

Susanne Stensland Eggen

**Role Expectations and Rumors of Organizational Change as Potential Risk Factors for
Employee Mental Health**

A prospective study of role ambiguity, role conflict, rumors of organizational change and
mental distress

Master in Psychology

Specialization in Work and Organizational Psychology

(Trondheim, spring 2015)

Norwegian University of Science and Technology (NTNU)

Faculty of Social Sciences and Technology Management

Department of Psychology

Acknowledgements

First and foremost, I would like to thank the National Institute of Occupational Health, for letting me use the data material from “The New Workplace”, providing me with an office and making me feel very welcome at NIOH. My primary supervisor at NIOH, Jan Olav Christensen deserves especial thanks, for his motivation, time, patience and immense knowledge. He has supported and helped me throughout my thesis and repeatedly told me to “keep the faith”, as well as encouraged me to make my own choices, be confident in my writing, and thereby given me the room to develop as a researcher. Moreover, I would like to express my gratitude to my internal supervisor at NTNU, Per Øystein Saksvik, who has inspired me throughout the last two years, and provided with guidance and professional input on my thesis. Finally, I must thank my better half, Sondre, for his patience, our discussions and long conversations. I would not be where I am today without your love and support.

The original data material was collected by NIOH, as a part of the project “The New Workplace”. I created the research question and conducted all analyses, with helpful feedback from Jan Olav Christensen.

Abstract

The purpose of this study was to examine whether role expectations at baseline predicted self-estimated employee mental distress at follow-up, and whether rumors of organizational change mediated this potential relationship. Two types of role expectations were investigated; role ambiguity and role conflict. A total of 11689 Norwegian employees participated at baseline, and 4872 at follow-up, with an interval of two years between the measurements. Structural equation modeling was used to test the hypotheses of the study. The results suggest that role expectations have a short-term impact upon mental distress and rumors of organizational change, while rumors of organizational change were shown to predict mental distress cross-sectionally. Rumors of organizational change were found to partially mediate the relationship between role expectations and mental distress cross-sectionally. Convincing prospective effects of both role expectations on mental distress, and role conflict on rumors of organizational change were found, indicating that role expectations have a long-term influence on mental distress, and role conflict on change rumors when measured over a time period of two years. This knowledge provides a better basis for practical efforts to improve occupational health. Additionally, organizations can use this information to improve their work environment and to focus targeted interventions or changes. Further research is recommended to replicate this study, with the use of more measurements and alternative time intervals, and include individuals' cognitive appraisal as a moderator, as it may lead to different findings.

Keywords: mental distress, organizational change, rumors of organizational change, role ambiguity, role conflict, role expectations

Table of Contents

Introduction	1
The Purpose of this Study	2
Structure of Study	2
Theoretical Framework	4
Organizational Change	4
Rumors of Organizational Change	6
Factual and Rumored Change in relation to Factors at Work	7
Individual Appraisal of Work Stressors	9
Role Expectations	10
The Hypotheses and Models of this Study	14
Method	17
Design and Procedure	17
Ethics	17
Sample	18
Material	19
Independent Variables	20
Dependent Variable	21
Statistical Analyses	21
Confirmatory Factor Analysis	25
Results	28
Cross-sectional Analyses	28
Prospective Analyses	31
Discussion	35
Summary of Results	35
Main Findings	36
H1. The Influence of Role Expectations on Mental Distress	37
H2. The Influence of Role Expectations on Rumors of Organizational Change	38

H3. The Influence of Rumors of Organizational Change on Mental Distress	39
H4. Mediation by Rumors of Organizational Change.....	41
Methodological Considerations and Limitations	44
Implications and Possibilities for Further Research	49
Conclusions	51
References	55
Appendix A: Applied questions derived from “The New Workplace”.....	I
Appendix B: The overall structural models	II

List of Tables in Text

Table 1: Participation in relation to sex and age	18
Table 2: Goodness of fit for the measurement model	26
Table 3: Factor correlation matrix.....	27
Table 4: Goodness of fit indices of cross-sectional analyses	28
Table 5: Cross-sectional analyses of role ambiguity and role conflict.....	30
Table 6: Goodness of fit indices of prospective analyses	31
Table 7: Prospective analyses of role ambiguity and role conflict.....	33
Table 8: Summary of the indirect effects	34

List of Figures in Text

Figure 1: The hypothesized influence of role ambiguity/role conflict on mental distress.....	14
Figure 2: The hypothesized influence of role ambiguity/role conflict on rumors of organizational change.....	15
Figure 3: The hypothesized influence of rumors of organizational change on mental distress.....	16
Figure 4: The hypothesized mediation model.....	16

Introduction

As a result of economic, technological and global changes, the requirements for organizational change have increased considerably in recent years (Cummings & Worley, 2009). It is often a matter of continuous change processes rather than one specific and individual action. Organizational change occurs to a relatively high degree and can be considered common in Norway (Aagestad et al., 2011; Saksvik, 2011). A living condition survey conducted in 2006 reported that 51% of employees in the government sector had experienced a reorganization, which had affected their job situation during the last three years (Saksvik & Finne, 2009; Saksvik, 2011). The high prevalence of change in Norwegian firms is consistent with the widespreadness of organizational change among businesses in the rest of the world (see McShane & Von Glinow, 2014).

In order to become more cost efficient and to remain competitive in the market, organizations are implementing organizational change programs such as mergers and acquisitions, major reorganizations or restructurings, downsizing, layoffs, closures, the introduction of new top management teams and new strategic initiatives. These sorts of changes have become accepted features of work in modern occupational environments. However, change processes can be complicated both to implement and maintain. The literature shows that more than half of the changes implemented in the workplace, fail at some point during the process (Clegg & Walsh, 2004; Kramer, Dougherty, & Pierce, 2004). Nguyen and Kleiner (2003) concluded that 75-83% of organizations fail to reach target objectives. Unsuccessful changes may have unfortunate costs for both the organization and employees. For employees, organizational change can create feelings of insecurity, loss of control, job loss, reduced status, role ambiguity, interpersonal conflict at work and home, and threats to levels of self-esteem and psychological well-being (Holm & Hovland, 1999). Employees' reactions to the ongoing change have been reported as one of the main reasons many organizational change efforts do not work out as intended or desired (see Saksvik et al., 2007).

Although change processes can stimulate growth and development and introduce competitive advantages, research has shown that they can also have negative consequences for employees (Ferrie, Shipley, Marmot, Stansfeld, & Smith, 1998). Vahtera & Virtanen (2013) pointed out that there is a growing concern regarding the potential deleterious consequences of organizational change on employees' physical and psychological health. Although many changes may have positive long-term outcomes, the prevailing view in the literature seems to be that the change process itself engenders tensions and insecurities,

especially with regard to individuals' job future (Holm & Hovland, 1999; Saksvik, 2011). Eventually this may contribute to deteriorated mental health among employees.

Mental health problems constitute one of the leading causes of work disability worldwide, and may have negative consequences for the individual as well as the organization they work for (Harnois & Gabriel, 2000; Schaufeli & Kompier, 2001). Recent research has shown that the mere *anticipation* of major organizational change events can influence mental distress (Greubel & Kecklund, 2011). Thus, it may seem that future organizational changes, prior to any concrete actions or change events, may exert a considerable influence on mental health and well-being. Speculation and anticipation of changes that can affect the work situation is intimately connected with *rumors* of organizational change. Such rumors may be thought to arise from working conditions characterized by ambiguity and conflicting information – employees may be inclined to attempt to collectively “make sense of chaos” in order to be prepared and to minimize the psychological threat of not knowing what the future holds.

The Purpose of this Study

The objective of this study concerned whether employee self-reported mental health was associated with role expectations, and whether rumored organizational change mediated this potential relationship. Data from two measurement time points were utilized to explore temporal relationships in order to investigate effects over time. Two types of role expectations were taken into account; role ambiguity and role conflict. The overarching research question of the current study can therefore be formulated as follows; “*Do role ambiguity and role conflict affect employee mental distress, and if so, is this potential relationship (partially or fully) mediated by rumors of organizational change?*”

Structure of Study

In the following I will present the theoretical framework, where the concept of organizational change and rumors of organizational change in relation to mental distress will be introduced. Thereafter, the concept of role expectations will be reviewed through previous research, and put forth as a potential risk factor for employee mental health. The theoretical section ends with the hypotheses and models of the current study. Further are the methods reviewed and the results presented. The discussion addresses a summary of the result and the main findings, before they are compared to previous research. Methodological considerations

and limitations of the study will then be presented, before proceeding to implications, suggestions for further research and concluding remarks.

Theoretical Framework

Organizational Change

Most people depend on an income to make a living. Work is therefore of great importance, and for many the security of stable employment is of profound importance to quality of life. In an organization, employees may have the opportunity to develop self-confidence and personal growth through mastery (Knardahl, 2000). Many employees work hard to achieve specific positions in their organization, and their jobs may be central to their self-concept. They may invest time, resources and effort to achieve personal and organizational goals, which can result in a strong feeling of ownership, pride and commitment to their workplace (Knapp, Smith, & Sprinkle, 2014). Losing a job or a position can therefore be a profoundly unpleasant experience (Sverke, Hellgren, & Näswall, 2006). Downsizing, closure and restructuring are organizational changes that may threaten the status quo and may possibly result in fundamental changes to an employee's work situation (Sverke et al., 2006). Given the significance of work in people's lives this threat may be perceived as quite severe and fundamental (Holm & Hovland, 1999). Organizational changes may decrease predictability and be associated with ambiguity, fear and uncertainty (Dallner et al., 2000). If organizational changes are in fact characterized by an increased frequency of adverse feelings it seems plausible that adverse health may result. Past research has suggested that repeated exposure even to relatively minor stressors, or 'daily hassles', may influence the general regulation of hormonal systems that may influence both somatic and mental health (e.g. Sher, 2004). Thus depending on the *severity*, *frequency*, and *persistence* of adverse emotions, generalized anxiety and distress may result.

Consequences of organizational change have been investigated in a number of studies. Although many organizational changes are implemented with good intentions, which may have positive outcomes, several researchers have studied the adverse effects of change on employee mental health (see Vahtera & Virtanen, 2013). A review by Quinlan and Bohle (2009) showed that 85% of the studies that were investigated showed deteriorated occupational health and safety (OHS) outcomes, and only one study indicated a positive effect on OHS. The Whitehall II study was among the pioneering longitudinal research projects on health consequences of organizational change (Ferrie, Shipley, Marmot, Standfeld, & Smith, 1995, 1998). Research from this project has demonstrated that the mere *anticipation* of change was associated with adverse developments in self-reported morbidity and mental health among employees. Thus, the psychological content of a possible forthcoming change

process may be analytically separated from practical repercussions of actual implementation of change.

The Finnish Public Sector study is another example of a rare cohort study - in this study the same employees were followed from *before any rumors* of downsizing, *during* downsizing and *after* downsizing had occurred (Kivimäki, Vahtera, Pentti, & Ferrie, 2000). Several studies published from this cohort suggest that those continuing in employment were exposed to adverse health effects due to organizational change (Kivimäki et al., 2007; Vahtera et al., 2004). Among others, increased risk of mental health problems were associated with being exposed to major downsizing. Findings suggested that downsizing can affect working conditions in ways that may influence health, for instance by reducing job control and increasing work demands and job insecurity (Kivimäki et al., 2000). Job insecurity and threat of job loss have also been related to increased risk of psychological disorders, anxiety and depression in workplace closure studies (Iversen & Sabroe, 1988; Mattiasson, Lindgarde, & Theorell, 1990), while removal of this threat has been associated with reductions in psychological symptoms (Jenkins, MacDonald, Murray, & Strathdee, 1982). Vahtera and Virtanen (2013) have pointed out that longitudinal studies have revealed strong associations between organizational change and health outcomes. Yet associations between organizational change and mental distress have tended to be weaker in longitudinal studies than in cross-sectional studies. It should be noted that the majority of studies conducted within this field have been cross-sectional, thus, researchers have suggested a need for more longitudinal studies investigating the long-term effects of organizational change on employee mental health (see Bamberger et al., 2012, p. 592).

Typically, the larger and more extensive organizational changes have been shown to correlate with increases in employee mental distress (e.g. Greubel & Kecklund, 2011; Kivimäki, Vahtera, Ferrie, Hemingway, & Pentti, 2001a). Greubel and Kecklund (2011) divided different types and amounts of organizational changes into categories. The purpose was to investigate the impact of different kinds of organizational changes, as well as anticipation of such changes on the health of employees. The results showed that employees who anticipated or had experienced significant and extensive changes, such as downsizing or restructuring, reported signs of higher levels of mental distress (Greubel & Kecklund, 2011). Having experienced minor changes, such as relocation without having to move, was not associated with increased levels of mental distress.

In a systematic review of the “impact of organizational change on mental health” an association between organizational change and elevated risk of mental health problems were

found in 11 out of 17 studies (Bamberger et al., 2012). Studies from this review have suggested that the “survivors” of downsizing are not satisfied to simply still have a job. Instead they react with anger, fear, sadness, insecurity, diminished trust and job satisfaction, and increased job strain (Kivimaki et al., 2000). Other studies have reported downsizing and restructuring as predictors of depression, poor quality of sleep, anxiety, and emotional exhaustion (Brenner et al., 2014; Kivimäki et al., 2001a; Woodward et al., 1999).

Rumors of Organizational Change

Organizational change represents a topic of collective interest to most members of an organization. However, as this highly significant process regards events that have yet to take place, it is often characterized by limited or unclear information (DiFonzo & Bordia, 2007; Rosnow, 2001). In order to cope with uncertainty, individuals often participate in “collective sense-making” of situations perceived as ambiguous or threatening, and this often results in *rumor activity* (DiFonzo & Bordia, 2007; Rosnow, 1991). Ambiguous situations are those in which the meaning or significance of events is unclear, or in which the effect of events is not certain (DiFonzo & Bordia, 2007). Rumors surface as function of the core human motivation to *understand* and rumors are also a tool with which to manage threat and acquire a sense of control over one’s environment and to protect one’s self-image (DiFonzo & Bordia, 2007). Threatening situations are those in which people feel that their welfare or sense of self is in danger. When a company faces a possible change, such as downsizing, restructuring or closure, employees may perceive it as threatening for many reasons. For instance, to the extent that an organizational member is committed to and identifies with the organization, the possibility of change may be perceived as a threat to self-image.

Rumors are inevitable in organizational contexts and are a major source of information about a workplace, additionally they are known for the speed with which they transmit through the informal networks of an organization (Garnett, 1992; Harcourt, Richerson, & Wattier, 1991). Although collective problem-solving and verbal outlets for emotional tension are examples of positive functions of rumor activity, certain rumors may have an adverse impact on employees’ health (Allport & Postman, 1947; Shibutani, 1966). Research has shown that rumors with negative, fear-laden content are heard and passed on more often than those characterized by positive content (Walker & Blaine, 1991). Employees who anticipate an organizational change may participate in rumor activity or believe the content of destructive rumors circulating at the workplace. Instead of restricting or diminishing uncertainty, rumors that introduce and extrapolate the possibility of adverse future events may

increase rather than minimize uncertainty about working conditions (Rosnow, 1991). Such rumors may cause fear of being laid off, or lead employees to start questioning whether they are doing a well enough job, or if their position is essential and not at risk in case of downsizing. Since rumors can give misleading information, researchers have suggested that reliance on informal sources of information is likely to heighten the anxiety associated with a current situation (DiFonzo, Bordia, & Rosnow, 1994). Likewise, Terry and Callan (1997) showed that employees' reliance on informal sources of information concerned with a possible organizational change process was associated with higher levels of uncertainty and psychological distress.

Rumors are claimed to be especially rampant during times of organizational change (DiFonzo et al., 1994; Isabella, 1990). In organizational contexts rumors often preempt formal announcements by management, predicting the nature of the change or alleging dire consequences for employees (DiFonzo et al., 1994). The psychosocial work environment can have both positive and negative effects on employees (see Bowling & Beehr, 2006), however, if there are stressors in the workplace, work may induce psychological and physical strain (Knardahl, 2000). Rumors of organizational change may be a significant stressor, but little research has investigated this relationship directly. However, one recent study on workplace bullying showed that "rumors of changes in the workplace" were associated with employees' mental health functioning (Emdad, Alipour, Hagberg, & Jensen, 2013). Such rumors have been associated with higher levels of employee mental distress. The Whitehall II study (Ferrie et al., 1995, 1998), and a study conducted by Greubel and Kecklund (2011) suggested that threats to job security due to anticipation of major organizational changes were associated with employee mental distress already before a change process was implemented. Similarly, Swaen, Bültmann, Kant and van Amelsvoort (2004) found that after a closure threat those employees who did not perceive decreased job security had a lower relative risk of fatigue and mental distress than those who did perceive lowered job security. In an unclear organizational context putative future change may be especially threatening, since there may be more "psychological room" for rumination and catastrophizing, thereby creating especially fertile grounds for rumor activity.

Factual and Rumored Change in relation to Factors at Work

Organizational change is a broad concept that can involve a wide range of different strategies, actions, and consequences. Workers are increasingly confronted with frequent minor daily stressors related to changes in technology and workplace practices as well as the

major upheavals of mergers, downsizing, restructuring and closures (Bamberger et al., 2012). Typically, the term organizational change refers to planned, organization-wide change, as opposed to minor change initiatives (Saksvik et al., 2007). In this study, “change” includes downsizing, restructuring and closure. Employees may perceive such major organizational changes as unpleasant, as they may disrupt the stable and secure work situation by introducing new or changed job tasks and responsibilities, losing co-workers, or being exposed to layoffs.

Organizational change is an integral part of today's globalized work life. Change in the workplace can provide opportunities for organizational members to grow, however, in general, change processes make demands on both employees and management, regardless of the content of the change (Saksvik et al., 2007). Organizational change can have both positive and negative effects on the psychosocial work environment (Arbeidstilsynet, 2013). Change can lead to learning and personal development, more varied and interesting work tasks, increased responsibility, influence and self-determination and secure future employment opportunities. Unfortunately, adverse outcomes related to insecurity and fear often dominates employees' perception of change (Arbeidstilsynet, 2013). One of the reasons why change may have an adverse effect could be that they often lead to unpredictable environments and situations (see Dallner et al., 2000). Major change processes have been shown to increase workers levels of insecurity regarding their future position and employment (Ferrie, Shipley, Newman, Stansfeld, & Marmot, 2005; Holm & Hovland, 1999; Kivimäki et al., 2000). Insecurity or the anticipation of severe changes and job loss, in turn, have shown to be a health risk of a wide range of conditions, amongst others mental distress (Dekker & Schaufeli, 1995; Holm & Hovland, 1999). In such situations employees might doubt their own knowledge or start to question who they can trust. Changes may also lead to increased job demands and competition between co-workers, or decreased social support at work (Bamberger et al., 2012; Kivimäki et al., 2000; Saksvik et al., 2007). It may cause increased pressure to perform well in order to convince management that they are valuable resources to the firm. Poor communication can result in misunderstandings, which may affect people's attitudes toward their co-workers, leaders and possible future change processes. Additionally, change processes have shown to be perceived as strain in cases where employees are relocated, or must let go of safe and stable routines and well-known work tasks (see Saksvik & Hetland, 2009). Some workers may also react with resistance based on past experiences,

and spread their thoughts and attitudes to other employees (Cunningham et al., 2002; Saksvik & Hetland, 2009).

Studies have indicated that the psychosocial work environment is often affected by organizational change (e.g. Kivimäki, Vahtera, Elovainio, Pentti, & Virtanen, 2003). Increased job demands and insecurity and lowered control at the individual level, as well as reduced role clarity and changes in relations with or opportunities for social support, are all potential effects of going through change processes. This may, in turn, lead to increased levels of distress and affect the individual health of employees, the attainment of change goals and, ultimately, the organization's productivity (Saksvik et al., 2007). This relation between organizational changes and psychological/social work factors may also apply to rumors of organizational change. This in turn would indicate that speculations or rumors of organizational change also influence psychological/social work factors. The increased uncertainty regarding job future or the direction of organizational change has been suggested to be a principal cause of employee mental distress (Bordia, Hunt, Paulsen, Tourish, & DiFonzo, 2004). Recent research has proposed that organizational change acts as a stressor through the individual's negative appraisal of the changes (Pahkin, Väänänen, Koskinen, Bergom, & Kouvonen, 2011).

Individual Appraisal of Work Stressors

In order to gain understanding of employees' reactions and adjustment to work stressors it is necessary to not only consider the event characteristics, but also workers' individual appraisal of the event (Beehr & Newman, 1978). Selye (1976) has claimed that from the employees' perspective, organizational change, as a stressor can be perceived as threatening, and thereby evoke increased levels of distress. Lazarus and Folkman (1984) have pointed out that the anticipation of an unpleasant or threatening event (e.g. organizational change) represents an equally important source of anxiety and distress as the actual event. This traditional assumption is known as *cognitive appraisal*, and involves the process where an employee evaluates whether a particular encounter with the environment is relevant to his or her well-being, and if so, in what way (Lazarus & Folkman, 1984).

Cognitive appraisal theory distinguishes between primary and secondary appraisals. *Primarily* appraisal arises when an employee is exposed to a stressor for the first time, such as rumors of organizational change, and includes the assessment of whether the event is perceived as harmful, threatening, challenging or a potential benefit. *Secondary* appraisal involves the evaluation of how to cope or deal with the situation, such as expectations of

outcome, control and self-efficacy. Various coping strategies are evaluated, such as changing the situation, accepting it, seeking more information, or holding back from acting impulsively (Lazarus & Folkman, 1984). Whereas certain coping strategies are considered as adaptive as they have shown to improve functioning, other strategies are considered maladaptive as they are associated with maintained or increased levels of distress (Zeidner & Saklofske, 1996). Both primary and secondary appraisal interact with each other and shape individuals cognitive evaluation of a situation, and thus, they also shape employees' psychological and physical reactions to psychological/social work factors. Thereby, the impact of how employees appraise the work stressor investigated in the current study becomes important for the indication of deteriorated employee mental health.

Role Expectations

Individuals in complex organizations are constantly exposed to a variety of expectations from both themselves and others as they carry out their organizational roles (Keller, 1975). Organizational roles can be thought of as the set of expectations regarding actions and behaviors related to the particular position an employee possesses in the workplace. Such roles are related to social norms and can be considered rules for how employees should carry out their work and behave in social situations (Haukedal, 2010). Although role expectations may seem to refer to various job tasks, the literature distinguishes between job tasks and roles with the latter being the set of expected behaviors engaged in while performing the job tasks (Ilgen & Hollenbeck, 1991). Role behaviors, therefore, can include expectations not necessarily defined in terms of specific or formally defined job tasks.

Research regarding role expectations usually refers to three distinct concepts; role conflict, role ambiguity and role overload (Kahn, Wolfe, Quinn, Snoek, & Rosenthal, 1964; Beehr, Walsh, & Taber, 1976). *Role conflict* occurs when two or more expectations are incompatible. Three types of role conflict are frequently referred to: *intrasender* conflict, occurs when an employee is exposed to conflicting messages from one person, *intersender* conflict, refers to conflicting messages from two or more persons, and *interrole* conflicts, occurs when a person has two or more conflicting roles (Kahn et al., 1964). *Role ambiguity* refers to a situation where role expectations are unclear or unknown. It may occur when an employee does not know what is expected and is unsure of the job content and the methods available to achieve job goals. Information may be inadequate or confusing about functions that should be carried out or about what success criteria are important in the organization, i.e. evaluation ambiguity (Dallner et al., 2000).

Kahn et al. (1964) divides role ambiguity into task- and socio-emotional ambiguity. Task ambiguity is described as a lack of information with regard to job demands, how areas of responsibility shall be fulfilled, and uncertainty regarding the role senders. If employees receive conflicting messages from two different managers at the same level, uncertainty with regard to which expectations one should prioritize may occur. Socio-emotional ambiguity is described, as personal concerns about the consequences of one's own actions. Actions to achieve one's personal goals, actions in role set and actions carried out for the organization as a whole are included in this category (Kahn et al., 1964). *Role overload* arises when expectations for the role exceed the individual's capabilities, and may be associated with an excess of functions or difficult functions (Dallner et al., 2000).

Mental health consequences due to role expectations. Role expectations or “role stress” in the workplace can have adverse health effects (Kahn et al., 1964). Work stressors can be perceived as threats to the status quo, and may cause feelings of fear with regard to future employment. An overload of such stressors may affect employees' mental health negatively (Kahn et al., 1964). Role expectations such as role conflict and role ambiguity may be stressors associated with employee mental distress, in addition to other work related stressors such as rumors of organizational change. Further, employee mental health may be predicted by these possible relationships. Previous research has found a correlation between role conflict and poor mental health on one side, and a relationship between role clarity and good mental health on the other side (Kelloway & Barling, 1991).

Research involving role expectations has culminated in three meta-analytic reviews (Abramis, 1994; Fisher & Gitelson, 1983; Jackson & Schuler, 1985). The general conclusion of these reviews has been that role ambiguity and role conflict tend to be associated with negatively valued states such as tension, anxiety and low job satisfaction. Fisher and Gitelson (1983) and Jackson and Schuler (1985) found support for that role ambiguity and role conflict were associated with tension and anxiety. In the first study, both role ambiguity ($r = 0.19$) and role conflict ($r = 0.28$) were weakly correlated with anxiety (Fisher & Gitelson, 1983). In the second study, role ambiguity ($r = 0.47$) and role conflict ($r = 0.43$) were quite strongly correlated with anxiety (Jackson & Schuler, 1985).

Warr (1987) distinguish between context-free and context-specific mental health. Context-free mental health is a global construct, which is not tied to a particular context or setting. Whereas context-specific mental health refers to job-related mental health, such as the indices which reflect affective well-being and subjective competence in the workplace (Warr, 1987, p. 40). Individual perceptions of psychosocial work factors lay the foundation for job

satisfaction and well-being. These context-specific reactions can also predict employees' overall mental health (Jackson, Turner, & Brief, 1987). Based on Warr's (1987) classification of mental health Kelloway and Barling (1991) conducted a cross-sectional study in which they examined the relationship between role expectations and mental health. The results showed that context-free mental health correlated positively with role ambiguity ($r = 0.35$) and negatively with role conflict ($r = -0.24$). Positive mental health among employees was thus associated with low levels of role conflict and high role clarity.

In a recent study conducted at the Norwegian National Institute of Occupational Health (NIOH) a broad set of specific psychological and social work factors were studied as predictors of potentially clinically relevant mental distress (anxiety and depression), i.e. "caseness" level of distress (Finne, Christensen, & Knardahl, 2014). In this study role conflict was reported to be the most consistent risk factor associated with mental distress. Likewise, other recent studies have reported that employees who face high levels of role conflict at work are more likely to subsequently report mental distress, thereby placing them at higher risk of mental health disorder and reduced productivity (Johannessen, Tynes, & Sterud, 2013). Johannessen et al. (2013) reported role conflict and emotional demands to be "the most important and most consistent risk factors" for psychological distress. Problematic levels of distress were 53% more likely for workers reporting role conflict and 38% more likely for those facing high emotional demands. Role conflict has also been reported as a risk factor among nurses' aides (Eriksen, Tambs, & Knardahl, 2006), but has not been studied as a risk factor in any prospective studies of the general working population.

Role ambiguity and role conflict have been referred to as a "hindrances", because such stressors can potentially threaten personal development and goal attainment, and thereby evoke negative emotions and distress (Cavanaugh, Boswell, Roehling, & Boudreau, 2000; Podsakoff, LePine, & LePine, 2007). According to Kahn et al. (1964), ambiguous role expectations are conducive of dissatisfaction with the job in general and feelings of futility, in addition to be associated with tension, anxiety and fear. Similarly, Colligan and Higgins (2006) claimed that depression and anxiety may be psychological consequences of occupational stressors, amongst others role ambiguity and role conflict.

Role ambiguity and role conflict have also been shown to be associated with job insecurity and threat of job loss (Safaria, Othman, & Wahab, 2011). Insecurity in organizational contexts often results from low predictability regarding responsibilities and job future (Kahn et al., 1964). For employees to feel job security in the workplace, predictability and clear directions for how their job should be performed are considered to be very

important (Rizzo, House, & Lirtzmann, 1970). Role expectations can lead to feelings of uncertainty and fear with regard to employees' position, responsibilities and job future, which may further lead to anxiety and apprehension about their role in the workplace (Goksoy, 2012; Safaria et al., 2011). For instance, job insecurity has been shown to be related to increased psychological disorder, anxiety and depression (Iversen & Sabroe, 1988; Mattiasson et al., 1990).

If employees experience role conflict, role ambiguity and low predictability regarding their job tasks, responsibilities, or work future, it may cause threat of job loss or feelings of uncertainty (Kahn et al., 1964). In fear of losing a position or job, employees might anticipate threatening consequences, such as organizational changes. Since situations perceived as ambiguous or threatening often result in rumor activity, role ambiguity may cause speculations and rumors of downsizing, restructuring or closure. Additionally, organizational rumors can be a coping strategy to handle insecure and threatening situations. Thus, it is plausible that employees, who are exposed to work environments where role conflicts and role ambiguity often occur, tend to create rumors responding to the threats they may perceive that a work situation represents. In these cases role conflict and role ambiguity may lead to rumors of organizational change, which may further influence employee mental distress. With this in mind, the next section will explain the hypotheses and models of the study.

The Hypotheses and Models of this Study

It should now be clear why there is a value in investigating the relationship between role expectations, rumors of organizational change, and their effect on mental distress. Based on the theoretical framework that has been presented, the following seven hypotheses will be investigated both cross-sectionally and longitudinally:

H1.1. Role ambiguity is associated with higher levels of mental distress.

H1.2. Role conflict is associated with higher levels of mental distress.

H2.1. Role ambiguity is associated with rumors of organizational change.

H2.2. Role conflict is associated with rumors of organizational change.

H3. Rumors of organizational change are associated with higher levels of mental distress.

H4.1. The effect of role ambiguity on mental distress is mediated by rumors of organizational change.

H4.2. The effect of role conflict on mental distress is mediated by rumors of organizational change.

In order for the issue proposed by the study to be relevant and applicable, it was assumed that role ambiguity and role conflict influences employee mental distress. To establish the connection between the concepts, the associations of role conflict and role ambiguity with mental distress were first investigated cross-sectionally at the first wave of the study (T1). Then the longitudinal association was assessed with the predictors from T1 with mental distress at T2, whilst controlling for mental distress at T1. In other words, the effect of T1 work factors on T2 health *independent* of prior health was estimated. Another way to interpret this is as influence of T1 factors on the *development* of health during the follow-up period. Figure 1 to 4 gives an overview of the hypothesized *prospective* models.

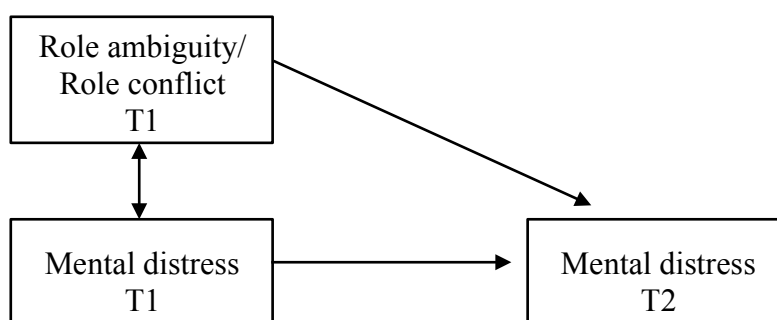


Figure 1. The hypothesized influence of role ambiguity/role conflict on mental distress.

Rumors of organizational change were hypothesized to mediate the relationship between role ambiguity/role conflict and mental distress (H4.1. and H4.2.). A mediation effect is thought to explain *why* an outcome occurs by accounting for parts of the relationship between the independent and dependent variable (Hayes, 2013). In order to investigate a mediation effect, three conditions had to be met (Baron & Kenny, 1986). First, role ambiguity/role conflict had to significantly be associated with employee mental distress, as hypothesized in H1.1 and H1.2. Second, role ambiguity/role conflict had to significantly be associated with rumors of organizational change (H2.1. and H2.2.). Ideally, this relationship would be temporal, i.e. rumors should be measured after role expectations and before mental distress. However, in a two-wave design one has to analyze the mediator at the same time as either the independent or the dependent variable. In the current study it seems plausible that the time period needed for rumors to affect health would be greater than the time period needed for existing working conditions to nourish the emergence of rumor activity. And third, that rumors of organizational change had to be significantly associated with employee mental distress, where it was hypothesized that high levels of rumors of organizational change would cause higher levels of mental distress (H3). The hypothesized mediation model is shown in Figure 4. The pathway from role ambiguity/role conflict to mental distress describes the direct effect, whilst the pathway from role ambiguity/role conflict through rumors of organizational change on mental distress describes the indirect effect (Hayes, 2013).

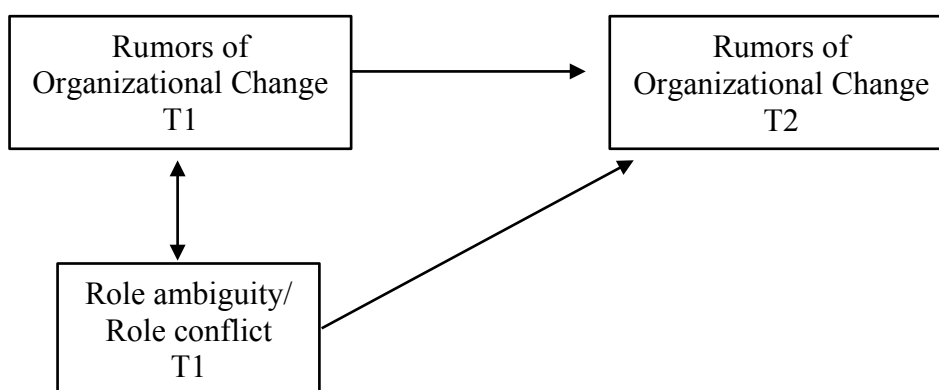


Figure 2. The hypothesized influence of role ambiguity/role conflict on rumors of organizational change.

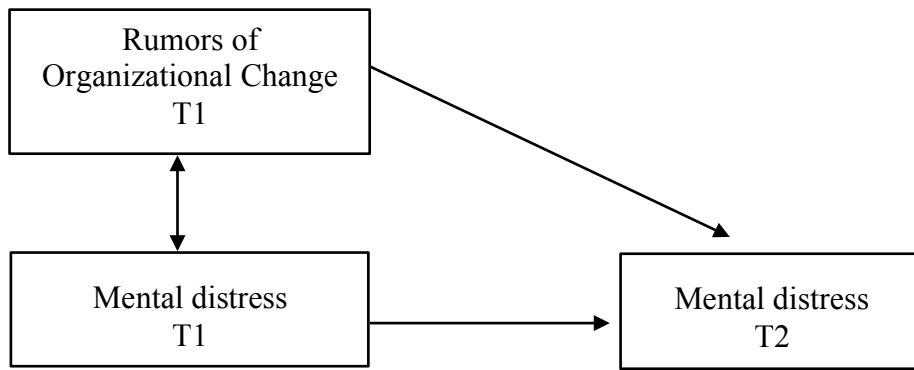


Figure 3. The hypothesized influence of rumors of organizational change on mental distress.

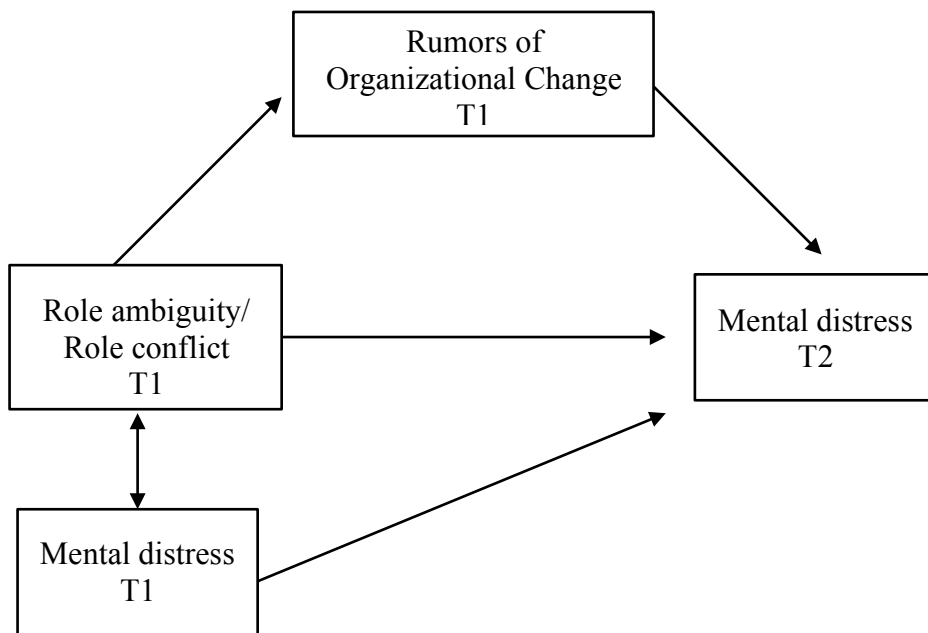


Figure 4. Hypothesized mediation model.

Method

Design and Procedure

The data material used in this study was a part of the project “The New Workplace” (Norwegian: “Den Nye Arbeidsplassen”) conducted by the National Institute of Occupational Health (NIOH) in Norway and the International Research Institute of Stavanger (IRIS). This is an ongoing two-wave prospective study, with a project period from 2003 to 2015. The purpose of the study was to increase new knowledge about work related factors that affect health and participation in the workplace through repeated measures of health and working conditions (NIOH, 2008). After an agreement with NIOH I was granted access to the data material from “The New Workplace”.

The sample was recruited at the organizational level. Information about the study was given to all employees and managers, and letters with general information concerning the aim of the study was then sent out to the participants. These letters also contained a personal access code to a web-based questionnaire. The questionnaire was electronically administered on the web page www.nyarbeidsplass.org, where the respondents signed in with their own username and password. Employees with limited access to computers at work were given the option of completing a paper version of the questionnaire. An agreement was made with the workplaces, and employees were allowed to answer the questionnaire during working hours. They had two to three weeks to answer and return the survey. Participants were asked to answer the same questionnaire after approximately two years.

Ethics

The project was approved by the Data Inspectorate of Norway and the Regional Committees for Medical and Health Research Ethics (REC). Respondents were guaranteed full anonymity and confidentiality and this was explicitly expressed in order to assuage any fears employees may have had about volunteering potentially sensitive information. Due to anonymity and private policy, it was provided that at least ten individuals in each specific department had to respond to the survey in order to store reports on both departments and the organization as a whole. Prior to answering the questionnaire, participants had to give their active, informed consent to provide personal information. The participants were also provided with information about what the data would be used for, purpose of the study, voluntary participation and anonymity. Responses and personal information were kept physically separate after the responses were emitted. Reports that were sent back to the companies were anonymized.

Sample

Subjects were recruited from a variety of occupations in Norway. A total of 98 businesses, both public and private sector, and 31776 employees were asked to participate in the survey. For the current prospective analyses, only workers invited at both time 1 (T1) and time 2 (T2) were eligible. And thus 14397 employees were invited and eligible. Baseline data in this sample were collected between 2004 and 2010, and follow-up data were collected between 2006 and 2013. The participants' sex and age were determined from their social security number.

Respondents eligible for the cross-sectional analyses had to be invited at T1, while the prospective analyses included those invited at both T1 and T2. In order to describe the sample used in the preliminary cross-sectional analyses, a criterion of having answered all the questions applied in this study at T1 was made. Thus, the cross-sectional sample comprised all employees that responded at T1, whether or not they, or their companies, were also invited to participate at T2. This left an effective sample size of 11689 employees, with a response rate of approximately 44%. Furthermore, the criterion of having answered all questions applied in this study at both T1 and T2 was made in order to define the sample used in the prospective analyses. This sample consisted of 4872 participants, constituting a response rate of 34%. This sample consisted of 46.4% males and 53.6% females. Age was categorized into five groups, with fewest respondents in the youngest (<30) and oldest age groups (>60) (M=44.1, SD=10.0, min= 19, max= 69). The distributions of sex and age were similar for the cross-sectional and prospective samples. Frequencies of sex and age are presented in Table 1.

Table 1

Participation in relation to sex and age (with participants obtained from only T1, and participants obtained from both T1 and T2) N (%)

		Invited T1	Participated T1	Invited T1T2	Participated T1T2
N		26338	11689	14397	4872
Sex	Male	11782 (44.7)	5320 (45.5)	6197 (43)	2259 (46.4)
	Female	13996 (53.1)	6369 (54.5)	8200 (57)	2613 (53.6)
Age	<30	3475 (13.2)	1227 (10.5)	1439 (10)	379 (7.8)
	30-39	6704 (25.5)	3212 (27.5)	3635 (25.2)	1291 (26.5)
	40-49	7360 (27.9)	3673 (31.4)	4455 (26.7)	1645 (33.8)
	50-59	6025 (22.9)	2730 (23.4)	3844 (26.7)	1261 (25.9)
	60<	2243 (8.5)	847 (7.2)	1024 (7.1)	269 (6.1)

Note. N = total number of invited/participating employees.

Material

All questions applied in this study were obtained from the questionnaire used in the project “The New Workplace”. The survey consisted of 213 questions, with additional sub-questions. The survey included questions on work organization, organizational change, psychological and social factors at work, personality, attitudes towards work, physical activity, mastery of work, working ability, smoking, alcohol use, mental health and health complaints. Organizations that participated in the survey supplied additional information about the employees, such as sex, age, address, department and classification of occupation. Questions were constructed by NIOH’s own employees, as well as derived from measurement scales such as the General Questionnaire for Psychological and Social factors at work (QPS Nordic)(Skogstad et al., 2001), and Hopkins symptom checklist-10 (HSCL-10) (Derogatis, Lipman, Rickels, Uhlenhuth, & Covi, 1974 in Syed, Zachrisson, Dalgard, Dalen, & Ahlberg, 2008). QPS Nordic and the HSCL-10 will be briefly presented as several questions used in this study were derived from them.

QPS Nordic. The QPS Nordic was designed for the assessment of a wide range of psychological, social and organizational factors in the workplace (Skogstad et al., 2001). It covers aspects of a working life that is rapidly changing, such as predictability in work and preferences for challenges. The different themes were chosen based on their relevance to work, health, well-being and motivation (Skogstad et al., 2001). The questionnaire measures factors on task-, individual- and organizational level. A validation study of QPS Nordic was conducted in 2000 (Dallner et al., 2000), comparing data from four Nordic countries collected from different sectors. The first data collection examined the conceptual structure and scale reliability. Exploratory factor analyses were performed on each level in order to reduce the number of items. Internal consistencies and reliabilities of different scales were then examined by test-retest. Structural equation modeling was used to examine construct validity. All scales met the expectations set by the conceptual structure and theory-relevant terms (Dallner et al., 2000). Criterion validity was assessed through relationships with individual outcomes, such as job commitment and distress, measured by self-report, indicating the predictive power of the scales used in QPS Nordic.

HSCL-10. The HSCL is a well-known and widely used self-administrated instrument designed to measure mental distress in population surveys (Derogatis et al., 1974). The instrument has been used since the 1950’s, and several studies have considered it to be both valid and reliable (Rickles, Garcia, Lipman, Derogatis, & Fischer, 1976), with a Chronbach’s alpha value of 0.86 (Syed et al., 2008) and 0.88 (Strand, Dalgard, Tambs, & Rognerud, 2003).

There are several versions of the questionnaire, with 90-, 58-, 35-, 25-, 10-, or 5-item versions (Søgaard, Bjelland, Tell, & Røysamb, 2003). A comparison of the HSCL-25, HSCL-10, and HSCL-5 has suggested that the shorter versions perform almost as well as the full version (Strand et al., 2003). The HSCL-10 consists of 10 items, where the first four are intended to measure anxiety, while the remaining are intended to measure depression (Syed et al., 2008). It is important to emphasize that HSCL-10 is not a measure of clinical diagnosis, but intended to measure psychological distress in a non-patient population.

Independent Variables

A selection of questions from “The New Workplace” was of interest to the current study. The variables used were; role ambiguity, role conflict, rumors of organizational change and mental distress. A brief presentation of these variables follows.

Role ambiguity. The QPS Nordic questions covering role clarity were: “Have clear, planned goals and objectives been defined for your job?”, “Do you know what your responsibilities are?”, and “Do you know exactly what is expected of you at work?” (Dallner et al., 2000, p. 76). Items measured frequency of occurrence with the following optional answers: 1=“very seldom or never”, 2=“somewhat seldom”, 3=“sometimes”, 4=“somewhat often” and 5=“very often or always” (Dallner et al., 2000). The items were reversed coded in SPSS so that they represented role ambiguity instead of role clarity. A high score on these questions would indicate that the employee experienced role ambiguity to a high degree. Cronbach’s α in the current study sample was .81.

Role conflict. Role conflict (QPS) was measured by using a scale consisting of questions about conflict between demands and resources, conflicting requests and conflicts between subject’s expectations and external demands (Dallner et al., 2000, p.77). The three questions covering role conflict were: “Do you have to do things that you feel should be done differently?”, “Are you given assignments without adequate resources to complete them?”, and “Do you receive incompatible requests from two or more people?”. Items measured frequency of occurrence with the following optional answers: 1=“very seldom or never”, 2=“somewhat seldom”, 3=“sometimes”, 4=“somewhat often” and 5=“very often or always” (Dallner et al., 2000). A high score on these questions indicated that the employee experienced role conflict to a high degree. Cronbach’s α in the current study sample was .71.

Rumors of organizational change. Rumors of organizational change were measured using multiple items from NIOH’s own questionnaire “The New Workplace”. It was directed toward employees’ experience of talking about the possibility of future changes at the

workplace. The question wording was: “How often the last 12 months have you and your colleagues talked about the possibility of changes in the organization?”, with five statements following; “possible downsizing”, “possible restructuring”, “possible closure”, “possible merger or acquisition” and “possible outsourcing”. The items were rated on a five point likert scale from “very seldom or never” to “very often or daily” (own translation from Norwegian). The rumors of organizational change questions were reduced from five to three items through assessments based on the relevance for the current study, including rumors of possible downsizing, restructuring and closure. Cronbach’s α in the current study sample was .70 at both T1 and T2.

Dependent Variable

Mental distress. Exposure to mental distress was measured using HSCL- 10, a shortened version of the Hopkins Symptom Checklist. The HSCL-10 consists of 10 items on a four-point scale, ranging from “1=not at all” to “4=extremely”. The main question was: “Have you experienced any of this in the last week (and even today)?” (own translation from Norwegian). Examples of items were: “feeling tense or keyed up” and “feeling hopeless about the future”. A high score would indicate poor mental health. Cronbach’s α in the current study sample was .76 at T1 and .88 at T2.

Statistical Analyses

Data was prepared using SPSS version 21, and Analysis of Moment Structure (AMOS) version 22 was used when conducting the structural equation modeling analyses. A prospective longitudinal design was used, meaning that the variables were followed forward in time (Skog, 2004). Structural equation modeling (SEM) was chosen as the method for testing the different hypotheses, as it offers several advantages. First, SEM provides a good statistical tool to investigate *latent* variables with multiple indicators (Holmbeck, 1997). The constructs that were investigated in the current study are latent in the sense that they cannot be directly measured, but rather have to be inferred from the variance that a set of observed indicators have in common. By only extracting the part of the variance that is relevant, measurement errors are controlled for, which should attenuate the problem of underestimation of effects. Structural equation modeling is also helpful in aiding model formulation by including a visual representation of the model, ensuring that all relevant paths can be included and tested (Baron & Kanny, 1986). Additionally, SEM makes it possible to assess overall model fit and evaluate whether the specified causal and non-causal relationships among

variables adequately account for the observed covariances among the selected variables (Savalei & Bentler, 2010).

The estimation technique applied in all analyses was maximum likelihood estimation (MLE). MLE is considered a robust and efficient technique for estimating the coefficients of SEM models (Hair, Black, Babin, & Anderson, 2010). The results of the analyses were considered significant if they had a p-value of $<.01$, indicating that if no substantive association existed between two variables, the observed association would have less than one per cent probability of occurring (by chance). All analyses adjusted for sex and age, and these control variables and all independent variables were assessed at T1. When conducting prospective analyses, the independent variable “rumors of organisational change” (T1), and the outcome variable “mental distress” (T1) were also adjusted for. Following recommended practice in longitudinal SEM, all models included measurement error covariances across time (see Appendix B), based on the assumption that errors of repeated measures co-vary (Burkholder & Harlow, 2003; Kline, 2005).

Analysis of mediation effect. A mediation effect, also known as an indirect effect, is an indication of the reduction in the regression coefficient of Y on X_1 , when the effect of X_2 is controlled for (Baron & Kenny, 1986). Mediation analyses provide a multivariate framework for testing hypotheses about chains of casual relationships among multiple variables (MacKinnon, 2008). As mentioned, three conditions had to be met in order to run the mediation analyses in the current study (Baron & Kenny, 1986). The first one was investigated in H1 (H1.1 and H2.2), where the independent variable (role ambiguity/role conflict) had to have an effect on the dependent variable (mental distress). The second was that the mediator variable (rumors of organizational change) had to be influenced by the independent variable (role ambiguity/role conflict), as examined in H2.1 and H2.2. Lastly, the mediation variable (rumors of organizational change) had to influence the dependent variable (mental distress), and this relationship was investigated in H3. The three conditions were assessed in each sub-hypothesis, before the mediation analyses were conducted. The possible role of rumors of organizational change as mediator of the effects of role ambiguity/role conflict on mental distress was examined in H4.1 and H4.2. The product of the direct path from the independent variable (role ambiguity/role conflict) to the mediator (rumors of organizational change) and the direct path from the mediator to the dependent variable (mental distress) was calculated to obtain a measure of strength of the indirect effect. Because this product term is not normally distributed (see Cheung & Lau, 2008, p. 300), the BC bootstrap method was utilized to obtain confidence intervals for the mediation effect.

In order to assess whether the mediation effects were statistically significant, a 95% bias corrected confidence intervals based on 2.500 bootstrap samples were obtained, as recommended by Cheung & Lau (2008). Bootstrapping is a non-parametric method based on resampling the data many times with replacement to generate an empirical estimate of the entire sampling distribution of a statistic. It is particularly useful when the statistics do not have known distributions, or when distribution assumptions have been violated (recommended for SEM as an approach to dealing with data that are multivariate non-normal) (Cheung & Lau, 2008).

A significant mediation effect would be indicated if the bootstrap confidence interval of the indirect effect did not cross zero, i.e. the indirect effect is most likely different from zero (Hair et al., 2010). Full mediation would be indicated if the relationship between the independent and the dependent variables was reduced to zero when the mediator variable was included in the analysis (Hair et al., 2010). Partial mediation would be indicated if the independent variable was reduced but remained significant when the mediator variable was included as an additional predictor in the model (Hair et al., 2010). Complete mediation by a single mediator is rare within psychological research, as most processes are inherently multifactorial, and multiple mediating factors are likely to play a part in the relationship under investigation (Maxwell, Cole, & Mitchell, 2011).

Assumptions. Data screening was performed in both SPSS and Amos prior to the SEM analyses, in order to ensure that relevant assumptions needed for running SEM were fulfilled. The following assumptions were checked because all the tests conducted in this study were parametric (Field, 2009).

Missing data. A listwise deletion was conducted to handle all missing data. Implementation of listwise deletion was used so that all cases having missing values at any of the variables in the data were excluded from all computation. As a consequence, the final sample to be used in the analyses only included cases with complete records. The disadvantage of this approach is the loss of information resulting from the reduced sample size (Byrne, 2013). However, the total amount of missing data among responders was only 3.59%, meaning that the majority of those who responded to at least one of the relevant items also responded to the rest of the relevant items. Since the sample size was considered large, the amount of missing data was considered negligible, and under such circumstances listwise deletion is likely to be appropriate (see Byrne, 2013, p. 355).

Outliers. Outliers represent cases whose scores are substantially different from all the others in a particular set of data (Kline, 2005). In order to locate possible outliers box plots for

all the variables were separately examined in SPSS. All items except sex and age were measured on likert scales with four or five categories, thus *extreme* outliers do not really appear (Gaskin, 2012). The outcome variable, mental distress, was the only factor showing outliers, as the majority of respondents were skewed towards the right end of the scale. This result was expected as most employees in today's worklife have good and not poor mental health. The observed outliers were not removed from the sample as they were considered important for the SEM analyses and not an issue in the current study.

Normality. Normality was assessed by examining the skewness and kurtosis for all the variables included in the study (distribution of the data). Most variables met the critical ratio of skewness between 2.1 and -2.1, and kurtosis between 7.1 and -7.1, as recommended by West, Finch and Curran (1995). The only exceptions were found in the outcome variable mental distress; item 1 "sudden fear without reason" and item 2 "do you feel afraid or anxious" (own translation from Norwegian) (see Appendix B for overall structural model). Both items showed significant skewness or/and kurtosis and thereby indicated non-normality (see West et al., 1995). Since maximum likelihood estimation (MLE) require multivariate normality, the results from the SEM analyses were controlled by examining all models with the use of *asymptotically distribution-free* (ADF) estimation, which adjust its results for the degree of kurtosis in the data (Byrne, 2013). The results from the ADF estimation showed similar correlations as in the SEM analyses conducted with the use of MLE, and therefor the occurrence of non-normality was not considered an issue in the current study.

Linearity. In order to assess linearity of the relationships between the independent variables and mental distress, a "deviation from linearity"-test was performed. This test was obtained by performing an analysis of variance (ANOVA) test, comparing the means of the independent variables (role ambiguity, role conflict and rumors of organizational change) with the dependent variable (mental distress). Statistically significant results indicate a deviation from the assumption of a linear relationship between two variables. According to the ANOVA table all relationships were significantly linear, as the deviation of linearity was far above the threshold ($p > .05$) (Gaskin, 2012), thus fulfilling the assumption of linearity.

Multicollinearity. Linear regression in SPSS was used to investigate Multicollinearity. Multicollinearity occurs when any single predictor variable is highly correlated with a set of other predictor variables (Hair et al., 2010). The presence of high correlations between the independent variables could cause methodological issues. For instance, important explanatory power could be lost, and difficulties determining which variable that was important could occur (Field, 2009). The multicollinearity between the independent variables; role ambiguity,

role conflict and rumors of organizational change were examined. The variable inflation factor (VIF) was under 2.00, which indicated that the variables were not multicollinear (see O'Brien, 2007).

Homoscedasticity. Homoscedasticity would indicate that the residuals (errors) at each level of the predictor variables had similar variance (Field, 2009). This assumption was examined in SPSS by using scatterplots of zPred and zResid on the relevant variables. All of the plots resulted in consistent patterns, where the variables residuals exhibited consistent residual variance across different levels of the variables, demonstrating homoscedasticity.

Confirmatory Factor Analysis

A confirmatory factor analysis (CFA) was conducted in Amos in order to check construct validity, that is, the extent to which the measured items actually reflected the theoretical latent construct they were designed to measure.

Model fit. The results from the CFA showed a good model fit for all the independent variables (analysis not shown); Role ambiguity: CFI=1.000, RMSEA=.433; Role conflict: CFI=1.000, RMSEA=.603; Rumors of organizational change: CFI=1.000, RMSEA=.362, therefore no further improvements were necessary. The dependent variable, mental distress, showed a weaker model fit (CFI=.896, RMSEA=.109), thus modification indices were investigated in order to see whether improvements upon the model fit could be made. Some of the mental distress items were allowed to co-vary as they were indicators of the same factor, and made theoretical sense (Syed et al., 2008). Two of them asked about anxiety, while the other two were concerned with depression (Syed et al., 2008). By allowing these error terms to co-vary the model fit was significantly improved (CFI=.965, RMSEA=.067). The model was fixed as little as possible, as it is recommended to not improve the original data material more than necessary in order to achieve a good fit (Gerbing & Anderson, 1984). Table 2 displays a summary of the model fit for the measurement model. The chi-square test was significant, which indicates suboptimal fit. However, the chi-square test is well known to be sensitive to sample size, meaning that even slight discrepancies between observed and implied data patterns will result in a statistically significant test in a large sample (Bearden, Sharma, & Teel, 1982). Additionally, the root mean square error of approximation (RMSEA), is according to Hu and Bentler (1999), indicative of a good fit when it is $<.05$, which it was in this case (RMSEA=0.33). The comparative fit index (CFI) was .957, which also indicated a good model fit (Hu & Bentler, 1999).

Table 2

<i>Goodness of Fit for the Measurement Model</i>	
Metric	Observed value
χ^2 (df)	3127.699 (493)
<i>p</i>	<.000
CFI	.957
RMSEA	.033
PCLOSE	1.00

Validity and reliability. The variables discriminant validity was established through the comparison of the square root average variance extracted analysis (AVE), that is, the proportion of the total variance in all indicators of a construct accounted for by the construct (see Fornell & Larcker, 1981), and the inter-factor correlations. Discriminant validity is the extent to which a construct is truly distinct from other constructs (Hair et al., 2010). If the estimated correlations of the factors that underlie sets of indicators that are supposed to measure different constructs are not excessively high, then there is evidence for discriminant validity (Kline, 2005). The discriminant validity was good for most of the factors, as the square root of the AVEs were greater than the inter-factor correlations (Hair et al., 2010). The only exception was ROCT1-ROCT2 and MDT1-MDT2, but this result was expected as these variables were measured by the exact same items and thus would easily correlate with each other.

Reliability was calculated through the composite reliability (CR) scores. All factors had high composite reliability scores (>.70) (Hair et al., 2010), indicating good reliability.

Convergent validity of the factors was checked through the AVE. A threshold value of >.5 would indicate acceptable convergent validity (Hair et al., 2010). None of the factors except age had an AVE above .5, which indicated that they did not have sufficient convergent validity. Despite the fact that the AVE values indicated weak convergent validity, this test can be considered conservative and a “strict measure of convergent validity” (Malhotra & Dash, 2011, p.702). Thus, with the high CR scores it was acceptable to move on and conduct the SEM analyses. Table 3 shows a summary of the validity and reliability of the latent constructs.

Table 3

Factor Correlation Matrix with Composite Reliability (CR), Average variance extracted (AVE), and the Square root of the AVE on the diagonal

	CR	AVE	RAT1	RCT1	ROCT1	MDT1	ROCT2	MDT2	Sex	Age
RAT1	.733	.239	.489							
RCT1	.829	.232	.387	.482						
ROCT1	.855	.028	.160	.387	.168					
MDT1	.884	.024	.257	.308	.201	.155				
ROCT2	.805	.036	.099	.240	.522	.134	.191			
MDT2	.881	.027	.219	.264	.129	.703	.157	.166		
Sex	.990	.062	-.114	-.132	-.067	.088	-.058	.092	.249	
Age	.989	12.7	.109	.203	-.030	.008	.069	.032	-.033	113.1

Note. CR = Composite reliability; AVE = Average variance extracted; Square root AVE = **bolded** and the inter-factor correlations are below.

Common method bias. *Harman's single-factor* test was used to investigate common method bias in the measurement model. This test was used to see whether the majority of the variance in the measurement model could be explained by a single factor. If the extracted model were to explain more than 50% of the variance, common method bias would be assumed (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). The extraction method in use was principal axis factoring, with extracted factors constrained to one. The total variance explained was 22.2%, which indicated that common method bias was not present.

Results

Cross-sectional Analyses

Table 4 displays the model fit indices for cross-sectional models obtained from the total baseline sample, including employees invited only at T1 who were not eligible for prospective analyses. Based on the recommendations of Vandenberg and Lance (2000), the metrics used were Tucker-Lewis Index (TLI), Comparative fit index (CFI), and Root-mean-square error of approximation (RMSEA) to evaluate fit of individual models. The model fit refers to how well a proposed model accounts for the correlations between variables in the dataset (Byrne, 2013). According to Hu and Bentler (1999) CFI-values have been advised to be $>.90$ or close to $.95$ to be considered representative of a well-fitting model. TLI -values close to $.95$ for large samples was indicative of a good fit (Hu & Bentler, 1999). RMSEA-values less than $.06$ indicates a good fit, values as high as $.08$ represents a mediocre fit, while values over $.10$ represents a poor fit between the hypothesized models and the observed data (Hu & Bentler, 1999). All models exhibited good to excellent fit (Table 5) - all CFIs were above 0.95 (range 0.953 - 0.985) and all RMSEAs were below 0.005 (range 0.038 - 0.049). TLIs were above 0.95 (range 0.942 - 0.974).

Table 4

Goodness of Fit Indices of the Preliminary Cross-sectional Analyses including all participants, also those not invited at T2 (N=11689). Models tested Direct and Indirect Effects of Role Ambiguity (RA) and Role Conflict (RC) on Mental Distress (MD) through Rumors of Organizational Change (ROC)

Models		X^2	(df)	CFI	TLI	RMSEA
<i>Role ambiguity</i>						
Model 1, Direct effect	RA→MD	2405.5	(83)	.960	.950	.049
Model 2, Effect on mediator	RA→ROC	330.3	(16)	.985	.974	.041
Model 3, Effect of mediator	ROC→MD	2409.7	(83)	.954	.942	.049
Model 4, Mediation	RA→ROC→MD	2957.7	(126)	.957	.948	.044
<i>Role conflict</i>						
Model 1, Direct effect	RC→MD	2362.4	(83)	.956	.944	.048
Model 2, Effect on mediator	RC→ROC	284.0	(16)	.981	.967	.038
Model 3, Effect of mediator	ROC→MD	2409.7	(83)	.954	.942	.049
Model 4, Mediation	RC→ROC→MD	2886.4	(126)	.953	.943	.043

Note. $X^2(df)$ = Degrees of freedom, CFI = Comparative fit index, TLI = Tucker-Lewis Index, RMSEA = Root-mean-square error of approximation.

Role ambiguity. Table 5 presents the effect estimates from the cross-sectional analyses of role ambiguity, rumors of organizational change and mental distress. It displays both unstandardized (B) and standardized (beta; β) effect estimates. The results showed that all effects were statistically significant, with p -values $<.001$. The beta-values indicated positive associations between all factors in the structural model. The strongest effect estimate was observed for the direct effect of role ambiguity on mental distress ($\beta=.267$). In comparison, the beta-values for the effect of role ambiguity on rumors of organizational change was $\beta=.130$ and for the effect of rumors of organizational change on mental distress was $\beta=.177$. Even though the effect strengths may be considered moderate to low, the results indicated that role ambiguity and rumors of organizational change had a negative impact on employee mental distress.

All effects remained statistically significant in mediation model 4, with somewhat lower effect strengths than in model 1, 2 and 3. The regression effect of RAT1 on MDT1 (Mediation model 4) was slightly reduced ($\beta=.247$) when ROCT1 was included in the model. Table 8 displays the estimated indirect effect of RAT1 on MDT1 through ROC ($\beta=.018$). The 95% BC confidence intervals for the indirect effect were between .014 and .023, with a p -value $<.001$ for two-tailed significant test. Thus, a partial mediation effect through ROCT1 on MDT1 was indicated.

Role conflict. The results from the cross-sectional analyses of role conflict, rumors of organizational change and mental distress are also presented in Table 5. The results showed that all effects were statistically significant ($p<.001$). Model 1 ($\beta=.348$) and model 2 ($\beta=.341$) showed stronger effects than model 3 ($\beta=.177$). All beta-values indicated moderate to low positive effects, suggesting that both role conflict and rumors of organizational change had an influence on mental distress at T1. All regression paths in Mediation model 4 were statistically significant, with lower beta-values than in model 1, 2 and 3. The direct effect of RCT1 on MDT1 was reduced ($\beta=.322$) when ROCT1 was included as an additional predictor. Table 8 display the estimated indirect effect of RCT1 on MDT1 through ROCT1 ($\beta=.024$). The 95% BC confidence intervals for the indirect effect were between .016 and .032, with a p -value $<.001$ for two-tailed significant test. Thus, a partial mediation effect was indicated.

Table 5

Cross-sectional Analyses with Unstandardized, Standardized Effect Estimates of Structural Equation Models including all participants, also those not invited at T2 (N=11689). Models tested Direct and Indirect Effects of Role Ambiguity (RA) and Role Conflict (RC) on Mental Distress (MD) through Rumors of Organizational Change (ROC)

Models		<i>B</i>	β	<i>p</i>
<i>Role ambiguity</i>				
Model 1, Direct effect	RAT1→MDT1	.050	.267	<.001
Model 2, Effect of mediator	RAT1→ROCT1	.171	.130	<.001
Model 3, Effect of mediator	ROCT1→MDT1	.054	.177	<.001
Model 4, Mediation	RAT1→MDT1	.046	.247	<.001
	RAT1→ROCT1	.165	.125	<.001
	ROCT1→MDT1	.021	.146	<.001
<i>Role conflict</i>				
Model 1, Direct effect	RCT1→MDT1	.067	.348	<.001
Model 2, Effect of mediator	RCT1→ROCT1	.459	.341	<.001
Model 3, Effect of mediator	ROCT1→MDT1	.054	.177	<.001
Model 4, Mediation	RCT1→MDT1	.067	.322	<.001
	RCT1→ROCT1	.427	.321	<.001
	ROCT1→MDT1	.011	.075	<.001

Note. N = total number of respondents used in the analysis.

RA = Role ambiguity; RC = Role conflict; MD = Mental distress; ROC = Rumors of Organizational Change; → = Regression coefficient (independent → dependent)

All models were adjusted for sex and age.

Prospective Analyses

Table 6 displays model fit indices for the prospective models, including employees that were invited and responded at both T1 and T2. All models exhibited good to excellent fit - all CFIs were above 0.95 (range 0.952-0.987) and all RMSEAs were below 0.05 (range 0.030-0.041). TLIs were above 0.95 (range 0.945-0.980).

Table 6

Goodness of Fit Indices of the Prospective Analyses including all participants invited at both T1 and T2 (N=4872). Models tested Direct and Indirect Effects of Role Ambiguity (RA) and Role Conflict (RC) on Mental distress (MD) through Rumors of Organizational Change (ROC)

Models		X^2	(df)	CFI	TLI	RMSEA
Role ambiguity						
Model 5, Direct effect	RA→MD	2435.3	(260)	.956	.950	.041
Model 6, Effect on mediator	RA→ROC	194.3	(35)	.987	.980	.031
Model 7, Effect of mediator	ROC→MD	2448.2	(260)	.953	.945	.041
Model 8, Mediation	RA→ROC→MD	2782.2	(333)	.953	.947	.039
Role conflict						
Model 5, Direct effect	RC→MD	2434.7	(260)	.954	.947	.041
Model 6, Effect on mediator	RC→ROC	202.9	(37)	.984	.976	.030
Model 7, Effect of mediator	ROC→MD	2448.2	(260)	.953	.945	.041
Model 8, Mediation	RC→ROC→MD	2930.5	(333)	.952	.945	.038

Note. X^2 (df) = Degrees of freedom, CFI = Comparative fit index, TLI = Tucker-Lewis Index, RMSEA = Root-mean-square error of approximation.

Role ambiguity. Table 7 displays effect estimates from prospective analyses of role ambiguity, rumors of organizational change and mental distress. Apart from autoregressions (i.e. the T2 variables regressed on themselves at T2), the only statistically significant prospective effect was the effect of role ambiguity T1 on mental distress T2. As evidenced by model 5 there was a statistically significant positive, but weak, relationship between RAT1 and MDT2 after adjusting for the association of RA and MD at T1 ($p < .001$; $\beta = .044$). RA was cross-sectionally associated with ROC at T1 and ROC was associated with MD at T1, but no prospective relationship was observed beyond these baseline relationship – that is, T1

exposures could not explain additional variance in T2 outcomes beyond the already established correlation at T1. High levels of role ambiguity were associated with high levels of mental distress. As shown in model 6, RAT1 and ROCT2 were also positively related, but not significant ($p=.818$; $\beta=.004$). ROCT1 and MDT2 (as shown in model 7) were negatively correlated and not significant ($p=.613$; $\beta=-.007$). Mediation model 8 showed that the direct path from RAT1 to MDT2 remained significant and unchanged once ROCT1 was included in the model as an additional predictor. These variables were negatively correlated and not significant ($p=.910$; $\beta=-.002$). Table 8 displays the estimated indirect effect of ROCT1 on MDT2 ($\beta=.000$). The 95% BC confidence intervals for the indirect effect were between $-.006$ and $.005$, with a p -value $.874$ for two-tailed significant test. Thus, the results gave no reason to assume that rumors of organizational change affected employee mental distress across a time period of two years, and consequently nor that the effect of role ambiguity on subsequent mental distress was mediated by rumors of organizational change.

Role conflict. Table 7 also displays the prospective analyses of role conflict, rumors of organizational change and mental distress. Model 5 and 6 exhibited statistically significant ($p<.01$) effects, indicating that high levels of role conflict were associated with increased levels of mental distress, and that high levels of role conflict at T1 were in fact associated with subsequently rumors of organizational change at T2 two years later. However, as already indicated by the analyses with role ambiguity, ROC was not associated with later mental distress (Model 7), so no mediation effect was observed. Table 8 displays the estimated indirect effect of RCT1 on MDT2 through ROCT1 ($\beta=-.009$). The 95% BC confidence intervals for the indirect effect were between $-.023$ and $.003$, with a p -value of $.164$ for two-tailed significant test. Hence, although a longitudinal effect of role conflict on both mental distress and rumors of organizational change were indicated, no mediation by rumors of organizational change was indicated.

Table 7

Prospective Analyses with Unstandardized, Standardized Effect Estimates of Structural Equation Models including participants from both T1 and T2 (N=4872). Models tested Direct and Indirect Effects of Role Ambiguity (RA) and Role Conflict (RC) on Mental Distress (MD) through Rumors of Organizational Change (ROC)

Models		B	β	Covariances	Correlations	p
<i>Role ambiguity</i>						
Model 5	RAT1→MDT2	.025	.044			<.001
Direct effect	MDT1→MDT2	.715	.689			<.001
	RAT1↔MDT1			.071	.257	<.001
Model 6	RAT1→ROCT2	.005	.004			.818
Effect on mediator	ROCT1→ROCT2	.557	.522			<.001
	ROCT1↔RAT1			.097	.159	<.001
Model 7	ROCT1→MDT2	-.008	-.007			.613
Effect of mediator	MDT1→MDT2	.728	.702			<.001
	ROCT1↔MDT1			.031	.200	<.001
Model 8	RAT1→MDT2	.025	.044			.002
Mediation	RAT1→ROCT1	.212	.178			<.001
	ROCT1→MDT2	-.001	-.002			.910
	MDT1→MDT2	.715	.689			<.001
	RAT1↔MDT1			.072	.261	<.001
<i>Role conflict</i>						
Model 5	RCT1→MDT2	.033	.056			<.001
Direct effect	MDT1→MDT2	.708	.682			<.001
	RCT1↔MDT1			.083	.308	<.001
Model 6	RCT1→ROCT2	.075	.055			.006
Effect on mediator	ROCT1→ROCT2	.528	.496			<.001
	ROCT1↔RCT1			.233	.384	<.001
Model 7	ROCT1→MDT2	-.008	-.007			.613
Effect of mediator	MDT1→MDT2	.728	.702			<.001
	ROCT1↔MDT1			.031	.200	<.001
Model 8	RCT1→MDT2	.038	.065			<.001
Mediation	RCT1→ROCT1	.474	.393			<.001
	ROCT1→MDT2	-.012	-.024			.143
	MDT1→MDT2	.709	.683			<.001
	RCT1↔MDT1			.086	.317	<.001

Note. RA = Role ambiguity; RC = Role conflict; MD = Mental distress; ROC = Rumors of Organizational Change; → = Regression coefficient (independent → dependent); ↔ = Covariance/Correlation. All models were adjusted for sex and age.

Table 8

Results of the Standardized Indirect Effect Test on Mental distress (MD) through Rumors of Organizational Change (ROC), based on Bootstrap Bias-corrected 95% Intervals

Models		β	Lower (BC)	Upper (BC)	<i>p</i>
<i>Role ambiguity</i>					
Model 4	RAT1→ROCT1→MDT1	.018	.014	.023	<.001
Model 8	RAT1→ROCT1→MDT2	.000	-.006	.005	.874
<i>Role conflict</i>					
Model 4	RCT1→ROCT1→MDT1	.024	.016	.032	<.001
Model 8	RCT1→ROCT1→MDT2	-.009	-.023	.003	.164

Note. β = standardized indirect effect.

Discussion

The objective of this study was to investigate whether and how role ambiguity and role conflict may affect mental distress, and whether rumors of organizational change played a role in these potential relationships. The use of data material derived from the ongoing prospective project “The New Workplace” made it possible to conduct analyses both cross-sectionally and prospectively. And thus, provided the opportunity to investigate potential direct and indirect effects over time. The next paragraphs present a summary of the results and the main findings of the study. Thereafter, the results of the different hypotheses, what they might imply, and how they relate to previous research, are discussed more closely in four sections; (a) the influence of role expectations on mental distress, (b) the influence of role expectations on rumors of organizational change, (c) the influence of rumors of organizational change on mental distress, and (d) mediation by rumors of organizational change. Following this, methodological considerations and implications, along with suggestions for further research, will then be addressed, before some concluding remarks.

Summary of Results

H1. Role ambiguity/Role conflict is associated with higher levels of mental distress. The results from the cross-sectional and the prospective analyses gave support to H1.1 and H1.2, suggesting that high levels of role ambiguity and role conflict may influence mental distress both in the short term (at T1) and over time (T1 → T2). However, as usually observed in follow-up studies that adjust for the initial level of the outcome, the cross-sectional associations were considerably stronger for both of the role expectation variables while the prospective associations were rather weak. This may indicate that the effect of role ambiguity and role conflict on mental distress is executed mainly in the short term.

H2. Role ambiguity/Role conflict is associated with rumors of organizational change. The findings also indicated that role ambiguity and role conflict were significantly associated with rumors of organizational change when assessed cross-sectionally, which gave support to H2.1 and H2.2. However, the results from the prospective analyses only supported H2.2 (role conflict → rumors of organizational change), and not H2.1 (role ambiguity → rumors of organizational change), thus H2 received partial support. This suggests that over time, employees in an environment characterized by conflicting roles are more prone to rumor activity regarding organizational change, whilst role ambiguity did not seem to have this impact.

H3. Rumors of organizational change are associated with higher levels of mental distress. H3 also received partial support. The results indicated that high levels of rumors of organizational change were related to high levels of mental distress in the cross-sectional analyses (at T1), but not in the prospective analyses (T1 → T2).

H4. The effect of role ambiguity/role conflict on mental distress is mediated by rumors of organizational change. Rumors of organizational change were found to partially mediate the relationship between role ambiguity/role conflict and mental distress in the cross-sectional analyses. The hypothesized indirect paths were found to be significant based on the bootstrap 95% bias-corrected confidence interval (Hayes, 2013). The results indicated that some of the adverse impact of role expectations on employee mental distress could be explained as role expectations might lead to increased levels of rumors of organizational change, thus supporting H4.1 and H4.2. However, no mediation effects were found when the same hypotheses were investigated prospectively, hence H4 received partial support.

Main Findings

The findings from the current study indicated that role ambiguity and role conflict have a short-term impact on rumors of organizational change and employee mental health. The results therefore support previous findings, in that an overload of role expectations can have adverse mental health effects, and increase employees' experience of anxiety and depression (Finne et al., 2014; Goksoy, 2012; Safaria et al., 2011). Moreover, rumors of organizational change were shown to predict mental distress cross-sectionally, indicating that not only concrete change events, but also the anticipation of an organizational change may represent an important source of employee mental distress (Greubel & Kecklund, 2011; Lazarus & Folkman, 1984). Additionally, partial mediation effects of rumors of organizational change on the relationship between both of the role stressors and employee mental distress were found when investigated cross-sectionally. However, cross-sectional designs are limited by the fact that they are carried out at one time point and give no indication of the sequence of events - whether exposure occurred *before*, *during* or *after* the onset of the mental health outcome. Thus, there was no basis to imply causality based on the cross-sectional results. Yet, by considering the limitations of the data, it seems reasonable to recommend future research to look into this field, for instance, with more measurements and alternative time intervals. Although the mediation hypotheses were not supported when investigated prospectively, it is important to emphasize the observation of convincing prospective effects of both role ambiguity and role conflict on mental distress, and role

conflict on rumors of organizational change. These findings indicated that role expectations have a long-term influence on mental distress, and role conflict on change rumors when measured over a time period of two years.

H1. The Influence of Role Expectations on Mental Distress

There are several theories concerned with role theory, but this study focused on the constructs of role ambiguity and role conflict as originally introduced by Kahn et al. (1964). The increased amount of restructuring, downsizing and closure processes in today's working life expose employees to layoffs, changed positions, new co-workers and work tasks, as well as increased demands and expectations (Karp, 2014). Organizational roles tend to guide expected behavior and may provide consistency and stability in the encounter with such extensive change processes, and in that way organizations are likely to remain intact (Ilgen & Hollenbeck, 1991). However, in a work life characterized by complex environments, the boundaries between occupations and departments can be ambiguous. In such environments the employees might not always get clear directions of what their position involves, and thus, they might experience insecurity and conflicting demands (see Safaria et al., 2011; Turbé & Collins, 2000). Since organizations are role-systems that depend on the interaction of members within the system (Turbé & Collins, 2000), high levels of role ambiguity and role conflict could be expected to have adverse consequences on both rumors of organizational change, and individuals' mental health. Hence, investigating how role expectations affect employees has become more important.

The results from the cross-sectional and the prospective analyses indicated that employees who experienced high levels of role expectations (both role ambiguity and role conflict) at T1 also experienced high levels of mental distress at both T1 and T2, when controlling for sex, age (and mental distress T1 in the prospective analyses). These findings correspond with previous research, in that an overload of role expectations has been shown to correlate with negatively valued states, such as anxiety, insecurity, tension and low job satisfaction (Finne et al., 2014; Fisher & Gitelson, 1983; Jackson & Schuler, 1985; Safaria et al., 2011). If the employees' in this study experienced role ambiguity or role conflict as an immediate threat to their work situation or self-concept, increased levels of mental distress may have occurred, indicating an acute effect. In line with prior studies, conflicting demands, insecurity and low predictability can have caused feelings of futility, loss of control, struggle to master work and reach one's personal and organizational goals (Cavanaugh et al., 2000; Podsakoff et al., 2007). However, this adverse mental health effect may have been reduced

with time if the workers got more defined roles, if the respondents no longer perceived the role stressors as threatening or harmful, or if the role expectations naturally faded away.

Nevertheless, it is important to keep in mind that the longitudinal effect of role expectations on mental distress in this study adjusted for the association between these variables at the first measure point. This implies that what was being estimated was the effect of role expectations on the change in mental distress between T1 and T2. If the effect of role expectations had already occurred on T1, this longitudinal effect would be severely attenuated.

Moreover, it is impossible to know if two years is a relevant time lag. Currently there is little research concerned with the “right” length of time lags when conducting occupational health research (Taris & Kompier, 2006). If one year is a more appropriate time lag (see de Lange, 2005), the prospective associations in the current study could have been underestimated. In summary, this means that a robust (cross-sectional and prospective) association between role expectations and mental distress was observed, but due to the relatively weak prospective association the question of *causality* is less convincingly accounted for. However, causality can never be confidently claimed in an observational study (de Lange, 2005).

H2. The Influence of Role Expectations on Rumors of Organizational Change

I was not able to find any previous studies investigating the association between role expectations and employees’ speculations or anticipation of organizational change. However, prior research has indicated that high levels of role expectations can have a negative impact upon work stressors (see Jackson & Schuler, 1985), and “rumors of organizational change” is an example of a possible stressor. Organizational rumors usually occur when there’s lack of information or if the meaning and significance of an important event is perceived as ambiguous. Additionally, rumor activity can be seen as a coping strategy to handle threatening and unclear situations (DiFonzo & Bordia, 2007), for example those created by increased levels of role ambiguity or role conflict.

In a workplace characterized by low role ambiguity (or high role clarity) employees are likely to be aware of their responsibilities, and thus organizing and performing expected work tasks might become easier. However, undefined or ambiguous roles can create insecurity and frustration (Kahn et al., 1964; Safaria et al., 2011). Likewise, the experience of conflicting demands from co-workers or supervisors (intra conflict) can result in strain and insecurity, which further may arise conflict between colleagues (Rizzo et al., 1970). Thereby,

the cross-sectional results from the current study might indicate that the employees who experienced high levels of role expectation also felt uncertainty and fear with regard to their future employment. In order to cope with uncertainty in an unclear organizational context workers may have participated in rumor activity with the desire to understand, protect their own self-image and manage threats by collectively making sense of the intimidating situation (e.g. putative organizational change).

The result from the direct structural path in the prospective analyses (role ambiguity/role conflict → rumors of organizational change) is possibly due to the potential influence of role expectations on rumors of organizational change not having a lasting effect (or a weak one on RCT1 → ROCT2), which faded away with time. For example, if rumors appeared one year after the initial exposure at T1, they could have resolved before the second measurement the following year. Similarly, role ambiguity may not have had an effect on rumors over a time period of two years if the ambiguity was temporary and disappeared within a short time. Employees who lack information regarding their work roles might have confronted their supervisor or management, or perhaps management has noticed the need for more clearly defined roles within a specific department. Thus, if the rumor activity resulted from high levels of role ambiguity, the rumors might have faded away as employees became more aware of their own and their co-workers organizational roles. Further, this may have resulted in non-existent rumors when the employees responded to the follow-up measure (at T2). This is an inherent challenge for any prospective study in which the length of time from putative exposure to outcome is unknown.

H3. The Influence of Rumors of Organizational Change on Mental Distress

The strain caused by rumors of organizational change may depend upon whether it was perceived as threatening or challenging (see Lazarus & Folkman, 1984), and partly depend upon the content of the change rumor (see Greubler & Kecklund, 2011). Although change processes including new work tasks, new positions or changing department may be perceived as less threatening in that they often just lead to minor changes, downsizing, closure and restructuring have been considered extensive, in the matter that they can have a negative impact on employees' future work situation and their mental health (Greubler & Kecklund, 2011). Quinlan and Bohle (2009) argued that the majority of organizational changes have an adverse effect on OHS outcomes, which may also indicate that workers' anticipation of a possible change process can cause the same adverse mental health effects.

In general the association between organizational change and mental distress have tended to be stronger in cross-sectional studies (Vahtera & Virtanen, 2013), however previous longitudinal research have revealed significant associations, and demonstrated that employee's mere anticipation of organizational change can cause adverse self-reported mental health (Ferrie et al., 1995, 1998; Kivimäki et al., 2000). The cross-sectional result from H3 is consistent with prior research, suggesting that instant exposure to negative and fear-laden rumors, concerned with extensive change, may evoke increased levels of anxiety and depression, as they can indicate a serious threat to employees' status quo and future employment (Greubler & Kecklund, 2011). Organizational rumors spread fast, especially those with a negative content (Walker & Blaine, 1991; Garnett, 1992; Harcourt et al., 1991), and thus the change rumors might have caused acute fear and insecurity, resulting in increased levels of employee mental distress. However, this adverse effect caused by rumor activity concerned with extensive changes does not necessarily last for a long period of time.

The prospective result from H3 suggests that putative organizational change does not have an effect on employees' mental health over a time period of two years, and thus, do not support The Whitehall II study (Ferrie et al., 1995) or The Finnish Public Sector study (Kiwimäki et al., 2000). However this prospective finding is in line with the meta-analysis conducted by Bamberger et al. (2012), where 11 of 17 studies showed an association between organizational change and an increased level of mental health problems, with a less provident association in the longitudinal studies. This result might be explained by an observed acute short-term effect on mental distress during the time of the rumor activity, which later disappeared or was normalized over time.

According to Rosnow and Fine (1976) rumors may fade away naturally if circumstances change and the rumor content becomes irrelevant. For example, a rumor concerned with downsizing on a specific department within the next six months is likely to cease once the deadline passes and no change has been made. At that point, the rumor may simply be modified, along with a new deadline and suspected reason for the delay, but the employees who participate in the rumor activity will probably recognize that the story is unreliable or they might grow weary of it (see Kimmel, 2013, p. 107).

Kimmel (2013) argued that employees most likely lose interest rather quickly in an unchanging story. Organizational change rumors that have been in circulation for some time are likely to dissipate when the "rumor public" grows tiresome of the "old" information, unless new details are forthcoming or a different audience becomes susceptible to the rumor spread. In addition, to irrelevance and dissipation, organizational rumors may disappear when

they are forcefully and effectively denied by a credible source. For instance, if management has confirmed an existing rumor concerned with an upcoming restructuring process, employees might have had the time to adapt or cope with the situation. Or, management might have disconfirmed a rumor concerned with a possible downsizing process, thus insecure employees might have stopped anticipating threatening consequences. Based on the above, the organizational change rumors in the current study may have been confirmed, disconfirmed or naturally faded away within a short period of time. Hence, the rumors may have disappeared before the follow-up measure was conducted (between T1 → T2), resulting in no prospective association between rumors of organizational change and mental distress.

As mentioned, it is important to keep in mind that the timing of the follow-up period cannot automatically be assumed to be optimal. This study tested associations with a two-year follow-up period, which is a time lag that has been considered appropriate in order to determine relationships between psychosocial work exposure and individual outcomes (Zapf, Dormann & Frese, 1996). However, recent research has suggested that such relationships vary over time (e.g. Ford et al., 2014).

The survey question concerned with “rumors of organizational change” was retrospective, in that it asked about how often an employee had talked about possible organizational changes with his or her colleagues the last 12 months. Thus, it could have been up to one year since the rumor activity occurred in the cross-sectional analyses, and up to three years in the prospective analyses. Not knowing the time period of the rumor activity and the way in which the employees coped with the change rumors becomes a central limitation in this study. Alternative time lags might be more appropriate when testing the associations between role expectations, rumors of organizational change and mental distress. Rumors of organizational change may arouse tension and anxiety in the short term and prospective effects may occur with a time lag shorter than two years. Hence, although the current prospective analyses may not support the hypothesis, absence of evidence is not evidence of absence. The fact that an association exists at T1 must not be overlooked, although causal interpretation is not truly viable.

H4. Mediation by Rumors of Organizational Change

Although partial mediation occurred in the cross-sectional analyses for both role ambiguity and role conflict, no mediation effects were found when the same hypotheses were investigated prospectively. The lack of support in the prospective mediation hypotheses (H4.1 and H4.2) was probably due to the fact that the influence of role expectations on mental

distress was quite weak in the prospective mediation analyses (RA/RCT1→MDT2). Additionally, the influence of role expectations on rumors of organizational change was relatively small or insignificant (ROCT1→MDT2). These low beta-values could be caused by other factors, in addition to the adjusting of mental distress at the first measure point. Role ambiguity and role conflict do most likely have an effect on several other variables in the psychosocial work environment in addition to rumors of organizational change, thus, the adverse affect of role expectations on mental distress might have been divided among them, and thereby been explained through several other variables. The small decrease in the relationship between role expectations and mental distress due to increased levels of rumors of organizational change might actually not be that small, compared to how small the relationship was to begin with. The current study conducted *simple mediation* models, which have been claimed as the most basic way of investigating mediation as it “greatly oversimplifies the complex dynamics” (Hayes, 2013, p. 88) of how and whether a predictor influences an outcome in real life. Increased levels of employee mental distress that may be due to role expectations are most likely to be recognized through multiple mediators, and increased levels of rumors of organizational change were only described as one potential possibility of explaining this relationship. In addition, Taris and Kompier (2006) argued that indirect associations are strongly underestimated when estimated with two-wave prospective data, and suggested that three-wave data would be more appropriate for determining indirect effects.

The healthy worker effect. Another explanation for the discrepancy between the cross-sectional and longitudinal results, and the in general low beta-values, could be that the employees who experienced high levels of mental distress had left work, were on sick leave or did not have the energy to participate in the survey (i.e. a selection bias known as the “healthy worker effect”). *The healthy worker effect* addresses the issue that workers who experience severe illness are likely to stop working, either as they are trying to find a new workplace better suited for them, being removed by redundancy programs, or quit due to disability pensions (Quinland & Bohle, 2009). A similar effect may occur when a worker quit his or her job because he or she feels that certain factors makes it unpleasant or difficult to be working full time. Hence, the remaining sample to be used in the current study may have consisted of a particular robust and healthy group of workers, and thereby disguised negative effects and limited the range of mental health outcomes. Employees who experienced severe mental distress, which might have been exacerbated by role expectations or change rumors, might not have been able to participate in the follow-up, and thus not included in the

prospective analyses.

Individual appraisal. Lazarus and Folkman (1984) have put forth the importance of taking individuals' appraisal of a stressor into account, and thus, primary and secondary appraisal become relevant in order to understand whether and how workers were affected by the predictor variables (role ambiguity/role conflict) and the mediator (rumors of organizational change) in the current study. Similarly, Bamberger et al. (2012) argued that the individual categorization of a possible change process (such as downsizing, restructuring or closure) as threatening or not is connected to the psychological reaction, and can be influenced by several factors, amongst others individuals' coping strategies. As the modern work life is characterized by continuous changes, rather than one specific and individual action (Saksvik & Finne, 2009), certain employees may constantly anticipate threatening changes and thereby constantly worry about their future employment.

Depending on the focus or the content of the change rumors and individuals' roles in the organization, employees may have experienced different degrees of job demands, pressure and insecurity. Further, the individuals' primary appraisal of role expectations and change rumors may have affected whether or not they experienced increased levels of mental distress. The investigated work factors did probably not have a serious impact upon employees' mental health if the encounter with role expectations and rumors of organizational change was appraised as irrelevant. On the other hand, if the employees perceived similar situations as threatening, challenging or harmful, it may have increased their experience of anxiety and depression. This reasoning is consistent with previous research, which has found associations between high threat perceptions because of extensive changes and increased job demands among employees (Spence-Laschinger, Sabiston, Finegan, & Shamian, 2001). Similarly, Verhaeghe, Vlerick, Gemmel, Maele and Backer (2006) have reported organizational change appraised as threatening to be positively related to distress.

The way in which individuals differ in the use of coping styles may also have affected respondents' experience of the work stressors investigated in the current study. Employees' perception and appraisal of a challenge, the appraisal of options and available resources, and the responses selected are all components of the coping concept (Lazarus & Folkman, 1984). Meta-analysis shows that problem-focused coping is associated with good mental health, while emotion-focused strategies are related to poor mental health (Penley, Tomaka, & Wiebe, 2002). A recent longitudinal study conducted by Nielsen and Knardahl (2014a) suggested that the use of disengagement coping strategies characterized by self-blame, behavioral disengagement, substance use and denial at base-line were related to increased

levels of mental distress at follow-up two years later. Hence, employees' use of problem focused coping strategies may have contributed to mastery, toleration and reduction of the demands and conflicts among them (Folkman & Lazarus, 1980), which further may have reduced or made them avoid the experience of adverse mental health.

Individuals' cognitive appraisal was not investigated in the current study, thus this could also be one of the reasons for the weak beta-values. By including additional information in the analyses concerned with employees' primary and secondary appraisal, and thereby investigating how role ambiguity and role conflict affected the individual worker, and what a possible change process implied for them, might have given different results. Despite the fact that appraisal of role expectations and rumored organizational change were not taken into account, the results provided a basis of indicating that role ambiguity, role conflict and rumors of organizational change are work factors that might be potential risks for employee mental health, thus supporting previous research (Finne et al., 2014; Greubel & Kecklund, 2011; Jackson & Schuler, 1985).

The results from this study provided an explanatory basis for one of the reasons why role expectations might have a negative impact on employees' mental health. Workers anticipation of a possible organizational change is a concrete example of an area within the psychosocial work environment that is affected by role expectations. It is important to note, that despite the lack of certain prospective associations, the "lack of correlation does not disprove causation" and "correlation is neither a necessary nor a sufficient condition of causality" (Bollen, 1989, cited by Hayes, 2013, p. 52), thus, the observation of significant cross-sectional and prospective effects should not be overlooked.

Methodological Considerations and Limitations

Although the current study had some considerable strengths, such as a large sample size, respondents from different organizations and job types, and a prospective design adjusting for mental distress at baseline, some limitations must be taken into consideration when interpreting the results.

The sample. The sample size was considered large and representative of the Norwegian working life, including a variety of occupations from 98 different organizations within both public and private sector. The cross-sectional response rate was approximately 44%, however, the prospective response rate (including the sample who answered all questions about role ambiguity, role conflict, rumors of organizational change and mental distress at both T1 and T2) was only 34%. Due to the low prospective response rate and the

absence of random sampling from the working population as a whole, external validity cannot be guaranteed. Moreover, the low prospective response rate may also have affected the internal validity of the study if non-response was related to role expectations, rumors of organizational change and mental distress (Hernán, Hernández-Díaz, & Robins, 2004).

It should also be noted that the reason why the different organizations participated in the project was unknown, except that they would get a free working environment survey in exchange. Therefore, participation might not have been a priority for those companies undergoing difficult or extensive changes at the time the questionnaire was sent out, which further might have skewed the representativeness of role expectations and rumors of organizational change on mental distress. Moreover, it is important to mention that the findings presented in this study are not necessarily representative outside Norway. With the Working Environment act, Norway has strong employment protection with requirements concerned with how employers are obligated to inform employees about potential organizational changes, as well as requirements for “facilitation, participation and development” in order to obtain a satisfactory working environment (see *Arbeidsmiljøloven*, § 4-2). This could be one of the reasons why the investigated relationships between role expectations, rumors of organizational change and employee mental distress were not found to be stronger.

The questionnaire. Limitations with regard to the use of self-reported data may have influenced the final results. Problems with recalling whether one had been exposed to any of the variables and report bias may have occurred, indicating that the respondent answered all questions in a certain way, due to factors such as negative affectivity and social desirability. However, the adjustment for mental distress at baseline should have minimized the bias related to negative affectivity. As for the measures of role ambiguity and role conflict, the QPSNordic instrument used in the current study should be fairly insensitive to respondents’ emotions or personality dispositions. Items derived from QPSNordic are constructed with the aim of avoiding emotion and social desirability bias in that subjects report frequency of occurrence rather than degrees of agreement or satisfaction, and items do not address issues that are inherently negative or positive (Dallner et al., 2000).

Recall bias might have influenced the results as employees differ in the way they experience and remember events. Those who experienced role expectations as traumatic or threatening might have anticipated an upcoming organizational change, and thus were more inclined to recall more rumor activity and mental distress than those who were less affected by the examined work stressors.

Moreover, answering the survey required time, as it was quite large (with 213 questions and additional sub-questions). Thus, it is possible that certain respondents might “drop out” when they got tired or thought they had spent enough time answering the questionnaire. Further, this may have influenced how accurately the respondents read and answered the questions. The internal validity might have been compromised by self-selection, as it was voluntary to participate. It should also be noted that questionnaires in general contain limited ways to be answered. The questions used in the current study ranged most response options on a likert-scale from 1 to 5, and such types of scales may feel insufficient for certain respondents, while it nevertheless makes it easier to fill out for others (Ringdal, 2001). A disadvantage might be that some respondent could have had a propensity to respond in extreme ways (in the far end of the scales), while others were more prone to respond in the middle.

Additionally, it was also unknown whether employees with poor mental health were less likely to respond to the questionnaire. Further this may have led to an underestimation of the relationships between role expectations, rumors of organizational change and mental distress. Previous experiences of extensive organizational changes might also have influenced the effects that were obtained in the present study. If a previous change process was experienced as negative or had unpleasant consequences for a worker, the anticipation of a possible restructuring, downsizing or closure process might caused increased levels of mental distress for that individual.

“Semi-prospective” analyses. The question concerned with rumors of organizational change was formulated by asking how often the respondents had talked about possible organizational changes the last 12 months. Thus, the mediator variable (ROC) could be considered retrospective in that it gave information of events that occurred prior to the first data collection (Skog, 2004). It was impossible to know exactly how long after the occurrence of rumor activity that mental distress was measured, and therefore, it was also unknown how long the change rumors had lasted. Questions concerned with role expectations and mental distress were aimed at the employees’ assessment of the current situation at the time they responded to the questionnaire. This could indicate, that the cross-sectional analyses had a time gap, despite the fact that all questions were answered at T1. Based on this, it was possible that rumors of organizational change did not occur due to role expectations, but other psychosocial work factors/external factors. Additionally, one could possibly consider the cross-sectional analyses including rumors of organizational change as “semi-prospective”.

Longitudinal design. Despite conducting a prospective study with two measure points, the final results cannot be interpreted as a change from T1 to T2. Skog (2004) argues that longitudinal studies with two measurement points are only capable of measuring whether there is a difference in the level of a variable at baseline and follow-up. This study included a time lag of two years, which made it difficult to reveal what happened in between T1 and T2, and whether an increase in employee mental distress was due to other factors than role ambiguity, role conflict and rumors of organizational change. It was also unknown exactly when the role expectations and change rumors occurred.

The current study used a longitudinal design known as “incomplete two-wave panel design” (Zapf et al., 1996). This design has the principal advantage of explicitly estimating the change in the outcome variable (i.e. mental distress at T2 after controlling mental distress at T1). However, the disadvantage of using this design was that it left the stability in the predictor variables uncontrolled and unknown, thus, it was unable rule out reversed causality and test reciprocal effects (Zapf et al., 1996). Unfortunately it was outside the scope of the current study to test different types of reverse causality, however it cannot be ruled out.

Reversed causation. Although it was implied that role expectations and rumors of organizational change preceded the outcome variable (mental distress), it might be possible that the employees differed with respect to anxiety and depression before they were exposed to the work stressors investigated in this study. Anxiety and depression might make people more sensitive with regard to appraising role expectations as conflicting or unclear. However, the risk of reporting high levels of work stressors are likely to decrease when asking respondents to report frequency of occurrence (“how often”), rather than degrees of agreement or satisfaction with certain work situations. Moreover, Beck (1972) argued that depressed and anxious people tend to assess their environment more negatively, and thereby contribute to a more negative group climate. This may indicate that work stressors can be affected by strain, and thus, it is possible that employees who experience high levels of mental distress participate in rumor activity and anticipate fearful organizational changes. Furthermore this may cause increased levels of role ambiguity, role conflict and organizational change rumors. Hence, reversed causal influences of strain on work stressors could be argued as plausible (Leventhal & Tomarken, 1987).

Confounding variables. The time gap between the baseline and follow-up measures was approximately two years, and it was likely that confounding variables had an influence on the effect of employee mental health during that period of time (Skog, 2004). Such variables present a threat to the validity of the current study, as the consequences of role

expectations and rumors of organizational change might be numerous. It is important to note that employee mental health is influenced and determined by several work factors in addition to role expectations and rumors of organizational change, including factors not related to one's workplace (see Semmer, Zapf, & Greif, 1996). So all in all, the multifactorial nature of mental health implies that it is difficult to identify strong single predictors.

Systematic changes in the dependent variable (mental distress) could be affected by external events, and maturation or development at an individual level (Skog, 2004). Confounding variables that are stable over time are the most problematic in terms of causation and longitudinal studies. Demographical variables were partially investigated in this study (sex and age). Other variables such as personality type, social status and genetic constitution were unknown, and might have affected the way respondents understood and experienced their working environment (Zapf et al., 1996). In addition, certain mental health problems may take several years to develop, while the data material only explored a time period of two to three years.

Attrition. Attrition has been pointed out as a central issue when conducting longitudinal analyses (Skog, 2004), and occurs when cases are lost (subjects drop out) from a sample over time or over a series of sequential processes. Although some attrition is expected, the occurrence becomes problematic when it is selective and not approximately the same amount for all groups, as it might skew the final results. Employees' willingness to participate in the survey, or inability to answer because of sickness absenteeism or new employment could be reasons for attrition in this study. The sample size at follow-up could still be considered quite large, despite the reduction in participants, which was of about 58% from T1 to T2. One should however be aware of the possibility of the healthy worker effect as mentioned previously (Quinlan & Bohle, 2009), which could have influenced the final sample size.

Correlated errors. The final structure model was significantly improved by allowing a few of the error terms related to the outcome variable (mental distress) co-vary. However, it is important to be aware of not making too many "improvements" as it can lead to "masking" the true underlying structure of the data (Gerbing & Anderson, 1984). By allowing errors to be co-varied, not only will a better fit be obtained but also the parameters will be re-estimated (Cote, 2001). Consequently, the estimates are the result of the re-specification rather than true construct relationships. Moreover, the co-varied errors may reduce the possibility of replication to another sample. Therefore, Cote (2001) has claimed that theoretical justification is needed in order to explain why certain error terms are co-varied. The current study only co-varied MDT1 and MDT2 error 1 and 2, and 8, 9 and 10 (see Appendix B). This made strong

theoretical sense, since the first two items were related to anxiety, and the last three were related to depression.

Implications and Possibilities for Further Research

The current study contributed support for the influence of psychological/social work factors on employee mental health (see Stansfeld & Candy, 2006), as the results imply that role ambiguity and role conflict can cause deteriorated employee mental health both in the short-term and over time. Additionally, rumors of organizational change had an acute effect on mental distress, as well as role expectations were shown to have both a direct and indirect effect, through rumors of organizational change, on employee mental distress in the cross-sectional analyses. Thereby the study also provided support for the *view* that putative organizational change can have the same impact upon employee mental health as an actual change process (Ferrie et al., 1995; Greubel & Kecklund, 2011, Lazarus & Folkman, 1984). By investigating the relationship between role expectations and rumors of organizational change, this study also contributed with new knowledge to an area that so far has received little attention within psychological and occupational health research. This study is a step towards a better understanding of how psychological/social work factors affect employee's mental health. Additionally, knowledge of how the investigated factors (role ambiguity, role conflict, rumors of organizational change and mental distress) affect each other and their impact on the individual employee provides a better basis for practical efforts to improve occupational health.

In line with previous research, the findings indicated that high levels of role ambiguity and role conflict often result from a working environment characterized by low predictability, undefined or blurred roles, and conflicting demands (see Kahn et al., 1964). These work stressors may have adverse impact on employees' anticipation of organizational change, causing insecurity and fear. Depending on the *severity*, *frequency*, and *persistence* of such adverse emotions, generalized anxiety and distress may result. This outcome could probably be reduced or avoided if organizations prioritized early role clarification, as it may increase predictability and reduce insecurity regarding employees' future work situation. In addition, being aware of one's own and co-workers responsibilities and work tasks may prevent person conflicts resulting from ambiguous roles (Saksvik, Nytrø, & Tvedt, 2008). The findings may also strengthen managers understanding of how employees' react to and experience the possibility of a significant organizational change. The results implied that rumor activity concerned with extensive changes might cause anxiety and depression among employees,

prior to any concrete actions or change events. This issue could perhaps be prevented or minimized if the employers used an open and clear communication style, informed their employees' in time of a potential forthcoming change, as well as letting the workers take part and influence the change process. Such initiatives might create a work environment where there's no fertile ground for rumor activity. Rumor activity and adverse mental health outcomes might be counteracted to some extent with clear information about the organization's future, and the intentions of a potential upcoming change, and the details about how it will affect the individual employee. By being informed and included in the actual process, it could possibly provide a basis of successful coping and adjustment to forthcoming change. Furthermore, this might make it easier for organizations to implement and maintain extensive organizational changes. As the modern work life is characterized by continuous changes, it becomes important for managers and Human Resources personnel to gain insight and knowledge with respect to how psychological/social work factors, such as role expectations and organizational change affect the individual employee. Organizations can use this information to work constructively and improve their psychological/social work environment, as well to focus targets of interventions or changes, and in that way increase their chances of conducting successful and "healthy" change processes.

Although the results implied that role expectations and change rumors did not affect employee mental health to a large degree, it is important to emphasize that the predictor variables (RA/RC) and the mediator (ROC) could still be seen as potential risk factors for employee mental health. This study focused on how and whether role expectations influenced mental distress, and whether this relationship was mediated by rumors of organizational change. This approach has provided new and useful information, however there are alternative possibilities for future research to conduct on the matter.

As the influence of role expectations on mental distress was only partially mediated by rumors of organizational change (cross-sectionally), several other factors were likely to play a role in whether employees' mental health was affected. Further research should investigate multiple mediators in order to provide a more comprehensive model of the possible ways role ambiguity and role conflict could influence employees' mental health. In addition it could be interesting to include employees' cognitive appraisal as a moderator, in order to investigate to what degree individual's primary appraisal and coping strategies affect their experience of role expectations and change rumors, and thereupon their levels of mental distress.

Lastly, the same hypotheses as studied in the current study should be investigated with the use of multiple follow-up measures and alternative time-intervals, both evenly and

unevenly spaced. By using unevenly spaced time lags, it's possible to explore different effects of role expectations and change rumors over time, and by using evenly spaced time lags, time-variant effects such as seasonal effects can be controlled for (Lange, Taris, Kompier, Houtman, & Bongers, 2003).

Conclusions

This study investigated whether employee self-reported mental health was associated with role expectations, and whether rumored organizational change mediated this potential relationship. The results from the SEM analyses supported all the cross-sectional hypotheses, and suggest that role expectations have a short-term effect upon employee mental distress and rumors of organizational change, and that rumors of organizational change has a short-term effect on mental distress. The cross-sectional findings also implied that some of the adverse mental health effects due to role expectations could be explained through rumors of organizational change, which was found to be more common when employees had experienced role ambiguity or role conflict at work, indicating partial mediation.

In general the cross-sectional analyses showed stronger effect sizes than the prospective analyses. This may indicate that the effect of role expectations and rumors of organizational change on mental distress is executed mainly in the short term, in the sense that the respondents' mental health did not seem to deteriorate over time. However, the prospective analyses controlled for the degree of mental distress at T1, thus the long-term effects referred to whether the predictor variables had an influence on health from T1 to T2, which may have made it difficult to detect strong prospective effects. It is also possible that employees who experienced high levels of mental distress had left work or were on sick-leave, and thus were not able to participate at follow-up (at T2), reflecting the healthy worker effect (Quinlan & Bohle, 2009). Nevertheless, it is important to emphasize the observation of convincing prospective effects of both role ambiguity and role conflict on mental distress, and role conflict on rumors of organizational change. This indicates that role expectations have a long-term influence on mental distress, and role conflict on change rumors when measured over a time period of two years.

The data material showed that role expectations and change rumors appear in various types of occupations, and are not unique to certain positions or workplaces. Additionally, frequent change is currently a fact of life for every organization, where extensive changes are often viewed in a negative light by several employees, being perceived as constant, disturbing, unnecessary or threatening to their job security (Arbeidstilsynet, 2013). With a

changing, unstable and complex work environment, it has become important to clarify work roles. In addition, informing and including employees in upcoming change processes is vital as it may reduce rumor activity and workers' experience of adverse mental health. Such initiatives may also enhance the implementation and maintenance of future organizational change processes. Further research is recommended to replicate this study, in other samples and with the use of more measurements and alternative time lags. Additionally, individuals' cognitive appraisal should be included in the model as a potential moderator, as it may result in different findings.

Even though the current study did not find results showing that role expectations or change rumors substantially affect employee mental distress, the findings still suggest adverse relationships. The experience of high levels of role ambiguity, role conflict and rumors of organizational change can therefore be seen as potential risk factors for employee mental distress.

References

- Aagestad, C., Tynes, T., Sterud, T., Løvseth, K. E., Gravseth, H. M., Eiken, T.,...Aasnæss, S. (2011). *Faktabok om Arbeidsmiljø og Helse 2011. Status og Utviklingstrekk* (STAMI Report No. 12-7). Oslo: Statens arbeidsmiljøinstitutt. Retrieved from <http://www.stami.no/arbeidsmiljoovervaking>
- Abramis, D. J. (1994). Work role ambiguity, job satisfaction, and job performance: Meta-analyses and review. *Psychological Reports, 75*, 1411-1433. doi:10.2466/pr0.1994.75.3f.1411
- Allport, G. W., & Postman, L. (1947). *The psychology of rumor*. New York: Henry Holt & Co.
- Arbeidsmiljøloven. (n.d). Retrieved 23.03.2015 from, https://lovdata.no/dokument/NL/lov/2005-06-17-62#KAPITTEL_4
- Arbeidstilsynet (2013). *Act relating to working environment, working hours and employment protection, etc. (Working Environment Act)*. Trondheim: Gyldendal Akademisk. Retrieved from <http://www.arbeidstilsynet.no/lov.html?tid=78120>
- Bamberger, S. G., Vinding, A. L., Larsen, A., Nielsen, P., Fonager, K., Nielsen, R. N.,...Omalnd, Ø. (2012). Impact of organisational change on mental health: A systematic review. *Occupational and Environmental Medicine, 69*(8), 1-7. doi:10.1136/oemed-2011-100381
- Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, Strategic and Statistical Considerations. *Journal of Personality and Social Psychology, 51*, 1173-1182. doi:10.1037/0022-3514.51.6.1173
- Bearden, W. O., Sharma, S., & Teel, J. E. (1982). Sample size effects on chi square and other statistics used in evaluating causal models. *Journal of Marketing Research, 19*(4), 425-430. Retrieved from <https://webkulia.unimedia.ac.id/ebook/>
- Beck, A. T. (1972). *Depression: Causes and treatment*. Philadelphia, University of Pennsylvania Press.
- Beehr, T. A., & Newman, J. E. (1978). Job stress, employee health, and organizational effectiveness: A facet analysis, model and literature review. *Personnel Psychology, 31*, 665-699. doi:10.1111/j.1744-6570.1978.tb02118.x
- Beehr, T. A., Walsh, J. T. & Taber, T. D. (1976). Relationship of stress to individually and organisationally valued states: Higher order needs as a moderator. *Journal of Applied Psychology, 61*, 41-47. Retrieved from <http://psycnet.apa.org/journals/apl/61/1/41.pdf>

- Bordia, P., Hunt, L., Paulsen, N., Tourish, D., & DiFonzo, N. (2004). Communication and uncertainty during organizational change: Is it all about control? *European Journal of Work & Organizational Psychology, 13*(3), 345-365.
doi:10.1080/13594320444000128
- Bowling, N. A., & Beehr, T. A. (2006). Workplace harassment from the victim's perspective: A theoretical model and meta-analysis. *Journal of Applied Psychology, 91*(5), 998-1012. doi:10.1037/0021-9010.91.5.998
- Brenner, M. H., Andreeva, E., Theorell, T., Goldberg, M., Westerlund, H., Leineweber, C.,...Bonnaud, S. (2014). Organizational downsizing and depressive symptoms in the European recession: the experience of workers in France, Hungary, Sweden and the United Kingdom. *Public Library of Science, 9*(5), e97063.
doi:0.1371/journal.pone.0097063
- Burkholder, G. J., & Harlow, L. L. (2003). An illustration of a longitudinal cross-lagged design for larger structural equation models. *Structural Equation Modeling Journal, 10*, 456-486. doi:10.1207/S15328007SEM1003_8
- Byrne, B. M. (2013). *Structural equation modeling with AMOS: Basic concepts, applications, and programming*. (2nd ed.). New York: Routledge.
- Cavanaugh, M.A., Boswell, W.R., Roehling, M.V., & Boudreau, J.W. (2000). An empirical examination of self-reported work stress among U.S. managers. *Journal of Applied Psychology, 85*, 65-74. doi:10.1037/0021-9010.85.1.65
- Cheung, G. W., & Lau, R. S. (2008). Testing mediation and suppression effects of latent variables: Bootstrapping with structural equation models. *Organizational Research Methods, 11*(2), 996-325. doi:10.1177/1094428107300343
- Clegg, C., & Walsh, S. (2004). Change management: Time for a change! *European Journal of Work and Organizational Psychology, 13*, 217-239. doi:10.1080/13594320444000074
- Colligan, T. W., & Higgins, E. M. (2006). Workplace stress: Etiology and consequences. *Journal of Workplace Health, 21*(2), 90-97. doi:10.1300/J490v21n02_07
- Cote, J. (2001). Improving model fit by correlating errors. *Journal of Consumer Psychology, 10*(1&2), 83-100. Retrieved from
<http://www2.owen.vanderbilt.edu/dawn.iacobucci/JCPmethodsIssue/VI-sem.pdf>
- Cummings, T. G., & Worley, C. G. (2009). *Organization development and change*. (9th ed.). Mason, OH: South-Western.
- Cunningham, C. E., Woodward, C. A., Shannon, H. S., MacIntosh, J., Lendrum, B., Rosenbloom, D., & Brown, J. (2002). Readiness for organizational change: A

- longitudinal study of workplace, psychological and behavioral correlates. *Journal of Occupational and Organizational Psychology*, 75, 377-392.
doi: 10.1348/096317902321119637
- Dallner, M., Elo, A-L., Gamberale, F., Hottinen, V., Knardahl, S., Lindström, K.,...Ørhede, E. (2000). *Validation of the General Nordic Questionnaire (QPSNordic) for Psychological and Social Factors at Work*. Copenhagen: Nordic Council of Ministers.
- Dekker, S. W. A., & Schaufeli, W. B. (1995). The effects of job insecurity on psychological health and withdrawal: A longitudinal study. *Australian Psychologist*, 30, 57–63.
doi:10.1080/00050069508259607
- De Lange, A. H. (2005). *What about causality? Examining longitudinal relations between work characteristics and mental health*. Ridderprint BV: Ridderkerk.
- De Lange, A. H., Taris, T. W., Kompier, M. A., Houtman, I. L., & Bongers, P. M. (2003). The very best of the millennium: Longitudinal research and the demand-control (-support) model. *Journal of Occupational Health Psychology*, 8(4), 282-305.
doi:10.1037/1076-8998.8.4.282
- DiFonzo, N., & Bordia, P. (2007). *Rumor psychology: Social & organizational approaches*. Washington, DC: American Psychological Association.
- DiFonzo, N., Bordia, P., & Rosnow, R. L. (1994). Reining in rumors. *Organizational Dynamics*, 23, 47-62. doi:10.1016/0090-2616(94)90087-6
- Emdad, R., Alipour, A., Hagberg, J., & Jensen, I. B. (2013) The impact of bystanding to workplace bullying on symptoms of depression among women and men in industry in Sweden: an empirical and theoretical longitudinal study. *International Archives of Occupational and Environmental Health*, 86(6), 709-716. doi:10.1007/s00420-012-0813-1
- Eriksen, W., Tambs, K., & Knardahl, S. (2006). Work factors and psychological distress in nurses' aides: A prospective cohort study. *BMC Public Health*, 6:290.
doi:10.1186/1471-2458-6-290
- Ferrie, J. E., Shipley, M. J., Marmot, M. G., Standfeld, S., & Smith, G. D. (1995). Health effects of anticipation of job change and non-employment: Longitudinal data from the Whitehall II study. *British Medical Journal*, 311(7015), 1264-1269.
doi:1136/bmj.311.7015.1264
- Ferrie, J. E., Shipley, M. J., Marmot, M. G., Standfeld, S., & Smith, G. D. (1998). The health effects of major organizational change and job insecurity. *Social Sciences Medicine*, 46(2), 243-254. doi:10.1016/S0277-9536(97)00158-5

- Ferrie, J. E., Shipley, M. J., Newman, K., Standsfeld, S. A., & Marmot, M. (2005). Self-reported job insecurity and health in the Whitehall II study: potential explanations of the relationship. *Social Science & Medicine*, *60*, 1593-1602.
doi:10.1016/j.socscimed.2004.08.006
- Field, A. (2009). *Discovering Statistics Using SPSS*. (3rd ed.). London: Sage.
- Finne, L. B., Christensen, J. O., & Knardahl, S. (2014). Psychological and social work factors as predictors of mental distress: A prospective study, *Public Library of Science*, *9*(7), 1-12. doi:10.1371/journal.pone.0102514
- Fisher, C. D., & Gitelson, R. (1983). A meta-analysis of the correlates of role conflict and ambiguity. *Journal of Applied Psychology*, *68*, 320-333. doi:10.1037//0021-9010.68.2.320
- Folkman, S., & Lazarus, R. S. (1980). An analysis of coping in a middle aged community sample. *Journal of Health and Social Behavior*, *21*(3), 219-239. Retrieved from <http://www.jstor.org/stable/2136617>
- Ford, M., Matthews, R., Wooldridge, J., Vipanchi, M., Kakar, U., & Strahan, S. (2014). How do occupational stressor-strain effects vary with time? A review and meta-analysis of the relevance of time lags in longitudinal studies. *Work & Stress*, *28*, 9-30.
doi:10.1080/02678373.2013.877096
- Fornell, C., & Larcker, D. F. (1981). Evaluation structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, *18*(1), 39-50.
doi:10.2307/3151312
- Garnett, J. L. (1992). Coping with rumors and grapevines: Practical lessons for public personnel administration. *Public Personnel Administration*, *72*(3) 42-49.
doi:10.1177/0734371X9201200304
- Gaskin, J. (2012). *Data screening*. Retrieved from <http://statwiki.kolobkcreations.com>
- Gerbing, D. W., & Anderson, J. C. (1984). On the meaning of within factor correlated measurement errors. *Journal of Consumer Research*, *11*, 572-580. Retrieved from <http://www.jstor.org/stable/2489144>
- Goksoy, A. (2012). The impact of job insecurity, role ambiguity, self monitoring and perceived fairness of previous changes on individual readiness for change. *Journal of Global Strategic Management*, *11*, 103-112. Retrieved from <http://www.isma.info/uploads/files/102-the-impact-of-job-insecurity-role-ambiguity--self-monitoring-and-perceived-fairness-of-previous-change-on-individual-readiness-for-change.pdf>

- Greubler, J., & Kecklund, G. (2011). The impact of organizational changes on work stress, sleep, recovery and health. *Industrial Health*, 49(3), 353-364.
doi:10.2486/indhealth.MS121
- Hair, J. F., Black, W., Babin, B., & Anderson, R. (2010). *Multivariate data analysis* (7th ed.). Upper Saddle River, NJ: Prentice-Hall, Inc.
- Harcourt, J., Richerson, V., & Wattier, M. J (1991). A national study of middle managers' assessment of organization communication quality. *International Journal of Business Communication*, 28(4), 348-365. doi:10.1177/002194369102800404
- Harnois, G., & Gabriel, P. (2000). *Mental health and work: impact, issues and good practices*, World Health Organization, 1-61. Retrieved from
http://apps.who.int/iris/bitstream/10665/42346/1/WHO_MSD_MPS_00.2.pdf?ua=1
- Haukedal, W. (2010). *Arbeids- og lederpsykologi* (8th ed.). Oslo: Cappelen Damm.
- Hayes, A. F. (2013). *Introduction to mediation, moderation, and conditional process analysis. A regression-based approach*. New York: The Guilford Press.
- Hernán, M. A, Hernández-Díaz, S., & Robins, J. M. (2004). A structural approach to selection bias. *Epidemiology*. 15(5), 615-625. doi:10.1097/01.ede.0000135174.63482.43.
- Holm, S., & Hovland, J. (1999). Waiting for the other shoe to drop: Help for the job-insecure employee. *Journal of Employment Counseling*, 36(4), 156–166. doi:10.1002/j.2161-1920.1999.tb01018.x
- Holmbeck, G. N. (1997). Toward terminological, conceptual, and statistical clarity in the study of mediators and moderators: Examples from the child-clinical and pediatric psychology literatures. *Journal of Consulting and Clinical Psychology*, 4, 599–610.
doi:10.1037/0022-006X.65.4.599
- Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, 6(1), 1-55. doi:10.1080/10705519909540118
- Ilgen, D. R., & Hollenbeck, J. R. (1991). The structure of work: Job design and roles. In M. D. Dunnette & L.M. Hough (Eds.), *Handbook of industrial and organizational psychology* (2nd ed., pp.165–207). Palo Alto, CA: Consulting Psychology Press.
- Isabella, L. A. (1990). Evolving interpretations as a change unfolds: How managers construe key organizational events. *Academy of Management Journal*, 33(1), 7-41.
doi:10.2307/256350

- Iversen, L., & Sabroe, S. (1988). Psychological well-being among unemployed and employed people after a company closedown: A longitudinal study. *Journal of Social Issues, 44*, 141-152. doi:10.1111/j.1540-4560.1988.tb02096.x
- Jackson, S. E., & Schuler, R. S. (1985). A meta-analysis and conceptual critique of research on role ambiguity and role conflict in work settings. *Organizational Behavior & Human Decision Processes, 36*, 16-78. doi:10.1016/0749-5978(85)90020-2
- Jackson, S. E., Turner, J. A., & Brief, A. P. (1987). Correlates of burnout among public service lawyers. *Journal of Occupational Behavior, 8*(4), 339-349. doi:10.1002/job.4030080406
- Jenkins, R., MacDonald, A., Murray, J., & Strathdee, G. (1982). Minor psychiatric morbidity and the threat of redundancy in a professional group. *Psychological Medicine, 12*, 799-807. doi:10.1017/S0033291700049102
- Johannessen, H. A., Tynes, T., & Sterud, T. (2013). Effects of occupational role conflict and emotional demands on subsequent psychological distress: A 3-year follow-up study of the general working population in Norway. *Journal of Occupational and Environmental Medicine, 55*(6), 605-13. doi:10.1097/JOM.0b013e3182917899
- Kahn, R. L., Wolfe, D. M., Quinn, R. P., Snoek, D., & Rosenthal, R. A. (1964). *Organizational stress: Studies in role conflict and ambiguity*. New York: John Wiley.
- Karp, T. (2014). *Endring i organisasjoner. Idologi, teori og praksis*. Oslo: Cappelen Damm.
- Keller, R. T. (1975). Role conflict and ambiguity: Correlates with job satisfaction and values. *Personnel Psychology, 28*, 57-64. doi:10.1111/j.1744-6570.1975.tb00391.x
- Kelloway, E. K., & Barling, J. (1991). Job characteristics, role stress, and mental health. *Journal of Occupational Psychology, 64*, 291-304. doi:10.1111/j.2044-8325.1991.tb00561.x
- Kimmel, A. J. (2013). *Rumors and rumor control: A manager's guide to understanding and combatting rumors*. Mahwah, NJ: Routledge.
- Kivimäki, M., Lawlor, D. A., Smith, G. D., Kouvonen, A., Virtanen, M., Elovainio, M., & Vahtera, J. (2007). Kivimäki et al. respond. *American Journal of Public Health, 97*(11), 1928-1929. doi:10.2105/AJPH.2007.119370
- Kivimäki, M., Vahtera, J., Elovainio, M., Pentti, J., & Virtanen, M. (2003). Human cost of organizational downsizing: Comparing health trends between leavers and stayers. *American Journal of Community Psychology, 32*(1/2), 57-67. doi:10.1023/A:1025642806557

- Kiwimäki, M., Vahtera, J., Ferrie, J. E., Hemingway, H., & Pentti, J. (2001a). Organisational downsizing and musculoskeletal problems in employees: a prospective study. *Occupational Environment and Health*, 58(12), 811-817. doi:10.1136/oem.5812.811
- Kiwimäki, M., Vahtera, J., Pentti, J., & Ferrie, J. E. (2000). Factors underlying the effect of organizational downsizing on health of employees: longitudinal cohort study. *British Medical Journal*, 320(971), 971-975. doi:10.1136/bm.320.7240.971
- Kline, R. B. (2005). *Principles and practice of structural equation modeling* (2nd ed.). New York: Guilford Press.
- Knapp, J. R., Smith, B. R., & Sprinkle, T. A. (2014). Clarifying the relational ties of organizational belonging. Understanding the roles of perceived insider status, psychological ownership, and organizational identification. *Journal of Leadership and Organizational Studies*, 21(3). 273-285. doi:10.1177/1548051814529826
- Knardahl, S. (2000). Arbeid, stress og helse. In S. Einarsen & A. Skogstad (Eds.), *Det gode arbeidsmiljø. Krav og utfordringer* (pp. 263-286). Bergen: Fagbokforlaget.
- Kramer, M. W., Dougherty, D. S., & Pierce, T. A. (2004). Managing uncertainty during a corporate acquisition: A longitudinal study of communication during airline acquisition. *Human Communication Research*, 30, 71-101. doi:10.1111/j.1468-2958.2004.tb00725.x
- Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*. New York: Springer Publishing Company.
- Leventhal, H., & Tomarken, A. (1987). Stress and illness: Perspectives from health psychology. In S. V. Kasl & C. L. Cooper (Eds.), *Stress and health: Issues in research methodology* (pp. 3-26). New York: Wiley.
- MacKinnon, D. P. (2008). *Introduction to statistical mediation analysis*. Mahwah, NJ: Erlbaum.
- Malhotra, N. K., & Dash, S. (2011). *Marketing research an applied orientation*. London: Pearson Publishing.
- Mattiasson, I., Lindgarde, F., Nilsson, J. A., & Theorell, T. (1990). Threat of unemployment and cardiovascular risk factors: Longitudinal study of quality of sleep and serum cholesterol concentrations in men threatened with redundancy. *British Medical Journal*, 301(6750), 461-466. Retrieved from <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1663764/>
- Maxwell, S. E., Cole, D. A., & Mitchell, M. A. (2011). Bias in cross-sectional analyses of longitudinal mediation: Partial and complete mediation under an autoregressive

- model, *Multivariate Behavioral Research*, 46(5), 816-841,
doi:10.1080/00273171.2011.606716
- McShane, S., & Von Glinow, M. (2014). *Organizational Behavior*. (7th ed.). New York: McGraw-Hill/Irwin.
- Meltzoff, J. (2007). *Critical thinking about research*. Washington, DC: APA.
- Nielsen, M. B., & Knardahl, S. (2014a). Coping strategies: A prospective study of patterns, stability, and relationships with psychological distress. *Scandinavian Journal of Psychology*, 55(2), 142-150. doi:10.1111/sjop.12103
- NIHO (2008). [National Institute of Occupational Health] *Nyhetsarkiv – 2008 – Kvartal 3. Den Nye Arbeidsplassen*. Retrieved from <http://www.stami.no/den-nye-arbeidsplassen2?lcid=1033>
- Nguyen, H., & Kleiner, B. H. (2003). The effective management of mergers. *Leadership & Organizational Development Journal*, 24(7/8), 447-455.
doi:10.1108/01437730310505876
- O'Brien, R. M. (2007). A caution regarding rules of thumb for variance inflation factors. *Quality & Quantity*, 41(5), 673-690. doi:10.1007/s11135-006-9018-6
- Pahkin, K., Väänänen, A., Koskinen, A., Bergbom, B., & Kouvonen, A. (2011) Organizational change and employees' mental health: the protective role of sense of coherence. *Journal of Occupational Environmental Medicine*, 53(2), 118-123.
doi:10.1097/JOM.0b013e318206f0cb.
- Penley, J. A., Tomaka, J., & Wiebe, J. S. (2002). The association of coping to physical and psychological health outcomes: a meta-analytic review. *Journal of Behavioral Medicine*, 25(6), 551-603. doi:10.1023/A:1020641400589
- Podsakoff, N. P., LePine, J. A., & LePine, M. A. (2007). Differential challenge stressor–hindrance stress relationships with job attitudes, turnover intentions, turnover, and withdrawal behavior: A meta-analysis. *Journal of Applied Psychology*, 92, 438–454.
doi:10.1037/0021-9010.92.2.438
- Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: a critical review of the literature and recommended remedies. *Journal of Applied Psychology*, 88(5), 879-903. doi:10.1037/0021-9010.88.5.879
- Quinlan, M., & Bohle, P. (2009). Overstretched and unreciprocated commitment: Reviewing research on the occupational health and safety effects of downsizing and job

- insecurity. *International Journal of Health services*, 39(1), 1-4.
doi:10.1177/1059601102250825
- Rickles, K., Garcia, C. R., Lipman, R. S., Derogatis, L. R., & Fischer, E. L. (1976). The Hopkins Symptom Checklist: Assessing emotional distress in obstetric-gynecological practice. *Primary Care*, 3, 751–76. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/1051525>
- Ringdal, K. (2001) *Enhet og mangfold – Samfunnsvitenskapelig forskning og kvantitativ metode*, Bergen: Fagbokforlaget
- Rizzo, J. R., House, R. J., & Lirtzman, S. I. (1970). Role conflict and ambiguity in complex organizations. *Administrative Science Quarterly*, 15, 150-163. Retrieved from: http://cyb.ox.or.kr/lms_board/bbs_upload/%C1%F7%B9%AB%BD%BA%C6%AE%B7%B9%BD%BA2.pdf
- Rosnow, R. L. (1991). Inside rumor: A personal journey. *American Psychologist*, 46(5), 484-496. doi:10.1037/0003-066X.46.5.484
- Rosnow, R. L. (2001). Rumor and gossip in interpersonal interaction and beyond: A social exchange perspective. In R. M. Kowalski (Ed.), *Behaving badly: Aversive behaviors in interpersonal relationships* (pp. 203-232) Washington, DC: American Psychological Association.
- Rosnow, R. L., & Fine, G. A. (1976). *Rumor and gossip: The social psychology of hearsay*. New York: Elsevier.
- Safaria, T., Othman, A., & Wahab, M. N. A. (2011). Role ambiguity, role conflict, the role of job insecurity as mediator toward job stress among malay academic staff: A SEM analysis. *Journal of Social Sciences*, 3(3), 229-235. Retrieved from <http://maxwellsci.com/print/crjss/v3-229-235.pdf>
- Saksvik, P. Ø. (2011). Å leve med omstilling. In S. Einarsen & A. Skogstad (Eds.), *Det Gode Arbeidsmiljø. Krav og Utfordringer* (2nd ed., pp. 199-219). Bergen: Fagbokforlaget.
- Saksvik, P. Ø., & Finne, L. B. (2009). Mestring av endring i arbeidslivet, In P. Ø. Saksvik & K. Nytrø (Eds.), *Klinisk organisasjonspsykologi* (pp. 277-292). Trondheim: Cappelen Damm AS.
- Saksvik, I. B., & Hetland, H. (2009). Resistance to organizational change: Individual reactions to change on the emotional, attitudinal, and behavioral levels, In P. Ø Saksvik (Eds.), *Prerequisites for healthy organizational change*, (pp. 70-75). Bentham Science Publishers.

- Saksvik, P. Ø., Nytrø, K., Tvedt, S. D. (2008). Sunn endring i organisasjoner. *Tidsskrift for Norsk Psykologforening*, 45, 295-300. Retrieved from http://www.ntnu.no/videre/kurs/Artikkel_Sunne_omstillingsprosesser.pdf
- Saksvik, P. Ø., Tvedt, S. D., Nytrø, K., Andersen, G. B., Andersen T. K., Buvik, M. P., & Torvatn, H. (2007). Developing criteria for healthy organizational change. *Work and Stress*, 21(3), 243-263. doi:10.1080/02678370701685707
- Savalei, V., & Bentler, P. M. (2010). Structural equation modeling. *Corsini Encyclopedia of Psychology*. 1–3. doi:10.1002/9780470479216.corpsy0953
- Schaufeli, W. B., & Kompier, M. A. J. (2001). Managing job stress in the Netherlands. *International Journal of Stress Management*, 8, 15-34. doi:10.1023/A:1009549312628
- Semmer, N., Zapf, D., & Greif, S. (1996). ‘Shared job strain’: A new approach for assessing the validity of job stress measurements. *Journal of Occupational and Organizational Psychology*, 69, 293–310. doi: 10.1111/j.2044-8325.1996.tb00616.x
- Selye, H. (1976). *Stress in health and disease*. Reading, MA: Butterworth.
- Sher, L. (2004). Daily hassles, cortisol, and the pathogenesis of depression. *Medical Hypotheses*, 62(2), 198-202. doi:10.1016/S0306-9877(03)00320-7
- Shibutani, T. (1966). *Improvised news: A sociological study of rumor*. Indianapolis, IN: Bobbs-Merrill.
- Skog, O-J. (2004). *Å forklare sosiale fenomener. En regresjonsbasert tilnærming* (2nd ed.). Oslo: Gyldendal Akademisk.
- Skogstad, A., Knardahl, S., Lindström, S., Elo, A. L., Dallner, M., Gamberale, F.,...Ørhede, E. (2001). *Brukerveiledning QPS Nordic. Generelt spørreskjema for psykologiske og sosiale faktorer i arbeid*. Oslo: Statens Arbeidsmiljøinstitutt.
- Spence-Laschinger, H. K., Sabiston, J. A., Finegan, J., & Shamian J. (2001). Voices from the trenches: nurses’ experiences of hospital restructuring in Ontario. *Canadian Journal of Nursing Leadership*, 14(1), 6–13. Retrieved from www.ncbi.nlm.nih.gov/pubmed/15487308
- Stansfeld, S., & Candy, B. (2006). Psychosocial work environment and mental health – a meta-analytic review. *Scandinavian Journal of Work, Environment & Health*, 32(6), 443-462. doi:10.5271/sjweh.1050
- Strand, B. H., Dalgard, O. S., Tambs, K., & Rognerud, M. (2003). Measuring the mental health status of the Norwegian population: A comparison of the instruments SCL-25, SCL-10, SCL-5 and MHI-5 (SF-36). *Nordic Journal of Psychiatry* 57(2), 113–118. doi:10.1080/08039480310000932

- Sverke, M., Hellgren, J., & Näswall, K. (2006). *Job insecurity - A literature review*. SALTSA report nr.1:2006. Stockholm, Sweden: National Institute of Working Life. Retrieved from http://nile.lub.lu.se/arbarch/saltsa/2006/wlr2006_01.pdf
- Swaen, G. M., Bültmann, U., Kant, I., & van Amelsvoort, L. G. (2004). Effects of job insecurity from a workplace closure threat on fatigue and psychological distress. *Journal of occupational and environmental medicine*, *46*(5), 443-449. doi:10.1097/01.jom.0000126021.25149.64
- Syed, H. R., Zachrisson, H. D., Dalgard, O. S., Dalen, I., & Ahlberg, N. (2008). Concordance between Hopkins Symptom Checklist (HSCL-10) and Pakistan Anxiety and Depression Questionnaire (PADQ), in a rural self-motivated population in Pakistan. *BMC Psychiatry*, *8*(59), 1-12. doi:10.1186/1471-244X-8-59
- Søgaard, A. J., Bjelland, I., Tell, G. S., & Røysamb, E. (2003). A comparison of the CONOR Mental Health Index to the HSCL-10 and HADS. *Norsk epidemiologi*, *13*(2), 279-284. Retrieved from <https://www.ntnu.no/ojs/index.php/norepid/article/download/296/274>
- Taris, T., & Kompier, M. (2006). Games researchers play - extreme group analysis and mediation analysis in longitudinal occupational health research. *Scandinavian Journal of Work, Environment and Health*, *32*, 463-472. doi:10.5271/sjweh.1051
- Terry, D. J., & Callan, V. J. (1997). Employee adjustment to large-scale organizational change. *Australian Psychologist*, *32*(3), 203-210. doi:10.1080/00050069708257382
- Tubre', T. C., & Collins, J. M. (2000). Jackson and Schuler (1985) revisited: A meta-analysis of the relationships between role ambiguity, role conflict, and job performance. *Journal of Management*, *26*, 155-169. doi:10.1016/S0149-2063(99)00035-5
- Vahtera, J., Kiwimäki, M., Pentti, J., Linna, A., Virtanen, P., & Ferrie, J. E. (2004). Organisational downsizing, sickness absence, and mortality: 10-town prospective cohort study. *British Medical Journal*, *328*(7239), 550-560. doi:10.1136/bmj.37972.496262.0D
- Vahtera, J., & Virtanen, M. (2013). The health effects of major organizational changes. *Occupational Environmental Medicine*, *70*(10), 677-678. doi:10.1136/oemed-2013-101635
- Vandenberg, R. J., & Lance, C. E. (2000). A review and synthesis of the measurement invariance literature: suggestions, practices, and recommendations for organizational research. *Organizational Research Methods*, *3*(1), 4-70. doi:10.1177/109442810031002

- Verhaeghe, R., Vlerick, P., Gemmel, P., Maele, G. V., & Backer, G. D. (2006). Impact of recurrent changes in the work environment on nurses' psychological well-being and sickness absence. *Journal of Advanced Nursing*, *56*(6), 646-656. doi:10.1111/j.1365-2648.2006.04058.x
- Walker, C. J., & Blaine, B. (1991). The virulence of dread rumors: A field experiment. *Language and Communication*, *11*(4), 291-297. doi:10.1016/0271-5309(91)90033-R
- Warr, P.B. (1987b). Job characteristics and mental health. In P. B. Warr (Ed.), *Psychology at Work* (3rd Ed., pp.247-269). Harmondsworth: Penguin Books.
- West, S. G., Finch, J. F., & Curran, P. J. (1995). Structural equation models with nonnormal variables: Problems and remedies. In R. H. Hoyle (Ed.), *Structural equation modeling: Concepts, issues, and applications* (pp. 56-75). Thousand Oaks, CA: Sage.
- Woodward, C. A., Shannon, H. S., Cunningham, C. E., McIntosh, J. E., Lendrum, B., Rosenbloom, D., & Brown, J. (1999). The Impact of re-engineering and other cost reduction strategies on the staff of a large teaching hospital: A longitudinal study. *Medical Care*, *37*, 547-555. Retrieved from <http://www.jstor.org/stable/3767017>
- Zapf, D., Dormann, C., & Frese, M. (1996). Longitudinal studies in organizational stress research: A review of literature with references to methodological issues. *Journal of Occupational Health Psychology*, *1*(2), 145-169. doi:10.1037/1076-8998.1.2.145
- Zeidner, M., & Saklofske, D. S. (1996). Adaptive and maladaptive coping. In M. Zeidner & N. S. Endler (Eds.), *Handbook of coping* (pp. 505-531). New York: Wiley.

Appendix A: Applied questions derived from “The New Workplace”

Role ambiguity (1-3)

Role conflict (4-6)

	Meget sjelden eller aldri	Nokså sjelden	Av og til	Nokså ofte	Meget ofte eller alltid	
	1	2	3	4	5	
Er det fastsatt klare mål for jobben din?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1
Vet du hva som er ansvarsområdet ditt?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2
Vet du nøyaktig hva som forventes av deg i jobben?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3
Må du gjøre ting som du mener burde vært gjort annerledes?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4
Får du oppgaver uten tilstrekkelige hjelpemidler og ressurser til å fullføre dem?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5
Mottar du motstridende forespørsler fra to eller flere personer?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6

Rumors of organizational change

Hvor ofte de siste 12 månedene har du og dine arbeidskolleger snakket om muligheten for disse endringene i virksomheten?

SETT KUN ETT KRYSS PER LINJE

	Meget sjelden eller aldri	Nokså sjelden	Av og til	Nokså ofte	Meget ofte eller daglig	
	1	2	3	4	5	
Mulig nedbemanning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1
Mulig omorganisering	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2
Mulig fusjon eller oppkjøp	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3
Mulig konkurranseutsetting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4
Mulig nedleggelse	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5

Mental distress

Under finner du en liste over ulike problemer. Har du opplevd noe av dette den siste uken (til og med i dag)?

SETT KUN ETT KRYSS PER LINJE

	Ikke opplevd det	Litt	Ganske mye	Veldig mye	
	1	2	3	4	
Pluselig frykt uten grunn	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1
Føler deg redd eller engstelig	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2
Matthet eller svimmelhet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3
Føler deg ansent eller oppjaget	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4
Lett for å klandre deg selv	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5
Søvnproblemer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6
Nedtrykt, tungsindig	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7
Følelse av å være unyttig, lite verd	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	8
Følelse av alt er et slit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9
Følelse av håpløshet mht. framtida	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10

Appendix B: The overall structural models

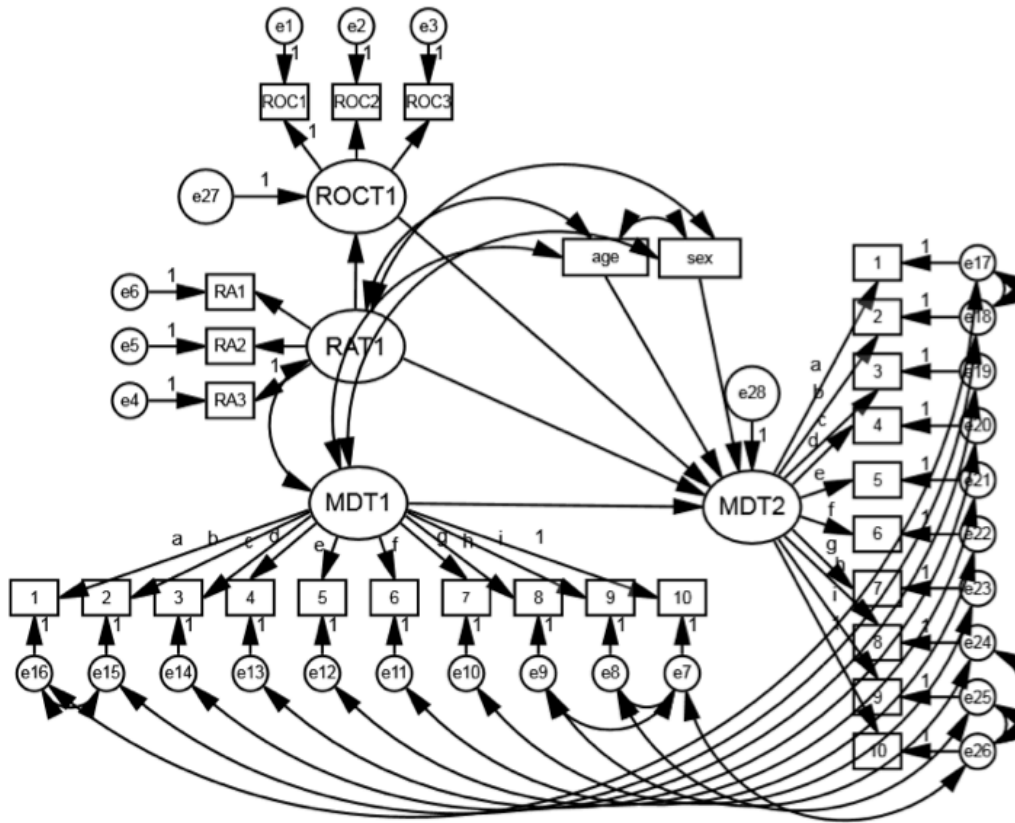


Figure B1. Role ambiguity: The overall prospective mediation model (structural equation model). The model includes single items and error terms for the latent constructs; role ambiguity T1, rumors of organizational change T1 and mental distress T2, while controlling for distress T1, sex and age. The mental distress error terms for item 1 and 2, 8 and 10, and 9 and 10 are co-varied, as well as the measurement errors across time (mental distress T1 and T2).

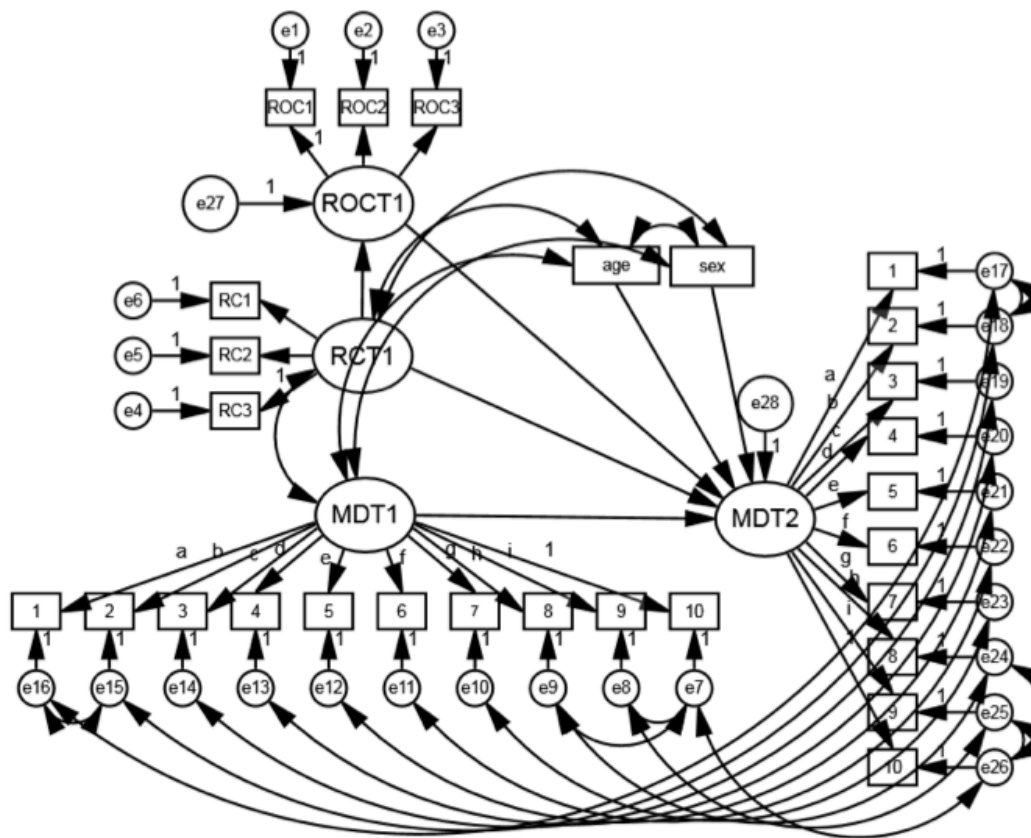


Figure B2. Role conflict: The overall prospective mediation model (structural equation model). The model includes single items and error terms for the latent constructs; role conflict T1, rumors of organizational change T1 and mental distress T2, while controlling for mental distress T1, sex and age. The mental distress error terms for item 1 and 2, 8 and 10, and 9 and 10 are co-varied, as well as the measurement errors across time (mental distress T1 and T2).