

## Managerial support for basic psychological needs, somatic symptom burden and work-related correlates: A self-determination theory perspective

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Somatic symptom burden, or the experience of physical symptomatology without a medical explanation, is related to functional disability and poor quality of life. The consequences of somatic symptom burden extend beyond the individual and affect society, as manifested in higher medical utilization and lower job productivity. Using self-determination theory, we posited that employees' perceptions of managerial support for basic psychological needs may be associated with lower levels of somatic symptom burden among employees, in part because such contexts promote autonomous self-regulation (a type of motivation) at work. Also, we posited that somatic symptom burden among employees would explain some of the relations of managerial need support and autonomous self-regulation at work to indices of work-related functioning, namely emotional exhaustion, turnover intention and absenteeism. Results from 287 Norwegian employees confirmed these hypotheses. These findings not only identify a theoretical mechanism that may explain (in part) the origin of somatic symptoms, but also offer a model by which social-contextual and motivational factors affect important work-related outcomes. These findings also bespeak the importance of developing workplace interventions that provide support for satisfaction of the basic psychological needs.

**Keywords:** autonomous self-regulation; need support; self-determination theory; managers; somatic symptom burden; workplace

### Introduction

Research from self-determination theory (SDT) has shown that managerial support for basic psychological needs is associated with autonomous self-regulation at work as well as indices of psychological health, social wellness and work-related functioning among employees (Gagné & Deci, 2005; Van den Broeck, Vansteenkiste, De Witte, Soenens, & Lens, 2010). Despite this impressive body of research, it is less clear whether managerial

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support for basic psychological needs also affects employees' experience of *physical symptoms* and, if so, whether those symptoms explain the relations of managerial need support and autonomous self-regulation at work to important work-related outcomes. To begin to fill this theoretical and empirical gap, herein we examined possible origins of somatic symptom burden and then we assessed the relations of somatic symptom burden to a variety of important indices of work-related functioning, namely emotional exhaustion, turnover intention and absenteeism.

### ***Overview of somatization and somatic symptom burden***

The focus of the current study is on somatic symptom burden or the sub-clinical manifestation of somatization. Herein we use the term *somatization* (Lipowski, 1988) when describing theory and research on the clinical disorder itself. According to Lipowski (1988, p. 1359), somatization is “the tendency to experience and communicate somatic distress and symptoms unaccounted for by pathological findings, to attribute them to physical illness, and to seek medical help for them ... (and) becomes manifest in response to psychosocial stress”. Without a single, standard definition (Kroenke, Sharpe, & Sykes, 2007), Lipowski's core elements of somatization offer a working definition of the disorder, whereby (1) one or more somatic symptoms that (2) lack an adequate medical explanation (3) cause patient distress and (4) prompt health-seeking behaviour. By definition, then, somatic symptoms have little or no basis in actual physical illness yet they account for over 50% of all outpatient medical encounters in the USA, or about 400 million medical visits per year (Katon, Ries, & Kleinman, 1984; Schappert, 1993; cf. Kroenke, Spitzer, & Williams, 2002). Somatization is estimated to cost US\$256 billion per year in health care utilization and lost job productivity in the USA (Barsky, Orav, & Bates, 2005), as employees with somatization often report disability, miss work, seek medical care and undergo testing to confirm or exclude physical illness (De Gucht & Fischler, 2002; Kroenke, 2007). Although sub-clinical, the experience of somatic symptom burden has a detrimental impact on multiple domains of health-related quality of life (cf. Kroenke, Spitzer, Williams, & Löwe, 2010). Somatic symptom burden has been associated with lower levels of functional status in each of the six life domains assessed by the SF-20 (Stewart, Hays, & Ware, 1988) – namely general, pain, role, physical, mental and social – as well as higher levels of disability days and health care utilization (Kroenke et al., 2002). As such, we consider somatization and somatic symptom burden to be (sub-)clinical phenomena that exist at the interface of physical and psychological health.

The aetiologies of somatization and somatic symptom burden are poorly understood even though both physical and psychological factors seem to be implicated in their being reported (Katon, Lin, & Kroenke, 2007; Kroenke, 2003; cf. Kroenke, Zhong, et al., 2010), and little is known about whether and how social contexts contribute to or prevent their occurrence (De Gucht & Fischler, 2002). Therefore, it is critical to identify theoretically based mechanisms that may explain (even in part) the origin of somatic symptoms. Using SDT, we posited that employees' perceptions of managerial support for basic psychological needs may be associated with lower levels of somatic symptom burden among employees, in part because such contexts promote autonomous self-regulation at work (Gagné & Deci, 2005). In what follows, we present an overview of SDT, which will offer a theoretical and empirical context into which our hypotheses can be placed. Indeed, SDT has already provided a framework for the development of clinical

interventions to enhance perceived support for basic psychological needs (Ryan, Patrick, Deci, & Williams, 2008; Williams & Niemiec, 2012) and has been shown to be relevant in the workplace (Baard, Deci, & Ryan, 2004).

### *Towards a model for understanding the origins of somatic symptom burden*

SDT (Deci & Ryan, 2000; Niemiec, Ryan, & Deci, 2010; Ryan & Deci, 2000b) is an organismic approach to human motivation and personality in social contexts that has applications in the workplace, in health care and in various other important life domains. At the core of SDT is the proposal of basic psychological needs for autonomy, competence and relatedness. The need for autonomy refers to the experience of behaviour as owned, volitional and reflectively self-endorsed, rather than controlled by internal or external forces. The need for competence refers to the experience of effectance in achieving desired outcomes. The need for relatedness refers to the experience of warm, caring and mutually supportive connections with others. Indeed, satisfaction of the basic psychological needs is necessary for full functioning and organismic wellness (cf. Niemiec & Ryan, 2013), and research from SDT has shown that satisfaction of autonomy, competence and relatedness is conducive to various indices of psychological, social and physical health (including lower levels of physical symptoms; Niemiec, Ryan, & Deci, 2009).

From the perspective of SDT, social contexts can provide support (or lack thereof) for satisfaction of basic psychological needs (see Williams et al., 2011, for an illustration in the health care domain). To support autonomy, managers can elicit and acknowledge employees' perspectives and feelings before making a recommendation, support employees' choices and self-initiatives, provide a meaningful rationale when advice is given or when a limit is set and minimize pressure and coercion. To support competence, managers can convey genuine confidence in employees' ability to succeed, identify barriers to success, provide feedback in a non-judgmental way and offer optimal challenges as opportunities for skills building and problem-solving. To support relatedness, managers can provide unconditional positive regard even when employees do not attain desired outcomes, remain empathic towards employees' concerns and provide a warm interpersonal environment. In essence, support for autonomy, competence and relatedness involves managers' being interested in and actively engaged with employees, and assuming an employee-centred perspective during interactions at work.

Although grounded in SDT, the concept of managerial support for basic psychological needs is similar to other leadership styles in organizational psychology. Transformational leadership, for instance, is an interpersonal approach in which a leader (viz., manager) strives to facilitate self-engagement and value internalization, self-efficacy and social identification among the followers (viz., employees; Shamir, House, & Arthur, 1993). These elements of transformational leadership have parallels with the SDT conceptualization of support for autonomy, competence and relatedness, respectively, and meta-analyses have confirmed the relation of transformational leadership to work-related outcomes (Fuller, Patterson, Hester, & Stringer, 1996; Lowe, Kroeck, & Sivasubramaniam, 1996).

As suggested earlier, past research from SDT has shown that managerial support for autonomy, competence and relatedness is associated with various indices of psychological health, social wellness and work-related functioning among employees. In several countries, managerial need support has been associated with higher levels of adjustment

and self-esteem (Baard et al., 2004; Deci et al., 2001), and lower levels of anxiety, emotional exhaustion, work–family conflict and family alienation (Deci et al., 2001; Sénécal, Vallerand, & Guay, 2001). Perhaps it is not surprising, then, that managers' interpersonal style is also associated with employees' attitudes towards and behaviour at work. Managerial need support has been associated with higher levels of trust in the corporation, feelings of support and non-pressure at work and overall job satisfaction (Deci, Connell, & Ryan, 1989), as well as higher levels of engagement (Deci et al., 2001) and performance (Baard et al., 2004) among employees.

From the perspective of SDT, the reason that need-supportive social contexts promote full functioning and organismic wellness is that such contexts facilitate internalization (Deci & Ryan, 2000) – that is, the natural, active process of coming to endorse the value of behaviours that are not inherently satisfying or enjoyable but nonetheless are important (Ryan, 1993). Indeed, both correlational (Niemic et al., 2006) and experimental (Deci, Eghrari, Patrick, & Leone, 1994) studies have supported the assertion that internalization is facilitated by provision of support for basic psychological needs. According to SDT, the reasons for enacting a behaviour vary along a continuum of relative autonomy, which reflects the degree to which the behaviour has been internalized into the self. The least autonomous type of motivation is external regulation, in which the behaviour is carried out solely to comply with external contingencies (in other words, the behaviour has not been internalized at all). For instance, an employee might complete tasks at work to earn a merit-based bonus or to avoid reprimand. The next type of motivation is introjected regulation, in which the behaviour is carried out to satisfy internal rather than external contingencies. For instance, an employee might complete tasks at work to feel pride for being a “good employee” or to avoid guilt for not having worked hard enough. Both external and introjected forms of regulation are experienced as relatively controlled, as the perceived locus of causality (deCharms, 1968) for the behaviour is experienced as external to the self. The next type of motivation is identified regulation, in which the value of the behaviour is understood and self-endorsed. For instance, an employee might complete tasks at work because he or she finds the work to be valuable and important. The most autonomous type of motivation is integrated regulation, in which the value of the behaviour is not only self-endorsed but is also consistent with other aspects of the self as well. For instance, an employee might complete tasks at work because doing so affords an opportunity to help those who are in need, which aligns with his or her abiding values and beliefs. Both identified and integrated forms of regulation, as well as intrinsic motivation – behaviour that is inherently interesting and enjoyable, and thus not subject to the process of internalization (Niemic & Ryan, 2009; Ryan & Deci, 2000a) – are experienced as relatively autonomous, as the perceived locus of causality (deCharms, 1968) for the behaviour is experienced as internal to the self.

Past research from SDT in the work domain has shown that managerial need support is associated with autonomous self-regulation among employees (Otis & Pelletier, 2005; Sénécal et al., 2001), and that transformational leadership is associated with autonomous self-regulation (or self-concordance) for goals pursued while at work (Bono & Judge, 2003). As well, autonomous self-regulation at work has been associated with higher levels of personal accomplishment and work satisfaction (Fernet, Guay, & Sénécal, 2004; Richer, Blanchard, & Vallerand, 2002), and lower levels of depersonalization, daily hassles, emotional exhaustion and family alienation (Fernet et al., 2004; Otis & Pelletier, 2005; Richer et al., 2002; Sénécal et al., 2001). However, very little research from SDT in the work domain has examined the relations of these social-contextual and motivational

factors to employees' experience of physical symptoms. Otis and Pelletier found that physical symptoms are inversely associated with autonomous self-regulation and support for competence, but are unassociated with support for autonomy. Given this paucity of data, it is critical to examine theoretically based factors that affect employees' experience of physical symptoms and to assess whether such symptoms are associated with important work-related outcomes.

### ***The present research***

Informed by SDT and located at the interface of work and health, the present research examined possible social-contextual (viz., managerial need support) and motivational (viz., autonomous self-regulation at work) origins of somatic symptom burden among employees, and assessed the relations of these factors to a variety of important indices of work-related functioning. It is important to note that our hypotheses and indirect effects models (presented below) are based on the SDT model of health behaviour (Ryan et al., 2008), in which need-supportive social contexts relate positively to autonomous self-regulation, which in turn relates positively to indices of physical health and mental health. A recent meta-analysis of 184 independent data-sets from studies that utilized SDT in health-related contexts provided strong support for this set of associations (Ng et al., 2012), and randomized clinical trials based on SDT have provided support for the salubrious effect of need-supportive social contexts on autonomous self-regulation, physical health and mental health (Niemic, Ryan, Deci, & Williams, 2009; Williams, Niemic, Patrick, Ryan, & Deci, 2009). Therefore, we maintain that our hypotheses and indirect effects models rest upon a solid theoretical and empirical foundation of support.

It is interesting to note, also, that Models 2 and 3 (presented below) are based on the assumption that a physical factor that is not directly related to the workplace (viz., somatic symptom burden) can mediate the associations between psychological factors that are directly related to the workplace (viz., managerial need support, autonomous self-regulation at work, emotional exhaustion, turnover intention and absenteeism). We theorize that one dynamic, maladaptive response to work contexts and phenomenological experiences that are not conducive to satisfaction of basic psychological needs is the experience of somatic symptom burden, which has been shown to contribute to poor functional status, disability days and lost job productivity (Barsky et al., 2005; Kroenke et al., 2002).

We specified six hypotheses based on the literature reviewed 7. earlier:

Hypothesis 1a. Employees' perceptions of managerial need support will be associated with higher levels of autonomous self-regulation at work.

Hypothesis 1b. Employees' perceptions of managerial need support will be associated with lower levels of somatic symptom burden among employees. We theorize that somatic symptom burden among employees may arise due to the psychological distress generated by lower levels of managerial need support.

Hypothesis 1c. Employees' perceptions of managerial need support will be associated with lower levels of emotional exhaustion, turnover intention and absenteeism. We theorize that turnover intention and absenteeism may result from lower levels of managerial need support, as previous research has revealed associations between managerial need support and trust in the corporation, feelings of support and non-pressure at work, overall job satisfaction and

engagement (Deci et al., 1989, 2001). Such positive experiences are likely to be antithetical to a desire to leave one's job and to actual missed work.

Hypothesis 2a. Employees' experiences of autonomous self-regulation at work will be associated with lower levels of somatic symptom burden among employees. While there are sparse data on the association between autonomous self-regulation and physical symptoms in the workplace, there is much evidence of an association between autonomous self-regulation and wellness in the health care domain (Ng et al., 2012; Niemiec, Ryan, Patrick, Deci, & Williams, 2010; Williams, Niemiec, et al., 2009; Williams, Patrick, et al., 2009). For instance, Niemiec, Ryan, Patrick, et al. (2010) found that autonomous self-regulation for smoking cessation related positively to vitality and related negatively to cigarette use. In a similar way, Williams, Patrick, et al. (2009) found that autonomous self-regulation for medication use related positively to quality of life and related negatively to glycosylated haemoglobin, glucose and non-HDL cholesterol.

Hypothesis 2b. Employees' experiences of autonomous self-regulation at work will be associated with lower levels of emotional exhaustion, turnover intention and absenteeism.

We theorize that turnover intention and absenteeism may result from lower levels of autonomous self-regulation at work, as previous research has revealed associations between autonomous self-regulation at work and personal accomplishment and work satisfaction (Fernet et al., 2004; Richer et al., 2002). Such positive experiences are likely to be antithetical to a desire to leave one's job and to actual missed work.

Hypothesis 3. Somatic symptom burden among employees will be associated with higher levels of emotional exhaustion, turnover intention and absenteeism. Somatic symptom burden has been associated with poor functional status, disability days and lost job productivity (Barsky et al., 2005; Kroenke et al., 2002), and such adverse experiences are likely to contribute to emotional exhaustion and absenteeism. We theorize that turnover intention may result from a link (made by employees) between somatic symptom burden and the psychological distress generated by lower levels of managerial need support.

We specified three indirect effects models based on the hypotheses reviewed earlier:

Model 1. Employees' experiences of autonomous self-regulation at work explains some of the association between managerial need support and somatic symptom burden among employees.

Model 2. Somatic symptom burden among employees explains some of the association between managerial need support and indices of work-related functioning (viz., emotional exhaustion, turnover intention and absenteeism).

Model 3. Somatic symptom burden among employees explains some of the association between autonomous self-regulation at work and indices of work-related functioning (viz., emotional exhaustion, turnover intention and absenteeism).

## **Method**

### ***Participants and procedure***

Participants were 287 (138 female, 148 male, 1 unspecified) employees in selected departments of four leading Nordic companies. The first organization was a supplier of branded consumer goods in which the study questionnaire was distributed electronically to 112 employees, of whom 66 provided data (response rate = 59%) and an additional 34

paper questionnaires were returned. The second organization was a mobile communications company in which the questionnaire was distributed electronically to 287 employees, of whom 103 provided data (response rate = 36%). The third organization was a producer and seller of electric power in which the questionnaire was distributed electronically to 117 employees, of whom 44 provided data (response rate = 38%). The fourth organization was a building company in which the questionnaire was distributed electronically to 252 employees and in paper form to an unknown number of employees, of whom 47 provided data overall (response rate unknown). The total sample ( $N = 287$ ) does not include seven outliers that were present in the original dataset. In their companies, participants held positions in production, sales, and customer support (61%); management (20%); administration (9%); marketing (4%); logistics (3%); development (2%); and "other" (one participant). The participant with unspecified gender was removed from subsequent analyses because the bootstrap approach in structural equation modelling (used for the primary analyses) requires complete data for the analysis to proceed. Data for the current study were collected between February 2010 and March 2010.

### **Measures**

*Managerial need support.* The Work Climate Questionnaire (Baard et al., 2004) assessed employees' perceptions of managerial need support (15 items; e.g. My manager provides me with choices and options about my work). Responses were made on a 7-point scale from 1 (*strongly disagree*) to 7 (*strongly agree*).

*Motivation at work.* The Revised Motivation at Work Scale (R-MAWS; Gagné et al., 2010) presented participants with the following stem: "I put effort into my job...". Participants rated preselected responses that assessed intrinsic motivation (5 items; e.g. Because I have fun doing my job), identified regulation (5 items; e.g. Because I personally consider it important to put effort into this job), introjected regulation (7 items; e.g. Because otherwise I would feel guilty) and external regulation (11 items; e.g. Because others pressure me). Responses were made on a 7-point scale from 1 (*not at all for this reason*) to 7 (*exactly for this reason*).

*Somatic symptom burden.* The Patient Health Questionnaire-15 (PHQ-15) (Kroenke et al., 2002) assessed somatic symptom burden. The PHQ-15 assesses 15 somatic symptoms that account for more than 90% of all physical complaints in outpatient settings (Kroenke, Arrington, & Mangelsdorff, 1990) and includes 14 of the 15 most prevalent DSM-IV symptoms of somatization (Liu, Clark, & Eaton, 1997). Participants were asked, "Over the last four weeks, to what extent have you been bothered by one or more of the following problems?" and responded to 13 items reflecting physical complaints (e.g. headaches, back pain, dizziness, trouble sleeping). Two items [viz., menstrual cramps or other problems with your periods (women only), pain or problems during sexual intercourse] were considered to be too sensitive and were omitted. Responses were made on a 3-point scale from 0 (*not bothered at all*) to 1 (*bothered a little*) to 2 (*bothered a lot*).

*Emotional exhaustion.* The emotional exhaustion subscale of the Maslach Burnout Inventory-General Survey (Maslach, Jackson, & Leiter, 1996) assessed emotional exhaustion at work (5 items; e.g. I feel emotionally drained from my work.). Responses were made on a 7-point scale from 0 (*never*) to 6 (*daily*).

*Turnover intention.* Separate scales assessed current thoughts about turnover (O'Driscoll & Beehr, 1994; 3 items; e.g. I am thinking of leaving this job) and thoughts about turnover during the past year (Luchak & Gellatly, 2007; 3 items; e.g. How frequently over the past year have you considered searching for another job?). Responses were made on a 7-point scale from 1 (*never*) to 7 (*all the time*).

*Absenteeism.* Participants were asked, "For how many working days were you absent in January (last month) due to your own sickness?" This question was also asked with regard to the two previous months (November and December). Although employees underestimate their own absenteeism (Johns, 1994), self-report measures of absenteeism over the preceding three months yield responses that are close to objectively assessed measures (Spector, 1987).

## Results

### Handling of missing data

Missing values (less than 1% of the possible responses) were estimated with regression imputation in AMOS 20.0 to permit a bootstrap analysis using structural equation modelling.

### Preliminary analyses

We examined whether the four types of motivation assessed by the R-MAWS (Gagné et al., 2010) formed a quasi-simplex pattern (Guttman, 1954), in which types of motivation that are closer to each other on the continuum of relative autonomy are expected to relate positively, whereas types of motivation that are further from each other on the continuum of relative autonomy are expected to relate less positively or negatively. Results confirmed the quasi-simplex pattern of the R-MAWS, as intrinsic motivation related positively to identified regulation ( $r = .59, p < .001$ ) and introjected regulation ( $r = .29, p < .001$ ), and related negatively to external regulation ( $r = -.12, p < .05$ ); identified regulation related positively to introjected regulation ( $r = .54, p < .001$ ) and was unrelated to external regulation ( $r = .08, ns$ ); and introjected regulation related positively to external regulation ( $r = .25, p < .001$ ). Therefore, we assigned weights of +2, +1, -1 and -2 to intrinsic motivation, identified regulation, introjected regulation and external

Table 1. Descriptive statistics, inter-correlations and scale reliabilities ( $\alpha$ ) for the study variables.

	1	2	3	4	5	6
1. Managerial need support	.97					
2. Autonomous self-regulation	.28***	–				
3. Somatic symptom burden	-.26***	-.26***	.80			
4. Emotional exhaustion	-.39***	-.30***	.50***	.86		
5. Turnover intention	-.40***	-.47***	.28***	.49***	.94	
6. Absenteeism	-.13*	-.12†	.35***	.16**	.14*	.86
Mean	5.31	2.33	0.37	2.74	2.56	1.25
SD	1.29	4.26	0.32	1.15	1.48	3.24
Skew	-1.13	-0.16	1.14	1.01	1.01	4.63
Kurtosis	0.86	-0.21	1.63	0.87	0.35	23.78

Note: Scale reliabilities (Cronbach's  $\alpha$ ) are shown on the diagonal.

† $p < .10$ ; \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ .



regulation, respectively, and we summed the weighted scores to create a composite measure of relative autonomous self-regulation at work. Similar procedures have been used in previous research (Ryan & Connell, 1989; Soenens, Vansteenkiste, & Niemiec, 2009; Trépanier, Fernet, & Austin, 2013).

Table 1 presents descriptive statistics, inter-correlations and scale reliabilities ( $\alpha$ ) for the variables assessed in this study. The pattern of associations among study variables was in line with our hypotheses, and all correlations were statistically significant or marginal.

Separate multivariate analyses of variance (MANOVAs; Hotelling's Trace) revealed a significant multivariate difference between men and women,  $F(6, 279) = 2.81, p < .05$ , and between participants who held positions in management and those who held positions other than in management,  $F(6, 279) = 4.02, p < .001$ , on the dependent variables. Univariate analyses of variance (ANOVAs) revealed that women reported higher somatic symptom burden,  $F(1, 284) = 13.29, p < .001$ . As well, univariate ANOVAs revealed that participants who held positions in management reported higher managerial need support,  $F(1, 284) = 9.71, p < .01$ , higher autonomous self-regulation at work,  $F(1, 284) = 10.08, p < .01$ , lower somatic symptom burden,  $F(1, 284) = 9.43, p < .01$ , lower emotional exhaustion,  $F(1, 284) = 4.74, p < .05$ , and lower absenteeism,  $F(1, 284) = 7.05, p < .01$ . Therefore, we controlled for gender and position in the primary analyses.

### Primary analyses

Primary analyses were performed using structural equation modelling, a data-analytic method that allows the researcher to test a simultaneous set of relations among multiple variables and assesses the overall goodness of fit of the model to the data. Structural equation modelling also allows the researcher to test indirect effects using a bootstrap approach, which is a resampling technique widely advocated for assessing such effects (Preacher, Rucker, & Hayes, 2007).

We estimated a model that included all hypothesized direct and indirect paths, as well as correlations among emotional exhaustion, turnover intention and absenteeism. As this model was saturated and analyses were based on complete data, the fit of the model to the data was perfect,  $\chi^2(0) = 0.00$ . The correlations between absenteeism and both emotional exhaustion ( $r = -.04$ ) and turnover intention ( $r = .04$ ) were not significant and thus were trimmed from the model. The fit of the resulting model to the data was excellent,  $\chi^2(2) = 0.55, ns$ ; comparative fit index (CFI) = 1.00; non-normed fit index (NNFI) = 1.03; root mean square error of approximation (RMSEA) = .00. Results for the model are shown in Figure 1.

Hypothesis 1a posited that employees' perceptions of managerial need support would be associated with higher levels of autonomous self-regulation at work. This prediction was confirmed, as managerial need support related positively to autonomous self-regulation at work ( $\beta = .26, p < .001$ ). Hypothesis 2a posited that employees' experiences of autonomous self-regulation at work would be associated with lower levels of somatic symptom burden among employees. This prediction was confirmed, as autonomous self-regulation at work related negatively to somatic symptom burden ( $\beta = -.20, p < .001$ ). Hypothesis 1b posited that employees' perceptions of managerial need support would be associated with lower levels of somatic symptom burden among employees. This prediction was confirmed, as managerial need support related negatively to somatic symptom burden while controlling for autonomous self-regulation at work ( $\beta = -.18, p < .01$ ). As specified in Model 1, a bootstrap analysis (with 2000 bootstrap samples) yielded

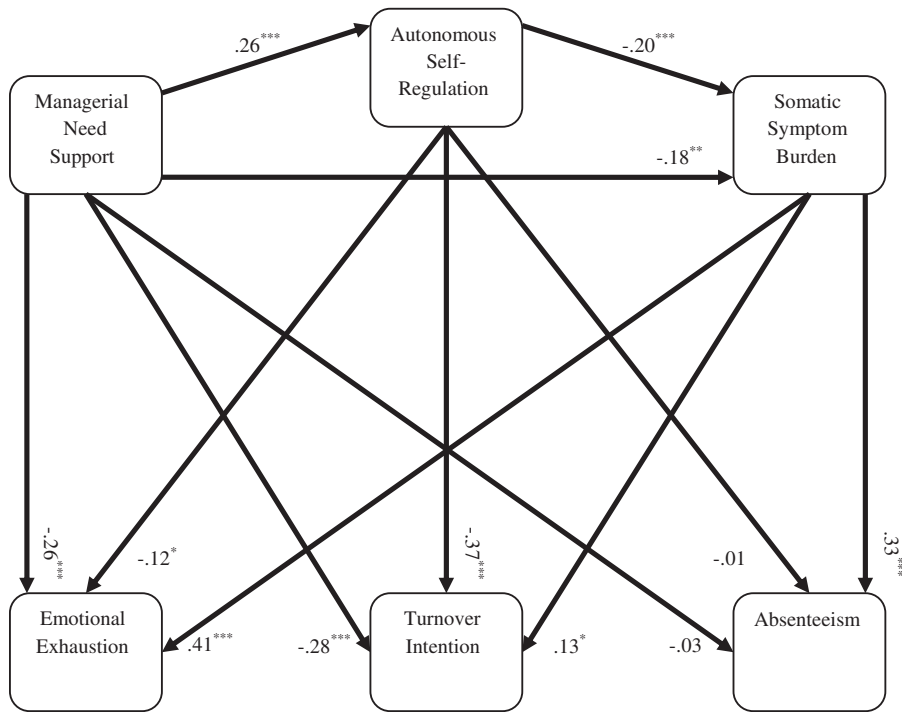


Figure 1. The structural equation model, with standardized parameter estimates, examining the associations among managerial need support, autonomous self-regulation, somatic symptom burden and work-related outcomes.

Note. All coefficients are standardized estimates.

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

a significant indirect effect of managerial need support to somatic symptom burden through autonomous self-regulation at work, indirect effect ( $SE$ ) =  $-.05$  (.02),  $p < .001$ ; 95% bias-corrected confidence interval (95% BC CI):  $-.11, -.02$ . Hypothesis 3 posited that somatic symptom burden among employees would be associated with higher levels of emotional exhaustion, turnover intention and absenteeism. This prediction was confirmed, as somatic symptom burden related positively to emotional exhaustion ( $\beta = .41$ ,  $p < .001$ ), turnover intention ( $\beta = .13$ ,  $p < .05$ ) and absenteeism ( $\beta = .33$ ,  $p < .001$ ). The predictors in this model explained 11% of the variance in autonomous self-regulation at work, 15% of the variance in somatic symptom burden, 34% of the variance in emotional exhaustion, 31% of the variance in turnover intention and 13% of the variance in absenteeism.

A set of bootstrap analyses (each with 2000 bootstrap samples) was conducted to test the indirect effects of managerial need support and autonomous self-regulation at work to the work-related outcomes through somatic symptom burden.

As specified in Model 2, there were significant indirect effects of managerial need support to emotional exhaustion, indirect effect ( $SE$ ) =  $-.13$  (.04),  $p < .001$ ; 95% BC CI:  $-.20, -.06$ , turnover intention, indirect effect ( $SE$ ) =  $-.12$  (.03),  $p < .001$ ; 95% BC CI:  $-.19, -.07$ , and absenteeism, indirect effect ( $SE$ ) =  $-.08$  (.03),  $p < .01$ ; 95% BC CI:  $-.15, -.01$ , through somatic symptom burden. Hypothesis 1c posited that employees'

perceptions of managerial need support would be associated with lower levels of emotional exhaustion, turnover intention and absenteeism. This prediction was partially confirmed, as managerial need support related negatively to emotional exhaustion ( $\beta = -.26, p < .001$ ) and turnover intention ( $\beta = -.28, p < .001$ ) but not absenteeism ( $\beta = -.03, ns$ ) while controlling for somatic symptom burden.

As specified in Model 3, there were significant indirect effects of autonomous self-regulation at work to emotional exhaustion, indirect effect ( $SE$ ) =  $-.08 (.03), p < .001$ ; 95% BC CI:  $-.14, -.03$ , turnover intention, indirect effect ( $SE$ ) =  $-.03 (.01), p < .05$ ; 95% BC CI:  $-.07, -.01$ , and absenteeism, indirect effect ( $SE$ ) =  $-.07 (.02), p < .001$ ; 95% BC CI:  $-.12, -.03$ , through somatic symptom burden. Hypothesis 2b posited that employees' experiences of autonomous self-regulation at work would be associated with lower levels of emotional exhaustion, turnover intention and absenteeism. This prediction was partially confirmed, as autonomous self-regulation at work related negatively to emotional exhaustion ( $\beta = -.12, p < .05$ ) and turnover intention ( $\beta = -.37, p < .001$ ) but not absenteeism ( $\beta = -.01, ns$ ) while controlling for somatic symptom burden.

## Discussion

Somatic symptom burden, or the experience of physical symptomatology without a medical explanation, is related to functional disability and poor quality of life (Löwe et al., 2008). Indeed, the consequences of somatic symptom burden extend beyond the individual and affect society at large, as manifested in higher levels of medical utilization and lower levels of job productivity (Barsky et al., 2005). Yet the social-contextual and motivational origins of somatic symptom burden are poorly understood. Using SDT, the present research examined whether employees' perceptions of managerial support for basic psychological needs are associated with lower levels of somatic symptom burden among employees, as such contexts promote autonomous self-regulation at work. In line with our hypotheses, the results suggested that autonomous self-regulation at work mediated the relation of employees' perceptions of managerial need support to somatic symptom burden. This finding is important not only because it speaks to possible social-contextual and motivational origins of somatic symptom burden, but also because somatic symptom burden was associated with higher levels of emotional exhaustion, turnover intention and absenteeism. Indeed, somatic symptom burden mediated the relations of both managerial need support and autonomous self-regulation at work to these work-related outcomes. Thus, managerial support for autonomy, competence and relatedness seems to benefit not only the employee but also the organization and perhaps society at large.

Interestingly, both managerial need support and autonomous self-regulation at work were significant predictors of emotional exhaustion and turnover intention while controlling for somatic symptom burden. Thus, contextual support for basic psychological needs and the phenomenological experience of volition have important work-related consequences that extend beyond those resulting from somatic symptom burden. Workplaces that are developed to support employees' psychological needs for autonomy, competence and relatedness may therefore protect against emotional exhaustion, desire to leave the job and perhaps even medical utilization resulting from somatic symptom burden. The potential benefits for employees' wellness and job productivity could be substantial if interventions show a causal effect of need support on these outcomes. Indeed, interventions have shown that clinical contexts designed to support psychological

needs facilitate the process of internalization, improve health outcomes and are cost-effective (Pesis-Katz, Williams, Niemiec, & Fiscella, 2011; Williams, Niemiec, et al., 2009). The present research suggests that similar studies are justified in the work domain and, if found to be efficacious, then cost-effectiveness analyses could determine the value of the intervention to employers.

Theoretically, these results suggest that one dynamic, maladaptive response to work contexts (viz., managers) that are not perceived as supportive of basic psychological needs is the experience of somatic symptom burden. In a sense, then, the psychological distress associated with a lack of need support at work appears to manifest (at least partially) as a physical burden. As SDT posits that support for basic psychological needs is a *universal* requirement for healthy functioning, it is likely that a similar dynamic may occur in other important life domains, including (but not limited to) familial and romantic relationships, school, sport and politics.

There is growing interest in the consequences of need thwarting as a phenomenon that is distinct from a lack of need support. Such measures are still being developed, but evidence suggests that need thwarting explains unique variance in the so-called “negative” indicators of wellness, such as emotional and physical exhaustion (Bartholomew, Ntoumanis, Ryan, & Thøgersen-Ntoumani, 2011). Thus, it is important for future research to assess whether need thwarting also explains unique variance in somatic symptom burden, as instances of need thwarting at work such as sexual harassment and racial discrimination may be implicated in the aetiology of somatic symptoms.

### ***Limitations and future directions***

Several limitations deserve mention. First, the data were correlational and thus do not speak to issues of directionality or causality. Only longitudinal studies can examine the issue of directionality and only intervention studies can examine whether managerial need support is causally related to somatic symptom burden, emotional exhaustion, turnover intention and/or absenteeism among employees. Second, medical utilization, which is one component of somatization (Lipowski, 1988), was not measured in this study. Previous research has shown a positive association between somatic symptom burden and medical utilization, and it is important for future research to assess whether need-supportive interventions reduce medical utilization and/or somatic symptom burden. Nonetheless, the diminished quality of life associated with somatic symptom burden (Löwe et al., 2008), coupled with the costs of emotional exhaustion and turnover, are likely enough to warrant organizational changes even if medical utilization is not reduced by need support. Third, we did not obtain physician validation of medically unexplained symptoms. Kroenke et al. (2002) have shown that the presence of three or more symptoms is not likely to have a medical cause, and it is important for future research to confirm that managerial need support and autonomous self-regulation at work are associated with medically unexplained symptoms.

### **Conclusion**

In the present research, we demonstrated that managerial need support was associated with lower levels of somatic symptom burden among employees, as mediated by autonomous self-regulation at work. These findings not only identify a theoretical mechanism that may explain (in part) the origin of somatic symptoms, but also offer a model by which social-contextual and motivational factors affect important work-related

outcomes such as emotional exhaustion, turnover intention and absenteeism. Interventions that examine whether causal relations exist among these variables would provide an important extension of these encouraging findings. For now, we recommend that organizations and employers create the conditions at work that are conducive to their employees' satisfaction of autonomy, competence and relatedness.

## References

- Baard, P. P., Deci, E. L., & Ryan, R. M. (2004). Intrinsic need satisfaction: A motivational basis of performance and well-being in two work settings. *Journal of Applied Social Psychology, 34*, 2045–2068. doi:10.1111/j.1559-1816.2004.tb02690.x
- Barsky, A. J., Orav, E. J., & Bates, D. W. (2005). Somatization increases medical utilization and costs independent of psychiatric and medical comorbidity. *Archives of General Psychiatry, 62*, 903–910. doi:10.1001/archpsyc.62.8.903
- Bartholomew, K. J., Ntoumanis, N., Ryan, R. M., & Thøgersen-Ntoumani, C. (2011). Psychological need thwarting in the sport context: Assessing the darker side of athletic experience. *Journal of Sport & Exercise Psychology, 33*, 75–102.
- Bono, J. E., & Judge, T. A. (2003). Self-concordance at work: Toward understanding the motivational effects of transformational leaders. *Academy of Management Journal, 46*, 554–571. doi:10.2307/30040649
- deCharms, R. (1968). *Personal causation: The internal affective determinants of behavior*. New York, NY: Academic Press.
- Deci, E. L., Connell, J. P., & Ryan, R. M. (1989). Self-determination in a work organization. *Journal of Applied Psychology, 74*, 580–590. doi:10.1037/0021-9010.74.4.580
- Deci, E. L., Eghrari, H., Patrick, B. C., & Leone, D. R. (1994). Facilitating internalization: The self-determination theory perspective. *Journal of Personality, 62*(1), 119–142. doi:10.1111/j.1467-6494.1994.tb00797.x
- Deci, E. L., & Ryan, R. M. (2000). The “what” and “why” of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry, 11*, 227–268. doi:10.1207/S15327965PLI1104\_01
- Deci, E. L., Ryan, R. M., Gagne, M., Leone, D. R., Usunov, J., & Kornazheva, B. P. (2001). Need satisfaction, motivation, and well-being in the work organizations of a former Eastern Bloc country: A cross-cultural study of self-determination. *Personality and Social Psychology Bulletin, 27*, 930–942. doi:10.1177/0146167201278002
- De Gucht, V., & Fischler, B. (2002). Somatization: A critical review of conceptual and methodological issues. *Psychosomatics, 43*(1), 1–9. doi:10.1176/appi.psy.43.1.1
- Fernet, C., Guay, F., & Senécal, C. (2004). Adjusting to job demands: The role of work self-determination and job control in predicting burnout. *Journal of Vocational Behavior, 65*(1), 39–56. doi:10.1016/S0001-8791(03)00098-8
- Fuller, J. B., Patterson, C. E. P., Hester, K., & Stringer, D. Y. (1996). A quantitative review of research on charismatic leadership. *Psychological Reports, 78*, 271–287. doi:10.2466/pr0.1996.78.1.271
- Gagné, M., & Deci, E. L. (2005). Self-determination theory and work motivation. *Journal of Organizational Behavior, 26*, 331–362.
- Gagné, M., Forest, J., Vansteenkiste, M., Crevier-Braud, L., Van den Broeck, A., Aspel, A., ... Wang, Z. (2010). *Validation evidence in 10 languages for the revised motivation at work scale*. Concordia University, Montreal, Canada. Unpublished manuscript.
- Guttman, L. (1954). A new approach to factor analysis: The radex. In E. Lazarfeld (Ed.), *Mathematical thinking in the social sciences* (pp. 258–348). New York, NY: Free Press of Glencoe.
- Johns, G. (1994). Absenteeism estimates by employees and managers: Divergent perspectives and self-serving perceptions. *Journal of Applied Psychology, 79*, 229–239. doi:10.1037/0021-9010.79.2.229
- Katon, W., Lin, E. H. B., & Kroenke, K. (2007). The association of depression and anxiety with medical symptom burden in patients with chronic medical illness. *General Hospital Psychiatry, 29*, 147–155. doi:10.1016/j.genhosppsy.2006.11.005

- Katon, W., Ries, R. K., & Kleinman, A. (1984). The prevalence of somatization in primary care. *Comprehensive Psychiatry*, *25*, 208–215. doi:10.1016/0010-440X(84)90009-9
- Kroenke, K. (2003). Patients presenting with somatic complaints: Epidemiology, psychiatric co-morbidity and management. *International Journal of Methods in Psychiatric Research*, *12*(1), 34–43. doi:10.1002/mpr.140
- Kroenke, K. (2007). Efficacy of treatment for somatoform disorders: A review of randomized controlled trials. *Psychosomatic Medicine*, *69*, 881–888. doi:10.1097/PSY.0b013e31815b00c4
- Kroenke, K., Arrington, M. E., & Mangelsdorff, A. D. (1990). The prevalence of symptoms in medical outpatients and the adequacy of therapy. *Archives of Internal Medicine*, *150*, 1685–1689. doi:10.1001/archinte.150.8.1685
- Kroenke, K., Sharpe, M., & Sykes, R. (2007). Revising the classification of somatoform disorders: Key questions and preliminary recommendations. *Psychosomatics*, *48*, 277–285. doi:10.1176/appi.psy.48.4.277
- Kroenke, K., Spitzer, R. L., & Williams, J. B. W. (2002). The PHQ-15: Validity of a new measure for evaluating the severity of somatic symptoms. *Psychosomatic Medicine*, *64*, 258–266. doi:10.1097/00006842-200203000-00008
- Kroenke, K., Spitzer, R. L., Williams, J. B. W., & Löwe, B. (2010). The patient health questionnaire somatic, anxiety, and depressive symptom scales: A systematic review. *General Hospital Psychiatry*, *32*, 345–359. doi:10.1016/j.genhosppsych.2010.03.006
- Kroenke, K., Zhong, X., Theobald, D., Wu, J., Tu, W., & Carpenter, J. S. (2010). Somatic symptoms in patients with cancer experiencing pain or depression: Prevalence, disability, and health care use. *Archives of Internal Medicine*, *170*, 1686–1694.
- Lipowski, Z. J. (1988). Somatization: The concept and its clinical application. *American Journal of Psychiatry*, *145*, 1358–1368.
- Liu, G., Clark, M. R., & Eaton, W. W. (1997). Structural factor analyses for medically unexplained somatic symptoms of somatization disorder in the Epidemiologic Catchment Area Study. *Psychological Medicine*, *27*, 617–626. doi:10.1017/S0033291797004844
- Löwe, B., Spitzer, R. L., Williams, J. B., Mussell, M., Schellberg, D., & Kroenke, K. (2008). Depression, anxiety and somatization in primary care: Syndrome overlap and functional impairment. *General Hospital Psychiatry*, *30*, 191–199.
- Lowe, K. B., Kroeck, K. G., & Sivasubramaniam, N. (1996). Effectiveness correlates of transformational and transactional leadership: A meta-analytic review of the MLQ literature. *The Leadership Quarterly*, *7*, 385–425. doi:10.1016/S1048-9843(96)90027-2
- Luchak, A. A., & Gellatly, I. R. (2007). A comparison of linear and nonlinear relations between organizational commitment and work outcomes. *Journal of Applied Psychology*, *92*, 786–793. doi:10.1037/0021-9010.92.3.786
- Maslach, C., Jackson, S. E., & Leiter, M. P. (1996). *Maslach burnout inventory manual* (3rd ed.). Palo Alto, CA: Consulting Psychologists Press.
- Ng, J. Y. Y., Ntoumanis, N., Thøgersen-Ntoumani, C., Deci, E. L., Ryan, R. M., Duda, J. L., & Williams, G. C. (2012). Self-determination theory applied to health contexts: A meta-analysis. *Perspectives on Psychological Science*, *7*, 325–340.
- Niemiec, C. P., Lynch, M. F., Vansteenkiste, M., Bernstein, J., Deci, E. L., & Ryan, R. M. (2006). The antecedents and consequences of autonomous self-regulation for college: A self-determination theory perspective on socialization. *Journal of Adolescence*, *29*, 761–775. doi:10.1016/j.adolescence.2005.11.009
- Niemiec, C. P., & Ryan, R. M. (2009). Autonomy, competence, and relatedness in the classroom: Applying self-determination theory to educational practice. *Theory and Research in Education*, *7* (2), 133–144. doi:10.1177/1477878509104318
- Niemiec, C. P., & Ryan, R. M. (2013). What makes for a life well lived? Autonomy and its relation to full functioning and organismic wellness. In S. A. David, I. Boniwell, & A. C. Ayers (Eds.), *The oxford handbook of happiness* (pp. 214–226). Oxford: Oxford University Press.
- Niemiec, C. P., Ryan, R. M., & Deci, E. L. (2009). The path taken: Consequences of attaining intrinsic and extrinsic aspirations in post-college life. *Journal of Research in Personality*, *43*, 291–306. doi:10.1016/j.jrp.2008.09.001
- Niemiec, C. P., Ryan, R. M., & Deci, E. L. (2010). Self-determination theory and the relation of autonomy to self-regulatory processes and personality development. In R. H. Hoyle (Ed.),

- Handbook of personality and self-regulation* (pp. 169–191). Malden, MA: Blackwell Publishing Ltd.
- Niemiec, C. P., Ryan, R. M., Deci, E. L., & Williams, G. C. (2009). Aspiring to physical health: The role of aspirations for physical health in facilitating long-term tobacco abstinence. *Patient Education and Counseling*, *74*, 250–257. doi:10.1016/j.pec.2008.08.015
- Niemiec, C. P., Ryan, R. M., Patrick, H., Deci, E. L., & Williams, G. C. (2010). The energization of health-behavior change: Examining the associations among autonomous self-regulation, subjective vitality, depressive symptoms, and tobacco abstinence. *The Journal of Positive Psychology*, *5* (2), 122–138. doi:10.1080/17439760903569162
- O'Driscoll, M. P., & Beehr, T. A. (1994). Supervisor behaviors, role stressors and uncertainty as predictors of personal outcomes for subordinates. *Journal of Organizational Behavior*, *15*(2), 141–155. doi:10.1002/job.4030150204
- Otis, N., & Pelletier, L. G. (2005). A motivational model of daily hassles, physical symptoms, and future work intentions among police officers. *Journal of Applied Social Psychology*, *35*, 2193–2214. doi:10.1111/j.1559-1816.2005.tb02215.x
- Pesis-Katz, I., Williams, G. C., Niemiec, C. P., & Fiscella, K. (2011). Cost-effectiveness of intensive tobacco dependence intervention based on self-determination theory. *The American Journal of Managed Care*, *17*, e393–e398.
- Preacher, K. J., Rucker, D. D., & Hayes, A. F. (2007). Addressing moderated mediation hypotheses: Theory, methods, and prescriptions. *Multivariate Behavioral Research*, *42*(1), 185–227. doi:10.1080/00273170701341316
- Richer, S. F., Blanchard, C., & Vallerand, R. J. (2002). A motivational model of work turnover. *Journal of Applied Social Psychology*, *32*, 2089–2113. doi:10.1111/j.1559-1816.2002.tb02065.x
- Ryan, R. M. (1993). Agency and organization: Intrinsic motivation, autonomy and the self in psychological development. In J. Jacobs (Ed.), *Nebraska symposium on motivation: Developmental perspectives on motivation* (Vol. 40, pp. 1–56). Lincoln: University of Nebraska Press.
- Ryan, R. M., & Connell, J. P. (1989). Perceived locus of causality and internalization: Examining reasons for acting in two domains. *Journal of Personality and Social Psychology*, *57*, 749–761. doi:10.1037/0022-3514.57.5.749
- Ryan, R. M., & Deci, E. L. (2000a). Intrinsic and extrinsic motivations: Classic definitions and new directions. *Contemporary Educational Psychology*, *25*(1), 54–67. doi:10.1006/ceps.1999.1020
- Ryan, R. M., & Deci, E. L. (2000b). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, *55*(1), 68–78. doi:10.1037/0003-066X.55.1.68
- Ryan, R. M., Patrick, H., Deci, E. L., & Williams, G. C. (2008). Facilitating health behaviour change and its maintenance: Interventions based on self-determination theory. *The European Health Psychologist*, *10*, 2–5.
- Schappert, S. M. (1993). National ambulatory medical care survey: 1991 summary. *Advance Data*, *230*, 1–16.
- Senécal, C., Vallerand, R. J., & Guay, F. (2001). Antecedents and outcomes of work-family conflict: Toward a motivational model. *Personality and Social Psychology Bulletin*, *27*, 176–186.
- Shamir, B., House, R. J., & Arthur, M. B. (1993). The motivational effects of charismatic leadership: A self-concept based theory. *Organization Science*, *4*, 577–594. doi:10.1287/orsc.4.4.577
- Soenens, B., Vansteenkiste, M., & Niemiec, C. P. (2009). Should parental prohibition of adolescents' peer relationships be prohibited? *Personal Relationships*, *16*, 507–530. doi:10.1111/j.1475-6811.2009.01237.x
- Spector, P. E. (1987). Method variance as an artifact in self-reported affect and perceptions at work: Myth or significant problem? *Journal of Applied Psychology*, *72*, 438–443. doi:10.1037/0021-9010.72.3.438
- Stewart, A. L., Hays, R. D., & Ware, J. E. (1988). The MOS short-form general health survey: Reliability and validity in a patient population. *Medical Care*, *26*, 724–735. doi:10.1097/00005650-198807000-00007
- Trépanier, S.-G., Fernet, C., & Austin, S. (2013). The moderating role of autonomous motivation in the job demands-strain relation: A two sample study. *Motivation and Emotion*, *37*, 93–105.
- Van den Broeck, A., Vansteenkiste, M., De Witte, H., Soenens, B., & Lens, W. (2010). Capturing autonomy, competence, and relatedness at work: Construction and initial validation of the Work-

- related Basic Need Satisfaction scale. *Journal of Occupational and Organizational Psychology*, 83, 981–1002.
- Williams, G. C., & Niemiec, C. P. (2012). Positive affect and self-affirmation are beneficial, but do they facilitate maintenance of health-behavior change? A self-determination theory perspective. *Archives of Internal Medicine*, 172, 327–328.
- Williams, G. C., Niemiec, C. P., Patrick, H., Ryan, R. M., & Deci, E. L. (2009). The importance of supporting autonomy and perceived competence in facilitating long-term tobacco abstinence. *Annals of Behavioral Medicine*, 37, 315–324. doi:[10.1007/s12160-009-9090-y](https://doi.org/10.1007/s12160-009-9090-y)
- Williams, G. C., Patrick, H., Niemiec, C. P., Ryan, R. M., Deci, E. L., & Lavigne, H. M. (2011). The smoker's health project: A self-determination theory intervention to facilitate maintenance of tobacco abstinence. *Contemporary Clinical Trials*, 32, 535–543. doi:[10.1016/j.cct.2011.03.002](https://doi.org/10.1016/j.cct.2011.03.002)
- Williams, G. C., Patrick, H., Niemiec, C. P., Williams, L. K., Divine, G., Lafata, J. E., ... Pladevall, M. (2009). Reducing the health risks of diabetes: How self-determination theory may help improve medication adherence and quality of life. *The Diabetes Educator*, 35, 484–492. doi:[10.1177/0145721709333856](https://doi.org/10.1177/0145721709333856)



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