https://doi.org/10.1007/s10902-008-9113-6

Ceja, L., & Navarro, J. (2011). Dynamic patterns of flow in the workplace: Characterizing within-individual variability using a complexity science approach. *Journal of Organizational Behavior, 32*, 627–651. https://doi.org/10.1002/job.747

Ceja, L., & Navarro, J. (2012). 'Suddenly I get into the zone': Examining discontinuities and nonlinear changes in flow experiences at work. *Human Relations, 65*, 1101–1127. https://doi.org/10.1177/0018726712447116

Cheung, G. W., & Rensvold, R. B. (2002). Evaluating goodness-of-fit indexes for testing measurement invariance. *Structural Equation Modeling, 9*, 233–255.

Ciarrochi, J., Atkins, P. W., Hayes, L. L., Sahdra, B. K., & Parker, P. (2016). Contextual positive psychology: Policy recommendations for implementing positive psychology into schools. *Frontiers in Psychology, 7*(1561), 1–16. https://doi.org/10.3389/fpsyg.2016.01561

Colombo, L., & Zito, M. (2014). Demands, resources and the three dimensions of flow at work: A study among professional nurses. *Open Journal of Nursing, 4*, 255–264.

Csikszentmihalyi, M. (1988). Introduction. In M. Csikszentmihalyi & I. S. Csikszentmihalyi (Eds.), *Optimal experience: Psychological studies of flow in consciousness* (pp. 3–14). Cambridge University Press.

Csikszentmihalyi, M. (1990). *Flow: The psychology of optimal experience*. Harper and Row.

Csikszentmihalyi, M. (1996). *Creativity: Flow and the psychology of discovery and invention*. New York: HarperCollinsPublishers.

Csikszentmihalyi, M. (2003). *Good business: Leadership, flow and the making of meaning*. Viking.

Csikszentmihalyi, M. (2014). *The systems model of creativity: The collected works of Mihaly Csikszentmihalyi*. Springer.

Csikszentmihalyi, M., & Beattie, O. V. (1979). Life themes: A theoretical and empirical exploration of their origins and effects. *Journal of Humanistic Psychology, 19*(l), 45–63.

Csikszentmihalyi, M., & LeFevre, J. (1989). Optimal experience in work and leisure. *Journal of Personality and Social Psychology, 56*, 815–822.

Csikszentmihalyi, M., & Rathunde, K. (2014). The development of the person: An experiential perspective on the ontogenesis of psychological complexity. In M. Csikszentmihalyi (Ed.), *Application of flow in human development and education* (pp. 7–79). Springer.

Csikszentmihalyi, M., & Robinson, R. E. (2014). Culture, Time, and the development of a talent. In M. Csikszentmihalyi (Ed.), *The systems model of creativity: The collected works of Mihalyi Csikszentmihalyi* (pp. 27–61). Springer.

Csikszentmihalyi, M., & Schneider, B. (2000). *Becoming adult: How teenagers prepare for the world of work*. Basic Books.

Csikszentmihalyi, M., Rathunde, K., & Whalen, S. (1997). *Talented teenagers: The roots of success and failure*. Cambridge University Press.

Datu, J. A. D., & Mateo, N. J. (2015). Work-related flow dimensions differentially predict anxiety, life satisfaction, and work longevity among Filipino counsellors. *Current Psychology*. https://doi.org/10.1007/s12144-015-9401-3

Deci, E. L., & Ryan, R. M. (1985). *Intrinsic motivation and self-determination in human behavior*. Plenum Press.

De Fraga, D. & Moneta, G. B. (2016). Flow at work as a Moderator of the Self-Determination Model of Work engagement. In L. Harmat, F. Ørsted Andersen, F. Ullén, J. Wright, & G. Sadlo (Eds.), *Flow experience: Empirical research and applications* (pp. 105–123). Switzerland: Springer.

Delle Fave, A. (2009). Optimal experience and meaning: Which relationship? *Psychological Topics, 18*(2), 285–302.

Delle Fave, A., & Massimini, . (2003). Optimal experience in work and leisure among teachers and physicians: Individual and bio-cultural implications. *Leisure Studies, 22*, 323–342.

Delle Fave, A., Massimini, F., & Bassi, M. (2011). *Psychological selection and optimal experience across cultures: Social empowerment through personal growth*. Springer.

Demerouti, E. (2006). Job characteristics, flow, and performance: The moderating role of conscientiousness. *Journal of Occupational Health Psychology, 11*, 266–280. https://doi.org/10.1037/1076-8998.11.3.266

Demerouti, E., Bakker, A. B., Sonnentag, S., & Fullagar, C. J. (2012). Work-related flow and energy at work and at home: A study on the role of daily recovery. *Journal of Organizational Behavior, 33*, 276–295. https://doi.org/10.1002/job.760

Diener, E. (2000). Subjective well-being. The science of happiness and a proposal for a national index. *American Psychologist, 55*, 34–43.

Dormann, C., & Griffin, M. A. (2015). Optimal time lags in panel studies. *Psychological Methods, 20*(4), 489–505. https://doi.org/10.1037/met0000041.

Eisenberger, R., Jones, J. R., Stinglhamber, F., Shanock, L., & Randall, A. T. (2005). Flow experiences at work: For high need achievers alone? *Journal of Organizational Behavior, 26*, 755–775. https://doi.org/10.1002/job.337

Fagerlind, A. C., Gustavsson, M., Johansson, G., & Ekberg, K. (2013). Experience of work-related flow: Does high decision latitude enhance benefits gained from job resources? *Journal of Vocational Behavior, 83*, 161–170.

Fredrickson, B. L. (2001). The role of positive emotions in positive psychology: The broaden-and-build theory of positive emotions. *American Psychologist, 56*, 218–226.

Fullagar, C. J., & Kelloway, E. K. (2009). 'Flow' at work: An experience sampling approach. *Journal of Occupational and Organizational Psychology, 82*, 595–615.

Gardner, H., Csikszentmihalyi, M., & Damon, W. (2001). *Good work: When excellence and ethics meet*. Basic Books.

Geyser, I., Geldenhuys, M., & Crous, F. (2015). The dimensionality of the Work related Flow Inventory (WOLF): A South African study. *Journal of Psychology in Africa, 25*(4), 282–287. https://doi.org/10.1080/14330237.2015.1078084

Govindji, R., & Linley, P. A. (2007). Strengths use, self-concordance and well-being: Implications for strengths coaching and coaching psychologists. *International Coaching Psychology Review, 2*, 143–153.

Greenberger, E., & Sorensen, A. B. (1974). Toward a concept of psychosocial maturity. *Journal of Youth and Adolescence, 3*, 329–358.

Green, S., Oades, L. G., & Robinson, R. (2011). Positive education: Creating flourishing students, staff and schools. *InPsych*. April, pp. 16–17.

Happell, B., Gaskin, C. J., & Platania-phunga, C. (2014). The construct validity of the work-related flow inventory in a sample of Australian workers. *The Journal of Psychology: Interdisciplinary and Applied, 149*(1), 42–62. https://doi.org/10.1080/00223980.2013.838539

Harackiewicz, J. M., & Elliot, A. J. (1998). The joint effects of target and purpose goals on intrinsic motivation: A mediational analysis. *Personality and Social Psychology Bulletin, 24*, 657–689.

Hefferon, K., Ashfield, A., Waters, L., & Synard, J. (2017). Understanding optimal human functioning—the 'call for qual' in exploring human flourishing and well-being. *The Journal of Positive Psychology, 12*, 211–219. https://doi.org/10.1080/17439760.2016.1225120

Hektner, J. M., Schmidt, J. A., & Csikszentmihalyi, M. (2007). *Experience sampling method measuring the quality of everyday life*. Sage Publications.

Hobfoll, S. E., Johnson, R. J., & Jackson, A. P. (2003). Resource loss, resource gain, and emotional outcomes among inner city women. *Journal of Personality and Social Psychology, 84*, 632–643.

Hu, L., & Bentler, P. (1999). Cutoff criteria for fit indices in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling, 6*, 1–55.

Ignjatovic, C. (2020). *Investigating flow at work and vital engagement of working adults across 3 years*. (Unpublished doctoral dissertation). The University of Melbourne, Graduate School of Education, School of Positive Psychology, Victoria, Australia.

Ilies, R., Wagner, D., Wilson, K., Ceja, L., Johnson, M., DeRue, S., & Ilgen, D. (2017). Flow at work and basic psychological needs: Effects on well-being. *Applied Psychology: an International Review, 66*(1), 3–24. https://doi.org/10.1111/apps.12075

Inghilleri, P. (2014). Phenomenology of positive change: Social growth. In P. Inghilleri, G. Riva, & E. Riva (Eds.), *Enabling positive change: Flow and complexity in daily experience* (pp. 6–16). De Gruyter Open Ltd.

Kern, M. L., Park, N., Peterson, C., & Romer, D. (2017). The positive perspective on youth development. In *Treating and preventing adolescent mental disorders: What we know and what we don't know (v. 2)*. In In D. Romer & the Commission Chairs of the Adolescent Mental Health Initiative of the Annenberg Public Policy Center and the Sunnylands Trust (pp. 543–567). New York: Oxford University Press.

Kern, M. L., Williams, P., Spong, C., Colla, R., Sharma, K., Downie, A., Taylor, J. A., Sharp, S., Siokou, C., & Oades, L. G. (2020). Systems informed positive psychology. *Journal of Positive Psychology*, *15*, 705–715. https://doi.org/10.1080/17439760.2019.1639799.

Korn, M. A., Woodard, C. R., & Tucker, C. A. (2016). Positive character traits of special education staff: Commonalities and applications. *International Journal of Special Education, 31*(3), 1–26.

Lan, J., Wong, C.-S., Jiang, C., & Mao, Y. (2017). The effect of leadership on work-related flow: A moderated mediation model. *Leadership & Organization Development Journal, 38*(2), 210–228. https://doi.org/10.1108/LODJ-08-2015-0180

Lavigne, G. L., Forest, J., & Crevier-Braud, L. (2012). Passion at work and burnout: A two-study test of the mediating role of flow experiences. *European Journal of Work and Organizational Psychology, 21*(4), 518–546. https://doi.org/10.1080/1359432X.2011.578390.

Lavy, S., & Littman-Ovadia, H. (2016). My better self: Using strengths at work and work productivity, organizational citizenship behavior, and satisfaction. *Journal of Career Development, 44*(2), 95–109. https://doi.org/10.1177/0894845316634056

Lindsley, D. H., Brass, D. J., & Thomas, J. B. (1995). Efficacy-performance spirals: A multilevel perspective. *Academy of Management Review*, *20*, 645–678.

Linley, A. (2008). *Average to A+: Realising strengths in yourself and others*. CAPP Press.

Linley, P. A., & Harrington, S. (2006). Playing to your strengths. *Psychologist, 19*, 86–89.

Llorens, S., Salanova, M., & Rodríguez, A. M. (2013). How is flow experienced and by whom? Testing flow among occupations. *Stress and Health, 29*, 125–137.

Makikangas, A., Bakker, A. B., Aunola, K., & Demerouti, E. (2010). Job resources and flow at work: Modelling the relationship via latent growth curve and mixture model methodology. *Journal of Occupational and Organizational Psychology, 83*, 795–814.

Martin, A. J., & Jackson, S. A. (2008). Brief approaches to assessing task absorption and enhanced subjective experience: Examining 'short' and 'core' flow in diverse performance. *Motivation and Emotion, 32*(3), 141–157. https://doi.org/10.1007/s11031-008-9094-0.

Massimini, F., & Delle Fave, A. (2000). Individual development in a bio-cultural perspective. *American Psychologist, 55*, 24–33.

Meadows, D. H., Meadows, D. L., Randers, J., & Behrens, W. W., III. (1972). *The limits to growth: A report for the club of Rome's project on the predicament of mankind*. Universe Books.

Moneta, G. B. (2012). Opportunity for creativity in the job as a moderator of the relation between trait intrinsic motivation and flow in work. *Motivation and Emotion, 36*, 491–503. https://doi.org/10.1007/s11031-012-9278-5

Nakamura, J. (2011). Contexts of positive adult development. In S. I. Donaldson, M. Csikszentmihalyi, & J. Nakamura (Eds.), *Applied positive psychology: Improving everyday life, health, schools, work, and society* (pp. 185–202). Routledge.

Nakamura, J. (2014). Positive change and mentoring in Adulthood. In P. Inghilleri, G. Riva, & E. Riva (Eds.), *Enabling positive change: Flow and complexity in daily experience* (pp. 166–182). Berlin: De Gruyter Open.

Nakamura, J., & Condren, M. (2018). A systems perspective on the role mentors play in the cultivation of virtue. *Journal of Moral Education, 47*(3), 316–332. https://doi.org/10.1080/03057240.2018.1444981

Nakamura, J., & Csikszentmihalyi, M. (2005). The concept of Flow. In C. R. Snyder & S. J. Lopez (Eds.), *Handbook of Positive Psychology* (pp. 89–105). Oxford University Press.

Nakamura, J., Shernoff, D., & Hooker, C. (2009). *Good mentoring*. Jossey Bass.

Olcar, D., Rijavec, M., & Golub, T. L. (2017). Primary school teachers' life satisfaction: The role of life goals, basic psychological needs and flow at work. *Current Psychology*. https://doi.org/10.1007/s12144-017-9611-y

Peters, P., Poutsma, E., Van Der Heijden, B. I. J. M., Bakker, A. B., & De Bruijn, T. (2014). Enjoying new ways to work: An hrm-process approach to study flow. *Human Resource Management, 53*(2), 271–290.

Peterson, R., & Seligman, M. (2004). *Character strengths and virtues: A handbook and Classification*. Oxford University Press.

R Core Team. (2014). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. http://www.R-project.org/.

Rathunde, K. (2015). *Creating a context for flow: The importance of personal insight and experience*. Presentation at the *NAMTA adolescent workshop titled* Adolescent Creativity, Collaboration and Discovery, atthe AMI/USA Refresher Course, Atlanta, GA, *February* 13–16.

Rathunde, K., & Csikszentmihalyi, M. (2006). The developing person: An experiential perspective. In W. Damon & R. W. Lerner (Eds.), *Handbook of child psychology and human development-6th Edition* (pp. 465–515). Wiley.

Rathunde, K., & Isabella, R. (2017). Play, flow, and tailoring identity in middle adulthood. In J. Sinnott (Ed.), *Identity flexibility during adulthood* (pp. 211–232). Springer.

Revelle, W. (2015). *Package 'psych'*. Retrieved from http://personality-project.org/r/psych.manual.pdf.

Rodríguez-Sánchez, A., Salanova, M., Cifre, E., & Schaufeli, W. B. (2011). When good is good: A virtuous circle of self-efficacy and flow at work among teachers. *Revista De Psicología Social, 26*(3), 427–441.

Rosseel, Y. (2012). lavaan: An R package for structural equation modeling. *Journal of Statistical Software, 48*(2), 1–36. www.jstatsoft.org/v48/i02/.

Salanova, M., Bakker, A. B., & Llorens, S. (2006). Flow at work: Evidence for an upward spiral of personal and organizational resources. *Journal of Happiness Studies, 7*, 1–22. https://doi.org/10.1007/s10902-005-8854-8

Salanova, M., Schaufeli, Xanthopoulou, D., Xanthopoulou, D., & Bakker, A. B. (2010). The gain spiral of resources and work engagement: Sustaining a positive work life. In A. B. Bakker & M. P. Leiter (Eds.), Work engagement: A Handbook of essential theory and research (pp. 118–131). Hoboken: Taylor and Francis.

Schiepe-Tiska, A., & Engeser, S. (2017). Measuring flow at work. In C. Fullagar & A. DelleFave (Eds.), *Flow at work; Measurement and Implications* (pp. 28–49). Routledge.

Seligman, M. E. P. (2002). *Authentic happiness: Using the new positive psychology to realize your potential for lasting fulfillment*. Random House.

Seligman, M. E. P. (2011). *Flourish: A new understanding of happiness and wellbeing: The practical guide to using positive psychology to make you happier and healthier*. Free Press.

Seligman, M. E. P., Steen, T. A., Park, N., & Peterson, C. (2005). Positive psychology progress: Empirical validation of interventions. *American Psychologist, 60*(5), 410–421. https://doi.org/10.1037/0003-066X.60.5.410

Senge, P. M. (2006). *The fifth discipline: The art and practice of the learning organization.* New York: Doubleday.

Slemp, G. R., Chin, T. C., Kern, M. L., Siokou, C., Loton, D., Oades, L. G., Vella-Brodrick, D. A., & Waters, L. (2017). Positive education in Australia: Practice, measurement, and future directions. In E. Fryenberg, A. J. Martin, & R. J. Collie (Eds.), *Social and emotional learning in Australia and the Asia Pacific* (pp. 101–122). Springer.

Smith, M. B., Bryan, L. K., & Vodanovich, S. J. (2012). The counter-intuitive effects of flow on positive leadership and employee attitudes: Incorporating positive psychology into the management of organizations. *The Psychologist-Manager Journal, 15*, 174–198. https://doi.org/10.1080/10887156.2012.701129

Tobert, S., & Moneta, G. B. (2013). Flow as a function of affect and coping in the workplace. *Individual Differences Research, 11*(3), 102–111.

Tomlinson-Keasey, C. (1993). Opportunities and challenges posed by archival data sets. In D. C. Funder, R. D. Parke, C. Tomlinson-Keasey, & K. Widaman (Eds.), *APA science Vols. Studying lives through time: Personality and development* (pp. 65–92). American Psychological Association. https://doi.org/10.1037/10127-020.

Tse, D. C. K., Nakamura, J., & Csikszentmihalyi, M. (2019). Beyond challenge-seeking and skill-building: Toward the lifespan developmental perspective on flow theory. *The Journal of Positive Psychology*. https://doi.org/10.1080/17439760.2019.1579362

Trevino, L. K., & Webster, J. (1992). Flow in Computer-Mediated Communication; Electronic Mail and Voice Mail Evaluation and Impacts. *Communication Research, 19*(5), 539–573.

Williams, P., Kern, M. L., & Waters, L. (2015). A Longitudinal Examination of the Association Between Psychological Capital, perception of organizational virtues and work happiness in school staff. *Psychol Well-Being, 5*(1), 1–18. https://doi.org/10.1186/s13612-015-0032-0

Williams, P., ø, M. L., & Waters, L. (2016). Inside-out-outside-in: A dual approach process model to developing work happiness. *International Journal of Wellbeing, 6*(2), 30–56. https://doi.org/10.5502/ijw.v6i2.3

Weeks, J. (2013). *Bringing together the best of science and practice in a K-12 schooling culture and context*. Presented at the meeting of Positive Education Schools association, Wollongong, Australia.

Wood, A. M., Linley, P. A., Maltby, J., Kashdan, T. B., & Hurling, R. (2011). Using personal and psychological strengths leads to increases in well-being over time: A longitudinal study and the development of the strengths use questionnaire. *Personality and Individual Differences, 50*, 15–19. https://doi.org/10.1016/j.paid.2010.08.004

Wrzesniewski, A., McCauley, C., Rozin, P., & Schwartz, B. (1997). Jobs, Careers, and Callings: People's Relations to Their Work. *Journal of Research in Personality, 31*, 21–33.

Zito, M., Bakker, A. B., Colombo, L., & Cortese, C. G. (2015). A two-step study for the Italian adaptation of the work-related flow (WOLF) inventory: The I-WOLF. *Testing, Psychometrics, Methodology in Applied Psychology, 22*(4), 553–570. https://doi.org/10.4473/TPM22.4.8

Zito, M., Cortese, C. G., & Colombo, L. (2016). Nurses' exhaustion: The role of flow at work between job demands and job resources. *Journal of Nursing Management, 24*, 12–22. https://doi.org/10.1111/jonm.12284