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Changes in Motivation and Burnout Indices in High-Performance Coaches Over The Course of a Competitive Season

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Abstract

Being subject to a great range of demands is believed to increase burnout propensity in high-performance coaches. This study is the first to explore whether the four step self-determination theory process model is a valuable framework to better understand the process influencing burnout and well-being in high-performance coaches (N = 343, M = 40.33 years) throughout a competitive season. Findings indicated that coaches on average increased in burnout and decreased in well-being. Hypotheses were to a large extent supported: change in perceived environment → change in psychological need satisfaction → change in autonomous motivation → change in burnout and well-being.

Keywords: high-performance coaches, burnout, well-being, SDT process model, needs, motivation

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Coaching in sports is increasing in popularity as a profession for coaches of all performance levels (Duffy et al., 2011). Coaches working with elite athletes are known as high-performance coaches (Lyle, 2002). This profession deals with a high degree of performance related stressors (Hanton, Fletcher, & Coughlan, 2005; Fletcher & Scott, 2010) regarding their own performance (Thelwell, Weston, Greenlees, & Hutchings, 2008) and regarding less controllable stressors such as the performance of their athletes (Hanton et al., 2005). Organizational stressors for coaches include inadequate leadership within their own organization, excessive administrative tasks, high-perceived work overload, challenges associated with need to balance work and private life, as well as team related stressors (Rhind, Scott, & Fletcher, 2013; Thelwell, et al., 2008). Many high-performance coaches have long and irregular work hours, a heavy travel load, short contracts, low job security (Altfeld & Kellmann, 2013; Lundkvist, Gustafsson, Hjälm, & Hassmen, 2012; Rhind et al., 2013), they have to respond to media, fans, and sponsors (Fletcher & Scott, 2010; Rhind et al., 2013), and they risk getting fired if performance expectations are not met (Arnulf, Mathisen, & Haerem, 2012). These working conditions are believed to increase the risk for burnout in high-performance coaches (Hjälm, Kenttä, Hassmén, & Gustafsson, 2007; Lundkvist et al., 2012; Olusoga, Butt, Maynard, & Hays, 2010), but researchers have called for longitudinal studies to better understand the effect of working conditions for high-performance coaches over time (Altfeld & Kellmann, 2013; Goodger, Gorely, Lavallee, & Harwood, 2007; Raedeke & Kenttä, 2013).

Burnout is the result of a prolonged exposure to high work related demands in relation to the individual's resources (Maslach & Schaufeli, 1993), and consists of three dimensions; emotional exhaustion, cynicism, and a reduced sense of accomplishment (Maslach & Leiter,

2008). Emotional exhaustion is often described as the key characteristic of burnout, where a person feels exhausted and drained. Cynicism is characterized by a negative attitude and sense of alienation towards one´s work, where work is no longer perceived as valuable or interesting (Maslach & Leiter, 2008). Reduced sense of personal accomplishment refers to feeling inadequate at work, experiencing poor professional self-esteem, and having a general negative work evaluation (Maslach, 2003). Burnout is a process that evolves over time (Fernet, Guay, Senecal, & Austin, 2012). The longer time-perspective is also implied in the term burning out (i.e., depletion one's resources) (Maslach & Schaufeli, 1993). Scholars do not specify the actual timespan on this process, though it is assumed that there are individual differences depending on how large the gap is between the demands and the resources. Further, there are different opinions on how the three dimensions of burnout develop and predict one another (Taris, Le Blanc, Schaufeli, & Schreurs, 2005), but researchers generally agree that the three burnout dimensions are likely to develop somewhat differently and should be studied independently (Fernet et al., 2012; Maslach, 2003; Taris et al., 2005). As coaches deal with different demands over the course of a season, there is a need for studies on how burnout develops within sport-specific cycles of a season (Altfeld & Kellmann, 2013). The only longitudinal study conducted so far on coach burnout revealed that exhaustion levels increased throughout a competitive season (Raedeke, 2004). Important individual differences are to be expected, and studying change in burnout on an intraindividual level would address individual differences in burnout over time (Fernet et al., 2012).

So far, no study has looked at how high-performance coaches may differ in developing burnout symptoms over time (Altfeld & Kellmann, 2013; Goodger et al., 2007; Raedeke & Kenttä, 2013). While some cross-sectional studies have investigated possible causes and correlates of burnout, research has primarily been limited to a cognitive affective model of sport framework (Smith, 1986), using a stress-perspective to explain burnout

(Kelley, Eklund, & Ritter-Taylor, 1999; Vealey, Udry, Zimmerman, & Soliday, 1992). This approach is based on the assumption that burnout is the result of imbalance between personal and/or situational variables and the person's resources, which creates a stress appraisal that serves as a mediator within this relationship. Contextual variables of interest are low social support and role conflict (Kelley & Gill, 1993). Thus far, individual variables found to be related to burnout have been gender, experience (Kelley & Gill, 1993), anxiety (Vealey et al., 1992; Kelley et al., 1999), hardiness (Kelley et al., 1999), and perfectionism (Tashman, Tenenbaum, & Eklund, 2010). However, the stress-perspective might not sufficiently explain the development of burnout, as the drive and energizing force of individuals should be preferred when examining the process linked to burning out (Gould, 1996; Pines & Aronson, 1983). Pines explains that: "While everyone can experience stress, burnout can only be experienced by people who entered their careers with high expectations, goals, and motivation—people who expected to derive a sense of significance from their work" (Pines, 1993, p. 38). High-performance coaches tend to be highly passionate about and dedicated to their work and sport (Mclean & Mallett, 2012; Mclean, Mallett, & Newcombe, 2012). Thus investigating coach burnout is highly intuitive from a motivational perspective, and some studies have emerged using the Self-Determination Theory (SDT) (Ryan & Deci, 2002) as a theoretical framework to explain the process and predict differentiated levels of burnout (Mclean et al., 2012; Stebbings, Taylor, Spray, & Ntoumanis, 2012; Sullivan, Lonsdale, & Taylor, 2014).

The SDT process model (Williams, McGregor, Zeldman, Freedman, & Deci, 2004) explains what happens between the individual's interactions with the environment to the outcomes experienced. As the term 'process model' indicates, the steps in the process sequentially predict one another and are as follows: Perceived environment → basic psychological needs → quality of motivation → outcomes. Several studies have explored

how either basic psychological needs (Fernet, Austin, Trepanier, & Dussault, 2013; Van den Broeck, Vansteenkiste, De Witte, & Lens, 2008) or quality of motivation (Fernet et al., 2012) may mediate the relationship between perceived environmental factors and burnout. So far, only one study has been conducted using the four step SDT process model in relation to work in sports and burnout (Sullivan et al., 2014), however data was cross-sectional and the study was limited in its ability to examine change.

SDT describes how different perceptions of the work environment can either promote or undermine well-being for employees (Deci & Ryan, 2000). An autonomy supportive environment is characterized by leaders who understand and acknowledge the coach's perspectives, provide a meaningful rationale for work tasks that might not be of immediate interest to the coach, offering opportunities for individual choices and minimizing performance pressure (Deci & Ryan, 2000; Ryan & Deci, 2002). A controlling environment will typically have a leader who overrules coaches' decisions, puts constraints on how they can behave, imposes goals, sets time restraints, imposes contingent rewards or pressure, and increases workload beyond reason (Deci & Ryan, 2000; Fernet et al., 2013; Gagné & Deci, 2005). Autonomy supportive environments promote basic psychological needs satisfaction in coaches and foster a healthy psychological balance. A controlling environment will likely challenge the satisfaction of those needs and thwart the process to achieve a healthy balance (Deci & Ryan, 2000; Ryan & Deci, 2002). Within sports, an autonomy supportive environment has been shown to predict satisfaction of basic needs in athletic directors independently from their workload (Sullivan et al., 2014). However, workload has been a frequent predictor for burnout, where the critical point occurs when coaches are unable to recover from work demands (Leiter & Maslach, 2004; Maslach & Leiter, 2008). Two SDT based organizational studies have demonstrated that higher levels of work demands (e.g.,

workload) are negatively related to basic psychological needs satisfaction and positively related to exhaustion (Fernet et al., 2013; Van den Broeck et al., 2008).

In the process model, the fulfillment of the basic psychological needs for autonomy (e.g., having ownership over one's behavior and being able to make choices and decisions), competence (e.g., effective behavior that leads to intended outcomes), and relatedness (e.g., the desire to achieve a sense of communion and belongingness) is considered essential for the development and maintenance of psychological well-being (Deci & Ryan, 2000). Additionally, psychological needs fulfillment leads to a greater internalization of motivation (Ryan & Deci, 2002). Coaches who perceive their three basic psychological needs to be fulfilled will likely feel in charge of their own destiny, capable and competent to deliver in line with expectations, and they will likely feel that they share a meaningful relationship with their co-workers. The degree of basic psychological needs fulfillment is key to the study of the development of burnout as satisfaction of the three psychological needs is the source of energy, direction, and adherence to the behavior of coaches at work (Gagné & Deci, 2005). Accordingly, differentiated levels of need satisfaction will directly enhance or hamper psychological and physical well-being (Deci & Ryan, 2000). Struggles to fulfill coaches' psychological needs will typically drain their energy over time, increasing risk for exhaustion and burnout (Fernet et al., 2013). A lower degree of basic psychological needs fulfillment has been reported to predict exhaustion and has been found to be a mediator between demanding work situations and feeling exhausted (Van den Broeck et al., 2008). Past studies have been inconclusive about the unique contribution of each of the three psychological needs on all three burnout dimensions. For example, in a study of school board employees, autonomy need fulfillment was negatively related to exhaustion and depersonalization (cynicism), relatedness was negatively related to depersonalization and positively related to personal accomplishment, and competence was positively related to personal accomplishment (Fernet

et al., 2013). In a study of athletic directors, only the need for competence was associated with all three burnout dimensions, but was mediated through motivation (Sullivan et al., 2014). These studies suggest the possible independent contribution of each of the three needs on changes in each of the three burnout dimensions. These respective patterns have not been examined in previous research related to the process of burnout in coaches.

The third step of the process model describes different qualities of motivation. Coaches are involved in coaching for various reasons, and these reasons can be categorized into different motivational regulations characterized by their level of relative autonomy (Deci & Ryan, 2000). To simplify, motivational regulations can be termed autonomous versus controlled (Gunnell, Crocker, Mack, Wilson, & Zumbo, 2014; Solberg, Halvari & Ommundsen, 2013). Autonomous motivation refers to initiating an activity for its own sake because it is interesting and satisfying. Autonomously motivated coaches find working closely with athletes enjoyable and interesting, and may, for example, participate in a course to enhance their knowledge about recovery of sport injuries because they find that valuable and of importance (Mclean et al., 2012). When a coach is engaging in activities for autonomous reasons, the activity will be done with high energy, as it is an integrated part of who the coach is, and will more likely lead to excitement, interest, good psychological health, and high levels of performance and persistence (Mclean et al., 2012). Controlled motivation refers to participating in activities because of external demands or reward (Ryan & Deci, 2002). For example, coaches can do their job to get attention and recognition through public appearance and media, or attend a course for accreditation (Mclean et al., 2012). Being driven by controlled motivation over time has been found to drain energy and promote ill-being, as these activities are not done of free will and are not integrated within the coaches' self (Ryan & Deci, 2002). Thus far, studies using cross-sectional designs on sub-elite populations have reported a negative relationship between self-determined motivation and burnout, and a

positive relationship between less-self-determined motivation and burnout among coaches (Mclean et al., 2012) and athletic directors (Sullivan et al., 2014). Moreover, a study using intraindividual change over a school year found that changes in teachers' perception of classroom overload and students' disruptive behavior were negatively related to changes in autonomous motivation, which in turn negatively predicted changes in exhaustion (Fernet et al., 2012). Additionally, Sullivan et al. (2014) examined how quality of motivation served as a mediating variable to explain additional predictive effects between psychological needs and burnout dimensions, though no previous studies have examined this with intraindividual changes.

Researchers who aim to better understand what predicts burnout will want to apply this understanding and eliminate, reduce, or prevent correlates and causes of burnout. Though, in order to better understand and facilitate well-being, it is important to focus not only on repairing damage within a disease model of human functioning (Seligman & Csikszentmihalyi, 2000). Research has successfully embraced this idea and provided evidence on the feeling of engagement as an antipode of burnout (e.g., Van den Broeck et al., 2008). Though, as engagement and motivation have clear relations (Meyer, 2014), engagement as an outcome will be redundant when motivation is argued to be a mediator in the same model. Two concepts that represent hedonic well-being (happiness) and eudemonic well-being (human potential) (Ryan & Deci, 2001) are satisfaction with life and vitality. Satisfaction with life is a central indicator for hedonic well-being and is defined as "a global assessment of a person's quality of life according to his chosen criteria" (Shin & Johnson, 1978, p. 478). Vitality represents eudemonic well-being, reflecting the energy available to the self of the individual (Ryan & Frederick, 1997).

The current study explores whether the four step SDT process model (Williams et al., 2004) is suitable to explain the process towards burnout and well-being among high-

performance coaches over a competitive season. It is anticipated that coaches experience increased burnout and decreased well-being during this time span. It is also anticipated that there will be individual differences in the development of burnout and well-being, and the SDT process model will be tested with intraindividual changes. Consequently, the term *change* in variables is used, rather than *increase* or *decrease*, and further it is the direction of the relationship between the changes of the variables that is of interest (positive or negative). Previous research showed that a high degree of performance pressure influences coaches' propensity to burnout, and so perceived goal attainment is added as a control variable (Lundkvist et al., 2012). In figure 1, a proposed process model illustrates the hypotheses in the current study, where all direct and indirect pathways illustrated will be examined.

Method

Study Design, Participation Recruitment and Participants

The current study had a longitudinal design, where participants were asked to answer on an online questionnaire three weeks before the beginning of their competitive season (T1) and three weeks before the end of competitive season (T2).

High-performance coaches coaching athletes at the highest national level within their sport (15 sports in Norway; nine sports in Sweden), were recruited with the assistance of their respective national sport federations. Information about the study, a letter of recommendation for participation in the study from the relevant sport federations, and ethics approval from the Norwegian Social Science Data Services or The Regional Ethical Review Board in Sweden were sent in an email to all coaches. In total, 853 coaches were invited to participate in the study. At T1, 467 coaches responded (54.7 % response rate) and 343 coaches responded at both T1 and T2 (40.2% response rate).[1] The 343 coaches worked in the following sports:

[1] Data obtained for this investigation was part of a larger study, longitudinally examining the process of burnout among high-performance coaches with three measurement points throughout a competitive season

soccer (N = 91) , track and field (N = 39), biathlon (N = 37), swimming (N = 32), handball (N = 31), cross country skiing (N = 25), orienteering (N = 16), ice-hockey (N = 15), volleyball (N = 14), basketball (N = 13), ski jumping (N = 9), skating (N = 8), alpine (N = 8), Nordic combined (N = 3) and telemark skiing (N = 2).[2] All participants provided written informed consent prior to the study.

Measures

Demographics were measured at T1; Perceived goal attainment was measured at T2; all other variables were measured at both time points. The questionnaire could be answered in Norwegian, Swedish, or English. For the English questionnaire, the original versions were used. For Norwegian and Swedish questionnaires, translated and validated questionnaires were used if available, if unavailable, translation-back-translation method was used (Duda & Hayashi, 1998). All questionnaires, except the Maslach Burnout Inventory and perceived goal attainment, were answered on a 7-point Likert-scale ranging from 1 (*strongly disagree*) to seven (*strongly agree*).

Perceived goal attainment. Objective measures of goal attainment do not take into account differentiated and individual goal setting for a team / athletes. Perceived goal attainment was measured at T2, where the coaches were asked to look back at the start of the

(start, mid and end). Some of the same participants are used in a different manuscript (Development of Exhaustion for High-Performance Coaches in Association with Workload and Motivation: A Person-Centered Approach). This sample uses data from all three time-points, and due to a higher dropout rate this sample was smaller (N = 299) than the sample used in the current study. Some of the same variables are used, though not as residual change scores: workload, four specific motivational regulations (intrinsic, identified, introjected and external) and exhaustion. Additionally, this manuscript used other variables: work-home interference, relaxation, and psychological detachment.

[2] Data for these sports were only collected in Norway: Cross country skiing, Skating (speed and figure), Alpine skiing, Nordic combined, and Telemark skiing.

season and write down what had been their two most important goals for that season (Sheldon & Houser-Marko, 2001). For each goal they were asked: "To what extent do you perceive that goal number 1 has been reached" and rate this on a 7-point Likert-scale ranging from 1 (*Not at all*) to 7 (*To a large extent*). Perceived goal attainment was defined by the sum score of the two answers.

Workload. Workload was assessed with the subscale Workload from *The Areas of Work Life Scale* with 6-items (AWLS: Leiter & Maslach, 2004). The AWLS was developed to measure a match or a mismatch between work environment and the individual. An example of items was: "I do not have time to do the work that must be done" (α_{time1} = .75; α_{time2} = .79). The scale was reversed, so higher scores indicated a higher perceived workload. The AWLS was previously used in a sport setting, showing acceptable internal validity of its different subscales including workload (α = .78-.90; DeFreese & Smith, 2013).

Perceived autonomy support. Sports organizations are heterogeneous in terms of organization and management, depending on the sport, performance levels, and resources of the club. As coaches are accountable to various managers, participants were asked to base their answers about leadership to 'your closest leader.' Perceived autonomy support from the coaches' closest leader was measured with an adapted version of the Health Care Climate Questionnaire (HCCQ: Williams, Grow, Freedman, Ryan, & Deci, 1996), which is an 8-item version of the questionnaire previously used in Norway and demonstrating acceptable internal consistency (α; .90, .91; Solberg, Hopkins, Ommundsen, & Halvari, 2012). The term *my boss* was used; for example, "I feel that my boss cares about me as a person" and "I feel a lot of trust in my boss" (α_{time1} = .93; α_{time2} = .95).

Psychological need satisfaction at work. Need satisfaction was measured with the 18-item Basic Needs Satisfaction at Work scale (BNSW; Van den Broeck, Vansteenkiste, De Witte, Soenens, & Lens, 2010). This scale has shown acceptable internal reliability for

autonomy, competence, and relatedness (α; .85, .86, and .86; Vander Elst, Van den Broeck, De Witte, & De Cuyper, 2012). The need for autonomy was measured by six items (e.g., "I feel free to do my job the way I think it could best be done"; α_{time1} = .75; α_{time2} = .77). The need for competence was measured by four items (e.g., "I feel competent at my job"; α_{time1} = .87; α_{time2} = .90). The need for relatedness was measured by six items (e.g. "At work, I can talk with people about things that really matter to me"; α_{time1} = .80; α_{time2} = .81).

Motivation. Motivation was measured by subscales of the Self-Regulation Questionnaire at Work, which is validated in Norwegian (MAWS; Gagné et al., 2010; Gagné et al., 2014). Aggregation of autonomous and controlled motivation was conducted in line with suggestions (Gagné et al., 2010, p. 632). Autonomous motivation was measured by the sum score of three intrinsic regulation items (e.g., "Because I have fun doing my job"), four integrated regulation items (e.g., "Because it has become a natural habit for me"), and three identified regulation items (e.g., "Because I personally consider it important to put effort into this job"; α_{time1} = .80; α_{time2} = .82). Controlled motivation was measured by the sum score of four introjected regulation items (e.g., "Because I have to prove to myself that I can"), three external regulation materialistic items (e.g., "Because others will reward me financially only if I put enough effort in my job"), and external regulation social items (e.g., "To get others' approval"; α_{time1} = .80; α_{time2} = .76).

Burnout. Burnout was measured with the Maslach Burnout Inventory-General scale (MBI-GS; Schaufeli, Leiter, Maslach, & Jackson, 1996), consisting of three subscales. Exhaustion was measured with five items (e.g., "I feel emotionally drained from my work"; α_{time1} = .85; α_{time2} = .88); cynicism was measured with five items (e.g., "I have become less interested in my work since I started this job"; α_{time1} = .63; α_{time2} = .75); and personal accomplishment was measured with six items (e.g., "I can effectively solve the problems that arise in my work"; α_{time1} = .79; α_{time2} = .83). This latter subscale was reversed and labeled

"Reduced Personal Accomplishment." Cynicism showed relatively low internal consistency at T1 but the scale was kept in its original form for conceptual reasons and as internal consistency above .60 has been deemed acceptable in previous studies (Dekovic, Janssens, & Gerris, 1991; Holden, Fekken, & Cotton, 1991). The Norwegian version of the MBI-GS has previously shown acceptable internal consistency across occupational groups and over time (Richardsen & Martinussen, 2005). Participants responded on a 7-point scale as follows: 0 (*never*), 1 (*a few times a year or less*), 2 (*once a month or less*), 3 (*a few times a month*), 4 (*once a week*), 5 (a few times a week), and 6 (*every day*).

Vitality. Vitality was measured with the 6-items Subjective Vitality Scale (Ryan & Frederick, 1997; e.g., "I feel alive and vital"; $\alpha_{time1} = .91$; $\alpha_{time2} = .93$). Participants were asked to answer based on how they had felt for the last four weeks. This scale has previously shown good alpha reliability in a study in Norway ($\alpha = .91, - .93$; Solberg et al., 2012).

Satisfaction with work. Satisfaction was measured with an adapted version of the 5-items Satisfaction with Life Scale (SWLS: Diener, Emmons, Larsen, & Griffin, 1985). "In most ways my work-life is close to my ideal" was used rather than the original "In most ways my life is close to my ideal" ($\alpha_{time1} = .80$; $\alpha_{time2} = .83$). Participants responded based on how they had felt in general over the previous four weeks. This scale has previously shown acceptable alpha reliability in a study in Norway ($\alpha = .82$; Solberg et al., 2013).

Data Analysis

At T1, 467 coaches responded (54.7 % response rate) and 343 coaches responded at both T1 and T2 (40.2% response rate). The dropout range from T1 to T2 was 27.0 %. Little's MCAR test on missing data run using IBM SPSS 21 showed that the data were completely missing at random ($\chi^2 = 80.272$, $df = 96$, $p = 0.876$). Further, dropout analyses were conducted to test for differences between those participating at T1 ($n = 124$) versus those participating both at T1 and T2 ($n = 343$) for all study variables with independent sample *t*

test, and no significant differences were found. An attempt to use multiple imputations was conducted, though the model fit in MPlus indicated an over-fitted model, thus the dataset of $N = 343$ were used in subsequent analyses. The dataset used in this study included 343 coaches who responded to the questionnaire at both T1 and T2, with a maximum 5.2% of data missing at each time point. To obtain a complete dataset, an expectation maximum algorithm (EM) was used in SPSS to impute missing data per subscale for each time point. Estimates of internal consistency score reliability of the scales were conducted in SPSS at each time point on original data. A paired sample *t* test with eta square for effect size was used to test for changes in study variables on the mean level over the competitive season (T1 – T2). Residualized change scores were then calculated in SPSS by regression Time 2 observed variable on Time 1 observed variable, and saving the unstandardized residual values (Zumbo, 1999). Bivariate correlations were conducted with change scores of study variables and control variables in SPSS. Further, the SPSS data file was transformed into MPlus (MPlus 7.2; Muthén & Muthén, 2012), and the residualized changes scores were used as observed variables in path analyses. Skewness and kurtosis values for all items in the study ranged from $\left|-2.31 \text{ to } 2.19\right|$ and $\left|-1.38 \text{ to } 9.00\right|$, suggesting normally distributed data (Kline, 2011), so the full structural model was tested with a ML estimator. Further, to test for indirect effects in the model, a bootstrapping method for multiple mediations was conducted with 10000 bootstraps (Preacher & Hayes, 2008). Results from analyses of indirect effects are reported with additional explained variance for each of the specified paths. A combination of fit indices were used to examine and evaluate the degree of model fit with specified criteria for an acceptable fit (Brown, 2006); Comparative Fit Index (CFI) ≥ 0.90, Tucker–Lewis index (TLI) ≥ 0.90, Standardized Root Mean Square residual (SRMR) ≤ 0.08, and Root Mean Square Error of Approximation (RMSEA) ≤ 0.06.

Results

Preliminary Analyses

The participants' average age was M = 40.33 years (*SD* = 9.80, range 21-70 years), and their average experience as a coach was M = 13.11 years (*SD* = 9.66, range 1-49). Women comprised 8.7% of the coaches, and men 91.3%. Of all coaches, 57.1% worked in Norway and 42.9% in Sweden, and 47.8% of the coaches worked in team sport and 52.2% in individual sport. As the length of competitive seasons for the different sports ranged from four to 10 months, season length was added as a control variable in relation to change in the burnout dimensions. Additionally, as the preliminary analysis indicated a wide age range of the coaches and as previous studies have found a negative relationship between age and burnout (e.g., Kelley & Gill, 1993), age was added as a control variable. A bivariate correlation matrix was performed to do a preliminary test of the relationship between the change scores of all outcomes and the control variables age, length of season, and perceived goal attainment. Age correlated significantly with change in exhaustion r (342) = -.15, change in cynicism r (342) = -.17, and change in vitality r (342) = .18. Length of season correlated significantly with change in satisfaction with work, r (342) = -.15, $p < .01$. Perceived goal attainment at the end of the season correlated significantly with change in reduced personal accomplishment r (342) = -.11, $p < .05$, and change in vitality r (342) = .18, $p < .01$. Even though these findings were in the expected direction, they were 'no to low' in effect size (< r = .25, Fraenkel & Wallen, 2000), and consequently they were not included in further analysis.

Main Analyses

Changes in variables over time. To test for changes over the competitive season, paired sample *t* tests were conducted (Table 1). Results revealed a negative trend for all significant changes, with a decrease in perceived autonomy support, the need for autonomy,

competence and relatedness, vitality, and satisfaction with work. An increase was found for controlled motivation, exhaustion, cynicism, and reduced accomplishment. Correlations between change variables in the study are presented in Table 2. All correlations indicated results as expected, except the results indicating no significant relationships between change in controlled motivation and changes in the outcomes.

Structural model—Testing the process model of change. The hypothesized model was tested using structural equation modeling (fig.2), as previously done by Gunnell et al. (2014). First, a structural path model was specified and tested in MPlus. Covariance between the disturbances terms of change in all three psychological needs was allowed to co-vary based on theoretical assumptions. This model yielded a superior fit to the data: $\chi 2\ (5) = 5.37$, $p = 0.37$, CFI = 1.00, TLI = 1.00, RMSEA = .02 (90% CI = .00– .08), SRMR = 0.01. A relatively large variance was explain by the model for a majority of the outcomes: 34% in change of exhaustion, 23% in change of cynicism, 25% in change in vitality, 39 % in change in satisfaction of work, and 10% in reduced sense of accomplishment. Further, the results of model were:

Consequences of changes in the environment. Change in workload positively predicted change in exhaustion (ß = .45) and change in cynicism (ß = .19). Further, change in workload negatively predicted change in vitality (ß = -.16) and change in satisfaction with work (ß = -.19). Lastly, change in workload negatively predicted change in the need for autonomy (ß = -.22), competence (ß = -.08), and relatedness (ß = -.16) respectively. Change in perceived autonomy support positively predicted change in vitality (ß = .15) and change in satisfaction with work (ß = .20), and negatively predicted change in reduced accomplishment (ß = -.09). Change in perceived autonomy support positively predicted change in the need for autonomy (ß = .32) and relatedness (ß = .24).

Consequences of changes in the basic psychological needs. Change in the need for autonomy negatively predicted change in controlled motivation (ß = -.16). Further, change in the need for autonomy negatively predicted change in exhaustion (ß = -.20), and change in cynicism (ß = -.25). Additionally, change in the need for autonomy positively predicted change in vitality (ß = .30) and change in satisfaction at work (ß = .22), though it did not predict change in autonomous motivation. Change in the need for competence positively predicted change in autonomous motivation (ß = .24), and negatively predicted change in reduced personal accomplishment (ß = -.16). Change in the need for relatedness positively predicted both change in autonomous motivation (ß = .16) and change in satisfaction with work (ß = .20).

Consequences of changes in quality of motivation. Change in autonomous motivation negatively predicted change in cynicism (ß = -.26) and change in reduced personal accomplishment (ß = -.27), and positively predicted change in vitality (ß = .27) and change in satisfaction with work (ß = .23). Change in controlled motivation did not predict change in any of the outcome variables.

Indirect effects within the process model of change. To examine indirect effects, the structural model (fig.2) was tested adding additional indirect effects. Additional explained variances of the indirect effects in the model are presented in Table 3. Because of the complexity of the model, results with point estimates $\leq .03$ will not be commented on further due to its low predictive value.

First, the additional indirect effects between changes in the basic psychological needs to changes in the outcomes via change in autonomous motivation will be presented: Additional explained variance in change in cynicism was negatively predicted by change in competence (ß = -.06) and change in relatedness (ß = -.04). Additional explained variance in change in reduced accomplishment was negatively predicted by change in competence (ß = -

.07) and change in relatedness (ß = -.04). Additional explained variance in change in vitality was positively predicted by change in competence (ß = .07) and change in relatedness (ß = .04). Finally, additional explained variance in change in satisfaction with work was positively predicted by change in competence (ß = .06) and change in relatedness (ß = .04).

Second, the results indicated additional indirect effects from changes in the environmental variables to changes in the outcomes via change in the need for autonomy. Additional positive indirect effects were found from change in workload to change in exhaustion (ß = .04) and change in cynicism (ß = .05). Further, additional negative indirect effects were found from change in workload to change in vitality (ß = -.07) and change in satisfaction with work (ß = -.05). Next, additional negative indirect effects were found from change in perceived autonomy support to change in exhaustion (ß = -.06) and change in cynicism (ß = -.08). Additional positive indirect effects were found from change in perceived autonomy support to change in vitality (ß = .10) and change in satisfaction with work (ß = .07).

Discussion

This study uniquely contributes a better understanding of the development of burnout in high-performance coaches as it is the first to investigate change in burnout and well-being throughout a competitive season. While changes in the mean values of increase in burnout and decrease in well-being could be characterized as small to moderate (Cohen, 1988), findings indicated a clear negative trend in overall well-being over the course of a season. Yet, no significant relationship between length of season and changes in any of the burnout dimensions were found, suggesting that the competitive season itself is not a factor leading to burnout, and that other variables better explain changes in burnout indices. Age and perceived goal attainment also failed to show strong relations to changes in burnout, suggesting that other process variables may offer better predictive value.

Overall, findings indicated that the SDT process model of change was supported and that it offers a solid framework to better understand *how* and *why* differences in burnout and well-being in professional work experiences could be explained (Gagné & Deci, 2005). In addition to the direct effects of changes in both work environmental variables on changes in all the outcomes, both changes in need satisfaction and autonomous motivation are key variables explaining *why* changes in environmental variables lead to changes in burnout and well-being dimensions. Findings of this study indicate that the motivational perspective (Ryan & Deci, 2002; Gould, 1996; Pines & Aronson, 1983) effectively complements the stress-perspective (Smith, 1986), as the current study used perceived workload as an assessment of the level of perceived work demands (Leiter & Maslach, 2004). Moreover, findings support and add to our understanding of the dynamics of intraindividual changes over time (Fernet et al., 2012). Different antecedents within the model predicted changes in burnout dimensions. Thus, the three dimensions should be examined as independent subscales rather than as a combined burnout score (Fernet et al., 2012; Maslach, 2003).

Consequences of Changes in Perceived Work Context

As previously found in other organizational settings, change in workload had a strong and positive prediction on change in exhaustion (Leiter & Maslach, 2004; Maslach & Leiter, 2008). In line with Fernet and colleagues' (2013) findings, change in workload did not have the same dominant influence on change in cynicism and reduced personal accomplishment compared to the change in exhaustion. Avoiding an increase in perceived workload throughout a season is therefore particularly important to prevent exhaustion. Perceived autonomy support had a positive effect on changes in well-being. Findings suggest that the autonomy support offered by leaders in sport is key to vitality and work satisfaction in high-performance coaches (Gagné & Deci, 2005).

Only partial support was found for the hypothesis that changes in both environmental variables would predict changes in all three needs—this in contradiction to previous findings (Van den Broeck et al., 2008; Sullivan, et al., 2014). Change in competence was only offered a marginal prediction, and it could be argued that change in the need for competence among high-performance coaches likely depends on other processes than the ones provided by their relationships with their leaders and perceived workload. Coaches' perceived job security and opportunities for professional development (Stebbings et al., 2012) and their professional education and coaching experience (Côté & Gilbert, 2009) are other factors that may have an effect on the fulfillment of the need for competence. Some of the same variables may add to the prediction of change in reduced personal accomplishment, as change in this variable also was to a lesser extent predicted in the SDT process model.

Consequences of Changes in Psychological Need Satisfaction

As hypothesized, change in the three psychological needs predicted change in both controlled motivation and autonomous motivation (Deci & Ryan, 2000). However, changes in all three needs separately did not predict changes in the two different motivational qualities. Change in controlled motivation was only negatively predicted by change in the need for autonomy. Additionally, the explained variance of change in controlled motivation were to a lesser extent predicted by change in the psychological needs compared to how change in the needs predicted change in autonomous motivation. A possible explanation may be the chosen methodology. While need satisfaction was measured in the current study, even a low degree of need satisfaction may represent need satisfaction and thus predict change in autonomous motivation (Ryan & Deci, 2000). Adding intentional obstruction of basic psychological needs, or need thwarting, may offer a greater prediction of controlled motivation (Bartholomew, Ntoumanis, Ryan, Bosch, & Thogersen-Ntoumani, 2011). Further, change in autonomous motivation was positively predicted by change in needs for

competence and relatedness, while the need for autonomy did not offer the expected prediction (Deci & Ryan, 2000). A possible explanation could be that change in the need for autonomy had a strong and direct prediction on changes in four of the five outcomes in the study. Previous burnout studies conducted in work settings have typically studied need satisfaction *or* motivational regulation as predictors of burnout dimensions (Van den Broeck et al., 2008; Fernet et al., 2013; Fernet et al., 2012; Stebbings et al., 2012). This study's findings add to previous knowledge, demonstrating that change in perceived autonomy need fulfillment is a strong predictor of work outcomes, even when quality of motivation is assessed within the process model. However, future studies should examine the relationship between changes in the need for autonomy and changes in autonomous motivation when they are both present within a process model. Such an approach would offer an opportunity to investigate whether the non-existing relationship is a statistical artifact or a finding of theoretical importance suggesting that changes in the need for autonomy do not necessarily directly affect changes in autonomous motivation when studying change in burnout and well-being. While changes in the need for competence and relatedness offered fewer direct effects on outcomes than what was expected, they both explained added variance in outcome variables, with the exception of change in exhaustion, via change in autonomous motivation. The current findings highlight the importance of changes in need satisfaction as a crucial contributor to the SDT process model. A decrease in needs fulfillment is an important risk factor limiting psychological resources necessary for coaches working in demanding high-performance sport contexts (Gagné & Deci, 2005; Stebbings et al., 2012).

Consequences of Change in Motivational Regulation

Change in controlled motivation did not significantly contribute to the model. This is unexpected as previous findings show a positive relationship between low self-determined motivation and burnout at work (Fernet et al., 2012; Mclean et al., 2012; Sullivan et al.,

2014). A possible explanation may lay in the choice of study methods and design. Mclean et al. (2012) and Sullivan et al. (2014) used cross sectional data. Fernet et al. (2012) examined change, however they measured quality of motivation on a continuum with an aggregated motivational index as did Sullivan et al. (2014). Collapsing the different qualities of motivation may not sufficiently capture the multidimensionality of motivation, and consequently important differences between the qualities of motivation could be missed (Chemolli & Gagne, 2014). This implies that a weak correlation between controlled motivations could be 'hidden' if autonomous motivation has a strong correlation with burnout. Further, research on quality of motivation in relationship to burnout among high-performance coaches is recommended to use either autonomous or controlled motivation, or to more accurately examine the specific impact of different motivational regulations (Chemolli & Gagne, 2014). Change in autonomous motivation contributes in important ways to the process leading to variations in overall well-being. High-performance coaching as an occupation is often highly autonomously motivated where coaches often express a strong affection for their sport and tend to have a long term investment in their the sport. Their sport and profession are often an important part of their identity (Mclean & Mallett, 2012; Mclean et al., 2012; Vallerand & Houlfort, 2003). A decrease in autonomous motivation is therefore likely to have damaging effects, leading to increased cynicism and reduced personal accomplishment, important burnout dimensions thought to be closely related to motivational processes (Fernet et al., 2013). In addition, decrease in autonomous motivation will likely be linked to a decrease in well-being as the fun and interest in their profession erode (Deci & Ryan, 2000).

Indirect Effects Within the SDT Process Model

Current study findings are in line with SDT theory tenets (Ryan & Deci, 2002) and previous findings from Fernet et al. (2013). Proximal variables in the process model are of

higher predictive value than distal variables. This was true for all findings except the relationship between change in workload and change in exhaustion. Consequently, it is crucial to study indirect effects from change in the environment through the mediating variables of change in need satisfaction and quality of motivation when seeking a greater understanding of the process leading to changes in burnout and well-being indices (Van den Broeck et al., 2008). Change in the need for autonomy is an important mediational contributor between the changes in the environmental variables to change in exhaustion, change in cynicism and change in well-being indices. These findings are dissimilar to Fernet et al.'s (2013) findings, where all the three needs mediated the relationship between, for instance, role overload and social support and the three burnout dimensions. High-performance coaches are highly responsible for athlete development and performance (Thelwell et al., 2008). They need to experience autonomy, in order to be able to do their job in accordance with their philosophy and values, and to maintain a high quality of motivation for their work. When high-performance coaches' experience an increase in workload and a decrease in perceived autonomy support, then this will decrease the fulfillment of their need for autonomy, leading to increases in exhaustion and cynicism and decreases in vitality and work satisfaction.

Change in autonomous motivation appears to be an important mediating variable between changes in competence and relatedness need satisfaction and all outcomes except change in exhaustion. The current study adds valuable knowledge as it is one of two studies using a four-step SDT process model towards burnout in a work setting, and the only study using change data and measuring the unique contribution of change in autonomous motivation as a mediator between changes in two of the three needs and the outcome variables. When high-performance coaches experience a decrease in satisfaction of both the need for competence and relatedness, leading to a decrease in autonomous motivation, then

this will likely have a detrimental effect on all burnout and well-being variables, with the exception of change in exhaustion which may be better predicted by other variables.

Limitations and Future Directions

Measuring a complex model enhances our understanding of the hypothesized SDT process in a work setting. However, it also limits and challenges the capacity to specifically target the contribution of a few specific variables within the model. In the current study, although the population was large and representative of high-performance coaches in Scandinavia, the response rate was fairly low. In accordance with guidelines to enhance response rates for web surveys, the current study used a longer completion time than recommended (Fan & Yan, 2010). Future web studies should aim for higher response rates.

Current findings offered relatively low correlations between burnout dimensions and age and perceived goal attainment. Future studies should examine possible moderating effects in relation to these variables to examine possible relationships for different subsamples. For instance, age could be tested as a moderator between work-home-interference and burnout (Demerouti, Bakker, & Bulters, 2004) or performance level at work and burnout (Hjälm et al., 2007). Perceived goal attainment could be tested as a moderator between for instance recovery and burnout (Sonnentag & Fritz, 2014). The present study did not examine the direct relationship between burnout and well-being indices, and future studies may consider examining how the promotion of vitality and work satisfaction could be a preventive strategy to avoid burnout in sport coaches (Keyes, 2002). Finally, current findings were based on a variable-centered approach, which means that the focus of the study is to explore the relationships between the variables. In the future, person-oriented research may purposely target coaches who are experiencing higher levels of burnout to better grasp the causes and consequences of burnout in this population.

Practical Implications

Implications to reduce exhaustion and cynicism and increase vitality and satisfaction with work for high-performance coaches are clear. First, a manageable workload throughout a competitive season is crucial, especially to prevent exhaustion (Fernet et al., 2013; Van den Broeck et al., 2008). The sports organization and leaders of high-performance coaches should demonstrate awareness around unreasonably high demands on their coaches (Bentzen, Lemyre, & Kenttä, 2015; Fletcher & Scott, 2010). For instance, it is not sustainable for coaches who work in a team of three colleagues to complete the same work-load as a team of four colleagues, no matter how important the tasks are. Sports organization should therefore help coaches prioritize tasks in relationship to available resources. This should be prioritized if club leaders want to foster a work environment that enhances the overall well-being and long-term performance of coaches.

Secondly, sport organizations need to foster autonomy need satisfaction in the daily work life of high-performance coaches and thereby influence involvement which is important for the coaches to sustain their well-being (Gagné & Deci, 2005). Additionaly, sport federations need to adress how to best support coaches' psychological needs in general. Unmet psychological needs will increase susceptibility to burnout and decrease well-being.

Lastly, it is important for sports organizations, leaders, and coaches to be aware of the damaging consequences of a decrease in autonomous motivation. As coaches have demanding work, they need to be able to sustain the genuine interest in their work and avoid distancing from the purpose of their work, prevent cynicism and a reduced sense of personal accomplisment, and prevent a decrease in vitality and satisfaction with work.

In conclusion, changes in workload and autonomy support, along with changes in the need for autonomy and autonomous motivation, are strong predictors of changes in burnout and well-being. Findings of this study suggest that monitoring variation in these key variables may help prevent burnout and promote well-being in high-performance coaches.

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Table 1

Paired Sample t Test for Change in Variables of the Competitive Season, T1 – T2

	Time 1		Time 2					
Variable	*M*	*SD*	*M*	*SD*	*df*	*t*	*p*	η^2
Autonomy support	5.60	1.14	5.23	1.35	342	5.62	.000	.06
Workload	4.49	1.08	4.44	1.14	342	.82	.413	.00
Autonomy	5.45	0.95	5.14	1.03	342	6.11	.000	.10
Competence	6.03	0.69	5.96	0.75	342	2.13	.034	.01
Relatedness	5.40	1.18	5.10	1.24	342	5.90	.000	.09
Autonomous motivation	5.81	0.72	5.77	0.73	342	1.20	.229	.00
Controlled motivation	4.03	1.10	4.25	0.97	342	-4.39	.000	.05
Exhaustion	1.69	1.07	1.90	1.21	342	-4.04	.000	.05
Cynicism	1.21	0.92	1.53	1.12	342	-6.07	.000	.10
Reduced accomplishment	0.99	0.75	1.14	0.87	342	-3.38	.001	.03
Vitality	5.32	1.07	4.98	1.27	342	5.59	.000	.08
Satisfaction with work	4.83	1.03	4.64	1.18	342	3.87	.000	.04

Note. $N = 343$, η^2 = Cohen's effect size (.01 = small, .06 = moderat, .14 = large)(Cohen, 1988)

Table 2

Correlations Among Change Scores and Control Variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Ch Autonomy Support														
2. Ch Workload	-.22**													
3. Ch Autonomy	.48**	-.33**												
4. Ch Competence	.12*	-.14**	.25**											
5. Ch Relatedness	.34**	-.23**	.33**	.12*										
6. Ch Autonomous motivation	.14**	-.06	.22**	.28**	.30**									
7. Ch Controlled motivation	-.06	.07	-.15**	.01	.01	.08								
8. Ch Exhaustion	-.25**	.54**	-.38**	-.15**	-.25**	-.12*	.10							
9. Ch Cynicism	-.29**	.30**	-.38**	-.13*	-.25**	-.25**	.03	.52**						
10. Ch Reduced Accomplishment	-.17**	.05	-.13*	-.20**	-.10	-.26**	-.01	.08	.08					
11. Ch Vitality	.34**	-.28**	.41**	.19**	.25**	.26**	-.00	-.46**	-.42**	-.23**				
12. Ch Satisfaction work	.46**	-.36**	.47**	.21**	.38**	.30**	-.01	-.33**	-.43**	-.25**	.48**			
13. Age	.03	-.03	.11*	.14**	.00	.04	-.09	-.15**	-.17**	-.03	.18**	.09		
14. Season length	-.11	.10	.02	.04	-.05	.07	-.01	.09	.08	-.05	-.03	-.15**	.02	
15. Goal attainment T2	.07	-.12*	.06	.08	.09	.15**	-.00	-.05	-.10	-.11*	.05	.18**	.02	.03

Note. $N = 343$. All correlations are between residual change scores; Ch = Change.

*p < .05, two-tailed. **p < .01, two-tailed.

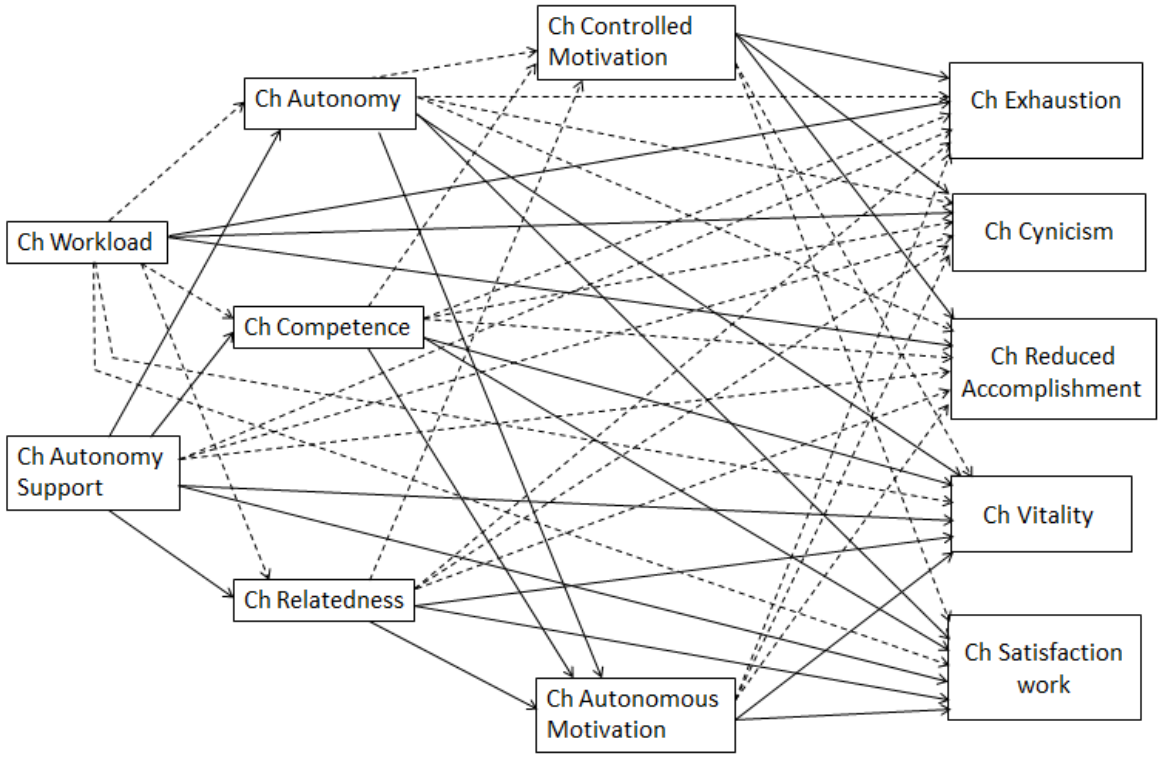

Figure 1. The proposed model. All direct and inderect pathways will be examined. Dashed line = negative relationship. Solid line = Positive relationship. Ch = Intraindividual change.

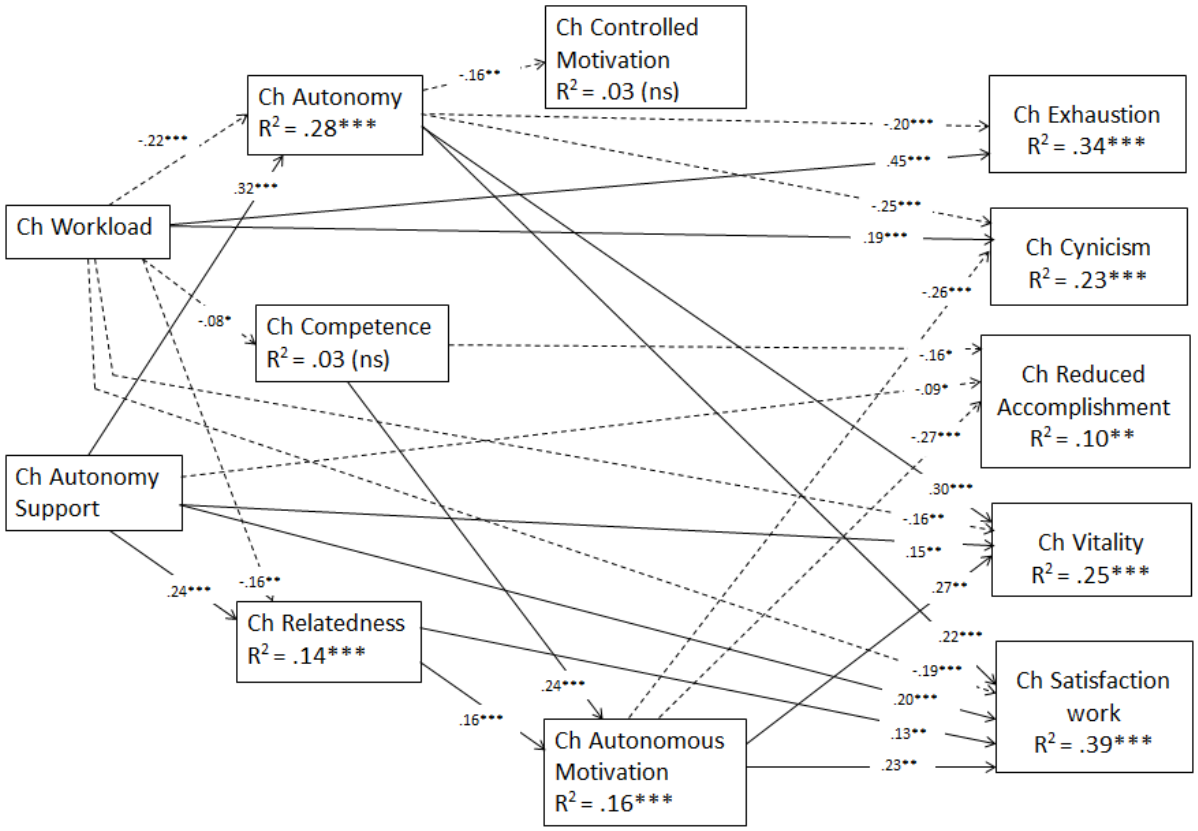

Figure 2. Unstandardized values for structural model. Note, only statistical significant paths are shown. Dashed line = negative relationship. Solid line = Positive relationship. In addition, significant relationships were found between the disturbances terms of respectively; autonomy and competence, and autonomy and relatedness. These findings are not specified in the model, since they were not part of the hypotheses of the current study.

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

Table 3.

Additional Estimates of Indirect Effects of the Hypothesized SDT Process Model

Independent variable	Mediator / mediators	Dependent variable	Specific indirect Estimate	95% BcCI
Ch Competence	Ch Autonomous Motivation	Ch Cynicism	-.062	-.13 – -.02
Ch Competence	Ch Autonomous Motivation	Ch Reduced Accomplishment	-.066	-.13 – -.03
Ch Competence	Ch Autonomous Motivation	Ch Vitality	.065	.02 – .14
Ch Competence	Ch Autonomous Motivation	Ch Satisfaction Work	.056	.02 – .11
Ch Relatedness	Ch Autonomous Motivation	Ch Cynicism	-.042	-.08 – -.02
Ch Relatedness	Ch Autonomous Motivation	Ch Reduced Accomplishment	-.044	-.08 – -.02
Ch Relatedness	Ch Autonomous Motivation	Ch Vitality	.044	.02 – .09
Ch Relatedness	Ch Autonomous Motivation	Ch Satisfaction Work	.037	.01 – .08
Ch Workload	Ch Autonomy	Ch Exhaustion	.043	.01 – .10
Ch Workload	Ch Autonomy	Ch Cynicism	.054	.02 – .11
Ch Workload	Ch Autonomy	Ch Vitality	-.066	-.14 – -.03
Ch Workload	Ch Relatedness → Ch Autonomous Motivation	Ch Vitality	-.007	-.02 – -.002
Ch Workload	Ch Autonomy	Ch Satisfaction Work	-.047	-.09 – -.02
Ch Workload	Ch Relatedness	Ch Satisfaction Work	-.020	-.05 – -.004
Ch Workload	Ch Competence →Ch Autonomous Motivation	Ch Satisfaction Work	-.004	-.01 – -.001
Ch Workload	Ch Relatedness → Ch Autonomous Motivation	Ch Satisfaction Work	-.006	-.02 – -.002
Ch Autonomy Support	Ch Autonomy	Ch Exhaustion	-.062	-.11 – -.02
Ch Autonomy Support	Ch Autonomy	Ch Cynicism	-.079	-.14 – -.04
Ch Autonomy Support	Ch Relatedness → Ch Autonomous Motivation	Ch Cynicism	-.010	-.02 – -.01
Ch Autonomy Support	Ch Autonomy	Ch Vitality	.097	.04 – .18
Ch Autonomy Support	Ch Relatedness → Ch Autonomous Motivation	Ch Vitality	.010	.003 – .02
Ch Autonomy Support	Ch Autonomy	Ch Satisfaction Work	.069	.03 – .12
Ch Autonomy Support	Ch Relatedness	Ch Satisfaction Work	.030	.01 – .07
Ch Autonomy Support	Ch Relatedness → Ch Autonomous Motivation	Ch Satisfaction Work	.009	.003 – .02

Note. Ch = Change. All values are unstandardized. All results are significant based on the 95% Bias Corrected Confidence Intervals. Only significant results of the analysis were presented in this table due to limitation of space. All result can be obtained by contacting the first author.