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Original Research Article

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Mueller and Lovell

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Senior Executives' Basic Psychological Need Satisfaction and Psychological Well-being: Is It Different at the Top?

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Abstract

Senior executives' decisions can have a substantial impact on their own lives, their families, their organizations' workers and employees, and society. This quantitative study (1) investigated the relationship between basic psychological need satisfaction (BPNS) at work and psychological well-being (PWB) in 142 senior executives as antecedent of their decision making and (2) compared the results to two other managerial level samples of 260 managers and 445 employees. The results have implications for theory and practice. Our findings contribute the new theoretical perspectives of differences in the relationship between BPNS at work and PWB by managerial level and senior executives' gender ("complementarity effect"). In turn, our research provides evidence for practical organizational applications such as the design and implementation of effective human resource development programs based on BPNS. Our findings further underscore the importance of senior executive psychology as a field of academic inquiry and provide directions for future research focused on further improving senior executives' optimal functioning.

Keywords: Senior executives; Human resource development; Need satisfaction; Well-being; Performance; Gender; Managerial level.

1. INTRODUCTION

Organizations are a reflection of their senior executives (Hambrick and Mason, 1984). Workers' and employees' work lives in these organizations have spillover effects on their private lives (Baumeister and Leary, 1995, Vansteenkiste *et al.*, 2007, Bassi *et al.*, 2013). In recognizing senior executives' substantial impact on society (Kets De Vries and Florent-Treacy, 2002, Kets De Vries and Korotov, 2005), EU legislation requires top management to establish surveillance systems as part of their human resource management (HRM) to identify and reduce job stress factors that negatively impact workers' and employees' psychological well-being at work as a key determinant of societal health (EU-OSHA, 2012). This legislation was designed to protect organization workers and employees. However, what about the psychological well-being of the senior executives themselves, that, if positive, is building "individual and collective value," if negative, "is a threat to the executive, the organization, family and community" (Quick and Quick, 2013)? A long list of literature supports our consideration of senior executives as a distinct research population based on the unique challenges of senior executive positions (Levinson, 1964/1985, Cooper and Marshall, 1978, Lynch, 2000, Loehr and Schwartz, 2003, Quick *et al.*, 2004, Hambrick *et al.*, 2005, Levinson, 2006, Cameron, 2007, Quick and Quick, 2013).

This current research studied the psychological well-being of senior executives, specifically basic psychological need satisfaction (BPNS) at work and its relationship with psychological well-being (PWB). The conclusions of our research provide theoretical insights into senior executive psychology as a basis for future research. Our findings could also support executive development programs in the design and implementation of prevention and intervention measures "at the top" as a contribution to executive, organizational, and societal well-being.

2. LITERATURE REVIEW

In addition to economics and systems theory, psychology has been postulated as a third foundational dimension of human resource development (HRD) (Passmore, 1997, Swanson and Holton, 2009). HRD integrates individual psychological perspectives such as cognitive, educational, developmental, and industrial psychology with economics and systems theory that contribute aspects of organizational systems, work processes, and teams as a basis for individual and organizational learning and performance (Swanson, 1999, Swanson and Holton, 2009). In conclusion, the impact of HRD for senior executives' contribution to executive, organizational, and societal well-being can be strengthened by further investigating the role of HRD's foundational theories for senior executives' behavior. In this respect, the psychology of senior executives seems to be a neglected field of academic investigation.

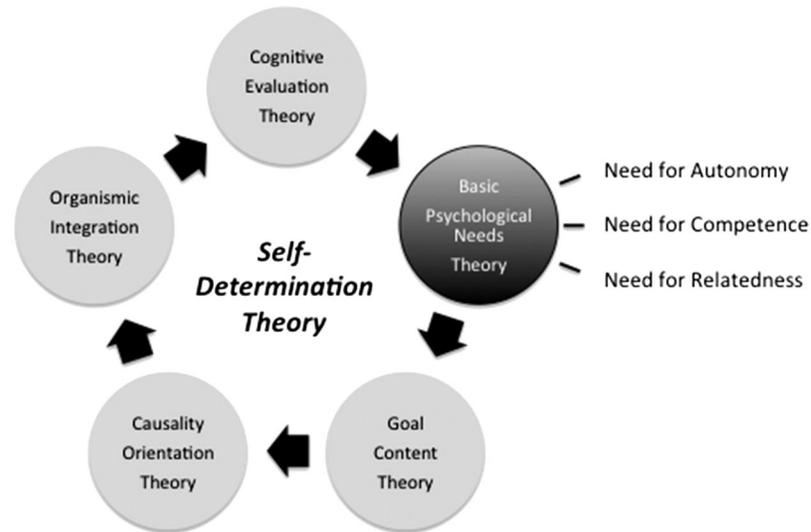
In 2013, the suicides of Swisscom CEO Carsten Schloter (in July) and Zurich Insurance CFO Pierre Waulthier (in August) shocked the corporate world and fueled a public debate over "stress at the top." Some newspapers and business magazines argued that it had become increasingly tough and lonely at the top, with rising stakes in decision making, mounting pressures from shareholders, energy depleting "game face" role playing, and an erosion of private social support due to over-commitment at work (Reuters, 2013). Other commentators found senior executive suicides counterintuitive suggesting that senior executives had better mental health than the lower ranks in organizations and, if needed, more and better resources to overcome life challenges (Fortune, 2013). There is very little academic evidence to support either side of the discussion. Ashkanasy and Jordan (2008) suggest that inner life investigation was an under-researched field in organizational sciences. Amabile and Kramer (2007) support this view pointing at a very limited academic foundation on how people feel at work as an antecedent of their organizational performance and well-being. Despite a recent expansion in the literature (Trepanier *et al.*, 2015, Van den Broek *et al.*, 2016, Deci *et al.*, 2017), we conclude that the substantial individual, organizational, and societal ramifications of people's inner work life have not been reflected in the level of research activity. According to our review of the literature, the lack of scientific studies into people's inner work life seems to be particularly salient when considering the field of senior executives. Academic scholars such as Zaleznik (for example 1992, Zaleznik, 1995), Levinson (for example 1990, Levinson, 1991), and Kets de Vries (Kets De Vries and Florent-Treacy, 2002, Kets De Vries and Korotov, 2005, Kets De Vries, 2007a, 2007b, 2010, 2014b), have been highlighted by academic literature as well as popular press as the leading scholars in the field of senior executives psychology. For example, some comments suggested that Kets de Vries had "uncompared exposure to the mind of the business leader knowing what really goes on inside the mind of the leader" (Coutu, 2004). Despite these ample claims, a review of the literature appears to convey that the scholars' work has been based on limited empirical data, lacked a comprehensive research framework, and focused on the consequences of senior executive behavior rather than the "inner resources for (senior executives') personality development and behavioural self-regulation" (Ryan and Deci, 2000). Quick and Quick (2013) suggest that inner life investigations into senior executives were limited to mostly case study research calling for larger scale quantitative studies defining investigations into the antecedents of senior executives' well-being as a "fertile ground for inquiry" (pp. 809-10). A more recent publication by Mills and Grotto (2017) arrived at a similar conclusion proposing senior executive psychology as an under-researched area limited by mostly qualitative research designs.

2.1. Self-Determination Theory

Self-determination theory (SDT) provided the theoretical foundation for this research. The origins of SDT date back to the initial work of Deci (1971, Deci, 1975) followed by several developmental extensions (Deci and Ryan, 1980a, 1980b, 1985, 1991, 2000, 2008a, 2012; Ryan and Deci, 2000). Throughout this evolution, SDT has focused on the dynamic relationship of people and their social contexts (Vallerand and Pelletier, 2008). As a hybrid motivational framework, SDT currently comprises five mini-theories (see Figure 1) suggesting that motivation was not a singular construct but rather a continuum of degrees of motivations (Deci and Ryan, 2008b).

At the core of SDT is basic psychological needs theory (BPNT) suggesting the satisfaction of three basic psychological needs, autonomy ("free to decide, express ideas and opinions, no pressure"), relatedness ("I like interacting with people, people care about me, mutual support"), and competence ("I am good at what

Figure 1. Overview of Self-Determination Theory (SDT): The Five Mini-Theories.



I do, I feel a sense of accomplishment, I am learning interesting things”), “essential for facilitating optimal functioning of the natural propensities for growth and integration, as well as for constructive social development and personal well-being” (Ryan and Deci, 2000). The three needs are considered independent of each other, persistent across cultures and people’s developmental stages as well as life domains (Deci and Ryan, 2008b). When these needs are thwarted, people tend to engage in anti-social and self-defeating coping strategies leading to alienation and ill-being (Baumeister and Leary, 1995, Ryan and Deci, 2000).

Across social contexts, SDT proposes that the satisfaction of basic psychological needs predicts better outcomes, for example, individuals’ well-being (Ryan and Deci, 2000). When Sheldon and Filak (2008) studied BPNS in the context of well-being in a sample of psychology students, they found that autonomy, relatedness, and competence combined additively to predict well-being. Kasser and Ryan (1999) showed that autonomy and relatedness need satisfaction were positively associated with well-being and negatively associated with mortality of nursing homes residents. In a longitudinal study with elite youth soccer players over two competitive seasons, Adie *et al.* (2012) identified coaching behavior as predictor of players’ BPNS and, in turn, their well-being over time.

In the organizational context, BPNS was reported to be driving engagement and well-being in a sample of employees from 10 large Bulgarian corporates (Deci *et al.*, 2001). Gillet *et al.* (2012) contended the mediating role of BPNS and thwarting in the relationship of organizational factors and well-being in two samples employees from a diverse set of small to large companies. Fernet *et al.* (2013) extended Gillet *et al.*’s (2012) findings by identifying perceived autonomy, competence, and relatedness as mediators in the relationship of job characteristics and burnout in a sample of 356 school board employees. Two studies with Belgian employees by Vansteenkiste *et al.* (2007) identified basic psychological need thwarting as a valid and reliable predictor of negative work outcomes such as emotional exhaustion. An important aspect of their work was that the negative outcomes were not limited to employees’ work environments but also extended to employees’ general mental health. SDT research by Fernet and Austin (2014) conceptualized the reactions to basic psychological need thwarting at work into four categories: “affective (e.g., anxiety or depressive symptoms), cognitive (e.g., memory lapses), physical (e.g., back pain, headaches), or behavioral (e.g., impulsivity, lifestyle)” (p. 237). They suggest key ramifications for not only the individuals themselves, but also in terms of lower organizational productivity and increased societal cost due to more severe health conditions. Trepanier *et al.* (2015) investigated the impact of job characteristics on employee functioning and found that job resources positively (job demands negatively) predicted employee functioning. Recently, Deci *et al.* (2017) highlighted the relevance of SDT research to the workplace and van den Broeck *et al.* (2016) contributed a meta-analytic review of 99 SDT studies examining the antecedents and consequences of BPNS.

Substantial literature based on experimental designs further highlights, more specific, anti-social and self-defeating outcomes associated with basic psychological need thwarting. For example, lacking BPNS has been associated with aggression (Baumeister *et al.*, 2000), addiction (Baumeister, 2003), cognitive impairment (Baumeister *et al.*, 2005), impulsive temptations (Baumeister *et al.*, 2005), violation of rules and guidelines (Baumeister *et al.*, 2007), foolish and disproportionate risk taking (Twenge *et al.*, 2002), and reduced stamina (Vohs *et al.*, 2005) or lethargy (Twenge *et al.*, 2003). Particularly important when considering the evidenced role of senior executives in shaping individual, organizational, and societal well-being is a recent qualitative study by Mueller and Lovell (2013a) contending that senior executives are no different from other individuals when it comes to responses to basic psychological need thwarting.

We conclude that BPNS can be considered as an indicator of a long list of individual and interpersonal outcomes including well-being. Despite the high stakes associated with senior executive positions, no SDT research has investigated the levels of basic psychological needs of autonomy, competence, and relatedness and its relationship with well-being in senior executives thus far.

2.2. Well-Being

“Psychology has, since World War II, become a science largely about healing” that concentrates on “repairing damage within a disease model of human functioning” with “almost exclusive attention to pathology” (Seligman and Csikszentmihalyi, 2000). Instead, the origins of well-being as a field of psychological investigations date back to the seminal works of Diener on subjective well-being (Diener, 1984) and Seligman on positive psychology (Seligman and Csikszentmihalyi, 2000). Since then, well-being has grown increasingly popular as a field of research. Two schools of thought have evolved around the theory of well-being: a hedonic and an eudaimonic perspective (Ryan and Deci, 2001; Huta and Ryan, 2010).

When Kahneman *et al.* (1999) introduced a “new field of psychology” (p. ix), well-being was conceptualized as a hedonic phenomenon, that is outcome-focused in terms of “feeling good,” seeking pleasure and maximizing happiness. In contrast, eudaimonic well-being could be described as process-focused, being concerned with “living well” (Ryan and Deci, 2001) and in congruence with one’s true self (Waterman, 1993). Huta and Ryan (2010) summarize “that hedonia and eudaimonia occupy both overlapping and distinct niches within a complete picture of well-being.” (p. 735). In conclusion, when researchers study well-being, they need to clarify their theoretical perspective: hedonic, eudaimonic, or both.

SDT follows the eudaimonic tradition of well-being by proposing that BPNS, through a process of psychological growth and internalization, leads to well-being (Ryan and Deci, 2000). For example, SDT research established the theoretical construct of vitality, “a positive and phenomenologically accessible state of having energy available to the self” (Ryan and Deci, 2001) as a measure of well-being. Ryan and Frederick (1997) demonstrated in a sequence of six studies how subjective vitality was significantly related to both, psychological and somatic factors, postulating it as a valid predictor of psychological and physical well-being.

PWB is a relatively new theme in organizations. Historically, employers have looked at workers’ and employees’ well-being from a purely physical perspective. Industry-specific occupational health and safety regulations, for example by the International Labour Organization (ILO, 2016) have focused on the prevention of physical harm in work environments. Only recently, governments have started promoting the prevention of psychological ill-being at work (EU-OSHA, 2012; SafeWorkAustralia, 2012) as an imminent burden on global social welfare due to increasing health-related cost and a threat to organizations based on decreasing productivity of workers and employees (Hall *et al.*, 2010; Dollard and Bailey, 2013). There seem to be particular challenges to the PWB of senior executives. For example, Quick *et al.*’s (2013) review of literature identified stress, burnout, social isolation, traumas and tragedies, and toxic effects of emotions such as anxiety, anger, or rage, as specific burdens on senior executives’ PWB. Although the literature undoubtedly contributes to the current understanding, our review raises questions related to the reliability and generalizability of findings due to the qualitative nature of research designs. Underlying data were mostly collected through case studies from medical practices or coaching situations, for example Kets de Vries’ work on toxic leader pathologies (Kets de Vries, 2014a). In light of this limitation in previous research, our current investigation aimed at contributing a more objective perspective based on a quantitative approach.

2.3. Senior Executives

There seem to be two main contributing factors to the lack of large sample based quantitative investigations into senior executives’ PWB: the logistical challenges of conducting senior executive research and a

scholarly debate over whether senior executives are different from the rest of us. First, senior executive research requires excellent contacts and credentials to enable access (Odendahl and Shaw, 2002). Time can also be a major factor, due to senior executives' often overloaded schedules (Easterby-Smith *et al.*, 2008) and a reliance on their donation of time in an area where senior executive hours can be worth several \$1000 (Conti and O'Neil, 2007). In addition, data protection and confidentiality issues also represent obstacles due to potential threats to the positions of power and authority in which senior executives reside (Easterby-Smith *et al.*, 2008). A potential reason why members of the research community may have declined to persevere against these logistical challenges could have been due to a second reason of limited research in this space: the suggestion that senior executives and non-executive individuals are the same.

Hambrick, Finkelstein, and Mooney (2005) claim that there was "no more fertile ground in the organizational sciences than the study of (senior) executive cognitions, personality, and interpersonal relationships" (p. 503). At the same time, Hambrick *et al.* (2005) suggest that there was no difference between senior executives and non-executive individuals when it comes to psychology. In support of Hambrick *et al.* (2005), two SDT research studies by Mueller and Lovell (2013a, Mueller and Lovell, 2015) found no difference in the conceptualization and levels of relatedness need satisfaction between senior executives and non-executive individuals. So why invest in the extra effort required to recruit senior executives? In answer to this valid question, there is a body of literature suggesting that there were unique challenges associated with senior executive positions. In essence, senior executives are faced with a combination of (i) the complexity and sheer number of stimuli, (ii) the high stakes associated with their decisions, (iii) the fear of failure and self-doubt, (iv) the "loneliness of command" (p. 806), and (v) the negative spillover effects of over-commitment at work to other life domains, mainly family (Quick and Quick, 2013). Therefore, studying the psychology of senior executives under such unique environmental conditions is suggested as a valid field of investigation. Hambrick *et al.* (2005) conclude that "scholarly attention to executives is warranted not because they are different from the rest of us but precisely because they are *not* different from the rest of us" (p. 503).

2.4. Present Research

Literature suggests senior executives' PWB as a contributor to the greater good and claims that it should be included as a dimension of public health (Quick and Quick, 2013). However, the high stakes associated with senior executive PWB have not been reflected in research activity. This present research addressed this gap of psychological investigations into senior executives adopting an SDT theoretical framework. Specifically, our study (a) examined the relationship between senior executives' levels of PWB and BPNS from the organizational context as predictor of PWB and (b) compared senior executive data to a sample of managers and a sample of employees.

3. METHOD(S)

3.1. Procedure and Participants

Data were collected from 847 participants across three samples, executives (Executive sample; N = 142), managers (Manager sample; N = 260), and employees (Employee sample; N = 445). The principal researcher approached his network of professional contacts with an email including a link to an online survey asking people to further distribute the link within their respective networks. Recipients of the email were informed that they were consenting to the procedure by filling out the online questionnaire. No incentives or compensation were provided for participation.

Executive Sample (Ex). Only C-level executives (e.g., chief executive officer, chief financial officer, chief marketing officer) who, self-reportedly, fulfilled at least three of the five core qualifications criteria of the senior executive service of the U.S. government (see supplement material; SeniorExecutiveService, 2012) were included in the Executive sample. Among the 142 executive participants (30% women, $M_{age} = 46.7$ years, $SD_{age} = 6.6$), 31% came from North America, 22% from Europe, 19% from Asia, 15% from Australia, 12% from South America, and 1% from Africa.

Manager Sample (M). To be included in the Manager sample, participants, self-reportedly, had five or more direct reporting lines and were not C-level executives. Among the sample of 260 managers (34% women, $M_{age} = 39.2$ years, $SD_{age} = 9.0$), 25% came from North America, 29% from Europe, 16% from Asia, 18% from Australia, 7% from South America, and 5% from Africa.

Employee Sample (Em). Participants categorized as employees had, self-reportedly, less than five direct reporting lines and were not C-level executives. Among the 445 employees (37% women, $M_{\text{age}} = 40.8$ years, $SD_{\text{age}} = 8.0$), 42% came from North America, 10% from Europe, 26% from Asia, 5% from Australia, 10% from South America, and 7% from Africa.

3.2. Measures

All measures were administered in English language. Given time constraints and confidentiality challenges in the domain of senior executives (Conti and O'Neil, 2007, Easterby-Smith *et al.*, 2008), several senior executives were consulted in the design phase of this research project regarding the potential format and number of questions. Based on this inquiry, it was decided to limit the questionnaire to approximately 30 questions and limit demographic questions to a minimum.

BPNS. The 21-item Basic Psychological Need Satisfaction at Work Scale (BPNS-W) (Deci *et al.*, 2001) assessed satisfaction of autonomy (A-NS; seven items; e.g., "I am free to express my ideas and opinions on the job"), competence (C-NS; six items; e.g., "People at work tell me I am good at what I do"), and relatedness (R-NS; eight items; e.g., "I really like the people I work with"). Responses were made on a 7-point Likert-type scale, ranging from 1 (not at all true) to 7 (very true). Scores for each subscale were computed by averaging associated individual item scores; high scores represented higher levels of satisfaction of basic psychological needs. The BPNS-W has been shown to be a reliable and valid tool. Cronbach's α for the three BPNS-W subscales for the Ex sample were .71 (A-NS), .75 (C-NS), .86 (R-NS), for the M sample, .81 (A-NS), .73 (C-NS), .85 (R-NS), and for the Em sample, .77 (A-NS), .70 (C-NS), .79 (R-NS).

Subjective Vitality. PWB was assessed by the trait Subjective Vitality Scale (SVS, Ryan and Frederick, 1997). Even though the original scale had seven items, subsequent work by Bostic, Rubio, and Hood (2000) using confirmatory factor analysis indicated that a 6-item version, which was used in this study, demonstrated stronger psychometric qualities. Responses were made on a 7-point Likert-type scale indicating the degree to which a statement (e.g., "I feel alive and vital") was considered true in general, ranging from 1 (not true at all) to 7 (very true). The score was computed by averaging the individual item scores; a high score represented higher PWB. The SVS has been extensively validated showing a high reliability. Cronbach's α for the SVS in previous studies has ranged between 0.84 and 0.91 (Nix *et al.*, 1999, Vansteenkiste *et al.*, 2006, Ryan *et al.*, 2010). The internal consistencies of the SVS in this study were .90 (Ex sample) and 0.88 (M and Em samples).

4. RESULTS

4.1. Preliminary Analyses

Data screening was conducted to ensure that assumptions for the associated statistical analyses were met. Descriptive statistics indicated that all data were within expected ranges, with plausible mean and standard deviation scores. Data from an initial 1076 participants were screened and corrected for missing values. In total, 229 participants were deleted as their level of seniority (Executive, Manager, or Employee) could not be determined due to missing values for the senior executive core qualification criteria section of the questionnaire. Cases with >5% missing data were inspected. Missing data points for the remaining 847 participants were considered random. Mean substitutions were used to estimate missing values on continuous variables, while mode substitutions were used for categorical variables. Although mean substitution is a conservative procedure that reduces variance, any method for replacing missing values utilized in large samples with <5% missing data points yields similar results (Tabachnik and Fidell, 2007).

All variables were examined for fit between the distributions and assumptions for parametric tests. Shapiro-Wilk, Kolmogorov-Smirnov, and Levene's statistic tests of normality were significant for all variables ($p < 0.001$). Field (2009) indicates that statistical normality is rarely achieved in large samples. A visual examination of distributions indicated no gross deviations from normality for all variables. In conclusion, the use of parametric tests was considered justified.

4.2. Main Analyses

Levels of BPNS and PWB. Table 1 presents the means and standard deviations for participant samples' BPNS-W subscales and PWB.

Table 1. Means and Standard Deviations of Participant Samples' Basic Psychological Need Satisfaction at Work (BPNS-W) Subscales and Psychological Well-being (PWB) Scores.

	Executive sample		Manager sample		Employee sample	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
A-NS ^(a)	5.41	0.91	4.27	1.29	3.94	1.51
C-NS ^(a)	5.60	0.90	5.12	1.01	5.03	1.25
R-NS ^(a)	5.66	0.86	4.50	1.23	4.19	1.15
PWB ^(b)	5.17	1.13	4.95	1.00	4.82	1.15

^(a)NS = Need Satisfaction, A = Autonomy, C = Competence, R = Relatedness.

^(b)PWB = Psychological Well-being.

Table 2. Results for Post Hoc Analysis with Tukey's HSD for Mean Differences in Levels of Basic Psychological Need Satisfaction at Work (BPNS-W) and Psychological Well-Being (PWB) Scores between Executives (Ex), Managers (M), and Employees (Em).

	Ex/M samples		Ex/Em samples		M/Em samples	
	<i>p</i>	<i>d</i>	<i>p</i>	<i>d</i>	<i>p</i>	<i>d</i>
A-NS ^(a)	<0.001	0.22	<0.001	0.77	<0.01	0.54
C-NS ^(a)	<0.001	0.14	<0.001	0.37	not sig.	
R-NS ^(a)	<0.001	0.67	<0.001	0.93	<0.01	0.24
PWB ^(b)	not sig.		<0.01	0.23	not sig.	

^(a)NS = Need Satisfaction, A = Autonomy, C = Competence, R = Relatedness.

^(b)PWB = Psychological Well-being.

One-way between groups analysis of variance (ANOVA) and independent *t*-test failed to demonstrate any significant mean differences of BPNS-W and PWB scores by age and gender. However, significant mean differences of BPNS-W and PWB scores were detected by managerial levels.

The ANOVA showed statistically significant differences in all four measures of BPNS-W and PWB, that is Autonomy, $F(2, 844) = 63.26, p < 0.001, \eta^2 = 0.13$ (large effect size), Competence, $F(2, 844) = 14.06, p < 0.001, \eta^2 = 0.032$ (small to medium effect size), Relatedness, $F(2, 844) = 90.67, p < 0.001, \eta^2 = 0.18$ (very large effect size), and PWB, $F(2, 844) = 5.53, p < 0.001, \eta^2 = 0.013$ (small effect size). Post hoc analyses with Tukey's HSD revealed the below differences and effect sizes between the three samples of executives, managers, and employees shown in Table 2.

Basic psychological need satisfaction (BPNS-W). Executives had significantly ($p < 0.001$) higher levels of BPNS at work for each of the three basic psychological needs than both Manager and Employee samples. The effect sizes for the differences between the Executive sample and the Manager sample were small for Autonomy ($d = 0.22$) and Competence ($d = 0.14$), medium to large for Relatedness ($d = 0.67$). For the differences between the Executive sample and the Employee sample, the effect sizes were large for Relatedness ($d = 0.93$) and Autonomy ($d = 0.77$) and medium for Competence ($d = 0.37$).

When comparing the levels of BPNS at work between the Manager sample and the Employee sample, the Manager sample was significantly ($p < 0.01$) higher in Autonomy ($d = 0.54$, medium effect size) and Relatedness ($d = 0.24$, small effect size). There was no significant difference in the levels of Competence between Managers and Employees.

Psychological well-being (PWB). There was a significant difference ($p < 0.01$) in PWB levels between the Executive sample and the sample of Employees with a small size of effect ($d = 0.23$). No significant differences in the PWB levels were detected between Managers and Employees as well as between Executives and Managers.

Relationship between BPNS and PWB. Based on our previous statistical analysis showing significant differences in the levels of BPNS between the three samples, standard multiple regression (MRA) analyses were performed separately for each managerial level (Executives, Managers, and Employees). Table 3 shows unstandardized (B), standardized (β) regression coefficients, and squared semi-partial correlations (sr^2) for each basic psychological need predictor by managerial level and gender.

Managerial level effects. In combination, our MRA analysis showed different effect sizes for BPNS at work on PWB by managerial levels. At the Employee level, the effect was large for women, $f^2 = 0.37$, $R^2 = 0.27$, adjusted $R^2 = 0.25$, $F(3, 113) = 13.88$, $p < 0.001$, and medium to large for men, $f^2 = 0.30$, $R^2 = 0.23$, adjusted $R^2 = 0.22$, $F(3, 328) = 32.49$, $p < 0.001$. At the Managerial level, both female and male samples

Table 3. Unstandardized (B) and Standardized (β) Regression Coefficients, and Squared Semi-Partial Correlations (sr^2) for each Basic Psychological Need Predictor in a Regression Model Predicting Psychological Well-being (PWB) by Managerial Level and Gender.

	Female			Male		
	$B[95\% \text{ CI}^{(b)}]$	β	sr^2	$B[95\% \text{ CI}^{(b)}]$	β	sr^2
Executives ($N = 142$)						
A-NS ^(a)	0.013 [-0.493, 0.520]	0.012	0.000	0.511 [0.265, 0.757]***	0.420	0.084
C-NS ^(a)	0.028 [-0.495, 0.550]	0.026	0.000	0.392 [0.127, 0.658]**	0.320	0.042
R-NS ^(a)	0.717 [0.245, 1.189]**	0.591	0.145	0.056 [-0.169, 0.280]	0.048	0.001
Cohen's $d^{(c)}$	Very large			Extremely large		
CL ^(d)	83%			91%		
Managers ($N = 260$)						
A-NS ^(a)	-0.077 [-0.283, 0.130]	-0.094	-0.005	0.000 [-0.160, 0.160]	0.000	0.000
C-NS ^(a)	0.328 [0.079, 0.578]*	0.331	0.070	0.264 [0.084, 0.444]**	0.270	0.042
R-NS ^(a)	0.067 [-0.158, 0.292]	0.080	0.004	0.127 [-0.025, 0.279]*	0.153	0.014
Cohen's $d^{(c)}$	Medium			Medium		
CL ^(d)	65%			63%		
Employees ($N = 445$)						
A-NS ^(a)	0.032 [-0.136, 0.200]	0.043	0.001	0.121 [0.020, 0.223]*	0.392	0.013
C-NS ^(a)	0.243 [0.074, 0.413]**	0.279	0.052	0.275 [0.162, 0.389]***	0.434	0.054
R-NS ^(a)	0.273 [0.082, 0.464]**	0.296	0.052	0.136 [0.016, 0.256]*	0.334	0.012
Cohen's $d^{(c)}$	Large			Medium to large		
CL ^(d)	73%			68%		

^(a)NS = Need Satisfaction, A = Autonomy, C = Competence, R = Relatedness.

^(b)CI = Confidence Interval.

^(c) Combined Size of Effect for A-NS, C-NS, and R-NS Predicting PWB according to Cohen's (1988) Suggestions for the Assessment of R^2 .

^(d) Common Language Effect Size according to McGraw and Wong (1992) and Lackens (2013).

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

showed medium effect sizes, $f^2 = 0.13$, $R^2 = 0.12$, adjusted $R^2 = 0.08$, $F(3, 86) = 3.72$, $p = 0.014$ for women and $f^2 = 0.16$, $R^2 = 0.14$, adjusted $R^2 = 0.13$, $F(3, 170) = 9.21$, $p < 0.001$ for men. The Executive sample's BPNS levels accounted for the strongest prediction levels of PWB, with a very large effect for women, $f^2 = 1.06$, $R^2 = 0.51$, adjusted $R^2 = 0.50$, $F(3, 98) = 34.58$, $p < 0.001$ and extremely large effect for men, $f^2 = 0.62$, $R^2 = 0.38$, adjusted $R^2 = 0.34$, $F(3, 40) = 8.32$, $p < 0.001$.

Gender effects. In our analysis, we detected significant differences in the relationship between BPNS at work and PWB between women and men.

Executives. Executive men's PWB was significantly driven by Autonomy, $s^2 = 8.4\%$, and Competence, $s^2 = 4.2\%$ with Relatedness not showing a significant effect on their PWB. The combined prediction level of BPNS at work on executive men's level of PWB was extremely large. For female executives, the size of the BPNS' at work effect on their PWB was very large, with Relatedness accounting for a significant $s^2 = 14.5\%$ of PWB.

Managers. Competence showed the most significant predictive relationship with PWB in men and women explaining 4.2% of male managers' and 7% of female managers' variability in PWB. Men's Relatedness was significantly associated with their PWB at a prediction level of $s^2 = 1.4\%$ with no significant relationship between Relatedness and PWB for manager women. Autonomy did not have an effect on PWB for neither women nor men. In combination, BPNS at work had a medium effect on PWB for both women and men.

Employees. Competence was the strongest predictor of PWB explaining similar levels of variance in PWB, 5.2% for women and 5.4% for men. Relatedness was a significantly stronger predictor of PWB in women, $s^2 = 5.2\%$, than in men, $s^2 = 1.2\%$. In contrast, Autonomy accounted for a significant but smaller $s^2 = 1.3\%$ of the variability of PWB in men with no significant prediction levels in women. The combined effect of BPNS at work on PWB was large for women and medium to large for men.

In summary, for males, Autonomy was the most powerful predictor of PWB for the Executive sample, while Competence showed the strongest relationship with PWB for both the Manager and Employee sample. For females, Relatedness was the only BPNS at work predictor of PWB in the Employee sample, only Competence showed a significant relationship with PWB in the Manager sample, and both Relatedness and Competence showed the same effect on PWB in the Employee sample. Autonomy did not have an effect on female's PWB in any of the three managerial levels of Executives, Managers, and Employees.

5. DISCUSSION

This comparative study investigated how senior executives' inner work life, as measured by their levels of BPNS at work, contributed to their PWB and compared this mechanism to other managerial levels. Within the framework of SDT, we examined the satisfaction levels of the basic psychological needs of autonomy, competence, and relatedness at work and their relationship with the level of PWB, as a measure for PWB, in three samples: executives, managers, and employees.

First, our results show significantly higher levels of BPNS at work in executives than in non-executive individuals. Specifically, executives seem to feel more competent and much more autonomous and related at work. However, this effect does not seem to translate into PWB differences to the same degree. Executives' PWB was not higher than managers' PWB and only marginally higher than employees' PWB. This finding seems to indicate that the work domain plays a more significant role for executives' PWB than for employees' PWB. BPNS from other life domains, for example family and friends, may contribute comparatively more to employees' PWB than to executives' PWB.

Second, our data show, what may be called a "career effect," when it comes to the impact of BPNS at work on PWB. The importance of work BPNS for PWB seems to drop, from large to medium, when individuals advance from the level of employee to manager with competence representing the main source of BPNS at work driving PWB. Initially, we assumed that this finding could be attributed to a diversification of life domains when people form families and have children in their late twenties and thirties. However, we could not detect a statistically significant difference in age between both samples. Neither had we asked for data on marital status nor the number of children to test further hypotheses. The effect is reversed when managers become executives with the relationship of BPNS at work and PWB strengthening to very and

extremely large effects well beyond the levels of employees. Feelings of autonomy were only detected as predictors of executives' PWB and did not play a role for the PWB of managers and employees.

Third, our results indicate differences between women and men at all managerial levels. Female employees showed perceived competence and relatedness at work as equally strong sources of PWB whereas male employees' PWB was strongly associated with perceived competence and, to a weaker extent, feelings of relatedness. This mechanism was reversed at managerial level with women's PWB exclusively and strongly driven by feeling competent. Manager men's PWB showed a strong relationship with perceived competence and, to a weaker extent, with perceived relatedness. At the executive level, men's PWB was very strongly driven by autonomy and, to a lesser extent, competence with feelings of relatedness not playing a role. Female executives showed the exact opposite effect with perceived relatedness extremely strongly impacting their PWB with autonomy and competence not showing any significant effect. Given that there were no gender or age differences in the levels of BPNS, our data cannot explain this effect.

In summary, our study identified significantly higher levels of BPNS at work and a much stronger relationship between BPNS at work and PWB in executives than in managers and employees. These effects did not translate into similar differences in PWB. Female executives were different in that relatedness was their only source of BPNS at work driving PWB. Male executives were the only participant group where perceived autonomy predicted PWB.

5.1. Implications for Theory and Future Research

This study advances the understanding of senior executives' PWB and contributes new perspectives on the debate over whether senior executives are different from non-executive individuals. To date, some literature has argued that senior executives' personality, for example as measured by the Myers-Briggs Type Inventors (MBTI), differs from other individuals' and could be used as an indicator of individual outcomes such as performance (Moutafi *et al.*, 2007). Alternatively, Hambrick *et al.* (2005) suggest that senior executives do not differ by personality. Instead, they postulate that senior executives' work environments represent different challenges compared to non-executive workplaces impacting senior executive outcomes. Our findings show that the levels of BPNS at work and their association with PWB is significantly higher for senior executives compared to non-executive individuals. We draw on Person-Environment Fit Theory (PEF) (Caplan, 1987, Kristof, 1996, Kristof-Brown and Guay, 2011) integrating both schools of thought by proposing that the levels of senior executives' BPNS at work driving senior executives' PWB is based on both, personality as well as work environment factors. Future research should examine the impact of individual differences and workplace factors on senior executives' levels of BPNS at work.

Second, as the strong effect sizes of differences in the levels of BPNS at work between executives on the one hand and managers and employees on the other did not translate into similar effect sizes for difference in PWB, the PWB of managers and employees seems to have BPNS sources other than work. These sources may include BPNS from other life domains or additional basic psychological needs from work that have not been identified to date. Effects between life domains have been well documented, for example, by addressing "spillover" from job to private life and vice versa (Baumeister and Leary, 1995, Kahneman *et al.*, 1999, Milyavskaya and Koestner, 2011). In addition, balanced BPNS across the different spheres of life has been shown to predict higher PWB (Milyavskaya *et al.*, 2009). Future research could explore the relationship between senior executives' BPNS from multiple life domains and outcomes such as PWB to shed further light on social contextual factors impacting senior executive actions at work.

Third, SDT's tenant of universality proposes that there should be no difference by gender in the theoretical processes underlying BPNS or PWB, only in the perception of environmental cues (Ryan and Deci, 2000). A recent meta-examination of 27 studies in the field of physical exercise did not find any gender differences in motivational regulations (Guérin *et al.*, 2012). Sapmaz *et al.* (2012) could not detect any difference by gender in the levels of BPNS and PWB in a sample of 192 university students. Our results support previous findings in the context of the theoretical framework of SDT as there were no differences in the levels of BPNS and PWB between female and male executives. However, only relatedness need satisfaction was a predictor of PWB for executive women compared to executive men whose PWB was strongly driven by the satisfaction levels of autonomy and, to a lesser extent, by competence. This finding extends senior executive research in the field of SDT as well as in the organizational sciences. Women have been found to place more emphasis on establishing sustainable, close relationships than men (Schwartz and Rubel, 2005).

At the same time, a study by Hewlett (2002) revealed that only 57% of senior executive women were married, 83% of senior executive men. Most of the senior executive women without children regretted not having any, whereas there was almost no disparity between the desire to have children and actually having them in male senior executives (Hewlett, 2002). Our findings could also be explained by a gender gap in job satisfaction due to work orientations (for review Zou, 2015). For example, job satisfaction literature outlines that women full-time employees derived significantly higher job satisfaction from human interaction than men full-timers (Zou, 2015). This effect could have been amplified by senior executives' work environmental factors such as stress, social isolation, or anger as outlined by Quick and Quick (2013). We hypothesize that the strong and only link between relatedness need satisfaction and PWB in female senior executives could be explained by (a) their desire to establish sustainable, close relationships, (b) a lack of partners and/or children in their private life, and (c) a resulting focus on relatedness cues from relationships at work. Organizational research may want to further investigate this phenomenon specific to senior executive women.

Fourth, our research seems to add a managerial level perspective to the relationship of BPNS and PWB in the context of organizations. Even though our data did not show differences of BPNS at work and PWB by age, there may be effects in the relationship between individuals and their life domains when people progress through their careers influencing the link between BPNS at work and PWB. Neither our data nor our review of literature could further explain this effect. Even though we do not suggest a linear relationship between BPNS and PWB and people's career paths, we propose future research to further explore these results.

Finally, our work supports SDT as a relevant theory for organizational research in the context of Gagné and Deci's framework (2005). SDT proposes that BPNS delivers the nutrients for optimal functioning including PWB. However, little SDT research, with the exception of Mueller and Lovell's work (2013a, 2015) has focused on senior executives. To the best of our knowledge, no SDT study has focused on potential differences between senior executives and other managerial levels. Our results provide the basis for a new stream of SDT research to advance the literature in the organizational sciences.

5.2. Limitations of This Research

There are limitations to this study. First, our investigation into the relationship between BPNS and PWB in senior executives does not constitute a validation of cause and effect. Even though SDT postulates BPNS at work as an antecedent of outcomes such as PWB across life domains (Ryan and Deci, 2000) as well as in the organizational context (Gagné and Deci, 2005), a reverse causal relationship between the two constructs could be possible. For example, it may be possible that people with higher PWB may derive more BPNS for autonomy, competence, and relatedness from the same organizational cues than individuals lower on PWB. Future research could use longitudinal or experimental design to examine causality. Second, we only collected a very limited amount of information from participants. For example, demographic data such as the level of education, firm size, location, marital status, or number of children could have effects that were not addressed by this study. The same is true for other theoretical constructs that have previously been shown to effect the relationship between BPNS and PWB, for example mood. Given the challenges of studying senior executives, future research may be expected to progress in comparatively smaller steps based on the limited scope for designs. Finally, our results may have been unduly impacted by common method bias. All data were self-reported and collected at the same time. Future studies may identify ways to include data from company's personnel records, study participants' managers, co-workers or subordinates as well as information collected at different times.

5.3. Implications for Executive Development Programs

Our current findings have practical implications for the field of HRD. There seems to be an increasing emphasis on the design and implementation of executive development programs in organizations (Humphreys, 2005, Novicevic *et al.*, 2009, Harrell, 2016). Such HRD programs can make valuable contributions at the levels of (a) senior executives (b) organizations, and (c) society.

Senior executives. At the individual level, HRD programs should make senior executives aware of the inner life dynamics between their job BPNS and PWB. Clinical inquiry suggests self-awareness as a powerful pathway to well-being (Boyatzis and McKee, 2005). At the same time, senior executives have been described as individuals with rather low levels of self-knowledge (Kets de Vries, 2009). How autonomous,

competent, and related, senior executives feel at work could be applied as an HRD prevention and intervention tool for self-monitoring. In addition, executive development programs should enable senior executives in the creation of a “safety net” outside work by diversifying their sources of BPNS from other life domains, such as family and friends, just in case things go wrong at work. Given the strong relationship between senior executives’ BPNS at work and their PWB, one can see how their mental health may suffer in a work environment of basic psychological need thwarting due to conflicts and dilemmas.

Organizations. At the organizational level, HR functions have operational responsibility for establishing psychosocial risk surveillance systems and our findings support the claim of senior executives to be included into systematic monitoring, prevention, and intervention. Consistent with previous research we postulate the perspective of senior executives as “risk factors” (Mueller and Lovell, 2013b) and the use of BPNS at work and PWB as “risk management” tools for prevention and intervention in the context of senior executives’ mental health.

Applying PWB as an indicator of mental health (Ryan and Frederick, 1997), our data support the hypothesis that executives have better mental health than employees but are no different from managers. This can be attributed to higher BPNS that executives derive from their workplace, statistically. However, given the potential impact of individual executive actions for themselves and others, executives’ PWB deserves individual attention on a case-by-case basis beyond statistics. Ten (7%) of the 142 executives in our study had PWB scores that were more than 2 *SD* lower than the sample mean. Taking PWB as an indicator, each of the 10 participants could be red-flagged for further investigation as a potential threat to themselves and others.

At this point in time, corporate risk management focuses on financial risk management and potential physical and psychological hazards to employees. Given the high stakes associated with senior executives’ actions, organizations should monitor senior executives’ mental health, for example by using BPNS at work and PWB and include both aspects in their corporate policies and procedures, job content and design, and training and development for senior executives. Our research showed complementary BPNS at work profiles for female and male senior executives (“complementarity effect”) which suggests different designs of corporate policies and procedures, job content and design, and training and development for senior executives by gender.

To date, there is a top-down approach to PWB at work in terms of what company management should do to care for its and employees. We suggest an additional HRD perspective related to senior executives’ job environments. How can, for example, employees be trained to support senior executives in coping with the unique challenges of senior executive positions by contributing to senior executives’ PWB through BPNS at work?

Society. Individual senior executive decisions can affect everyone. Therefore, Quick and Quick (2013) promote senior executives’ PWB as a public health aspect. As such, BPNS at work and PWB could be included in the legislation of occupational health and safety regulations, for example OSHA-EU, as a preventive measure. In addition to the public health perspective, regulation on corporate governance could be amended by a regular “fit and proper” test of senior executives’ PWB, possibly based on SDT and its BPNS approach, as a further prevention tool against corporate scandals and wrongdoings.

5.4. Practical Example

The below questions show how our findings could translate into a module of an executive development program by specifically addressing BPNS at work:

1. *Which key BPNS supporting elements of your work environment would you like to keep?*

These elements could be considered the anchors of a senior executive’s PWB at work that should under all circumstances remain in place.

2. *Which key BPNS destroying elements of your work environment would you like to change?*

Once the elements have been identified, they provide an agenda for the senior executive and the organization to change for an increase in BPNS at work and, in turn PWB, by eliminating these factors.

3. *Which elements currently not present in your work environment would further support your BPNS at work?*

By adding these new factors or circumstances to a senior executive’s environment, the BPNS at work and, in turn, PWB will be increased.

4. Which elements currently not present in your work environment should be avoided under all circumstances?

Every moment we open our eyes, the world is different that also applies to organizations. The earlier question provides insights into what elements of job environments should be avoided for a senior executive's BPNS at work and, in turn, PWB not to deteriorate.

6. CONCLUSION

This research provides insights into the relationship between senior executives' BPNS at work and their PWB comparing the results to other managerial levels. Our findings show higher BPNS at work in senior executives compared to managers and employees translating into moderate differences in higher senior executives' PWB compared to employees. Future research could examine the causal relationship between BPNS at work and PWB and further investigate effects of gender, career, and multiple life domains as contributions to how HRD programs can support the well-being of senior executives, their organizations, and society.

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SUPPLEMENTARY MATERIAL

Qualification Criteria of the Senior Executive Service of the U.S. Government

Criteria	Description
Leading change	Establishing organizational visions and implementing them in a continuously changing environment.
Leading people	Leading people toward meeting organizational vision, mission, and goals.
Results driven	Making decisions that produce high-quality results by applying technical knowledge, analyzing problems, and calculating risks.
Business acumen	Managing human, financial, and information resources strategically.
Building coalitions	Networking, identifying internal and external politics, persuading others, building consensus through give and take