Psychological autonomy and well-being of employees in low-skilled occupations

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Abstract

Psychological autonomy and the impact it has on employees' well-being has seldom been examined for those employed in low-skilled occupations. Using self-determination theory (SDT) as the theoretical grounding, this study aimed to investigate the relationship between supervisors' support for psychological autonomy and employee outcomes such as well-being, stress, and job performance, for those in low-skilled occupations. SDT proposes that the effect of supervisors' autonomy support is mediated through the satisfaction and frustration of employees' needs. Survey data were collected from 171 employees at four different organisations in New Zealand. Regression analysis indicated that supervisors' autonomy support was positively related to the satisfaction of employees' autonomy, competence and relatedness needs, and negatively related to frustration of employees' autonomy and relatedness needs. In addition, supervisors' autonomy support was related to job performance through competence and relatedness satisfaction and to well-being through autonomy satisfaction. Findings highlight the importance of supervisors' autonomy support for employees' well-being and job performance, giving organisations ways to improve well-being and job performance.

Keywords: low-skilled occupations, well-being, supervisors' autonomy support, autonomy

Introduction

Autonomy at work has been shown to have positive effects on employees' well-being. For example, job autonomy, where an employee has control over the nature and type of task, has a positive relationship with employees' well-being (Boxall & Macky, 2014). Autonomy in scheduling or timing, where employees control the start and end of their working hours, is also positively related to well-being (Nijp, Beckers, Geurts, Tucker, & Kompier, 2012). While both job and time autonomy contribute to the well-being of employees, neither of these forms of autonomy are widespread in low-skilled occupations (Wheatley, 2017). Low-skilled occupations can be defined as occupations where work experience of up to a year is required with little or no formal education required to perform the tasks (Australian Bureau of Statistics, 2006). The nature of work in these occupations is typically characterised as highly routinised with fixed production or service hours, and therefore limited in job and time autonomy. These occupations can also be physically and psychologically demanding. Karasek and Theorell (1990) suggest that occupations such as assemblers and machine operators, where job-holders tend to work in isolated work stations, are found to have low control and social support, but

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are high in physical and psychological demands. Similarly, front-line hospitality occupations are also low in autonomy and high in demands (Walters & Raybould, 2007). According to Marmot (2005), those holding low-skilled jobs with less control tend to experience an increased level of alienation and boredom and a reduced level of social contact. Individuals working in these occupations are more prone to experience adverse outcomes, such as health and mental health complaints, fatigue and low job satisfaction (de Jonge, Bosma, Peter, & Siegrist, 2000; Pelfrene et al., 2002).

This research generally supports the notion that high job demands and psychological strain generate negative well-being outcomes for both organisations and employees. The well-being of employees in low-skilled occupations is commonly investigated from the work system and design perspective, such as lean manufacturing practices (e.g., Cullinane, Bosak, Flood, & Demerouti, 2014) and has often neglected the individual psychological aspect within well-being. This study provides an understanding of the individual psychological process by investigating the role of psychological autonomy in the well-being of employees in low-skilled occupations, hence providing organisations with another means to improve their well-being. Using self-determination theory (SDT) as a framework, we discuss psychological autonomy, the autonomy-supportive environment and basic psychological needs.

Self-Determination Theory (SDT)

The core concept of SDT concerns the facilitation or hindering of human flourishing (Ryan & Deci, 2000a). The basic assumption of SDT is that humans are innately curious, active and desire social connection, and much of SDT research focusses on the social conditions that enhance or undermine an individual's capacity for psychological growth, wellness and engagement (Ryan & Deci, 2017). An individual's capacity for growth is grounded in two fundamental principles: firstly, the need for an environment that supports psychological autonomy and, secondly, the satisfaction of basic psychological needs. These are discussed below.

Autonomy

Autonomy is commonly seen as being synonymous with independence, having the ability to behave and think outside the bounds of societal conformity, and making decision based on personal judgement (Ryff & Keyes, 1995). This view of autonomy is consistent with a great deal of the organisational research on job and time autonomy, which suggests that autonomy is having the independence to decide how tasks can be completed and the flexibility to decide when to start and end work. In contrast, SDT defines autonomy as *inter*dependence. Deci and Ryan (2000) suggest that autonomy, in essence, is self-organisation and self-regulation, where one endorses one's own action while *finding coherence between the inner self in association with the external environment or conditions*. Drawing on SDT research in the workplace, Nie, Chua, Yeung, Ryan and Chan (2015) and Williams et al., (2014) found the experience of interdependent autonomy, measured as autonomous motivation, was facilitated by an autonomy-supportive environment.

Interdependent autonomy has a broader application ***to*** work than the view of independent autonomy, because employees are not independent of the organisation and its policies, but are commonly subjected to organisational standards which employees may not fully endorse. Moreover, employees in low-skilled occupations often follow a routine and are required to

strictly adhere to procedure. Thus, they may find work less interesting (Morgeson & Humphrey, 2006) and, consequently, more challenging to engage autonomously at work. Therefore, interdependent autonomy, where employees willingly engage in an activity at work without having their values and goals undermined, while also being aware of the expectations and standards of the organisation, may be more relevant to low-skilled occupations which lack job and time autonomy. The key to this willing engagement with organisational standards and activity at work is supervisors' autonomy support for the employees (Ryan & Deci, 2000a).

Supervisors' autonomy support (SAS)

Employees' autonomy can be supported by the supervisors who act as their first line of report. An autonomy-supportive supervisor tends to provide an explanation for a given task, be open to employees' points of view, encourage initiative-taking and minimise the use of punishment or external rewards to motivate or change behaviour (Slemp, Kern, Patrick, & Ryan, 2018). In summary, SAS is a supervisory style aimed at fostering a supportive and understanding climate within the supervisor–employee relationship.

However, SAS is also commonly associated with being permissive and providing minimal guidelines (Reeve, 2009), which may lead supervisors in highly routinised occupations to discount the practicality of SAS. Nevertheless, studies have shown that SAS is a supervisory style that promotes well-being (Deci et al., 2001) without neglecting order and guidelines (Jang, Reeve, & Deci, 2010). Therefore, in a routinised work environment, SAS can be demonstrated through providing the rationale for seemingly repetitive and meaningless tasks, acknowledging and accepting employees' views when issues arise, avoiding controlling language (e.g., should, must) when outlining guidelines and expectations, and providing personal development opportunities. Through SAS, employees' basic psychological needs are satisfied, leading to better well-being and benefitting the organisation through improved performance (Deci, Olafsen, & Ryan, 2017).

Autonomy support and needs satisfaction

SDT posits that the optimal functioning and well-being of an individual is dependent on the satisfaction of the three fundamental psychological needs – autonomy (self-regulating one's behaviour; achieving inner coherence with external demands and goals), competence (engaging in optimal challenges and mastery in the physical and social world) and relatedness (seeking attachment and desiring the feelings of security, belongingness and intimacy with others) (Deci & Vansteenkiste, 2004). Similarly, the satisfaction of employees' basic psychological needs is key to their well-being (Ryan & Deci, 2000b). As such, SAS aims to provide an environment allowing employees to make choices and take action to satisfy the need for autonomy, competence and relatedness (Ryan & Deci, 2017). While such relationships have been widely studied in various occupational groups (Gillet, Fouquereau, Huyghebaert, & Colombat, 2015), the effect of SAS specifically on employees in low-skilled occupations is not known. Based on previous findings that SAS is positively related to needs satisfaction, the following hypotheses are proposed for employees in low-skilled occupations:

H1a: SAS is positively related to autonomy need satisfaction.
H1b: SAS is positively related to competence need satisfaction.
H1c: SAS is positively related to relatedness need satisfaction.

Autonomy support and needs frustration

Needs, if frustrated or thwarted, will have a negative outcome on the person's well-being, which is likely to diminish the person's ability to function optimally (Deci & Vansteenkiste, 2004). Deci and Ryan (2000) suggested the lack of satisfaction of needs may reflect a lower state of well-being, but the active or constant frustration of needs may lead to a more negative outcome such as anxiety, depressive symptoms and other maladaptive coping strategies. Needs satisfaction and frustration are negatively related to each other (Chen et al., 2015). However, they are not antithetical, as the antecedent and outcome of needs satisfaction and needs frustration tend to correlate, but they do so in the opposite direction (Vansteenkiste & Ryan, 2013). The effect of SAS on needs satisfaction has been widely studied, but the same could not be said about the effect of SAS on needs frustration. Although Vansteenkiste and Ryan (2013) suggest that SAS could prevent needs frustration, not many organisational studies have chosen to confirm this path, except for a few, such as those by Gillet, Fouquereau, Forest, Brunault and Colombat (2012), Gillet, Forest, Benabou and Bentein (2015) and Schultz, Ryan, Niemiec, Legate and Williams (2015). These studies found a negative relationship between SAS and needs frustration at work. However, needs frustration was analysed as a composite unit. Hence, how SAS is related to the frustration of each need is not known, and to our knowledge, no other prior research has informed about this relationship. Nevertheless, based on the findings that SAS is negatively related to needs frustration, the following hypotheses for employees in low-skilled occupations are proposed:

H2a: SAS is negatively related to autonomy need frustration.
H2b: SAS is negatively related to competence need frustration.
H2c: SAS is negatively related to relatedness need frustration.

Needs satisfaction and frustration as mediators

SAS has been found to have a significant positive relationship with the following: employees' tendencies to self-initiate and regulate (Baard, Deci, & Ryan, 2004); acceptance of organisational change (Gagné, Koestner, & Zuckerman, 2000); organisational identification, work satisfaction and job performance (Gillet, Colombat, Michinov, Pronost, & Fouquereau, 2013); well-being and task engagement (Deci et al., 2001); and decreased burnout (Fernet, Guay, Senécal, & Austin, 2012***).*** A meta-analysis by Slemp et al., (2018) found a similar effect of SAS on well-being and needs satisfaction across individualistic and collectivistic cultures. Thus, they concluded that SAS universally supports employees' well-being. As SAS is commonly known to contribute to employees' well-being and a positive organisational outcome, we hypothesised the following specific outcomes for employees in low-skilled occupations:

H3a: SAS is positively related to job performance.
H3b: SAS is positively related to well-being.
H3c: SAS is negatively related to stress.

While SAS is related to positive organisational outcomes, it is often mediated by the satisfaction of needs (Baard et al., 2004; Deci et al., 2001). Employees whose needs are satisfied showed increased work performance in a banking firm (Baard et al., 2004), greater well-being and job satisfaction in a shoe factory (Ilardi, Leone, Kasser, & Ryan, 1993), reduced symptoms of anxiety and depression in Bulgaria where employees are dominated by a "top-down" management approach (Deci et al., 2001) and a higher level of organisational citizenship behaviour in New Zealand organisations (Roche & Haar, 2013). Other studies with Dutch-speaking employees also found needs satisfaction leads to better well-being (Van den Broeck,

Vansteenkiste, De Witte, Soenens, & Lens, 2010) and lower stress (Van den Broeck, Vansteenkiste, De Witte, & Lens, 2008). SAS provides the environment in which needs may be satisfied, which leads to positive outcomes.

On the other hand, research suggests that when employees' needs are frustrated, this can lead to negative outcomes such as employees engaging in counterproductive behaviours: taking long breaks and turning up late to work (Van Den Broeck et al., 2014); experiencing burnout, high turnover intent, absenteeism (Schultz et al., 2015); psychological distress, psychosomatic complaints (Gillet et al., 2015; Trépanier, Forest, Fernet, & Austin, 2015); and higher levels of stress (Olafsen, Niemiec, Halvari, Deci, & Williams, 2017). Needs frustration also mediates between SAS and employee well-being and job satisfaction (Gillet et al., 2012). Although research examining needs frustration is growing, to our knowledge, no research has been conducted with low-skilled occupations.

Based on studies which found needs satisfaction and frustration as mediators between SAS and outcome variables, we hypothesise the following relationships:

H4a: The relationship between SAS and job performance, well-being and stress will be mediated by satisfaction of the need for autonomy.
H4b: The relationship between SAS and job performance, well-being and stress will be mediated by satisfaction of the need for competence.
H4c: The relationship between SAS and job performance, well-being and stress will be mediated by satisfaction of the need for relatedness.

H4d: The relationship between SAS and job performance, well-being and stress will be mediated by frustration of the need for autonomy.
H4e: The relationship between SAS and job performance, well-being and stress will be mediated by frustration of the need for competence.
H4f: The relationship between SAS and job performance, well-being and stress will be mediated by frustration of the need for relatedness.

High performance and well-being as well as lower levels of stress are not only good for the employees, but they are also indicators of a healthy organisational culture (Cooper & Cartwright, 1994; Grabovac & Mustajbegovic, 2015). This study aims to understand how needs satisfaction and frustration may mediate the relationship between supervisors' autonomy support and employees' well-being, job performance and stress, hence providing information on the antecedent and psychological process leading to positive outcomes.

Method

Participants and procedure

The data for this study were collected from employees in low-skilled occupations in New Zealand. Employees from three factories and one hotel participated in the study. The survey was distributed to the participants during a pre-arranged meeting. Arrangements were also made for the employees to return the completed survey forms via survey boxes placed in different locations (i.e., cafés and the clock-out machine area). The survey boxes were then collected by the lead researcher a week after the survey forms were distributed.

A total of 171 employees (out of 229) completed the survey with a response rate of 74.7 per cent. Of the 171 employees, 39 were from Organisation 1, 61 from Organisation 2, 28 from Organisation 3 and 43 were from Organisation 4. The majority of the participants were male (66.7 per cent), 28.7 per cent were female, and the remainder did not specify their gender. The mean age of the participants were 39.6 years (SD = 13.2). Most of the participants were factory operators (74.9 per cent) while 25.1 per cent were from various services in the hotel industry (i.e., housekeeping, food and beverage, receptionist, etc.).

Measures

The questionnaire administered to the employees consisted of five different scales and all the measures were administered in English.

Supervisors' support for autonomy
Employee perceptions of supervisors' autonomy support (SAS) were assessed using the Work Climate Questionnaire (WCQ). The WCQ uses 15 items (e.g., *My manager listens to how I would like to do things*) and a 7-point response scale from *strongly agree* to *strongly disagree*. Baard et al. (2004) adapted the scale to the work context by changing the reference person to manager from Williams, Grow, Freedman, Ryan and Deci (1996) who used the survey with patients to assess the autonomy-supportiveness of their healthcare provider (α = .92) and Williams and Deci (1996) who used the survey with students to assess autonomy-supportiveness of their instructor (α = .96).

Basic psychological needs satisfaction and frustration
The needs satisfaction and frustration 24-item scale (BPNSF-W) was designed to measure the satisfaction and frustration of competence, relatedness and autonomy needs at work. The scale was initially developed by Chen et al. (2015) and was adapted to a work context by Schultz et al. (2015), with Cronbach's alpha of 0.90 for needs satisfaction and Cronbach's alpha of 0.88 for needs frustration. Participants responded to a series of items such as *"At work, I feel a sense of choice and freedom in the things I undertake"* for needs satisfaction and "I feel insecure about my abilities on my job" for needs frustration, using a 7-point scale ranging from 1 *totally disagree* to 7 *totally agree*.

Employees' well-being
The well-being of employees was measured using the WHO-5 Well-being Scale (WHO-5) and the Perceived Stress Scale (PSS-4). The WHO-5 scale was developed by the World Health Organization (WHO) from the WHO-10 and has been phrased to reflect subjective positive well-being. The scale consists of five items, where the participants rated their well-being with items such as *"I have felt cheerful and in good spirits at work"* on a scale of 0 *at no time* to 5 *all of the time* (Topp, Østergaard, Søndergaard, & Bech, 2015).

The Perceived Stress Scale (PSS-4) scale was used to measure the perceived stress of employees. The PSS-4 scale was a short version of the 14-item scale originally developed by Cohen, Kamarck and Mermelstein (1983). The Cronbach's alpha for the 4-item scale was 0.72. The items in the scale asked the participants to rate the items such as *"In the last month, how often have you felt that you were unable to control the important things in your life?"* from 0 *never* to 4 *very often*. In general, the greater the score, the higher the level of stress reported.

Job performance

The job performance scale was adapted from Abramis (1994), which characterised job performance into technical ($\alpha = 0.83$) and social performance ($\alpha = 0.76$), absenteeism and lateness. In this study, technical and social performance are used as a measure of job performance. The items in the scale included, *"In the past four weeks you worked, how well did you perform without mistakes?"* and participants rate it from 1 *very poorly*, to 5 *exceptionally well*. Self-rated job performance was chosen in consideration of the pressure the employees might feel about their prospects in the organisation if supervisor- or organisational-rated job performance was used.

Results

Reliability and validity

Most scales demonstrated high reliability, ranging from .70 to .96. The reliability value for the scale measuring stress was relatively low ($\alpha = .57$) and the inter-item correlations were considerably weak (range from $r = .11$ to $r = .39$). Hence, the PSS-4 scale has been removed from further analysis.

Preliminary analysis

Correlations between the variables are presented in Table 1. From the correlation analysis, needs satisfaction (i.e., autonomy satisfaction) showed stronger correlations with well-being ($r = .58$, $p < .01$), while needs frustration (i.e., autonomy frustration) showed weaker correlations with well-being ($r = -.26$, $p < .01$).

Table 1 Means, Standard Deviations, and Correlations for Employees

	M	*SD*	1	2	3	4	5	6	7	8	9
1. SAS	5.1	1.2	*(.96)*								
2. Autonomy satisfaction	4.6	1.1	.48**	*(.75)*							
3. Competence satisfaction	5.8	.9	.29**	.46**	*(.70)*						
4. Relatedness satisfaction	5.0	1.1	.35**	.47**	.36**	*(.76)*					
5. Autonomy frustration	3.8	1.4	-.23**	-.19*	-.09	-.19*	*(.76)*				
6. Competence frustration	2.6	1.2	-.07	-.14	-.34**	-.16*	.51**	*(.78)*			
7. Relatedness frustration	3.2	1.2	-.26**	-.16	-.26**	-.35**	.51**	.58**	*(.77)*		
8. Job performance	4.0	.5	.16*	.24**	.40**	.41**	-.14	-.40**	-.32**	*(.82)*	
9. Well-being	3.2	1.1	.37**	.58**	.24**	.36**	-.26**	-.16*	-.08	.35**	*(.84)*

**$p < .01$, *$p < .05$; $n = 154$.

Note: Alpha reliabilities presented in italics on the diagonal

Regression analysis

SAS and needs satisfaction and frustration

A series of hierarchical regression analyses were run using SPSS version 24, to test the hypotheses of SAS as a predictor of autonomy, competence and relatedness needs satisfaction and frustration individually. The organisations, types of contract, and tenure of employment were first entered in the regression analysis as controls. In the second step, SAS was entered. Results of the regression analysis showed a significant positive relationship between SAS and the satisfaction of autonomy, relatedness, and competence needs, as shown in Table 2.

Table 2 Hierarchical regression analysis for SAS and autonomy, competence and relatedness needs satisfaction and frustration

	Autonomy satisfaction				Competence satisfaction				Relatedness satisfaction			
	β	*SE B*	R^2	ΔR^2	*B*	*SE B*	R^2	ΔR^2	*β*	*SE B*	R^2	ΔR^2
Step 1 (Control variables)												
Employment term	-.02	.08			.03	.06			.02	.08		
Org 1[a]	-.15	.25			-.02	.18			-.29**	.24		
Org 2[b]	-.14	.25			-.23*	.18			-.39**	.24		
Org 3[c]	-.12	.28			-.02	.20			-.16	.27		
Fulltime & Part-time	-.18	.23			-.11	.17			-.14	.22		
Fulltime & Fixed term	-.24	.27			-.18	.20			-.21*	.26		
Fulltime & Others	.02	.32			-.03	.23			-.08	.31		
Model summary			.08				.05				.11*	
Step 2												
Employment term	-.03	.07			.06	.06			.05	.07		
Org 1[a]	-.14	.23			.00	.18			-.26**	.23		
Org 2[b]	-.08	.23			-.20	.17			-.36**	.23		
Org 3[c]	-.08	.25			.01	.19			-.13	.25		
Fulltime & Part-time	-.15	.21			-.06	.16			-.07	.21		
Fulltime & Fixed term	-.17	.25			-.12	.19			-.14	.24		
Fulltime & Others	.01	.29			-.04	.22			-.09	.29		
SAS	.44**	.07			.31**	.05			.36**	.07		
Model summary			.26**	.18**			.14**	.09**			.23**	.12**

Note: *N = 162;* $^{**}p < .01$, $^{*}p < .05$. [a]Org 4 vs Org 1; [b]Org 4 vs Org 2; [c]Org 4 vs Org 3

Table 2 continued

	Autonomy frustration				Competence frustration				Relatedness frustration			
	β	*SE B*	R^2	ΔR^2	*B*	*SE B*	R^2	ΔR^2	*β*	*SE B*	R^2	ΔR^2
Step 1 (Control variables)												
Employment term	.07	.10			-.02	.09			.07	.09		
Org 1[a]	-.12	.30			-.23	.29			-.30**	.29		
Org 2[b]	.01	.30			-.04	.29			-.05	.29		
Org 3[c]	-.07	.33			-.17	.31			-.21*	.31		
Fulltime & Part-time	.22*	.28			.12	.26			.05	.26		
Fulltime & Fixed term	-.01	.32			-.03	.31			-.01	.30		
Fulltime & Others	.14	.38			.06	.37			.06	.36		
Model summary			.06				.07				.10*	
Step 2												
Employment term	.06	.10			-.02	.09			.05	.09		
Org 1[a]	-.14	.30			-.23*	.29			-.31**	.28		
Org 2[b]	-.01	.30			-.05	.29			-.07	.28		
Org 3[c]	-.08	.33			-.17	.32			-.23*	.30		
Fulltime & Part-time	.18	.27			.12	.27			.01	.26		
Fulltime & Fixed term	-.05	.32			-.03	.31			-.05	.30		
Fulltime & Others	.14	.38			.06	.37			.07	.35		
SAS	-.17*	.09			-.03	.09			-.23**	.08		
Model summary			.09*	.03*			.07	.00			.15**	.05**

Note: *N = 162;* $^{**}p < .01$, $^{*}p < .05$. [a]Org 4 vs Org 1; [b]Org 4 vs Org 2; [c]Org 4 vs Org 3

Hypotheses 1a, 1b and 1c are supported. SAS also predicted reduced frustration of relatedness and autonomy needs, but not competence need. Hypotheses 2a and 2c are supported, but not 2b. Generally, SAS accounted for greater variance in needs satisfaction (R^2 of .09 to .18) than in needs frustration (R^2 of .03 to .05).

Multiple mediation analysis

According to Preacher and Hayes (2008), a multiple mediation analysis is an appropriate analysis for multiple potential mediators, which, in this study, are autonomy, competence and relatedness needs satisfaction and frustration. Based on the recommendation by Van den Broeck, Ferris, Chang and Rosen (2016), individual needs should be analysed separately to test the unique effect of each need on the outcome variables. Therefore, the relationship between SAS and the outcome variables were first tested. Following this, autonomy, competence and relatedness satisfaction and frustration were tested as mediators of the relationship between outcome variables and SAS. Analyses were conducted using SPSS version 24, Process version 3.0. The coefficients and confidence intervals for the outcome variables based on 10,000 bootstrap samples are presented in Table 3 and 4.

Table 3 Summary of mediation analysis with SAS as predictor, needs satisfaction as mediators and outcome variables

	Outcome							
	Job performance [a]				Well-being [b]			
			95% CI				95% CI	
Predictors	*Coeff*	*SE B*	*LL*	*UL*	*Coeff*	*SE B*	*LL*	*UL*
SAS	.08*	.03	.01	.05	.35**	.06	.22	.47
Autonomy satisfaction	-.02	.04	-.10	.06	.46**	.08	.31	.61
Competence satisfaction	.26**	.05	.16	.36	-.04	.10	-.23	.15
Relatedness satisfaction	.15**	.04	.08	.23	.10	.10	-.05	.24
Model R^2	.30**				.36**			
SAS								
Total effect	.08*	.03	.01	.15	.35**	.06	.22	.47
Direct effect	-.02	.03	-.08	.05	.12	.07	-.01	.25
Total indirect effect	.10*	.03	.05	.15	.23*	.05	.15	.33
Indirect effect via								
(A) Autonomy satisfaction	-.01	.02	-.04	.03	.21*	.05	.13	.31
(B) Competence satisfaction	.06*	.02	.02	.10	-.01	.03	-.06	.04
(C) Relatedness satisfaction	.05*	.02	.02	.09	.03	.03	-.03	.10

Note: [a] $N = 165$; [b] $N = 165$. $^{**}p < .01$, $^{*}p < .05$. CI = Confidence intervals based on bias-corrected $k = 10{,}000$ bootstrap samples, *LL* lower limit, *UL* upper limit.

Table 4 Summary of mediation analysis with SAS as predictor, needs frustration as mediators, and outcome variables

	Outcome							
	Job performance [a]				Well-being [b]			
			95% CI				95% CI	
Predictors	*Coeff*	*SE B*	*LL*	*UL*	*Coeff*	*SE B*	*LL*	*UL*
SAS	.08*	.03	.01	.15	. 35**	.06	.22	.47
Autonomy frustration	.08*	.04	.01	.15	-.16*	.07	-.30	-.02
Competence frustration	-.17**	.04	-.25	-.09	-.13	.08	-.29	.04
Relatedness frustration	-.05	.04	-.13	.03	.18*	.08	.02	.34
Model R^2	.19**				.21**			
SAS								
Total effect	.08*	.03	.01	.15	.35**	.06	.22	.47
Direct effect	.08*	.03	.01	.14	.35**	.07	.23	.48
Total indirect effect	.00	.02	-.03	.04	.22	-.01	.03	-.06
Indirect effect via								
(A) Autonomy frustration	-.01	.01	-.04	.00	.03	.02	-.00	.08
(B) Competence frustration	.00	.01	-.02	.04	.01	.01	-.01	.04
(C) Relatedness frustration	.01	.01	-.01	.04	-.04*	.03	-.11	-.00

Note: [a] $N = 165$; [b] $N = 165$. **$p < .01$, *$p < .05$. CI = Confidence intervals based on bias-corrected $k = 10{,}000$ bootstrap samples, *LL* lower limit, *UL* upper limit.

SAS and outcome variables

The main effect analyses showed SAS was significantly related to job performance ($\beta = .08$, $p < .05$) and well-being ($\beta = .35$, $p < .01$). Therefore, hypotheses 3a and 3b are supported. Following the significant main effect results, mediation analyses were conducted.

Needs satisfaction as mediators

The mediation analysis showed a significant relationship between SAS and job performance through competence and relatedness satisfaction only. Hence, hypotheses 4b and 4c are supported for job performance only. Autonomy satisfaction mediates the relationship between SAS and well-being, with an effect size of .21. Therefore, hypothesis 4a is supported only for well-being.

Competence and relatedness satisfaction mediate SAS and job performance while autonomy satisfaction mediates SAS and well-being. The mediation model provides a better explanation of the relationship between SAS and job performance and well-being than the direct relationship between SAS and job performance and well-being.

Needs frustration as mediators

The total direct effects between SAS and job performance and well-being were significant, while the indirect effect through needs frustration were not significant. Therefore, the mediation hypotheses between SAS and the outcome variables through needs frustration were not supported. This relationship can possibly be influenced by SAS contributing to less variance in needs frustration, as demonstrated in the second set of hypotheses and the mixed results between needs frustration and outcome variables.

Discussion

This study investigated (1) the relationship between supervisors' autonomy support and the satisfaction or frustration of employees' autonomy, competence, and relatedness needs, and (2) the relationship between supervisors' autonomy support and organisational outcomes mediated through needs satisfaction and frustration. The results showed that autonomy support is uniquely related to satisfaction and frustration of each of the three needs satisfaction, as demonstrated by different effect sizes. Although SAS predicts autonomy and relatedness frustration, it does so to a lesser degree than needs satisfaction. These findings are consistent with Bartholomew, Ntoumanis, Ryan, Bosch and Thøgersen-Ntoumani (2011) and Gillet et al. (2012), who found autonomy support relates to needs satisfaction to a greater degree than needs frustration. The findings suggest SAS functions to increase positive resources rather than preventing needs frustration of employees in low-skilled occupations. Therefore, if employees continuously operate under a controlling management style that is rigid, prescriptive and frequently uses punishment as a corrective method (Ryan & Deci, 2017), SAS may not be able to prevent employees' needs from being frustrated.

It was hypothesised that the satisfaction of needs through SAS would lead to better job performance and well-being. Competence and relatedness satisfaction mediate job performance, while only autonomy satisfaction mediates well-being. Mixed results were found, suggesting that each need uniquely mediates the relationship between SAS and the outcome variables, hence reinforcing the requirement to examine

each need individually (Van den Broeck et al., 2016). On the other hand, the results do not imply that needs that did not mediate the relationship between SAS and job performance and well-being should be ignored, as needs satisfaction varies daily and with different activities (Reis, Sheldon, Gable, Roscoe, & Ryan, 2000). Future studies focussing on activities and daily variation might be able to provide insight into the role of each need in employees' well-being. However, what we can infer through this study is that, despite limitation in job and time autonomy, psychological autonomy plays an important role in the well-being of employees in low-skilled occupations.

On the other hand, needs frustration does not mediate SAS and job performance and well-being. This result contrasts with that of Gillet et al. (2012), who found that needs frustration mediates SAS and organisational outcomes such as job satisfaction, happiness and self-realisation. In their study, needs frustration was investigated as an overall index while, in this study, needs frustration was analysed separately as three mediators. This difference in the analysis might influence the mediation effect. In addition, the evidence of needs frustration as a mediator between controlling and negative outcomes is stronger than needs frustration as a mediator between autonomy-support and positive outcomes. For example, Vander Elst, Van Den Broeck, De Witte and De Cuyper (2012) found that needs frustration mediates the relationship between job insecurity and emotional exhaustion and vigour. Needs frustration also mediates the relationship between workplace bullying and burnout (Trépanier, Fernet, & Austin, 2015). Our study suggests that, although SAS can prevent autonomy and relatedness frustration to a certain degree, it is not sufficient to impact job performance and well-being of employees in low-skilled occupations.

Finally, the PSS-4 scale demonstrated low reliability and was removed from further analysis. The scale chosen for this study, consisting of two positively and two negatively worded items, might appear confusing to the participants in low-skilled occupations who might not be used to filling in surveys. Since the scale has not been used extensively with people in low-skilled occupations, it may be that a brief stress scale for our participants might not be the best measure, especially when the scale has both positive and negative items. Therefore, studies with low-skilled occupations in the future should consider using the 10-item stress scale, which is a two-factor model, instead of the more popular single-factor model (Taylor, 2015).

Limitations and future research

There are a few limitations in this study to take note of when interpreting the results and considering directions for future research. First of all, the data collected was cross-sectional. Though no single factor emerged after performing Harman's one-factor test, we do not deny that cross-sectional data is still subject to other common method biases (Podsakoff, Mackenzie, Lee, & Podsakoff, 2003). Moreover, cross-sectional data cannot conclude causality. Future organisational studies can consider using longitudinal or experimental methods to establish the relationship between SAS and employees' well-being through needs satisfaction and needs frustration.

Secondly, the relatively weak effect sizes of SAS on job performance through needs satisfaction suggest that future studies should include types of motivation as potential mediators (Deci et al., 2017). Moreover, since only SAS was investigated as a predictor, researchers might also want to include supervisors' controlling behaviour in relation to needs frustration and organisational outcomes. Bartholomew et al. (2011) suggested needs frustration has different antecedents and predicted outcomes. Therefore, future

studies could measure controlling behaviours that might lead to needs frustration and negative outcomes to gain better understanding of the predictors as well as the outcomes of needs frustration.

Finally, research with low-skilled occupations posed some unique challenges, such as lower literacy skills, leading to the possibility of participants misunderstanding certain items in the questionnaire. Moreover, as employees in low-skilled occupations work with machines or in service areas that run continuously and under tight schedules, it can be challenging to motivate them to participate in the study as they are unable to move away from their work station, and they might not see the benefit of participating in a study. Because of this, the sample size of this study, although sufficient, is limited.

However, these limitations should encourage rather than discourage researchers to study low-skilled occupations, as they present unique contexts for the application of SDT. Future studies could pay closer attention to simplifying the items in the questionnaire and providing literacy support to the participants. In addition, researchers could attempt to gain support from management prior to the study so employees are able to take time away from their work station to participate in the study. This could both increase the participation rate and also convey organisational commitment to improving employee well-being.

Practical implication and conclusion

Following the results of this study, we offer a practical suggestion that might improve well-being and job performance of employees in low-skilled jobs. Our findings suggest that for employees in low-skilled occupations where job and time autonomy are limited, supervisors' support for psychological autonomy plays an important role in the satisfaction of autonomy, competence and relatedness needs, which, in turn, leads to better job performance and employee well-being. Organisations should consider encouraging supervisors to practise an autonomy-supportive interaction style with employees. One of the ways to increase autonomy supporting interaction is through training supervisors in autonomy-supportive behaviours. Autonomy-supportive skills training includes providing a meaningful rationale when assigning a task, accepting rather than correcting employees' views when assigning tasks that are not of employees' interest, using informational rather than punitive language in correcting behaviour, and providing opportunities for development, learning and interactions at work. Studies have shown that autonomy-supportive training with managers, coaches, health practitioners and teachers resulted in more autonomy-supportive interactions with their employees, athletes, patients and students (Su & Reeve, 2011). Therefore, investing in such training could provide great benefit to the employees and organisation.

In conclusion, this study has provided insight into the relationship between supervisors' autonomy support and organisational outcomes (job performance, well-being and stress). While the relationship between supervisors' autonomy support and job performance and well-being was mediated by needs satisfaction, there is no evidence that needs frustration mediates the same relationships. In conclusion, supervisors' autonomy support plays an important role in the satisfaction of needs and improvement of job performance and well-being.

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