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Documentation requirements, intrinsic motivation, and worker absence^{*}

ABSTRACT

Command systems are widely used to monitor public service provision, but little is known about unintended effects on individual workers' motivation and work effort. Using insights from motivation crowding theory, we estimate a SEM model that captures how Danish childcare assistants and social/healthcare assistants perceive documentation requirements. We analyze how this perception relates to intrinsic motivation measured in a survey and sickness absence as reported in administrative registers and find that individuals who perceive documentation requirements as controlling have lower intrinsic motivation and higher sickness absence. The association is statistically significant, but very small in substantive terms. The result is nevertheless consistent with the expectation in motivation crowding theory and contributes to the literature by including a new reliable behavioral variable, sickness absence, and by drawing attention to possible downsides of command-and-control. Even though command systems can also have positive disciplining effects, knowledge about potential drawbacks is important for public managers.

Keywords: Documentation, Command systems, Sickness absence, Intrinsic motivation, SEM.

INTRODUCTION

Regulation and incentives do not always work as intended, especially if the potential effect on intrinsic motivation is not taken into account (Frey 1997; Perry et al. 2009).

Public employees “are often to a high degree intrinsically motivated, that is, they perform tasks because of loyalty, an internalized sense of duty, and/or enjoyment” (Weibel et al. 2010, 388), and therefore, a naive adoption of command systems might be especially harmful in the public sector. The red tape literature focuses on rules that are perceived as redundant and controlling (Bozeman 2000; Bozeman and Feeney 2011; DeHart-Davis and Pandey 2005), and several studies have shown that red tape is negatively related to employee motivation (Scott and Pandey 2005; Moynihan and Pandey 2007). Nevertheless, the present management style in many public organizations can still be described as command-and-control (Seddon 2008; Le Grand 2010). There is still a great deal of bureaucracy and control in public organizations (Boyne 2002; Bysted and Jespersen 2013), and Seddon (2008) argues that many public organizations are top-down hierarchies – managers make decisions, workers do the work – controlled by the managers with a variety of management practices such as procedures, rules, specifications, inspections, and the like. This is based on the belief that workers are essentially lazy and self-interested, and need to be motivated by extrinsic forms of motivation: carrots and sticks. A specific type of stick is command systems, defined as directives for worker behavior that are monitored and may ultimately be sanctioned. According to the motivation crowding literature (Frey 1997; Frey and Jegen 2001; Weibel et al. 2010; Georgellis et al. 2011), external interventions such as command

systems and financial incentives decrease individuals' intrinsic motivation if they are perceived as controlling, while the opposite applies if they are seen as supportive. Intrinsic motivation includes "interest in or enjoyment of the task" (Gagné and Deci 2005, 336), and high intrinsic motivation is expected to lead to high work effort and ultimately high performance. The key factor is perception of the command system, which is expected to determine the effect on intrinsic motivation. Intrinsic motivation is expected to be crowded out if the command system is perceived as controlling and crowded in if perceived as supportive. Given that intrinsic motivation and innovation are positively related (Rosenblatt 2011), crowding could be one of the mechanisms behind the conflicting results regarding the relationship between red tape and innovation (Kim et al. 2014; Moon and Bretschneider 2002; Pandey and Bretschneider 1997). The existing empirical studies of crowding effects for financial incentives (e.g., Weibel et al. 2010; Andersen and Pallesen 2008; Fehr and Falk 2002; Bertelli 2006) find support for motivation crowding, but only a few studies have investigated crowding effects for command systems (e.g., Dickinson and Villeval 2008; Jacobsen and Andersen 2014). We therefore lack empirical knowledge about how the perception of command systems affects intrinsic motivation and work effort.

We address this question by analyzing one particular command system, namely documentation requirements for Danish social/healthcare and childcare assistants. Documentation requirements mean that the individual employee must provide information about how they spend their time and how the relevant services are provided. This could, for instance, be registration of time for specific tasks in eldercare, such as

cleaning, bathing a client, or registering the client's personal well-being. In terms of the dependent variable, we focus on one type of behavior, namely, short-term absence from work reportedly due to sickness. When employees report sickness as the reason for absence from work, they may of course be too sick to go to work. However, as Markussen (2010, 1) succinctly phrases it, "In between fit as a fiddle and halfway dead there is a grey area in which workers may be able to work or may qualify for sick leave. Within this area there is room for subjective judgment. In many cases, two workers with the same health problem and the same job will evaluate their ability to work differently." High absence, reportedly due to sickness, may indicate absenteeism, that is, a habitual pattern of absence from a duty or obligation (Yang and Liern 2009), and the perception of a command system, such as documentation requirements, may be a key factor in this connection. Even for individuals working under the same formal command system, there can be much variation in their perception. This article holds the formal command system constant and investigates whether documentation requirements are perceived as controlling rather than supporting and how this perception is related to (1) intrinsic motivation and (2) sickness absence.

There are three important reasons to investigate the occupations of childcare and social/healthcare assistants. First, while crowding out has been convincingly demonstrated for high-level, interesting tasks (Weibel et al. 2010), we have less knowledge about workers at lower organizational levels, such as the occupations investigated here. Second, they work in areas (eldercare and daycare for children) with massive documentation requirements. Third, municipal employees in Denmark, such as

our sample of social/healthcare and childcare assistants, on average have 13.3 sick days per year, while Danish state employees have 8.6 , and Danish private employees have 9.0 (Ministry of Employment 2008). This indicates that it might be possible to reduce sickness absence among municipal employees. It is therefore particularly pertinent and interesting for our specific sample of social/healthcare and childcare assistants to analyze a potential link between the number of sick days and the employees' perception of documentation requirements as controlling.

The study is based on register data on absence from work reportedly due to sickness (henceforth referred to as sickness absence). The register data are matched at the individual level with data from a web-based survey of social/healthcare and childcare assistants employed in Danish municipalities. This survey includes measures of intrinsic motivation, perception of documentation requirements, and a number of control variables. Based on theoretical discussions that build on the existing literature on motivational crowding, we formulate a structural equation model that allows us to study the link between latent variables of intrinsic motivation and perception of documentation requirements with sickness absence modeled in a simultaneous equation framework.

Our main finding is that the perception of documentation requirements as controlling is associated with higher sickness absence. As expected in motivation crowding theory, a controlling perception of documentation requirements is negatively associated with intrinsic motivation, and individuals with lower intrinsic motivation have significantly higher sickness absence. Still, although the associations are statistically significant, they are small in substantive terms. Sickness absence and perception of

documentation requirements are not found to be associated when controlling for the level of intrinsic motivation, which is also consistent with motivation crowding theory.

The paper proceeds as follows. Section 2 presents motivation crowding theory, and in section 3, we discuss our expectations to the relationships between the perception of documentation requirements, intrinsic motivation, and absence. Section 4 discusses our SEM model, and section 5 describes the data. In section 6, we first test our measurement model and subsequently present estimation results from the structural model. In section 7, we discuss the estimation results, and finally, we conclude and outline suggestions for a future research agenda within this field.

THEORY: MOTIVATION CROWDING

A typical assumption behind the use of external interventions such as command systems and monetary incentives is that workers derive negative utility from working. As workers usually have more information about their actions than their managers, moral hazard is expected to arise if the workers are not forced to work by sanctions or tempted to work by incentives. Shirking may happen either in the form of leisure-shirking, where workers simply prefer leisure to work, or dissent-shirking, where the workers do not work as an expression of protest. In the latter case, workers display dissatisfaction by silent protest (Brehm and Gates 1997, 28-30). Command and incentive systems may provide the sticks and carrots that induce the workers not to shirk and, at the same time, be opposed by the workers and lead to dissent-shirking, indicating that a nuanced understanding of command-and-control is warranted.

In this connection, the motivation crowding theory is relevant because it includes intrinsic motivation as another motivation for working and analyzes the *conditional* effect of monetary incentives and command systems (Frey 1997; Weibel et al. 2010).

Motivation crowding theory argues that command systems have two effects: a disciplining effect and a crowding effect. The *disciplining effect* draws upon principal-agent theory (Hart and Holmström 1987; for a recent review, see Miller 2005). One of the core results from this approach is that principals (e.g., managers) use outcome-based incentives to overcome the problems of moral hazard. Although most principal-agent studies focus on the use of financial incentives, some also focus on command systems (Alchian and Demsetz 1972; Mitnick 1980; Weingast 1984). The underlying logic of command systems also applies to financial incentives; workers are penalized if they do not act as specified in the command system (Gneezy and Rustichini 2000, 14). Facing a risk of sanctions, workers are expected to align their behavior more with the principal's directives. Morally hazardous behavior is, in other words, not in the workers' self-interest if the sanctions (or incentives) are strong enough. Accordingly, principal-agent theory expects command systems to increase performance (Frey and Osterloh 2006, 3). This positive effect on work effort and performance is called the *disciplining effect* for command systems and the *price effect* for incentive systems (Frey and Jegen 2001, 593). Motivation crowding theory agrees that this effect exists but argues that it is not the only effect of external interventions such as command systems.

The *crowding effect* indirectly affects work effort and performance through intrinsic motivation. Intrinsic motivation is expected to be "crowded out" when a

command/incentive system undermines intrinsic motivation, while “crowding in” denotes when intrinsic motivation is increased. Whether intrinsic motivation is crowded in or out is expected to depend on whether the command/incentive system is perceived as either supportive or controlling (Frey and Jegen 2001, 594-95). According to Frey (1994, 337), “[w]hen individuals perceive the external intervention to be controlling in the sense of reducing the extent to which they can determine actions by themselves, they substitute intrinsic for extrinsic control.” In other words, the intrinsic motivation is reduced, and more extrinsic control is required when command systems are seen as controlling. For “soft regulations” that are seen as supportive rather than controlling, Frey (1997, 32) argues that they will tend to leave intrinsic motivation unaffected or even crowd it in.

Social psychological processes explain why intrinsic motivation is reduced if interventions are perceived as controlling. According to *self-determination theory* (Deci 1971; Deci, Koestner and Ryan 1999; Gagné and Deci 2005), the extent to which three basic needs for autonomy, competence, and relatedness are met influences intrinsic motivation. The need for autonomy is the urge to control one’s life and act in harmony with one’s integrated self. Self-determination theory argues that motivation can be more or less autonomous (Gagné and Deci 2005). Autonomy involves acting with a sense of volition and having the experience of choice: Controlling command systems are expected to take away this sense of volition and experience of choice, and thereby decrease motivation due to reduced satisfaction of the need for autonomy. Consequently, autonomous kinds of motivation, in particular intrinsic motivation, are crowded out. This especially happens when monitoring (as part of a command or incentive systems)

indicates that the principal sees the worker as unwilling or unable to fulfill the assigned task to the principal's satisfaction (Frey 1993). This is in conflict with another basic need, namely, the need for competence. This need involves doing a good job as well as getting something done. As workers enjoy fulfilling their tasks (Bertelli 2006), we expect intrinsic motivation to decrease if they experience that command systems or incentive systems reduce their possibility of doing a good job. *Relatedness*, the third need, is the universal want to interact with other people, be connected to them, and experience caring for others. It is not as explicitly integrated in the motivation crowding theory as the other two needs, but command systems may also decrease the fulfillment of the need for relatedness given that directives and monitoring can degrade relationships among people. An example could be if the directives demand workers to spend more time on documentation requirements and less time on meetings with clients and home visits. This may result in less connection between employees and those they assist, and therefore decrease the workers' experience of caring for service recipients and consequently reduce their intrinsic motivation.

If a negative crowding effect is larger than the positive disciplining effect, command systems can actually counteract the targeted behavior. On the other hand, if the employees see the command system as supportive, that is, it acknowledges their work effort and their high intrinsic motivation (seen and appreciated rather than controlled), crowding in is expected to happen, and work effort may increase even more than expected from the disciplining effect. Frey thus generalizes the possible dual impact of command systems by distinguishing between situations that are perceived as controlling

and supportive (Frey 1997, 18). Specifically, implementing a command system is expected to crowd out intrinsic motivation if the affected individuals perceive it as a control device.

Quite a few empirical studies have tested motivation crowding theory. Most studies (e.g., Frey and Jegen 2001; Bertelli 2006; Andersen and Pallesen 2008; Weibel et al. 2010) concentrate on financial incentives and indicate that payments perceived as controlling decrease intrinsic motivation and thereby reduce work effort and performance, whereas payments perceived as supportive have the opposite effect. A few studies (Bohnet et al. 2001; Falk and Kosfeld 2006; Dickinson and Villeval 2008) have investigated how command systems affect performance when the perception of these systems is taken into account and indicate that command systems may be harmful for performance if they are seen as controlling. Variations in the perception of the *same* command system as either supportive or controlling also seem to affect intrinsic motivation (Jacobsen et al. 2013; Jacobsen and Andersen 2014). A full test of the motivation crowding theory requires variation on both command system/incentive system and perception of the relevant system. This can best be obtained in panel studies.

Andersen and Pallesen (2008) thus test the motivational effect of financial incentives, and Jacobsen and Andersen (2014) investigate variations in command systems, but they do it for very highly educated workers (researchers) where individual performance can be measured. This is unusual in public organizations, but analyzing the relationship between individuals' varying perceptions of a given command system and their motivation also tests an important part of motivation crowding theory, especially when perception and

motivation can be linked to behavioural outcomes related to work effort (such as sickness absence). Does it matter for a given command system how it is perceived?

Based on theoretical arguments and existing empirical studies, the general expectation is that if a command system is perceived as controlling, it relates negatively to intrinsic motivation. The effect on work effort is expected to be negative if a negative crowding effect is greater than the disciplining effect. We do not study the disciplining effect in this paper (only the crowding effect), and the next section therefore focuses on the *perception* of documentation requirements and how this might affect sickness absence.

EXPECTATIONS: RELATIONSHIPS BETWEEN PERCEPTION OF DOCUMENTATION REQUIREMENTS, INTRINSIC MOTIVATION, AND SICKNESS ABSENCE

As mentioned, this study examines whether documentation requirements are perceived as controlling rather than supporting, and how this perception relates to intrinsic motivation and sickness absence for Danish social/health care and childcare assistants. These workers are required to document how they carry out their assignments. For instance, childcare assistants document how they stimulate children's language and how pedagogical objectives are met, and eldercare workers document how they spend their time; for instance, how much time it takes to clean for the elderly or to give them a bath. In the terminology used in the motivation crowding theory (Frey 1997, 11), these documentation requirements are command systems, that is, directives for the workers'

behavior that are monitored and may ultimately lead to sanctions. Given that assistants from the same occupation face approximately the same requirements, the relevant empirical variation is between perceptions of the controlling or supportive nature of the documentation requirements rather than the command systems themselves. Differences in documentation requirements between the two types of assistants and other differences between these two groups are handled by including a dummy variable for occupation.

Motivation crowding theory normally focuses on performance or work effort, but similar mechanisms are likely to be found for missing days of work. This measure is included in numerous studies that link missing days of work to worker perceptions and attitudes (Feeney and Boardman 2011). Thus, if documentation requirements are perceived as controlling, we would theoretically expect intrinsic motivation to be affected negatively and also to affect sickness absence. Here, self-determination theory provides additional underpinnings that can supplement previous work on worker absence as it offers a theoretical explanation of why a relationship between the perception of command-and-control and absence from work (mediated by intrinsic motivation) may exist.

There are also theoretical reasons why a controlling perception of documentation requirements and sickness absence may exist even when we control for intrinsic motivation. Workers who see the documentation requirements as controlling may have a higher level of dissent-shirking and therefore be more absent (Brehm and Gates 1997). They may also be or become sicker, and/or feel sicker. The causal direction could even be reversed: It is not impossible that high sickness absence could affect individuals'

perception of documentation requirements towards being more controlling than supportive. We cannot distinguish among these reasons. In addition, the grey zone between very sick and completely healthy may expand if the individual is sceptical about documentation requirements. All these arguments imply that intrinsic motivation does not mediate the entire association between the perception of documentation requirements and sickness absence, while motivation crowding theory implies that intrinsic motivation is the key mechanism behind the association. Note that the arguments supporting (a), an association between a controlling perception and sickness absence controlling for intrinsic motivation and (b), a mediated association between controlling perception of command systems and sickness absence through intrinsic motivation are complementary rather than conflicting. Three expectations are outlined here:

H1: The perception of documentation requirements as controlling is negatively associated with intrinsic motivation.

H2: Intrinsic motivation is negatively associated with sickness absence.

H3: The perception of documentation requirements as controlling is positively associated with sickness absence when the level of intrinsic motivation is controlled for.

To date, a substantial amount of research has been devoted to worker absence. In the following, the associations above are placed into this larger context in order to discuss if other factors known to be relevant to worker absence may influence the associations expected above. Worker absence can be seen as a function of two factors: the motivation

to attend work and the ability to attend (Steers and Rhodes 1978). The ability to attend is influenced by actual illness and accidents, family responsibilities, and so on, which are again influenced by personal characteristics such as age, education, occupation, and gender (Alexanderson et al. 1994; Paringer 1983). Actual illness and accidents could influence the perception of documentation as workers who are more absent are also less prone to workplace socialization (Feeney and Boardman 2010, 681). Hence, workers who are more absent may lack the opportunity to discuss the documentation requirement with co-workers and managers. Less workplace socialization can possibly lead to more controlling, as well as more supportive, perceptions of documentation requirements, depending on the specific situation.

Furthermore, the motivation to attend work may also be influenced by satisfaction with the job situation, which is influenced by the workers' job expectations and by personal factors (Steers and Rhodes, 1978). Here, the basic idea is that when an individual's expectations are not substantially met, his propensity not to attend work will increase (Porter and Steers 1973; Nelson and Quick 2002; Scott and Taylor 1985). This idea is in line with the associations expected in this study. However, motivational crowding theory and the theory on dissent-shirking make the mechanisms behind these associations more explicit. Furthermore, worker absence is influenced by the pressure to be at work formed by, for instance, market conditions such as the risk of unemployment (Hausknecht et al. 2008), the incentive system (Barmby and Sibly 2004), and work group norms (Spencer and Steers 1980; Drago and Wooden 1992; Hesselius et al. 2009). The incentive systems for each occupational group are largely the same across the country,

but the risk of unemployment and workgroup norms may vary geographically, and hence, we control for regional variations. In sum, there are alternative explanations for worker absence in the form of ability, motivation, and pressure to come to work.

THE STRUCTURAL EQUATION MODEL

The three expectations are best tested by formulating a structural equation model (SEM). The SEM approach is extremely flexible and allows us to combine measurement models for the two latent variables, perception of documentation requirements and intrinsic motivation, with observable variables, some of which are exogenous explanatory variables, while the outcome variable, sickness absence, is obviously endogenous.

Another key advantage of SEM is the tight link between theory and empirical model. Based on the theoretical arguments discussed in the preceding sections, the theoretical model can be depicted as in the path diagram in Figure 1.

<<<Insert Figure 1 about here>>>

As is customary for path diagrams in SEM analysis, circles signify latent variables, and boxes signify observed variables. The two latent variables, perception of documentation requirements and intrinsic motivation, are described through multiple indicators for each latent variable. The link between observable indicators and latent variables in a reflective measurement model is such that each indicator is an imperfect measure (reflection) of the level of the latent variable. This part of the SEM is estimated

using a measurement model for each latent variable. Given measures of the latent variables, we can, simultaneously, model how the latent variables affect sickness absence. The path diagram shows how the perception of documentation requirements can be directly related to sickness absence as well as indirectly related through intrinsic motivation.¹ Whether or not such relationships exist is what we set out to test here.

We formulate our SEM as three equations, linear in both parameters and variables, that is, we model a system of simultaneous linear equations.²

The model parameters are identified through the restrictions imposed on the SEM and by multiple indicators for each latent variable. Given that we think of the indicators as error-ridden measures of the true latent covariates, we need more than two indicators for each latent variable (Yuan and Bentler 2007). As mentioned above, we restrict the variance of each latent variable to equal 1 as a normalization value, and the model is set up so that it assumes that most errors are uncorrelated. In order to work with theoretically well-defined measures of our latent variables, we impose a structure where each indicator only measures one factor, thus, keeping the indicators unidimensional. This imposed structure is tested empirically.

Although the model parameters are identified, and although we have imposed a structure on how the covariates are related, there is no causal identification. The SEM approach may reveal whether the causal assumptions embedded in our model match our data sample. That is, we can falsify any causal relationship but cannot prove its existence. In this way, associations can be used to reveal the absence of causal effects.

The SEM imposes a mean and covariance structure $\mu=\mu(\theta)$ and $\Sigma=\Sigma(\theta)$,

respectively. Parameter estimates are obtained by fitting the model-implied first and second order moments. The model is solved by weighted least squares, where the weight is implemented as with no distributional assumption, often referred to as asymptotic distribution free (ADF).³

DATA

We combine register data from municipality records on individuals' sickness absence with survey data on perception of documentation requirements and intrinsic motivation. The strength of our data is that we avoid common source bias that could arise had we used subjective answers related to both sickness absence and perception of documentation requirements. When we look at the association between perception of documentation requirements as controlling and intrinsic motivation, common source bias may drive parts of these results because both are measured in the same questionnaire, but this is not the case for sickness absence. The non-experimental cross-sectional data still do not allow claims about causality. In other words, we can test whether we can identify the expected associations, but we cannot test whether the perception of documentation requirements (mediated by intrinsic motivation) *affects* sickness absence.

The survey data were collected among members of a web panel from one of the major unions for workers employed in Danish municipalities, FOA. Members of unions might be expected to deviate from the workforce in general, but approximately 75 percent of the relevant group are unionized (Kristensen 2010).

The age of these web-panel members is higher than among all union members,

and members of a web panel might (compared to the average union member) be more resourceful, more positive towards the union, and have higher intrinsic motivation. However, even if this is correct, the association between perception of documentation requirements and sickness absence would not differ from the association for all the members if the relationship is linear. The web-based survey was sent out to about 2000 of FOA's web-panel members in April 2010. The response rate was 65 percent, and the answers generally appeared to be within sensible ranges, as described below. Only the social/healthcare and childcare assistants, for whom documentation requirements are relevant, were asked about their perception of these requirements in their work. 808 of these assistants answered the relevant questions validly. As we have very few males in the sample, we chose to exclude them from the model computations in order to gain a more homogenous sample and interpretation of parameter estimates that relate to women only. The sample is also restricted to observations where we observe an identifier for their workplace. Altogether, these sample requirements yield a sample of 683 observations.

The survey included a battery of five questions used to elicit the perception of documentation requirements; the response distribution of these items is given in Table 1. Our confirmatory factor analysis (CFA) of the measurement model (see section 6.1) made us exclude item 5 since exclusion improved the overall fit of the measurement model. Furthermore, we are worried that item 2 might capture something else than the other three items and, hence, exclude it from the main analysis (while including it in sensitivity checks).

<<<Insert Table 1 about here>>>

The survey also included questions intended to measure intrinsic motivation; see Table 2 for the distribution of answers. Table 2 reveals that respondents are relatively positive towards their job, but there is, nevertheless, also variation across respondents and between items. Our combined measure of intrinsic motivation will therefore clearly provide variation across respondents.

<<<Insert Table 2 about here>>>

Apart from the two above-mentioned measures (perception of documentation requirements and intrinsic motivation), the survey data also include information about socio-economic covariates such as gender, age, and region. Means and standard deviations of socio-economic variables are given in Table 3 for the subsample used in the estimation of the model, that is, excluding males. Note that about two out of three respondents are social/healthcare assistants, while the remaining respondents are employed as childcare assistants.

<<<Insert Table 3 about here>>>

In Denmark, everyone has a unique individual identification number in the

Central Personal Register (CPR). As we have the CPR number for respondents in the web panel, it is possible to match the survey answers with administrative municipal records at the individual level. Each municipality collects administrative data on all employees, including the survey respondents described above, and these municipality records are subsequently processed by the so-called “Joint Municipal Wage Data Office.”

Important for our purpose, the municipality registers include both detailed wage data and information about absence. The quality of these register data is generally considered very high (Kristensen and Westergaard-Nielsen 2007). An important advantage of combining register data on sickness absence with survey data is that we avoid problems with common source bias between perception of documentation requirements and sickness absence (Jakobsen and Jensen, 2014; Meier and O’Toole, 2013a and 2013b; Favero and Bullock, 2014).

The data on absence include information about start and end dates for all absence periods and the reason for the absence. In this paper, we use the information about individuals’ absence reported to be due to own sickness, measured as the number of sick days during the year.⁴ The collective agreement allows absence due to a child’s first or second sick day, but here, we only consider absence reported as being due to the worker’s own sickness. The maximum number of sick days during 2010 was 176, but very few had remotely that many sick days (see the distribution in Figure A1 in the online appendix). The 95th percentile was at 30 days, and in the following, we choose to condition on persons with less than 31 sick days in order to avoid a situation where a few long-term sick-periods drive results. The long-term incidences are theoretically less likely to be

related to shirking, which is another argument for excluding them from the analyses.

RESULTS

Our theoretical considerations strongly suggest a two-factor measurement model.

Nevertheless, we follow Anderson and Gerbing's (1988) recommendation of a two-stage approach to structural modeling. The first stage involves assessment of the measurement model prior to the second stage, which consists of simultaneous estimations of the measurement and structural parameters.

The Measurement Model

A first test of the underlying theory is to verify that the data support the theoretical two-factor construct. If a single-factor model cannot be rejected, there is little point in evaluating more complex ones. In addition, a necessary condition for assigning meaning to estimated constructs is that the measures posited as alternate indicators of each construct must be largely unidimensional (Anderson and Gerbing 1988). Therefore, we estimated two versions of the measurement model using confirmatory factor analysis: one, a model in which all four item measures for intrinsic motivation and the four item measures for perception of documentation requirements reflect the same unobserved factor; and two, a model that reflects two separate factors (Kline 2011, 234). This gives rise to a Chi-square test that strongly supports the two-factor model.⁵ To further verify unidimensionality, we estimate an exploratory factor analysis (EFA) model and, hence,

allow the loadings to correlate freely (see the online appendix:

<http://www.kora.dk/udgivelser/udgivelse/i9432/>).

Next, we verify that our measurement model is reliable. Reliability, that is, the absence of random noise, is usually measured by Cronbach's alpha. Concerning perception of documentation for the three individual items, we find Cronbach's alpha for the scale if the item was deleted in the range from 0.61-0.68 and an overall Cronbach's alpha at 0.74 (see Table A1 in the appendix). It is well known that Cronbach's alpha tends to underestimate reliability (Vehkalahti et al. 2006), and we therefore also report Joreskog's rho (Wertz et al. 1974) found to be 0.68, well above the commonly used threshold of 0.6 for a measure to be considered reliable (Bagozzi and Yi 1988).

When we investigate the items for intrinsic motivation, we find Cronbach's alpha at 0.77 overall with scale-if-item-deleted values in the range 0.63-0.85 and Joreskog's rho at 0.80 – again, well above the 0.6-threshold (see Table A2).⁶In addition, the CFA measurement model shows that all items are highly significant, which supports the notion of convergent validity, and therefore all included in our model.

As a final check of the measurement model, we report various model fit tests based on the CFA model with two factors (see Table 4).

<<<Insert Table 4 about here>>>

Column 1 in Table 4 provides information about how the estimated CFA model performs compared to a fully saturated model, that is, a model with all possible

correlations included, which, in this context, entails correlations between all indicators, which we do not allow. Not surprisingly, the model fit could generally be improved if such correlations were included. However, given that our latent variables are formulated as reflective measures,⁷ it does not make sense to include such correlations, and we have previously shown that they only load on the factor they were theoretically expected to load on. Column 2 provides a test for the model against “no model.” The test statistics show that this model is a great improvement compared to the null hypothesis of independence.

Column 3 in Table 4 provides a measure of the comparative fit index (CFI) (Bentler 1990), and column 4 provides the Tucker-Lewis reliability coefficient (Tucker and Lewis 1973). Both of these measures are comparative fit measures that (usually) lie in the range between 0 and 1 and work much like pseudo- R^2 measures, that is, values close to 1 indicate good fits, and values close to 0 indicate poor fits. The rule-of-thumb here is that values above 0.9 can be associated with a good fit (Browne and Cudeck 1993). We find both CFI and TLI well above 0.9.

Columns 6-7 in Table 4 show RMSEA and RMSEA confidence intervals. These fit indices offer information about the absolute fit (RMSR is the root of mean squared residuals, and the A signifies inclusion of an adjustment for the number of degrees of freedom (Steiger 1990)). The standard requirement for a good fit is here RMSEA values below 0.08 and preferably below 0.05 (Browne and Cudeck 1993; Jöreskog 1993), while values above 0.10 indicate approximation errors too high for the model to be any good. The RMSEA is 0.036 with a 90 percent confidence interval between 0.012 and 0.058, and

we therefore reject the hypothesis that the RMSEA is above 0.08, while we find that 0.05 is within the 95 percent confidence interval.⁸

Overall, these model fit indices are highly satisfactory and lend empirical support to the theoretical measurement model.

The Structural Model

Given that the assessment of the measurement model is satisfactory and supportive of the underlying theory, we now turn to the structural model. Here, we estimate the measurement model and the structural parameters simultaneously in order to test the three hypotheses previously formulated.⁹

The parameter estimates for the two measurement models reveal that all items are relevant measures of the underlying continuous latent variables (cf. Table 5). In fact, all factor loadings have a significance level beyond 0.1 percent, that is, they are all extremely significant.

<<<Insert Table 5 about here>>>

Our key parameters are the structural parameters in the part of our SEM that includes the endogenous variables (cf. Table 6).¹⁰ In particular, we highlight the three structural parameters that correspond to our three expectations (see the shaded area in the top panel of Table 6).

First, we find that the association between perception of documentation

requirements and intrinsic motivation is significantly different from zero and has the expected sign: Employees who predominantly perceive documentation requirements as controlling rather than supportive have lower intrinsic motivation.

Second, we find that perceiving documentation requirements as supportive rather than controlling has no significant association with the number of sick days when controlling for the level of intrinsic motivation.¹¹ Third, the association between sickness absence and intrinsic motivation is found to have the expected negative sign and statistically significant at the five percent level. In other words, we find that employees with high intrinsic motivation have less sickness absence than employees with relatively lower intrinsic motivation. These results reveal that the perception of documentation requirements indirectly affects sickness absence mediated through intrinsic motivation. We shall discuss the meaning of this result at length below.

<<<Insert Table 6 about here>>>

In the equation for sickness absence, we find that younger employees are more prone to report sick than their older peers (above 55 years of age is the reference group – this difference is only significant for the middle age groups). We also find that childcare assistants are significantly sicker than social/healthcare assistants. That the elderly in our sample have fewer sick days than their colleagues can, at least in part, be a reflection of the non-random sample whereby in particular elderly, relatively low-educated employees, who are members of a web panel constitute a rather selected group that can be expected

to be more resourceful than colleagues in their age group in general.¹²

In the equation for intrinsic motivation, we find that the higher the average number of sick days at the workplace, the lower the individual intrinsic motivation. Notice how the average number of sick days is highly insignificant in the equation for sickness absence. These results for average sickness absence at the workplace indicate that this variable serves as a proxy for workplace characteristics. Along the same lines, we also find that participation in training is significantly associated with intrinsic motivation (but not with sickness absence). While the result clearly cannot be given any causal interpretation, it can be seen as yet another proxy for otherwise unobserved workplace characteristics that affect intrinsic motivation.

The middle age groups (41-55 year-olds) are found to have a significantly higher level of intrinsic motivation. Similarly, people who work 38-40 hours per week have a higher intrinsic motivation than the reference group of people who work 37 hours. We also find that the wage level is positively associated with intrinsic motivation. Somewhat surprisingly, the association between being a manager and intrinsic motivation turns out to be negatively significant. However, only six percent of the respondents in our final sample are managers (approximately 40 women). Hence, once we condition on the number of hours worked, wage level, and age groups, there may be too little variation in the data to project the more intuitively appealing positive correlation between being a manager and intrinsic motivation.

Given the parameter estimates above, we can conclude that the SEM supports two out of our three expectations outlined in section 3: (1) We find a negative association

between documentation requirements perceived as controlling and intrinsic motivation (with the caveat that common source bias may drive parts of this result); (2) We find a negative association between intrinsic motivation and sickness absence. Importantly for this study, the combination of (1) and (2) gives rise to a statistically significant indirect effect of perception of documentation on sickness absence.

What are the real consequences of these results? Although we have found statistically significant parameters, it is not given that they lend support to any substantial effect. In order to investigate this, it is instructive to evaluate the impact that changing perceptions of documentation would have, *ceteris paribus*. Since this perception is a latent variable, we may preferably evaluate the impact a change of one standard deviation would have for sickness absence (which is why we report standardized parameter estimates). The interpretation of the parameter for intrinsic motivation is that a level of intrinsic motivation of one standard deviation below the mean predicts a level of sickness absence of 0.08 standard deviations above the mean level of sickness absence, *ceteris paribus*.

The association between perception of documentation and sickness absence is indirect through intrinsic motivation and is found to be 0.014 standard deviations.¹³ Given the standard deviation in sickness absence, this is equivalent to approximately 45 minutes per employee per year for a rather large change of one standard deviation in perception of documentation. This may not appear to be a substantially interesting difference, but it is, nevertheless, statistically significant. In comparison, however, a one standard deviation lower level of average sickness absence at the workplace and

participation in training (both indicators of workplace characteristics in general) have a combined effect of approximately similar size as perception of documentation.

The structural model has also been estimated using the standard ML technique. In this case, we obtain almost identical results with respect to the key parameters (results available upon request). However, we prefer to avoid the distributional assumption of joint normality and therefore consider ADF the preferred estimation method.¹⁴

As a last sensitivity check, the SEM was estimated separately by age above/below 50. The results were robust to this divide although the latent variable for intrinsic motivation turned insignificant at five percent for the younger group (but significant at 10 percent).

DISCUSSION AND CONCLUSION

The overall finding is that perceiving documentation requirements as controlling is positively, though very weakly, associated with sickness absence, mediated by intrinsic motivation. How should one interpret this finding? On the one hand, motivation crowding theory suggests that intrinsic motivation will be crowded out when a command system is perceived as controlling, and this is expected to reduce work effort. Such a crowding out effect might exceed the positive disciplining effect of the command system on work load, but that is not tested in this paper. We find statistically significant results that support that motivation crowding out can happen. This is an interesting result, especially, since we avoid common source bias in our link to sickness absence.¹⁵ On the other hand, the effect is extremely small in substantial terms, and the net effect from increased documentation

requirements could turn positive for even the slightest positive disciplining effect on employees' work effort. The disciplining effect on work effort is not investigated in this paper, because we cannot analyze variation in documentation requirements (only in the perception of these).¹ All investigated individuals have to meet documentation requirements, but our findings highlight the importance of the perception of these requirements.

As earlier stated, two employees with the same health problems and the same job may evaluate their ability to work differently (Markussen 2010). Our findings suggest that employees who perceive documentation requirements as controlling have slightly higher sickness absence. Maybe because individuals who perceive documentation requirements as controlling (1) become more ill, (2) stay away from work and report themselves sick more often or (3) have a lower pain tolerance. People who are absent for many days may also change their perception towards seeing documentation requirements as controlling as absence from work may limit the degree to which the individual becomes socialized into the workplace. This may, again, limit their opportunity to observe the quality of the public service provided by the organization (Feeney and Boardman 2011). Although the research design does not allow causal inference, the results are consistent with the theoretical expectation about a causal relationship between the perception of documentation requirements and work absence. They are also consistent with motivation theory, which expects the perception of a given command system to

¹ To measure disciplining effects, one would need to have variation in the actual requirements.

moderate the crowding effect of this command system on intrinsic motivation, which is then expected to affect behavior and performance.

An important novelty in our findings is that crowding may not only be relevant for employees with interesting, professionalized work. The expectation in the literature is that workers in the upper echelons, who tend to enjoy more discretion, perceive command systems as more controlling (Frey 1993, 665). Along the same lines, Weibel et al. (2010) find that the task type moderates the effect of pay for performance on performance. Pay for performance is found to have a strong, positive effect on performance in the case of non-interesting tasks, whereas the opposite effect, because of crowding out, applies when tasks are considered interesting. Our result of a negative correlation between intrinsic motivation and sickness absence corroborates Weibel et al.'s (2010) previous findings, but with two interesting modifications. First, the outcome is here sickness absence, which, to date, has only rarely been analyzed in the motivation crowding literature and, to our knowledge, never by using administrative records on sickness absence. As mentioned, this may be one reason why the association is weak in substantial terms. Second, we find a negative correlation even for relatively low-educated workers who perform tasks that might be considered “non-interesting,” using the terminology of Weibel et al. (2010).¹⁶ Future research should look further into whether this is a general finding or whether the job types we have examined are special because they allow employees to help other people although the jobs do not require a high level of education. These employees might focus more on meaningfulness and less on whether the jobs are seen as interesting by other people.

What does this imply for high-powered incentive schemes in the public sector?

The potential crowding effect should not be over-emphasized as we still expect a positive disciplining/productivity effect from documentation requirements and as the repercussions in terms of negative effects on intrinsic motivation and subsequent sickness absence are extremely modest in economic terms. However, this study shows that the perception of documentation requirements as controlling is positively associated with sickness absence even for jobs that do not demand extensive education (such as the employees investigated by Andersen and Pallesen 2008 and Jacobsen and Andersen 2014). Given that this is a conservative test in the sense that many other occupations might be expected to have more interesting tasks and more initial intrinsic motivation to crowd out, our results suggest that the critique of command-and-control may be well founded.

As mentioned, a full test of the motivation crowding theory requires variation on both command system/incentive system and also perceptions of the system. But this article tests an important implication of the theory by analyzing the relationships between the perception of a given command system, intrinsic motivation, and sickness absence. We find a crowding out effect on intrinsic motivation and an effect of intrinsic motivation on sickness absence, and knowledge that crowding out can be useful in itself. Future studies with panel data or even an experimental design should, however, expand on this framework by also including variation in the command system itself. Especially an experimental design would also give better opportunities for causal inference.

In terms of theory, this paper shows the relevance of integrating the literature on

worker absence with the literature on motivation crowding and also underlines the relevance of analyzing the perception of command and incentive systems. The relationship between perception and a type of behavior, which the motivation crowding literature has not yet looked at, indicates that motivation crowding theory is a fruitful starting point for future research. The associations we examined between command systems, intrinsic motivation, and outcome variables such as absence are also relevant for other parts of the literature, for example, the job characteristics literature (Hackman, and Oldham 1976), the job demands-resources literature (Schaufeli et al. 2009; Bakker et al. 2003), and the HRM literature in general (Johns 1997).

The implications of motivational crowding mechanisms for public-sector management differ across organizations, type of work, and employees. For managers in organizations where disciplining effects are considered especially important, the crowding effects found here may be considered of second-order importance. By contrast, in organizations with higher educated and highly intrinsically motivated employees performing more autonomous job functions (e.g., medical doctors or teachers), the implication of our study is that crowding effects could potentially also be economically important in terms of increased sickness absence in response to high levels of documentation requirements.

Another lesson to be learned for public managers is that *perception matters*. We measured how employees perceive documentation requirements. Two employees facing the exact same requirements may have very different perceptions of whether these requirements are meant to support them in their work or merely control them. Clear

articulation of *why* management imposes documentation requirements is therefore a relevant and low-cost approach to mitigating potential crowding effects from documentation. It may also serve as a test of managers' ability to justify why documentation requirements are imposed. In some cases, arguments for documentation may involve historical or other invalid reasons. Having a good understanding of the potential costs through crowding out may therefore also be useful in such circumstances.

Even if the net effect turns positive (if the disciplining effect is positive and larger than the crowding effect), this study suggests that the net effect could be even larger if documentation requirements were perceived as supporting rather than controlling. This means that there can be a potential for increasing a net positive effect of any documentation requirements by paying attention to the motivational crowding mechanism at work when such requirements are introduced. Our results indicate that sickness absence may be reduced and public sector efficiency potentially increased by avoiding the perception that documentation requirements are controlling. The possible harmful effect of a naive adoption of command systems is expected to be especially relevant in the public sector because public employees are more intrinsically motivated. Weibel et al. (2010, 406) argue that we need a better understanding of the hidden costs of rewards and also about the hidden costs of command. One of these costs may be absence from work, and it is therefore highly relevant for future research to further investigate the direction of causality between the concepts and to find out how the perception of documentation requirements and other command systems is formed.

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NOTES

* Acknowledgements deleted for confidentiality reasons.

¹ Note that this direct effect is not the same as the disciplining effect we described in section 2.

² This does not preclude nonlinear functions of parameters in the covariance structure (Bollen 1989). A formal representation of the SEM is available online at <http://kora.dk> (correct URL will be added in published version).

³ Comparison to the more standard maximum likelihood estimates are given in section 6.

⁴ The assumption here is that the perception of documentation requirements as controlling is time constant over the entire year 2010.

⁵ With one degree of freedom and a test statistic of 110.0, we obtain a p-value < 0.001 and reject the null hypothesis of a one-factor model.

⁶ Item 2, “A large proportion of my work assignments are boring,” has a relatively low score in the Explorative Factor Analysis (see online appendix). If this item is deleted, the overall reliability increases. For example, Joreskog’s rho increases from 0.80 to 0.83. The item is nevertheless maintained in the model since reliability is high when it is included

and since it has an inverted sign, which we prefer to have included in any set of items.

The results of the paper are robust to exclusion of this item.

⁷ All items have been selected because they are expected to reflect a respondent's score on a given latent variable, for example, intrinsic motivation.

⁸ Initially, five items were included. The fifth item for perception of control was tested out as the overall fit indices increased significantly with the exclusion of this item.

⁹ We employ weighted least squares (WLS) where the weight is an estimate of the asymptotic covariance matrix derived without any distributional assumptions, often referred to as asymptotic distribution free (ADF) estimation method. This approach works well with relatively simple models as ours. Having a fairly large sample size, we find the distribution free approach more attractive. As a sensitivity check, we also estimate the model using ML and briefly discuss these results below.

¹⁰ This distinction between structural parameters and parameters from the measurement models is not strictly correct since the measurement model is part of the overall SEM.

¹¹ Note that the scales for intrinsic motivation and perception of documentation requirements as controlling are modeled so that high values respectively indicate controlling perception of documentation requirements and high intrinsic motivation.

¹² Their propensity to have small children is also low, but this study only uses own sickness absence so unless some child sick days are erroneously reported as own sick days, this should not matter. Since parents can stay home the first two days of a child

sickness period, this is not likely to play any important role. Generally, when the investigated public employees report in sick, the main rule is that wage compensation is being paid from day one. This means that the costs of reporting sick are very low compared to what it can be in other institutional contexts.

¹³ This number arises from $(-0.077)*(-0.181) = 0.014$. Given the insignificant direct effect, we re-estimated the model without this direct link in order to base the interpretation of parameter estimates on a more parsimonious model. These parameter estimates are given in Tables A3 and A4 in the appendix. Results generally change little (the indirect association increases from 0.014 to 0.016), and overall conclusions remain unaltered.

¹⁴ For some of the other explanatory variables, there is some difference, and such difference between the two sets of estimates in itself indicates that the distributional assumption might be violated.

¹⁵ For instance, Brewer (2010), among many others, reports results that may be hampered by common source problems.

¹⁶ Based on data previously applied in Andersen et al. (2012), we find that social/health care assistants do have a significantly lower level of intrinsic motivation than higher educated workers in the sample. This suggests that they consider their tasks relatively uninteresting.

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APPENDIX

Supplementary information about the survey

In order to ensure that the respondents had the correct understanding of the term “documentation,” an introductory text was included prior to the five-item battery for control.

The introductory text for social/healthcare assistants reads as follows:

Members of [union name] spend some time every day on documentation, for instance, about time used to carry out certain assignments (bathing, cleaning, and the like). Documentation can also be about writing down how the citizen feels.

The introductory text for childcare assistants reads as follows:

Members of [union name] spend some time every day on documentation, for instance, work-related documentation (e.g., childcare curriculum, environmental appraisal for children, and language tests).

Supplementary Tables and Figures

Figure A1 and Figure A2 about here

Table A1 about here

Table A2 about here

Table A3 about here

Table A4 about here