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Abstract

This study aims to investigate the relationship between several job design variables and innovative work behaviour (IWB). Guided by the Job Demands Resources model, the aim was to evaluate the relationship between work demands (time constraints), resources (autonomy and social support), and other work factors (task monotony, complexity, and dealing with unforeseen circumstances) with idea generation and idea implementation behaviours in a sample of 12924 participants from the 27 European Union member states in 2010. We also wished to investigate if individual IWB, at the country level, is associated with country innovative performance (an aggregate of process/product and marketing/organizational innovation). We employed a multilevel generalised structural equation model to test our hypotheses. In our final model autonomy, manager encouragement and dealing with unforeseen problems showed the highest positive relationship with idea generation and idea implementation. Conversely, monotonous tasks and working at high speed were negatively related to IWB. Furthermore, we have found strong indications that country-level IWB positively relates to the odds of a country scoring higher on the aforementioned innovation indicators. Between-country unexplained variance in IWB was reduced from 17.1% in our initial model, to 1.9% in our final iteration. Limitations, implications and suggestions for future research are discussed.

Job Demands, Job Resources and Innovative Work Behaviour:

A European Union Study

Uncertain economic conditions throughout the European Union (EU) have had a severe impact on organizations, with many being forced into foreclosure and others struggling to survive on the market. This has affected working practices. Employees are required to meet higher workloads for less pay in an attempt from employers to cut down on costs, or else face the possibility of losing their job (James, 2014), and often the response strategies implemented (e.g. mass lay-offs and drastic pay cuts) have done nothing but worsen the situation (Totterdill & Exton, 2014). Considering the role of the workplace in the European economy and its competitiveness on a global level, it is important to understand the complexities that govern the relationship between individual and business performance. The present study aims to address this pertinent issue by investigating the relationship between organizational key determinants and individual innovative behaviour in the workplace.

As a result of the last crisis, a decrease in employee well-being has been observed (Chraif & Anitei, 2011) due to exposure to such factors as job insecurity, increased workload and time pressure, decreased control and less autonomy at work (Sinclair, Sears, Probst & Zajack, 2010) which has resulted in harmful effects at the individual, organizational and societal level due to poorer mental health, cardiovascular problems, even increased suicide rates (Deaton, 2012; Karanikolos et al., 2013). Academics, practitioners and policymakers agree that a new approach is needed in order to revitalize both the financial system and the increasingly overworked workforce (Eurofound, 2012). In this landscape, a call has been made for the promotion of conditions that will allow individuals, organizations and countries to move forward and overcome the crisis through innovation (Totterdill & Exton, 2014).

Innovation has received increasing attention since it enhances business performance and profitability, saves resources, improves employee job satisfaction, reduces absenteeism (European Economic and Social Committee, 2011), and brings improvements in quality of life (Pot, 2011). Before moving forward, it is important to differentiate between innovation and creativity (Potočnik & Anderson, 2016). Researchers argue that although creativity and innovation have been interchangeably used (Axtell et al., 2000), creativity is now agreed to refer more specifically to the generation of new ideas. While innovation at work may require creativity, it can just as easily be argued that innovative work behaviour (IWB) can appear even without the need to create something completely novel. More specifically, if an employee were to implement a work practice observed in another unit, but that would be new for his or her department, it could be argued that IWB has been observed, but not necessarily creativity in the true sense of the word (Anderson, De Dreu & Nijstad, 2004; De Spiegelaere, Van Gyes, De Witte, Niesen & Van Hootegem, 2014). However, many still argue that creativity and innovation many times overlap, and that often IWB includes creativity (De Spiegelaere et al., 2014). Considering all this, a good definition of IWB is that of West and Farr (1990): "… the intentional introduction and application within a role, group or organization of ideas, processes, products or procedures, new to the relevant unit of adoption, designed to significantly benefit the individual, the group, the organization or wider society" (p.9).

Innovative work behaviour is therefore a complex concept and some theorists identify as many as four distinct sub-factors which comprise it (e.g. opportunity exploration, idea generation, coalition building, idea implementation) (De Jong & Den Hartog, 2010). However, the general consensus is that IWB can be characterized by referring to just two dimensions: idea generation and idea implementation (Axtell et al., 2000; De Spiegelaere et al., 2014; Potočnik & Anderson, 2016). Idea generation is the stage in which the employee

recognizes a new potential problem and tries to come up with solutions to address it. Idea implementation requires that the employee enunciates, and follows through with putting his idea into practice (Yuan & Woodman, 2010). It is also important to note that although many times these processes are linked, by no means must they also follow one another (Scott & Bruce, 1994; Tuominen & Taivonen, 2011). This means that, for example, an employee might not go as far as implementing his idea because often the road to innovation has several challenges. This is something well recognized in the literature (Fay, Shipton, West & Patterson, 2014; Goepel, Hölzle & zu Knyphausen-Aufseß, 2012), and in order to overcome these problems the innovator will seek support from both his peers and his managers (De Spiegelaere et al., 2014). Moreover, many times job design factors such as autonomy (or control) and demands will have an impact on IWB (Anderson, Potočnik & Zhou, 2014; Wu, Parker & de Jong, 2011). Furthermore, to address one of the most recent criticisms of past research, namely the fact that in most cases the focus has been on idea generation (or the creative) process, and less so on implementation (Anderson et al., 2014), in this paper both aspects of IWB will be individually examined.

The decision to look at idea generation and idea implementation behaviours separately was in part guided by past literature. Several authors have suggested that managerial and organizational factors may indeed impact differently on these two IWB facets. Amongst the first to do so were de Jong and Den Hartog (2007), who identified in their qualitative study a number of 13 different leader behaviours, and proposed that while most are necessary for both stages in the innovative process, some are more important for idea generation (e.g. intellectual stimulation) while others take precedence for idea implementation (e.g. providing resources, monitoring). This could be because the different phases of the IWB process are characterized by different features (Rekonen & Bjorklund, 2016). While the idea generation phase can be more unstructured and fuzzy, the idea

implementation phase generally is more predictable and structured. While some have acknowledged these differences, there is much criticism even in recent publications which state that the vast majority of research "lumps together" these innovation phases, and as a result there is still a big gap in existing research (Seek & Diehl, 2016; Rekonen & Bjorklund, 2016). As a result, this could cause oversights with regards to how different antecedents impact on IWB. Where studies were designed as to pay special attention to how, for example, autonomy, colleague support, encouragement and working hours relate to these stages of innovation, several differences were observed. Encouragement, autonomy and flexible working hours were deemed more important for the idea generation phase, whereas colleague support (in the form of evaluation and feedback) were helpful in the idea implementation phase (Beugelsdijk, 2008; Seeck & Diehl, 2016). Therefore, the aforementioned reasons have supported the decision to separately look at the constituent dimensions that make up IWB, rather than create a unitary construct, as much prior research has done.

Theoretical Background

A recent meta-analysis has made evident the importance of several job characteristics (such as autonomy and support from both coworkers and supervisors) as drivers of innovation (Hammond, Neff, Farr, Schwall & Zhao, 2011). As one of the aims of the current paper is to evaluate the importance of several work features when it comes to IWB, it was necessary to look at a well-established model of job design when developing our approach. Grounded within Social Exchange Theory (Cropanzo, 2005), one such model is the Job Demands Resources (JDR) Model (Bakker & Demerouti, 2007). It builds from the well-established Job Demands Control (JDC) (Karasek, 1979) and Job Demands Control-Support (JDCS) (Johnson & Hall, 1988) models (where autonomy and social support buffer the effects of demands on individual performance and well-being), and offers a solid framework

when analyzing the demands and resources inherent in many types of different jobs (Bakker & Demerouti, 2007). Therefore, drawing from JDR (King, Chermont, Dawson & Hebl, 2007; Martin, Salanova, & Peiro, 2007) we will define autonomy and social support as resources and, in this case, time-related constraints as demands. JDR expands on JDC and JDCS by acknowledging more subtle determinants of work relationships (such as communication, manager support, psychological empowerment and motivation) (Bakker & Demerouti, 2007), which will be useful when discussing why and how the aforementioned resources and demands affect IWB.

Job Demands and Innovation

Huhtala and Parzefall (2007) have hypothesized how job demands and resources directly impact employee well-being and innovativeness. They define innovation as the process comprised of idea generation, promotion and finally idea realization, which arises when employees try to address organizational goals and needs in new ways. In their proposed model, when demands are high and resources are low, well-being and innovation decrease. More recent research seems to offer support to their idea. De Spiegelaere, Van Gyes, Vandekerckhove and Van Hootegem, (2012) conducted a study in which they used the JDC model to explore the relationship between demands, resources, job engagement and IWB. They defined demands as time pressures and emotional pressures. Interestingly when they looked at the difference between active jobs (both demands and resources high, proposed to be most conductive to learning and new behaviour formation) and low strain jobs (high resources and low demands), IWB seemed to be higher for employees in the latter category. A surprising finding was that the relationship between demands and IWB was positive if job control (or autonomy) was low (De Spiegelaere et al., 2012). However, in another study where the link between the JDR model and IWB was investigated, results differed. Martin et

al. (2007) found that when both demands and resources were high (active jobs), the relationship between demands and IWB was positive. Furthermore, in another study employing the JDR model conducted by King et al. (2007), demands (defined as time pressures) showed an ambiguous, if weak, relationship to an innovative climate (or how often people engage in IWB). It is clear, therefore, that although demands do affect IWB, the link between the two is still not very clear. Therefore, one of the aims of the present study is to add to the understanding of this complex relationship, by looking at the direct effect of demands (defined as working at high speed and under tight deadlines) on IWB.

Another way in which demands at work may influence IWB is in terms of the impact of long working hours, including that on work life balance (WLB). Following interviews with workers from the IT industry, James (2011) suggested that one of the biggest hindrances for the individual innovation process is having overworked employees because increased stress breaks down communication channels and impedes cooperation between colleagues. James (2014) in his qualitative study of IT workers, identified working long hours as a major problem which affects both the health and productivity of employees. He explained how after working a prolonged time (sometimes overall as much as 90 hours per week), workers feel exhausted the next day, and feel incapable of doing their jobs properly. Their study however, also found that given options to increase their WLB (e.g. flexible time, reduced work days, job sharing), employees are healthier, perform better, learning on the job increases and so does innovation. Considering all the above, we propose the following hypotheses to test how different job demands affect IWB. We leave the hypotheses non-directional because the relationship between demands and IWB has traditionally been unclear (something we hope to also address in this paper):

Hypothesis 1a: Job demands pertaining to working at high speeds will be related to idea generation and idea implementation behaviours.

Hypothesis 1b: Job demands pertaining to working under tight deadlines will be related to idea generation and idea implementation behaviours.

Hypothesis 1c: Job demands pertaining to working long hours will be related to idea generation and idea implementation behaviours.

Job Resources and Innovation

Autonomy has been investigated as a predictor of innovation in a number of papers. One such study was conducted by Ramamoorthy, Flood, Slattery and Sardessai, (2005) in a cohort of Irish blue-collar workers. The main model hypothesis was that aspects of organizational fairness, the psychological contract and job design factors (specifically autonomy) will influence IWB both directly and indirectly (through self-expectations and felt obligation). Their analysis showed autonomy to be the strongest direct predictor of IWB amongst all other variables. Furthermore, both Hammond et al. (2011) and De Spiegelaere et al. (2014) hypothesized autonomy to be an important antecedent to IWB. In De Spiegelaere et al.'s model, autonomy was defined as the amount of control that an individual has with regard to organizing and conducting his or her work tasks. It was proposed to act upon IWB both directly and through work engagement. They tested their hypotheses in a Finnish sample of white collar workers, and although autonomy was only one amongst many other variables which were tested as predictors of IWB (such as job insecurity and work engagement), following a structural equation modelling analysis, it resulted to be one of the most relevant predictors with direct path coefficients to IWB of 0.30. In addition, autonomy had an indirect effect on IWB, through work engagement.

Reflecting on these findings, it is easy to see why autonomy would be such an important factor for IWB. Being autonomous means having control, and thus the freedom to implement one's ideas freely and share knowledge (Cabrera, Collins & Salgado, 2006), both activities being of paramount importance for IWB (De Spiegelaere et al., 2014). From the two previously mentioned studies it is easily observed that autonomy is one of the most important antecedents of IWB, and it appears to be just as important in white and blue-collar jobs, suggesting its effects are generalizable over different jobs, an idea supported by a recent meta-analysis (Hammond et al., 2011). For the present study, autonomy will be defined as the amount of control an individual has to change his or her speed of work, methods of work or order of tasks. Accordingly, our hypothesis is:

Hypothesis 2: Autonomy will be positively related to idea generation and idea implementation behaviours.

Past studies and meta-analyses have found indications that indeed for a number of jobs that are high in demands and low in control (autonomy) and support (from colleagues and managers) stress levels increase and therefore the ability to learn on the job and general well-being decrease (e.g. Rodriguez, Bravo, Peiro & Schaufeli, 2001; Van der Doef et al., 1999). More recent research has linked the JDCS model to innovation, encouraging the idea that predictors of well-being and innovation are not alien to one another. In a study by Daniels, Wimalasiri, Cheyne and Story (2011), the authors suggest that the link between innovation and the JDCS model should be more extensively researched to better understand how increased social support leads individuals to create and employ more problem solving skills, and thus perform better and innovate. Problem solving has been indicated to be a key factor in innovation (Scott & Bruce, 1994). Furthermore, Karasek and Theorell (1990) also advocate that through increased support, workers apply more readily existing knowledge

when a problem arises, cope better with challenging situations and come up with more solutions for potential problems (thus engaging in IWB). This is, according to the authors, where the link between the JDCS and innovation lies. Furthermore, past studies have indicated that indeed the relationship and support between co-workers (Burningham & West, 1995; Hoegl & Proserpio, 2004), as well as supervisory support (Janssen, 2005; Madjar, Oldham & Pratt, 2002) have an impact on innovation. Accordingly, we hypothesize that:

Hypothesis 3a: Social support pertaining to colleague support will be positively related to idea generation and idea implementation behaviours.

Hypothesis 3b: Social support pertaining to manager support will be positively related to idea generation and idea implementation behaviours.

Hypothesis 3c: Social support pertaining to empowerment from the manager will be positively related to idea generation and idea implementation behaviours.

Additional factors

Apart from the aforementioned job design variables, previous studies also point to several others that might play a role in the IWB equation. To strengthen the theoretical framework of the current model, we have considered three additional (related) variables: task monotony, task complexity and dealing with unforeseen problems.

Task complexity (and its reverse monotony) has been linked with creativity and IWB in several studies. However, the findings to date have been inconclusive, with some research having found positive relationships (Axtell et al., 2000; Baer & Oldham, 2006), others suggesting its effects disappear when considering additional factors (Ohly et al., 2006; Shalley, Gilson, & Blum, 2009), while some even finding that it might hinder individuals'

innovative potential in some circumstances (Urbach, Fay & Goral, 2010). Similarly, dealing with unforeseen challenges has been recognized as a hallmark of the innovative process, whether it be at the idea generation stage or during the implementation process (Baer & Frese, 2003; Bledow, Frese, Anderson, Erez, & Farr, 2009; Mumford, Scott, Gaddis, & Strange, 2002).

To try and further elucidate the relationship between task complexity (monotony) and having to deal with unforeseen circumstances, we propose the following hypotheses:

Hypothesis 4a: Task complexity will be positively related to idea generation and idea implementation behaviours.

Hypothesis 4b: Task monotony will be negatively related to idea generation and idea implementation behaviours.

Hypothesis 4c: Dealing with unforeseen circumstances will be positively related to idea generation and idea implementation behaviours.

Further considerations

Overall it is clear that the link between job design and innovation is far from being completely understood. Considering available evidence, the current research employs a secondary analysis of the European Working Conditions Survey (EWCS) (Eurofound, 2012), an EU-wide survey with representative (EU and member state level) population samples, to test the study hypotheses. However, before moving forward, we must acknowledge that there are major differences between EU member states in their innovation scores, as evident from the European Innovation Scoreboard (Hollanders & Es-Sadki, 2017). Possible reasons for this range from cultural to wider institutional and economic motives (Hofstede, 2001; Kesselring,

Blasi, & Scopetta, 2014; Rank, Pace, & Frese. 2004). To this end, we have incorporated in our theoretical model an indicator of the overall level of organizational innovativeness in each country. It could be argued that many factors could make up such a measure: degree of organizational learning, training and education in organizations and the type of hierarchical structures, to name a few. However, we were interested in assessing the possible influence innovative employee behaviour can have on organizational outcomes, and that is why we have chosen to focus on the overall level of process, product, marketing and organizational innovations reported by companies in the EU member states. We have obtained this information from the Innovation Unions Scoreboard. Process/product innovations are measured as the percentage of companies that have introduced new goods, services or processes, and generally refer to technological innovations. Marketing and organizational innovations are those non-technological forms of innovation that are mainly found in the services sectors, where the former are less common (Hollanders, Es-Sadki, Vértesy & Damioli, 2017). We believe that these aforementioned factors do well in encompassing the different types of outputs that can be observed at the company level. Moreover, these innovative outcomes could reasonably be expected to be influenced by the amount of innovative work behaviour displayed by those companies' employees (Bos-Nehles, Renkema & Janssen, 2017; Chowhan, Pries & Mann, 2016; Jiménez-Jiménez & Sanz-Valle, 2008).

While it is not the main focus of this paper to explore these possible reasons, we do however acknowledge that there are differences between countries' innovative performance. That is why our approach will be to employ a multilevel structural equation model which will allow us not only to test for our hypothesis, but also to take into account these country-specific differences (Nezlek, 2008). Furthermore, because it is our belief that country-level reported levels of innovation should be influenced by individual innovative behaviour, we will also explore this relationship. Thus, the final hypothesis proposed is:

Hypothesis 5: Individual innovative work behaviour (at the country level) will be related with country innovation scores.

To keep to the theoretical and conceptual propositions of the JDR model on which this work is based on, while not expressly recognized above through additional hypotheses, we will also investigate all the interactions between the predictors in our model.

Method

Methodology

Before describing the data analysis procedure, it is important to clarify several things. Structural equation modelling (SEM) is preferred to other approaches such as multiple regression, as it not only allows the investigation of dependence relationships between constructs of interest, but it additionally takes into consideration measurement error (Hair, Black, Babin, Anderson & Tatham, 2009). Furthermore, work done by others casts doubt on the appropriateness of employing SEM techniques, designed for continuous response, with ordinal categorical data. Rather, techniques specifically developed for analyzing Likert-type scales are recommended (van der Eijk & Rose, 2015). That is why we will be using a multilevel logistic structural equation model. This type of analysis does not require data to be continuous, and accounts for possible non-normal distributions in the responses.

Sample

For the purposes of the present study, a secondary analysis was conducted on data obtained from the 5th European Working Conditions Survey conducted in 2010. It was chosen because it is one of the only representative surveys carried out at EU level which offers sufficient information for our purposes. The selection was based on a random, stratified sample. The response rate was 44%. The survey covered the 27 EU member states, and only

people who were at that time employed were surveyed (if they did paid work for at least one hour per week). It is important to note that the EWCS sample is representative of the working situation in the general population at the time of data collection which was the time period of the last financial crisis.

In this study we focused on the section of the sample represented by salaried individuals, meaning self-employed people and freelancers were excluded from the analyses. A second consideration was that the participants had to work in organizations with more than 10 employees. This was based on findings from previous studies which indicate that the relationship between organizational size and innovation is positive, and therefore observing innovation in smaller firms might be more difficult (Camisón-Zornoza, Lapiedra-Alcamí, Segarra-Ciprés & Boronat-Navarro, 2004). Furthermore, as stated in other studies, self-employed individuals and freelancers have more control over their working conditions and are not so dependent on others (Dhondt, Pot & Kraan, 2014). Conversely, it could be argued that some of the dimensions investigated in this study, like colleague and manager support, do not really apply to them. In terms of country data, we have chosen to include the 27 EU member states at the time. After the initial data screening, from 43816 cases we were left with 12924 valid responses.

Measures

All measures were based on questions taken from the 5th EWCS. Even though some questions might not be identical to some used in other, purpose-designed instruments, the items in this survey were tested and proved to have good face validity and many were adapted from validated instruments (Dhondt et al., 2014).

Demographic variables: age, gender and education. In an attempt to account for as many confounding factors as possible, age, gender and education were controlled for in the analyses. Age was measured on a continuous scale, gender was a dichotomous variable, with the values 1 (*male*) and 2 (*female*) and education was a categorical variable indicating the highest level an individual achieved (e.g. upper secondary, post-secondary), based on the International Standard Classification of Education (ISCED) norms.

Job demands. The first independent variable, job demands, was measured by using two questions which were adapted from the Job Content Questionnaire (JCQ) tool developed by Karasek et al., (1998). The items were: "And does your job involve": "…working at very high speeds?" and "working to tight deadlines?". Scoring was on a 7-point scale, between 1 (*Never*) and 7 (*Always*). Although it was a self-report measure of demands, which is affected by a degree of subjective appraisal, it can be argued that perceived demands are as important for the individual as are "actual" demands (Dhondt et al., 2014). Furthermore, there is support for the idea that a subjective measure of demands has the necessary validity (Karasek, Baker, Marxer, Ahlbom & Theorell, 1981). A third item (long working hours) was also used to measure another aspect of job demands, namely the effect increased demands and long working hours have on work-life balance. The phrasing of the item was: "Over the last 12 months how often has it happened to you that you have worked in your free time in order to meet work demands?". The scoring was done on a 5-point scale, between 1 (*Never*) and 5 (*Nearly every day*). All three factors were measured using a single item per indicator.

Job resources: autonomy and social support. Resources were measured by evaluating two dimensions, autonomy and social support. The second independent variable, *job autonomy,* was measured with 3 items adapted from the JCQ (Dhondt et al., 2014). The following items were used: "Are you able to choose or change…": "…your order of tasks",

"your methods of work" and "your speed or rate of work". The items were scored on a dichotomous scale, with the values 1 (*No*) and 2 (Yes). In a previous paper by Dhondt et al. (2014) the authors have used the same 3-item scale to measure job autonomy, but have made the decision to exclude a variable which was originally used in the JCQ tool, arguing that in a principal component analysis (PCA) it loaded on 2 factors. Considering that the sample population used in this study is different, we have run another PCA in order to confirm their factor loadings. The findings confirm what was previously observed, with the 3 items loading highly on the first factor, with the Kaiser-Meyer-Olkin test of sampling adequacy KMO = .76, $p < 0.001$, which is adequate (Field, 2012). Furthermore, the Cronbach's alpha measure of internal consistency for this scale was adequate, with a value of .75. The final composite measure was created by summing the responses from the scales and using the arithmetic mean as an indicator of the overall autonomy level.

The third independent variable, s*ocial support*, was measured using 2 items derived from the JCQ questionnaire (Dhondt et al., 2014). The questions were: "For each of the following statements, please select the response which best describes your work situation." with the subcategories "Your colleagues help and support you" and "Your manager helps and supports you". Both were measured on a 5-point Likert scale, between 1 (*Never*) and 5 (*Always*). A third item was also used to measure encouragement from the direct manager: "In general, your immediate manager encourages you to participate in important decisions", scored on a dichotomous scale, with 1 (*No*) and 2 (*Yes*). This item was chosen in addition to the first one focusing on supervisor support because it offers a more direct insight into how managerial support might influence employees, and research does agree with the idea that empowerment through encouragement has an impact on creativity (Özaralli, 2015), which is closely linked to innovation. The three factors are used independently in the analysis process, to better understand the specific effects of peer and managerial support on IWB. Therefore,

the three indicators, colleague support, manager support and manager encouragement, are measured using a single item for each.

Other factors: task complexity, monotony and dealing with unforeseen circumstances. These three factors were assessed with one question each: "Generally does your main paid job involve: with the options "solving unforeseen problems on your own", "monotonous tasks" and "complex tasks". Scoring was done on a dichotomous scale, 1 (*No*) and 2 (*Yes*). The three factors are measured using a single item for each.

Innovative work behaviour. The dependent variable, innovative work behaviour, was assessed using two items designed to measure the two dimensions believed to comprise IWB: idea generation and idea implementation. The first item was "You are involved in improving the work organization or work process of your department or organization", and the second item was "You are able to apply your own ideas in your work". Both were measured on a 5-point Likert scale, between 1 (*Never*) and 5 (*Always*). Cronbach's alpha was .64, which although small is acceptable. However, Cronbach's alpha could easily be influenced by other factors such as item wording and the number of items included (more items increasing the value), therefore care must be taken when interpreting it. Therefore, to further test that indeed the items measure one factor, a PCA analysis was performed, which returned good results, the two items loading high on one factor only, and with the Kaiser-Meyer-Olkin test of sampling adequacy KMO = .76, $p < 0.001$, which is adequate (Field, 2012). As one aim of this study is to investigate how different workplace characteristics relate to both aspects of IWB, each of the two items measuring the proposed dimensions of the variable were used independently. These two dependent variables were each measured with a single item.

Country level IWB. The two indicators used to measure individual IWB were also used to obtain the country-level innovative work behaviour score. We created a group-mean score for idea generation and one for idea implementation, and have used the arithmetic mean of the two as an overall indicator of country level IWB. This is how the composite measure for the country level IWB score has been derived. We have done this because it is not a methodologically sound approach to create paths from indicators measured at an individual level to indicators at the group level. However, in line with other researchers (e.g. Neal & Griffin, 2006), by aggregating individual data to the group level we can investigate if peoples' behaviours influence the group characteristics of which they are part of. More specifically, in our case this allows us to test if individual innovative work behaviour will be associated with country innovation scores.

Country innovation score. This score was obtained from data taken from the European Innovation Scoreboard (EIS), a survey designed by the European Commission as part of their efforts to monitor and evaluate innovative performance across Europe. The score used for each country was a rank. This was derived from the arithmetic mean obtained from the normalized values of two indicators: process/product and marketing/organizational innovation. In our case a score of 1 is attributed to the country with the lowest mean score, and 27 to the highest, respectively.

Results

Because all our data originates from a single source, the possibility of common-source bias was a concern. To investigate this, we conducted an EFA on all our variables to assess Harman's single factor score. According to the literature, this score should indicate that less than 50% of the variability in all our data can be explained by one single factor (Podsakoff,

MacKenzie, Lee, & Podsakoff, 2003). In our case, we observed that 23.6% of variability was explained, well under the maximum threshold accepted.

Before conducting our main analysis, we ran a correlation analysis (see Table 1); this allowed us to investigate how the main variables in our dataset are related with each other. While no directionality can be inferred, this is helpful in that it gives an overview of the most relevant and interesting relationships between the factors.

[Table 1 around here]

The highest positive correlations were observed between working at high speed and working on tight deadlines ($r = .60$), manager support and colleague support ($r = .54$), manager support and manager encouragement ($r = .34$), manager support and idea generation ($r = .32$) autonomy with idea generation and idea implementation ($r = .33$ and .46, respectively), manager encouragement with idea generation and idea implementation ($r = .42$ and .36 respectively), and finally between idea generation and idea implementation behaviours ($r = .46$). The highest negative correlations were between monotonous tasks and idea generation and idea implementation ($r = -.16$ and -.22 respectively), monotonous tasks and autonomy ($r = -.16$) and between working on tight deadlines and idea implementation ($r = -.15$). All the correlations are significant at $p < .005$ level.

The multilevel nature of the data required us to proceed with caution. After checking for homogeneity/homoschedasticity we investigated if we had a multilevel structure to the responses, and for this we have simply ran a random intercept model (M1) with only our two outcome variables, idea generation and idea implementation nested within countries. The between country variance observed was .171 (17.1%), a good indicator that a multilevel approach is recommended. In the following iterations of the model (M2-M7) we added, in

turn, the control variables, demands, resources, additional job characteristics (complexity, monotony, dealing with unforeseen circumstances), the interactions, and finally the higher-level relationships between country-level innovative work behaviour scores and country innovation scores. With each step, the between country unexplained variance in idea generation and idea implementation decreased. By M7 a .019 (1.9%) variance was left unexplained. We recognized that generalized structural equation models do not allow for goodness of fit statistics for each model to be reported. To address this to some extent, with each new, more complex version of the model, we conducted a likelihood ratio (LR) test, to evaluate if each new set of variables added brought significant improvements on the previous model. This was done for all the models, except for the last iteration from M6 to M7, because the LR test requires that the two models compared have the same number of dependent variables. As in M7 we have added country innovation as an additional outcome, the LR test could not be performed. Table 2 presents information on all the models, in order. Figure 1 presents the full model (M7). Path values are unstandardized betas.

[Figure 1 around here]

[Table 2 around here]

The odds-ratios for all the variables are presented in Table 2. We will focus on reporting in more detail the strongest relationships uncovered in the final model. By far the most important positive relationships observed were between IWB and autonomy (OR $_{idea\ generation}$ = 2.45; OR $_{idea\ implementation}$ = 3.99), manager encouragement (OR $_{idea\ generation}$ = 3.20; OR $_{idea\ implementation}$ = 2.21) and country level innovative work behavior (OR $_{idea\ generation}$ = 1.76; OR $_{idea\ implementation}$ = 2.30), as well as having to deal with unforeseen problems (OR $_{idea\ generation}$ = 2.19; OR $_{idea\ implementation}$ = 1.94). Put differently, people who enjoyed greater autonomy had twice as much, and four times as much chances of engaging in IWB. Similarly,

those that enjoyed high levels of manager encouragement were 320% and 221% more likely to engage in idea generation and idea implementation behaviours, respectively. On the other hand, those that were doing monotonous tasks were the least likely to innovate (OR $_{idea\ generation}$ = 0.80; OR $_{idea\ implementation}$ = 0.66), having a 20% and 34% decreased likelihood of generating ideas and implementing ideas, respectively. From the demographic variables, the highest relationship was observed with education (OR $_{idea\ generation}$ = 1.16; OR $_{idea\ implementation}$ = 1.12). By far the strongest, and possibly most important relationship was observed between country level innovative work behaviour scores and country innovation scores (OR $_{country\ innovation}$ = 6.54). What this means in theory, is that countries in which individuals engage in more idea generation and idea implementation behaviours are over 6 and a half times (654%) more likely to score higher on innovation indicators (an aggregate of process/product and marketing/organizational innovation measures, more precisely).

Discussion

H1a and *H1b* were partly confirmed, meaning that job demands pertaining to working under tight deadlines and at high speed were associated with idea generation and idea implementation, respectively. It is important to note that the exact relationship between job demands and innovation was elusive in past studies, and some research has found that when demands and control are both high, innovation is lower than if demands were low and control high (De Spiegelaere et al., 2012), while others found the opposite effects (Martin, et al., 2007). The unique strength of this study is its big sample size, which means that direct effects that are not easily observed in smaller samples due to reduced power can be observed here. Therefore, a more detailed investigation of job demands can be performed. As such, it was observed that working at high speed was negatively associated with idea implementation, but was non-significant for idea generation. However, working on tight deadlines had a small but

positive association with idea generation, but not with idea implementation. Considering these findings, it can be implied that different types of time constraints have different relationships with generating and implementing ideas. Working at high speeds seems to be detrimental to idea implementation, while working under tight deadlines might be slightly conductive to idea generation. These are interesting results, and a proposed explanation in past research was that the positive effect of job demands is attributed to their motivating effect. That is, employees are motivated to change their working environment, and therefore engage in coping behaviours, and in some cases one such behaviour is IWB (Martin et al., 2007; Ohly & Fritz, 2009). However, as our analysis shows, it appears that not all job demands have the same association with innovation. This is in line with the view that there are two different types of stressors, namely challenge and hindrance stressors. In a study conducted by Van den Broeck, De Cuyper, De Witte, and Vansteenkiste (2010), the differentiation between these two types of demands was investigated, and results indicated that indeed, challenge demands had a positive effect on vigor and did not influence exhaustion, while job hindrances had a negative effect on vigor and positively predicted exhaustion. If we consider this differentiation between demands, it can be proposed that working under tight deadlines, although demanding, encourages employees to rethink their working habits and innovate, to increase their performance, as it is perceived as challenging rather than hindering. At the same time, working at high speed might be just a stressful working condition, which hinders IWB overall.

Another aspect of job demands explored in our study was long working hours. Long working hours were positively associated with both idea generation and idea implementation (*H1c* confirmed). These findings must be interpreted with caution. First, we believe this sheds more light on findings from past studies, where it was shown that not all demands have the same effect, some leading to positive (challenges) and others to negative (hindering) effects

on individuals (Van den Broeck et al., 2010). However, we do not believe that employees that work overtime and become overworked are more likely to innovate. Rather, when innovating, employees may become more involved in their work as they refine and implement their ideas. This might mean that they are more likely to come to work outside normal working hours because they are very committed to their vision and idea. However, if this is the case, care must be taken. Working long hours can lead to a state of stress and fatigue, which reduce individual resources, directly impacting productivity (Hunter & Thatcher, 2007) and the long-term capacity to innovate. It is no use having employees who innovate but who end up overspent and burnt out by the end. If anything, our findings cast light on the importance of promoting good work-life balance during intense periods of innovation, when employees might not realize they may be overworking themselves.

Autonomy was found to have one of the highest associations with both idea generation and idea implementation (*H2* confirmed). It was observed to have a higher association with idea implementation than idea generation, leading to the idea that although important throughout the innovative process, autonomy is all the more vital when it comes to enacting proposed ideas. Looking at the interactions between the variables used to measure demands and autonomy in the idea implementation model the analysis indicates that a small but significant and positive relationship exists between autonomy and working at high speed. This lends support to the notion that having more autonomy in the job acts as a moderator, allowing individuals to better deal with some time constraints. The positive interaction with idea implementation suggests that as autonomy increases, the negative effects of working under high speed get buffered to a certain extent, allowing employees to be more creative and apply new working practices to achieve better results. This is interesting, and the findings suggest that the so called hindrance stressors might be well moderated by the appropriate resources. Striking a balance between offering the right amount of control to workers to

balance demands is therefore a topic that needs to be further investigated in other studies. There are a number of reasons why the aforementioned relationships might have arisen. First of all, employees who experience more control in their working environment might be more willing to show initiative, as they feel more trusted and more capable (De Spiegelaere et al., 2014). Furthermore, if enough autonomy is provided to workers, the job becomes more pleasurable and rewarding in itself, and it is hypothesized that individuals will engage more freely in experimenting and trying out their ideas, even at the risk of failure (through the so called "trial and error" process) (Ramamoorthy et al., 2005). Moreover, as IWB is a change oriented behaviour, a specific personality characteristic – the individual's resistance to change – has been proposed to have a negative effect on the level of innovation observed (Oreg, 2003). Autonomy was shown to moderate this relationship, meaning that for employees who have a high resistance to change and might otherwise not engage in IWB, high autonomy might buffer some of the unconducive effects this aspect of their personality might have on IWB because they feel more in control (Battistelli, Montani, & Odoardi, 2013). High autonomy also makes employees feel secure enough to put their ideas under scrutiny (Paul, Niehoff & Turnley, 2000), and thus they will more readily engage in idea generation and implementation. Furthermore, autonomy can increase the feeling of personal responsibility, making employees identify with their work, and therefore be more involved in improving their organization or working practices (Wu et al., 2011). Finally, autonomy also facilitates learning, knowledge exchange, and the perceived control over the ability to initiate change (Axtell et al., 2000; Daniels, Boocock, Glover, Hartley & Holland, 2009), all crucial aspects of generating and executing ideas.

Social support was another job resource investigated in this study. Both social support from colleagues and from managers positively related to both aspects of IWB (*H3a* and *H3b* confirmed). Idea generation in both cases was more strongly associated with colleague

support and manager support, as compared to idea implementation. This can mean that when trying to come up with something novel, it is essential to have support from colleagues and mangers, possibly because they provide initial feedback, encouragement and advice. Our findings do support the original proposition made by Karasek and Theorell (1990), who argued that communicating with others and discussing problems, as well as efficient ways of solving them, will increase problem solving and individual performance. Furthermore, De Dreu (2006) proposes that a supportive collective is a key factor for innovation in teams. In a qualitative study conducted by Daniels et al. (2013), the authors looked at how social support impacts problem solving defined as generating and implementing ideas (very similar to our measures). Their findings offer an interesting insight, namely that social support is essential for idea generation and implementation, which acts as a coping mechanism to deal with job demands. Social support plays two important roles; one is offering actual support when needed, and the other one is conferring peace of mind that support exists if needed, which can increase the control individuals feel over their work, and at the same time, IWB. Moreover, social support also helps refine existing ideas, as others can offer different perspectives on an issue (Daniels et al., 2013). An associated benefit of approaching and involving others in idea generation is that they become familiar with it and, as a result of direct participation, also take ownership of it to a certain degree. Therefore, when the time comes there will be less opposition to implement it (De Dreu & West, 2001). This might be especially important when considering support from the supervisor, and a possible explanation for why the item measuring managerial support had a slightly higher predictive power than that measuring social support from colleagues.

Another aspect of social support, managerial empowering behaviour, significantly and strongly associated to both aspects of IWB (*H3c* confirmed). The association was slightly stronger for idea generation than for idea implementation. To better understand why these

relationships appeared, it is important to note that supervisor behaviour has been indicated to be one of the most important factors affecting creativity and innovation (Anderson et al., 2014). More specifically, empowering behaviours from the supervisor have been linked to employees perceiving the whole organization as being more supportive towards innovation (Scott & Bruce, 1994). Being an empowering manager means, amongst other things, encouraging decision-making (Arnold, Arad, Rhoades & Drasgow, 2000) and participation in the decision-making process (Özaralli, 2015) which are concepts that are crucial to generating ideas. Furthermore, empowering employees leads to greater perceived self-efficacy, motivation and autonomy, all key factors for the innovative process (Zhang & Bartol, 2010).

Task complexity and having to deal with unforeseen problems on one's own were both positively related with both idea generation and idea implementation behaviours, while task monotony had a negative association with both (*H4a*, *H4b*, *H4c* confirmed). The degree of complexity in a task is many times telling of a cognitively demanding job. It would therefore be expected, to some extent, that those individuals engaging daily with such work would be the most likely to innovate. In line with this are the findings from several other studies, which have suggested that individuals that need to display a myriad of skills at work in order to deal with complex tasks also enjoy more freedom to come up with and implement new ideas (Basadur, Runco & Vega, 2000). Furthermore, highly complex jobs are usually more engaging and are linked to higher employee satisfaction, which in turn leads to more innovative behaviours (Noefer, Stegmaier, Molter & Sonntag., 2009). Task complexity and having to deal with unforeseen problems also interacted with working overtime, with interesting results. When working overtime on complex tasks, idea implementation levels went down, while when working overtime to deal with unforeseen problems, idea generation went down. While the magnitudes of the interactions were not massive (6% and 10%

decreases in reported idea generation and idea implementation behaviours, respectively), they are nevertheless important, especially considering that on their own both predictors had a positive influence on the two IWB dimensions. This brings to light the intricate nature and process of innovation. It becomes obvious that when multiple demands stack up (even if challenging and not hindering on their own), they will end up taking a toll on the individual, at the expense of innovation and possibly leading to decreased job satisfaction and engagement.

From the demographic variables, education played the most significant role, with people that have obtained a higher degree being more likely to innovate (16% and 12% more likely to engage in idea generation and idea implementation behaviours, respectively). This is not surprising, as several past papers have also found education to be a relevant predictor (Pieterse, van Knippenberg, Schippers & Stam, 2009; Scott & Bruce, 1994). This might be because with a higher level of education potentially comes a higher position within organizations. These senior positions are characterized by more autonomy and decision latitude, which are both important for innovation. Furthermore, highly educated individuals get employed in more complex, cognitively demanding jobs (Martínez-Román & Romero, 2016), which exposes them having to deal with a variety of issues. This might in turn also lead to engaging in innovation.

Finally, we now move to discuss the relationships between country level innovative work behaviour and country innovation scores. As previously mentioned we country-meaned IWB scores to create a level 2 IWB indicator that was then explored in relation to another level 2 indicator, the countries' innovation score (process/product and marketing organizational interventions). By creating a group-mean score of IWB we have, in effect, isolated between group effects from within-group effect on IWB (Hoffman & Gavin, 1998; Paccagnella, 2006). In a similar vein, Neal and Griffin, (2006) employed a similar

methodology to examine "bottom-up" effects, from individual safety behaviour to group accident rates. Here, we have done something analogous to that, we have looked at how IWB influences country innovation scores. First and foremost, a positive relationship between country level IWB and individual idea generation (81% more likely) and implementation (132% more likely) was observed. Second, and perhaps more interestingly, our results show a significant and strong relationship where an increase in IWB at the country level relates to a 6 and a half times greater likelihood of the country performing better on innovation indicators (*H5* confirmed). These findings are very encouraging, and to the best of our knowledge it is the first time when a "bottom-up" relationship between individual innovative behaviour and country innovation performance has been investigated. Even though not many studies like ours exist, there have been authors that have looked at HR practices within organizations, and how those practices influence both IWB as well as firm innovativeness and performance. For example, Jiménez-Jiménez and Sanz-Valle (2008) found a positive relationship between an HRM system characterized by autonomy, employee participation, teamwork and communication and firm product, process and administrative innovations. Similar findings are echoed in a study conducted by Messersmith and Guthrie (2010). As to why these factors correlate with firm innovativeness, one explanation would be because these factors are crucial for promoting IWB, as also proposed by Bos-Nehles, Renkema and Janssen (2017). They suggest that in HRM practices where the levels of autonomy are enhanced, individual and team support is provided, job demands are appropriately managed (with an emphasis on time pressures and work timeframes) and attention is paid to task composition (complexity/routinisation), employees engage in IWB much more readily. In this study, we observe conceptually similar results, on cross-national, macro scale. While we acknowledge that this is not a direct link, the possible impact and implications of the present findings must be acknowledged. If we could identify several factors that transcend cultural, sectoral and

organizational boundaries, and that can be used to further and enhance employee driven innovation in companies across Europe, more concerted and effective efforts could be made in developing a set of standards and guidelines for the promotion on innovation at all levels, across the EU and possibly beyond. Furthermore, thinking more broadly of the model, we have also shown an indirect link between the psychosocial work environment (in terms of job demands and resources), individual IWB and country innovative potential.

Limitations

Several limitations need to be addressed. First of all, this is a cross-sectional study, meaning that we cannot infer causality. However, our model offers interesting findings and we feel that the analysis techniques employed allowed for several insightful conclusions to be reached. However, both multilevel models and generalized structural equation models (GSEMs) have their limitations. The former only allows for one outcome to be investigated at a time. The latter is limited in that it does not provide traditional model evaluation techniques (i.e. goodness of fit statistics). However, we have tried addressing these restrictions. First, by using a GSEM we have managed to add all our variables of interest in one cohesive and comprehensive model. Furthermore, although GOF statistics were not available, we have employed other model analysis techniques (LR tests, for example), and taken together with the fact that between-country variation in IWB went down with each model iteration, we are confident that the final model, and the results are reliable.

It can also be argued that this study does not provide cultural considerations, and as literature suggests, there surely are differences between welfare states in the EU (Sapir, 2006). However, it was not this study's aim to offer such information, but rather to investigate how well job characteristics relate to the two dimensions of IWB at a multi-

national, but representative, EU-wide sample. Nevertheless, researchers might find it useful to conduct cultural investigation with such a model.

Another limitation is the fact that the analysis was based on secondary data, meaning that we did not have direct control over the design of the survey. As a result, the measures used are not standardized, however many were adapted from well validated instruments, such as the JCQ (Karasek et al., 1998), and other studies that aimed to examine effects at the EU level also used some of these items (Dhondt et al., 2014). Furthermore, some of our variables (the individual level idea generation and idea implementation indicators, all the demands, task monotony, complexity and dealing with unforeseen circumstances, as well as colleague support, manager support and manager encouragement) were assessed using a single item scale. This, it could be argued, is not as robust as having composite indicators, and therefore we invite that future research tests the model by using composite scales for the indicators as well. However, the rationale for using the specific items to measure our proposed variables was based on a comprehensive literature review, and several statistical checks were performed to examine their structure and appropriateness, such as reliability analysis and a principal component analysis, where composite measures were used.

Conclusion

The present study offers important implications, by presenting a clear picture of how job characteristics that have been historically examined in relation to well-being in the workplace fare in relation to IWB. The results of this study offer support to the idea that job design characteristics that have previously been indicated as being important to well-being also are important for other organizational aspects, such as employee innovation. This could shape the discourse used when introducing companies to the benefits of investing in effective

psychosocial risk management practices, the effects of which extend beyond the health and well-being of the employee.

More specifically, looking back on the main results, we can say that in order to have a productive and innovative workforce several factors seem to be crucial. First, the amount of decision latitude (autonomy), the levels of colleague and manager support and encouragement as well as one's level of education are all positively related with both idea generation and idea implementation. Task complexity and having to deal with unforeseen circumstances are similarly positively related with the two facets of IWB. Things get more interesting when looking at job demands, as some positively relate to idea generation but not idea implementation (e.g. working at high speed and on tight deadlines). Equally important, monotonous tasks were negatively related to both factors. It therefore appears that the jobs most conducive to IWB are those that are flexible and can be adapted as the requirements of the innovative process change. At the same time, it is necessary to consistently offer employees sufficient challenges in the form of exciting and multifaceted jobs, as well as a combination between sufficient agency in how they conduct their tasks and responsibilities and adequate support and encouragement from managers and colleagues. Furthermore, our study also points to the fact that the countries that benefit from more innovative employees are those that also score higher in their output of products, process, marketing and organizational innovations. As these are some of the most important factors for economic and societal growth, it is crucial to understand their precursors. The present study takes these efforts one step further, in that it identifies some of the cross-sectoral, tans-national (i.e. not cultural or country specific) factors.

Our findings could thus have implications at the macro level as well. Interested stakeholders and policy makers could use studies such as this to inform better policies,

programmes and initiatives, especially considering the pro-innovation agenda (e.g. EU 2020 Action Plan; Innovation Union) promoted at the international level. At the same time, several practical suggestions can be made, so that those that wish to promote innovation in the workplace should try increasing specific resources, while at the same time carefully managing both hindering and challenging demands.

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Table 1. Bivariate correlations between all the individual-level dependent and independent variables in the study.

Bivariate correlations

Variables	***1.***	***2.***	***3.***	***4.***	***5.***	***6.***	***7.***	***8.***	***9.***	***10.***	***11.***	***12.***
1. *Overtime*	-											
2. *High speed*	.09*	-										
3. *Tight deadlines*	.16*	.60*	-									
4. *Autonomy*	.16*	-.14*	-.05*	-								
5. *Colleague support*	-.04*	-.05*	-.03*	.08*	-							
6. *Manager support*	-.03*	-.10*	-.07*	.13*	.54*	-						
7. *Manager encouragement*	.08*	-.08*	-.02*	.25*	.21*	.34*	-					
8. *Complex tasks*	.17*	.08*	.16*	.19*	.06*	.04*	.15*	-				
9. *Monotonous tasks*	-.10*	.14*	.09*	-.16*	-.07*	-.09*	-.14*	-.04*	-			
10. *Unforeseen circumstances*	.15*	.01	.07*	.28*	.06*	.06*	.16*	.27*	-.07*	-		
11. *Idea generation*	.15*	-.03*	.04*	.33*	.25*	.32*	.42*	.21*	-.16*	.25*	-	
12. *Idea implementation*	.19*	-.15*	-.06*	.46*	.18*	.24*	.36*	.18*	-.22*	.27*	.46*	-

N = 12924; * p<.005

Table 2. Structural equation model results (presented as odds-ratios for ease of interpretation) for each iteration of the model, from simplest (Model 1 - M1) to the final and most complex (Model 7 - M7).

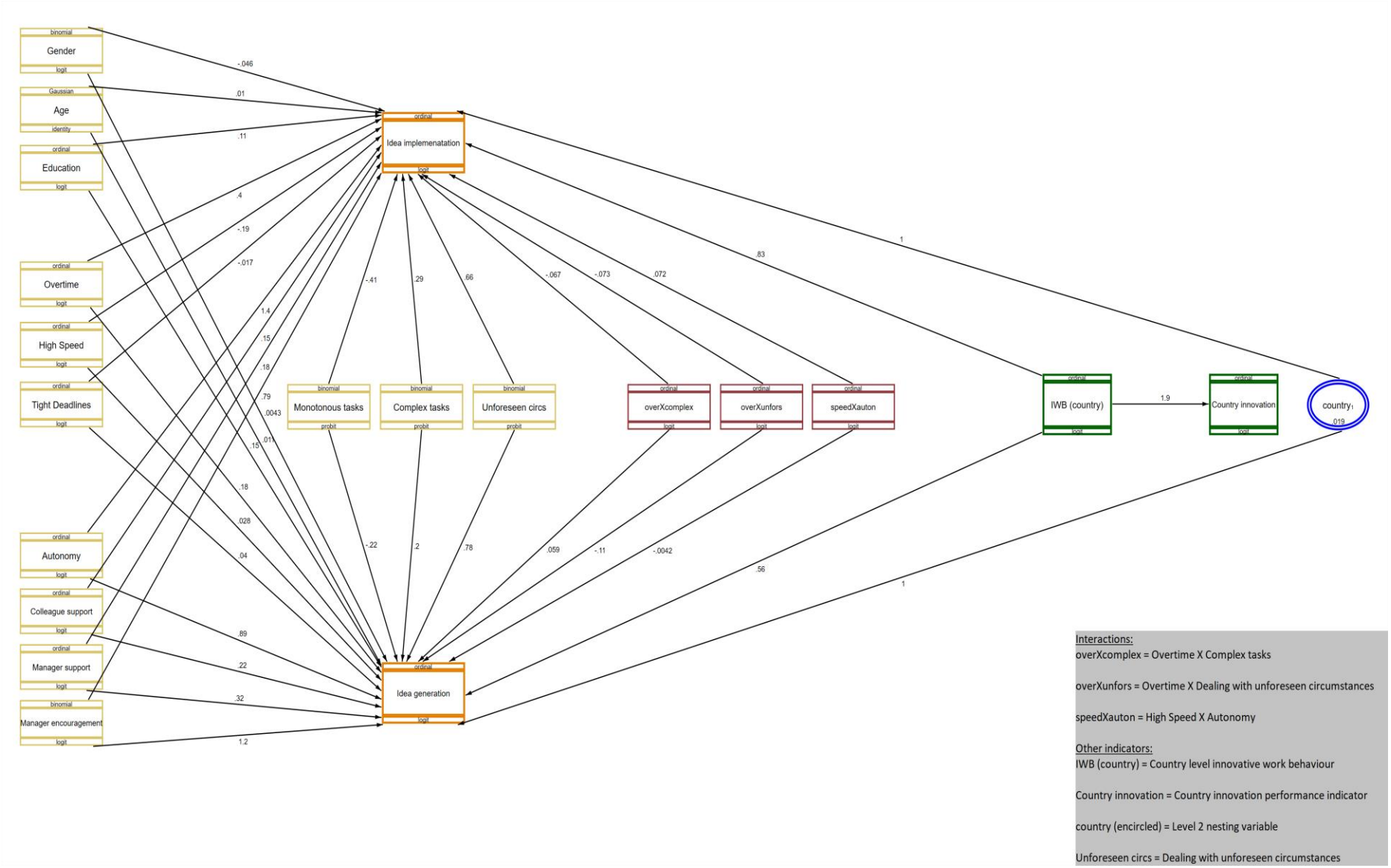
	*Idea generation **(1)** / idea implementation **(2)** / country level innovation **(3)*** [1]														
	- Odds-ratios (exponential beta)-														
Variables															
	M1		**M2**		**M3**		**M4**		**M5**		**M6**		**M7**		
	1	***2***	***1***	***2***	***1***	***2***	***1***	***2***	***1***	***2***	***1***	***2***	***1***	***2***	***3***
Gender			0.96*	0.91*	.98	.94	0.96	0.92*	1.00	0.95	1.00	0.95	1.00	0.96	-
Age			1.01*	1.01*	1.01*	1.01*	1.01*	1.01*	1.01*	1.01*	1.01*	1.01*	1.01*	1.01*	-
Education			1.43	1.49	1.37*	1.37*	1.20*	1.17*	1.15*	1.12*	1.16*	1.13*	1.16*	1.12*	
Overtime					1.12*	1.22*	1.10*	1.18*	1.08*	1.16*	1.20**	1.49*	1.20**	1.49*	-
High speed					0.95*	0.87 *	1.01	0.92*	1.02	0.93*	1.02	0.82*	1.03	0.82*	-
Tight deadlines					1.05*	0.99	1.06*	0.99	1.04*	0.98	1.04*	0.98	1.04*	0.98	-
Autonomy							2.84*	6.14*	2.40*	5.31*	2.42*	4.11*	2.45*	3.99*	-
Colleague support							1.26*	1.19*	1.24*	1.17*	1.24*	1.17*	1.24*	1.17*	-
Manager support							1.37*	1.20*	1.37*	1.19*	1.37*	1.19*	1.37*	1.19*	-
Manager encouragement							3.41*	2.37*	3.22*	2.22*	3.21*	2.21*	3.20*	2.21*	-
Complex tasks									1.36*	1.18*	1.22**	1.33*	1.22**	1.34*	-
Monotonous tasks									0.81*	0.66*	0.80*	0.66*	0.80*	0.66*	-

Unforeseen problems					1.80*	1.73*	2.18*	1.95*	2.19*	1.94*	-
*Overtime **X** Complex tasks*							1.06	0.94*	1.06	0.94**	-
*Overtime **X** Unforeseen problems*							0.90**	0.93	0.90**	0.92	-
*High speed **X** Autonomy*							1.00	1.07*	1.00	1.07*	-
Innovative work behavior (country level)									1.76*	2.30*	6.54*
Between-country variance	.171 (17.1%)	.147 (18.1%)	.156 (15.6%)	.075 (7.5%)	.064 (6.4%)		.065 (6.5%)		.019 (1.9%)		
Likelihood ratio test (p value)		< 0.00	< 0.00	< 0.00	< 0.00		< 0.00				

* p<.005; ** p<.05

Notes

1: for M7 the odds-ratio for the effect of innovative work behavior (country-level) on country innovation score is also presented (third OR).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1
Interactions:
overXcomplex = Overtime X Complex tasks
overXunfors = Overtime X Dealing with unforeseen circumstances
speedXauton = High Speed X Autonomy
Other indicators:
IWB (country) = Country level innovative work behaviour
Country innovation = Country innovation performance indicator
country (encircled) = Level 2 nesting variable
Unforeseen circs = Dealing with unforeseen circumstances