

Acknowledgements

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Bad things do happen; how I respond to them defines my character and the quality of my life. I can choose to sit in perpetual sadness, immobilized by the gravity of my loss, or I can choose to rise from the pain and treasure the most precious gift I have – life itself.

- Walter Anderson.

Margrethe Færgestad,

Oslo, April 2017

Abstract

This thesis evaluates the effects of a prolonged intervention effort implemented in a specific unit at a Norwegian university. The effort consisted of two interventions; the employeeship program and the health, safety and environment project. Interventions ran from early 2012, finishing late 2014/early 2015. The aim was to improve the psychosocial work environment, with emphasis on reducing widespread interpersonal conflicts. Data collected in fall 2012 and fall 2014, from a psychosocial work environment study involving the entire university, was used to evaluate effects. The unit was compared to the rest of the university on relevant variables over time. ANOVA showed a significant interaction effect for interpersonal conflicts, $F(1, 6901) = 5.376, p = .020$ - for the unit, interpersonal conflicts had decreased over time, whilst the same variable had increased for the rest of the university. A significant interaction effect was also found, $F(1, 6936) = 5.282, p = .022$, for social community. Whilst there was an increase in both groups, the unit had an increase so significant that they surpassed the university despite being lower on this variable in 2012. Other variables were largely unaffected. It is tentatively concluded that the interventions succeeded in their main goals of reducing interpersonal conflicts and in improving the collegial psychosocial climate. Effects that indicate that the efforts have resulted in a general increase in psychosocial resources are yet to be seen.

Keywords: effect evaluation, organizational interventions, psychosocial work environment

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Introduction

Today's work life is constantly changing due to globalization, rapid technological advances and increasing competition (Milch, Vaag, Giæver, & Saksvik, 2013). It follows that the working environment is being continuously challenged and that workers often face potential issues such as increases in job demands and greater workloads. These issues have been associated with adverse effects, and higher levels of stress-related disease is one of them (Christensen, 2012). In an attempt to tackle such issues and to promote and develop healthy organizations capable of dealing with the modern work life, organizational interventions are often implemented. According to Ipsen and Andersen (2013), healthy organizations have the ability to continuously monitor their organizational climate and are capable of acting and changing when necessary to ensure their best possible functioning. As modern organizations are dependent on being able to do exactly this in order to thrive, it comes as no surprise that interventions often aim to ensure this reality for the organizations in which they are implemented. It should also be mentioned that many countries have in fact developed laws and legislations to ensure the health of employees. In Norway, The Revised Working Environment Act (Arbeidsmiljøloven, 2006) posits that work is to be organized in such a way that it does not put physical strain on the employee. Furthermore, the working environment is to provide a basis for a healthy and meaningful work situation. Interventions can be conducted to ensure these conditions for organizations that may be struggling to achieve them, and Nielsen, Taris and Cox (2010b) note that successful interventions are indeed capable of promoting well-being and of addressing stressors in the workplace.

Nielsen et al. (2010b) define *organizational health interventions* as “planned actions that are designed to remove or modify the causes of job stress and impaired health and well-being, and that target a relatively large group of people in a relatively uniform way” (p. 220). These types of interventions typically aim to change one or more of the following: a) the work environment, b) roles and social relationships, c) work conditions (Semmer, 2011).

Traditionally, workplace interventions are often carried out to reduce or remove stressors, and are divided into three main categories (Hurrell, 2005; Reynolds, 1997; Richardson & Rothstein, 2008). The framework behind these is built on the notion that stressors may lead to strain, and the categories are differentiated in terms of their focus areas. There are *primary interventions*, where the focus is on reducing or eliminating stressors in the workplace. Then there are *secondary interventions*, where the focus is on changing or influencing a person's experience of/reaction to exposure to workplace stressors. Lastly, there's *tertiary interventions*, where the focus is treatment of individuals that have already had

negative reactions to strain. This division of workplace interventions suggests that there is no universal intervention method well suited for all conditions and situations. What all three categories have in common is that they all typically aim to solve specific problems or issues that have already occurred, by for example attempting to improve the working environment or reduce sickness absence (Milch et al., 2013). If the aim is to take a more proactive approach to building healthy workplaces, Milch et al. (2013) prefers primary interventions over the other two categories, but note that these interventions are typically still implemented *after* a problem or issue has been identified. This means that such interventions are more preventative, rather than proactive in nature.

Of the three aforementioned categories of interventions, the primary type is thought to be the most efficient (Kelloway & Day, 2005), but they are infrequently studied (Kelloway, Hurrell, & Day, 2008), are widespread and costly (Hurrell & Murphy, 1996), and have often yielded inconclusive results as far as their effectiveness goes (Saksvik, Nytrø, Dahl-Jørgensen, & Mikkelsen, 2002). More research and studies have therefore been conducted using the secondary and tertiary intervention approaches (Hurrell & Murphy, 1996).

Primary interventions can further be divided into 2 types: psychosocial interventions and sociotechnical interventions (Parkes & Sparkes, 1998). Psychosocial interventions, according to Hurrell (2005) “focus *primarily* on human processes and psychosocial aspects of the work setting and aim to reduce stress by changing employee perceptions of the work environment” (p. 624). Sociotechnical interventions, on the other hand, “focus *primarily* on changes to objective work conditions” (Hurrell, 2005, p. 625). According to Kelloway et al. (2008) the distinction between the two may be hard to make in practice, as interventions may involve changes of both the subjective and objective kind. Because this thesis deals with interventions that are mainly psychosocial, only these will be outlined further: Psychosocial interventions are typically of a participatory action nature. Here, both participants and “experts” are involved in the identification of issues and problems, the development and implementation of subsequent solution to these, and in the evaluation of effects (Hurrell, 2005). Kelloway et al. (2008) note that such interventions are ambitious and therefore often run into what the authors call “real world” constraints. As examples of such practical constraints the authors mention confounding co-occurring organizational events, the inability to implement the interventions as they were planned, and the need for short-time, small-scale implementations. The authors further state that this has made it difficult, if not impossible, to draw conclusions about psychosocial interventions in terms of their effectiveness (Kelloway et al., 2008). Even though some studies have been encouraging, unambiguous evidence for the

effectiveness of such interventions are missing. In one such study Theorell, Emdad, Arnetz and Weingarten (2001) trained 42 managers in a Swedish insurance company, using employees in a different department at the same company as a control group. The control group did not receive the intervention. The experimental group (the employees that received the intervention) reported improved decision authority and had lowered their serum cortisol levels.

Research has demonstrated that a range of outcomes may be positively affected by organizational interventions that have been developed to address issues of a psychosocial nature (Bourbonnais et al., 2006; Dahl-Jørgensen & Saksvik, 2005; Gilbert-Ouimet et al., 2011). However, systematic reviews and primary health intervention studies have not yielded conclusive results on the effectiveness of organizational health interventions (e.g. Montano, Hoven, & Siegrist, 2014; Bhui, Dinos, Stansfeld, & White, 2012), and rarely have the results been fully successful or positive (Saksvik et al., 2002). An organizational-level intervention found successful in one organization may even produce negative effects in another (Semmer, 2006). Reviews generally conclude that more studies and evidence on organizational health interventions is needed in order to have full faith in their effectiveness (e.g. Graveling, Crawford, Cowie, Amati, & Vohra, 2008; Parkes & Sparkes, 1998; Richardson & Rothstein, 2008).

Karanika-Murray, Biron and Saksvik (2016) write that there is a substantial divide between what organizations *do* to promote health and well-being, and *what is known* about the causes of ill health at work. These authors note that it is known that organizational-level interventions can be preventative and that they can deal with workplace problems at their source. This makes them more cost effective and more effective in general than individual-level interventions. Empirical research suggests that interventions addressing issues such as psychosocial constraints and poor leadership ought to work in practice, but intervention studies in “real life” have failed to yield strong evidence for this notion (Karanika-Murray et al. 2016). Karanika-Murray et al. (2016) claim one of the reasons for this is that little research has examined the methods that are needed to evaluate organizational health interventions sufficiently. It should be mentioned that research in the area is not helped by the fact that researchers often differ on matters such as theoretical frameworks, methodologies and levels of analysis (Burke, 1993; Colarelli, 1998). According to Tetrick and Winslow (2015), one of the reasons for the lack of substantial research findings is due to a non-existent unifying theory about organizational health interventions.

What does seem to be certain is that intervention programs are inherently difficult to implement (Lipsey & Cordray, 2000), and that the effectiveness of health intervention programs, due to the complex nature of organizations, is difficult to evaluate (Semmer, 2006). It is unclear what exactly makes a successful intervention successful (Graveling et al., 2008; Richardson & Rothstein, 2008). It appears whether an intervention is successful or not depends on several factors, including its content, context and its process of implementation (Karanika-Murray & Biron, 2013; Nielsen & Randall, 2013; Saksvik et al., 2002).

So, it seems major obstacles to achieving the desired or intended outcomes of an intervention include the lack of attention given to contextual differences (the environments in which the interventions take place) and to the effects different implementation processes may have on intervention outcomes (Nytrø, Saksvik, Mikkelsen, Bohle, & Quinlan, 2000). As a result, several researchers now argue evaluations should deal more with how the interventions have been implemented and how this in turn affects the interventions' outcomes (Biron & Karanika-Murray, 2014; Egan, Bamba, Petticrew & Whitehead, 2009; Nielsen & Abildgaard, 2013). However, such evaluations are still scarcely found in the literature. The treatment conditions need to be examined more closely as a result of literature demonstrating that interventions may fail to implement as they intended to (Lipsey & Cordray, 2000). Indeed, Saksvik et al. (2002) claim interventions often fail because context and process factors related to the implementation of them are not included in the evaluations, rather than because they are poorly designed.

This master thesis examines the outcome of intervention efforts conducted in the Economy Unit (EU) at the Norwegian University of Science and Technology (hereon referred to as NTNU). The intervention efforts included the implementation of two intervention programs that followed each other, the Employeeehip Program (EP) and the Health, Safety and Environment Project (HSEP). Management initiated the interventions because the EU demonstrated a less-than optimal psychosocial work environment ripe with interpersonal conflicts. In this thesis, the outcomes or effects of these salutogenic interventions are evaluated. The title of this paper refers to these efforts as just one intervention (in singular form) for the sake of simplicity, but the thesis is more accurately an effect evaluation of a prolonged intervention effort that consisted of two consecutive interventions. Saksvik, Olaniyan, Lysklett, Lien, and Bjerke (2015) believe that fundamental prerequisites behind the success of all types of organizational interventions are the involvement of the entire organization as well as the participation and involvement of all employees. As these prerequisite are largely met by the two intervention programs implemented on the economic

unit at NTNU, it is interesting to see whether this particular intervention effort can be deemed “successful”. Saksvik et al. (2015) conducted a process evaluation of the first intervention (the EP) and found it successful. This makes it especially intriguing to investigate effects; will the successful process also result in outcome success? A process evaluation of the second intervention has not yet been conducted. But, as the same people behind the first evaluation were also behind this intervention (and because they used the process evaluation of the first intervention to guide the second), one can tentatively assume that this also constituted a successful process. Even though, as outlined above, intervention research is now facing a shift in focus to intervention processes rather than outcomes, it is still important to assess whether such interventions ultimately succeed in achieving their desired outcomes.

To examine the question of intervention outcome success, data collected from a screening survey (the Knowledge Intensive Work Environment Survey Target, KIWEST) that is part of a working climate intervention tool known as the ARK Intervention Programme (ARK) was used. The whole of NTNU was expected to participate and the data comes from two points in time: KIWEST I was collected autumn of 2012 and KIWEST II was collected autumn of 2014. Comparisons should give an idea of the development over time for the EU, and this paper attempts to investigate whether or not the intervention efforts had the desired effects. By comparing the results of the EU with the results of the remainder of NTNU, it is assessed whether potential effects can be ascribed to the intervention efforts. If, for example, effects are found, but these effects are the same across the whole NTNU sample, they cannot be concluded to have been caused by the intervention efforts.

Theoretical Framework

In this section, due to its involvement in both the data collection and the interventions, the Job-Demands-Resources Model is explained. Next, because of their relevance to the interventions studied in this thesis, countervailing and participatory interventions are outlined. Theory and research on product evaluations, random control trials and quasi-experimental intervention are then presented. An alternative approach, process evaluation, is presented similarly in the section following. This also includes brief descriptions and theory regarding factors that potentially affect intervention process and evaluation. A relevant study that entails the process evaluation of an intervention is then described. Lastly, the hypotheses for this study are presented.

The Job Demands-Resources Model (JD-R)

The Job Demands-Resources Model (JR-R) constitutes a large part of the theory behind the ARK Intervention Programme and was used by the consultants at Kibu as a theoretical backdrop to their intervention efforts. In ARK, JD-R is supposed to “contribute a set of mental models that can help create shared visions in a way that gives access to both an individual’s own and others’ underlying knowledge and values” (Undebakke, Innstrand, Anthun, & Christensen, 2014, p. 6, translated from Norwegian). Randall and Nielsen (2012) claim interventions need to be a fit to both the organization and the individual to succeed, and in ARK’s usage of the JD-R the factors included in the model are meant to be those that are experienced as the most important in the local context in which it is used. The introduction of the JD-R in the intervention efforts may have helped build a common or shared frame of reference or mental models (Senge, 1990; 2006).

The JD-R is a theoretical model used for both research and for more practical developments of the working environment (Bakker, Demerouti, & Sanz-Vergel, 2014). The model explains both a health promoting (engagement) and a health impairing (burnout or exhaustion) process produced by two types of working conditions that can be found in every organizational context, namely job demands and job resources, see Figure 1. These processes are parallel and fairly independent.

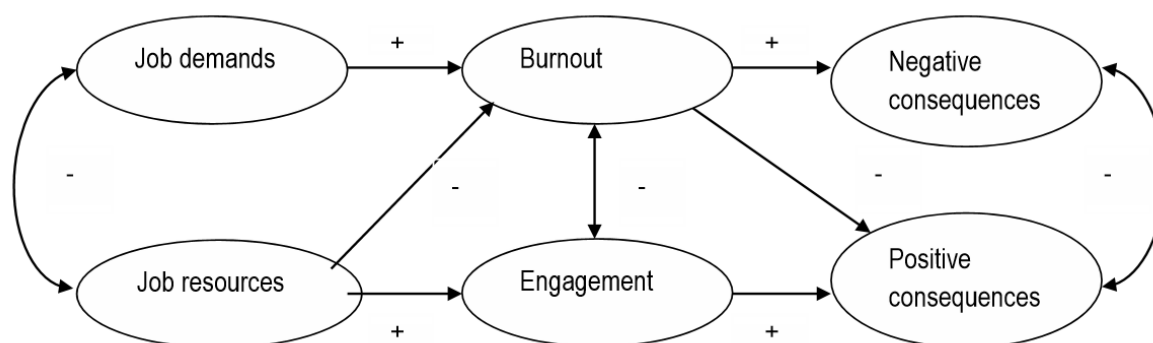


Figure 1. The Job Demands-Resources Model (JD-R) (Undebakke, Innstrand, Anthun, & Christensen, 2015).

Job demands. JD-R defines so-called job-demands as physical, psychological, social or organizational aspects of work that require sustained or lasting physical and/or psychological effort (Demerouti, Bakker, Nachreiner, & Schaufeli, 2001; Schaufeli & Bakker, 2004). Examples include emotional demands, (quantitative) work load, physical work environment, interpersonal conflicts at work and time pressure. In the first of two parallel processes proposed by the JD-R model, the *stress/health impairment process*, these job demands contribute to burnout/exhaustion. In accordance with this, studies show that job demands are typically the most important predictors of work negatives such as repetitive strain injury, complaints of psychosomatic health and exhaustion (e.g., Bakker, Demerouti, & Schaufeli, 2003; Haakanen, Bakker, & Schaufeli, 2006). These effects are thought to be explained by the fact that job demands are costly in terms of effort and energy consumption (Bakker, 2011; Deci & Ryan, 2000; Nahrgang, Morgeson, & Hofman, 2011).

Job resources. Job resources are physical, psychological, social or organizational aspects of work that can 1) stimulate personal growth, learning and/or development, 2) reduce job demands and their related physical and/or psychological costs, or 3) be regarded as functional in the sense that they aid the achievement of goals in the workplace (Bakker & Demerouti, 2007; Schaufeli & Bakker, 2004). Examples of job resources include empowering leadership, recognition, social community at work, trust in management, autonomy, feeling of control, managerial and coworker/collegial support (both emotional and instrumental), and opportunities for competence development. Studies have found a positive association with work engagement of job resources such as opportunities for learning, feedback, social support and task variation (Bakker & Demerouti, 2008). In the second and final process proposed by the JD-R model, the *motivational process*, these job resources contribute to engagement. In accordance with this, studies show that job resources are typically the most important

predictors of work positives such as motivation, engagement and enjoyment of work (Bakker, Haakanen, Demerouti, & Xanthapoulou, 2007; Bakker, Van Veldhoven, & Xanthopoulou, 2010). These effects are thought to be explained by the fact that job resources fulfil basic psychological needs, such as the needs for competence and autonomy (Bakker, 2011; Deci & Ryan, 2000; Nahrgang et al., 2011).

Several studies have given their support to the existence of these two processes proposed by the JD-R model. For example, when studying Finnish teachers, Haakanen et al. (2006) found that burnout worked as a moderator on the effect of job demands on adverse health outcomes, and that work engagement similarly mediated the effect job resources had on organizational commitment. In a study of Dutch call center employees, Bakker et al. (2003) found evidence for one health impairing process driven by energy where job demands (i.e. emotional demands, task changes, work pressure etc.) were identified as the most important predictors of sickness absenteeism; and one process driven by motivation where the only predictors for organizational commitment and dedication were job resources (i.e. performance control, social support, time control etc.).

Even though the processes initiated by job demands and job resources are different, they can also have joint effects (Bakker & Demerouti, 2014). According to JD-R, job demands and job resources may also interact in two possible ways that can predict occupational health and well-being (and indirectly, performance): 1) Job resources can function as a buffer on the impact job demands have on strain. The idea is that workers with an abundance of job resources are better equipped to cope with their job demands. In support of this, studies have demonstrated that job resources can lessen the impact job demands have on strain (Bakker, Demerouti, & Euwema, 2005; Xanthopoulou et al., 2007). 2) Job demands can amplify the impact job resources have on motivation/engagement (Bakker & Demerouti, 2014). The thought here is that job resources are particularly valuable when employees are faced with high job demands. Supporting this notion, studies have found that in cases where job demands are high, job resources impact work engagement the most positively (Bakker & Demerouti, 2014). For example, Bakker et al. (2007), in a study on Finnish teachers, found that job resources worked as buffers that reduced the negative relationship found between bad student behavior and work engagement. In sum, empirical evidence suggests that demands and resources can interact and have combined effects on well-being.

Personal resources. It is important to note, even though this is not a topic that will be explored or delved further into in this thesis, that extensions of the original JD-R model include personal resources. According to Hobfoll, Johnson, Ennis & Jackson (2003) personal

resources can be seen as self-evaluations that are of a positive nature and that have to do with individual's sense of his/her own capacity to successfully impact upon and/or control their environment. Bakker and Demerouti (2014), citing different studies, claim these personal resources for example can predict desirable outcomes such as job resources and work engagement or even act as buffers for the impact job demands has on undesirable health outcomes.

One of the major advantages of the JD-R is that it can be used regardless of which job demands and job resources can be found in a specific workplace, meaning that the model can be used on many different workplaces and professions. The relationship between job demands and job resources does not change significantly even if the content of these demands and resources are changed (Bakker & Demerouti, 2007; Schaufeli & Bakker, 2004). One thing to keep in mind, however, is that what constitutes and is experienced as important job demands and job resources will differ within individuals and working environments (Bakker & Demerouti, 2007; Schaufeli & Bakker, 2004). The ARK Programme therefore considers participation and dialogue prerequisites for the JD-R to work as intended, so that the job demands and job resources that are the most important for the local context are identified for further use in the model (Undebakke et al., 2014).

Countervailing Interventions

Whilst researchers underscore that intervention research should still have a primary focus on the elimination/reduction of job stressors (Kelloway et al., 2008; Milch et al., 2013), especially considering the vast amount of empirical research documenting that such stressors may be detrimental to employee health (e.g. Sauter, Murphy, & Hurrell, 1990), it may also be useful to investigate interventions that attempt to promote positive resources in the work environment. That is, interventions that go beyond the aim of identifying and eliminating negative aspects of work as is commonplace with the primary, secondary and tertiary interventions. Milch et al. (2013) state that the identification and promotion of positive factors that may help employees handle challenges in modern work life (such as increased demands) represent an essential objective. Kelloway et al. (2008) argue that interventions dubbed as “countervailing” may be an interesting area of research. Countervailing interventions can be defined as “interventions that are focused on increasing the positive experience of work rather than decreasing the negative aspects” (Kelloway et al., 2008, p. 433). Milch et al. (2013) and Bauer and Jenny (2013) write that interventions aimed at developing and promoting these positive aspects of work may simultaneously counteract the negative aspects within the same

environment. An important part of the rationale behind the idea of countervailing interventions is that the elimination of negative factors (stressors) is not enough to create a positive work environment. Positive factors (or resources) that enable employees to deal with stressors must also be promoted and developed (Christensen, 2012).

Kelloway et al. (2008) mention that there are a wide range of intervention programs that may be considered countervailing in nature, but also that more research needs to be conducted on their effectiveness. Even though programs with the aim of promoting the psychosocial work environment have been around for a long time (Milch et al., 2013), and appear highly popular in organizations (Kelloway et al., 2008), research on them is rarely found in the literature (Kelloway et al., 2008). Because these interventions differ in terms of their objectives from the more traditional interventions, more research should be conducted on how to best carry out and evaluate them.

Effect evaluations, Random Control Trials (RCT) and Quasi-Experimental Intervention Research

Traditionally, research on organizational interventions have followed a positivistic view with focus on measurement of outcomes. The aim has been to examine whether or not an intervention has succeeded in achieving the goals it set out to achieve. So-called randomized control trials (RCT) represent a kind of “golden standard” where research design is concerned (Biron, 2012) because they are assumed to be the optimal way to research causality. In such designs, participants are randomly placed into an experimental group (i.e. the group that will be exposed to an intervention/treatment) and one or more control groups (i.e. the group(s) that does not receive the intervention/treatment) (Howell, 2010; Tabachnick & Fidell, 2013). Participants are evaluated on specific outcomes (such as their level of work engagement) both prior to and following the intervention effort. Due to the randomized selection of participants and the fact that groups are typically considered quite similar prior to the intervention, researchers can have faith that any changes occurring between the experimental group and the control group following the intervention can be accredited to the intervention itself.

It goes without saying that RCTs are rather difficult to carry out in complex organizations, and such designs have achieved rather disappointing results when studying organizational health interventions (Biron, 2012). Often-times quasi-experimental designs are carried out in place of RCT, perhaps due to issues of practicality or ethicality. These designs lack the random assignment found in RCTs, but are otherwise quite similar in form.

Researchers may, for example, choose to use already intact groups (that are thought to be similar) as the experimental and control groups instead of randomly assigning participants to groups. In such cases it is unlikely that the groups are as similar as they would be if they were created through randomization and researchers cannot be entirely confident that the two are directly comparable.

The fact that organizational health interventions take place in “real-life” rather than in a laboratory may be part of the reason the design has achieved poor results. However, this is of little help or comfort, considering most research of this type is done in a naturalistic setting (Nielsen & Randall, 2013). It is conceivable that RCT-design may not be appropriate for use in organizational settings (Karanika-Murray et al., 2016). If the wrong method is used to evaluate interventions it is possible to evaluate a potentially successful intervention as unsuccessful and vice versa. According to Biron and Karanika-Murray (2014), some of the risks researchers run when they use methods of evaluation that are not appropriate for organizational interventions include a) assessing an intervention as unsuccessful when it was actually the implementation of it that was unsuccessful, and b) of concluding that an intervention program was unsuccessful because it failed to sufficiently impact target outcomes, when it in fact could have influenced other equally important ones.

Heaney and Goetzel (1997, cited in Biron, 2012), in a systematic review of research on health intervention programs that aimed to modify risk factors and reduce sickness absenteeism, found non-randomized control trials with a comparison (or control) group more likely than RCTs to produce positive effects in response to a treatment. Their review also documents that studies using a design without a comparison group typically find higher positive outcomes than studies using RCTs or quasi-experimental designs where groups are compared but not randomized.

Newer reviews have documented that several challenges are met when attempting to evaluate the total effects of an intervention in the highly complex context that it inevitably takes place within (Egan et al., 2009; Murta, Sanderson, & Oldenburg, 2007). It is difficult, if not outright impossible, to isolate potential intervention effects or outcomes due to the dynamic nature of organizations. Can the effects (if there are any) shown in the organization be ascribed to the intervention, or are they simply a result of other (and typically unmeasured) confounding variables surrounding it? If you only measure whether there were significant changes in select variables, chances are you ignore the inherent complexities of interventions. This complex context should be taken into consideration in order to find out what works for whom, why, how and under which circumstances (Pawson, 2006).

Time and effect evaluations. Time may be a factor of influence when evaluating interventions. Kico and Saksvik (2015) claim the length of the evaluation period is of significance as to whether or not an intervention is found successful. Often evaluations are undertaken one year after implementation, but this may not be a long enough time perspective. Expected effects may need time to mature in order to be seen on an intervention evaluation. Van der Hek and Plomp (1997) found that several preventative intervention studies had follow-up periods that were too short. Interventions, because they typically involve some sort of change to employees' routines, may themselves produce negative employee reactions (Kico & Saksvik, 2015). Organizational theory points to individuals responding negatively to such disruptions/changes (Lewin, 1951), and Tvedt and Saksvik (2012) claim interventions themselves in that sense may represent stressors. This should therefore be taken into account during the stages of an intervention process. With this in mind, Kico and Saksvik (2015) advise conducting long-term evaluations because they make it possible to study intervention outcomes when participants have "gotten used to it", so to speak. It is possible interventions that do not display the desired effects when assessed will be evaluated more positively if they are assessed at a later date, further down the line. As an example, Bourbonnais et al. (2006) and Bourbonnais, Brisson, and Vezina (2011) found that a longitudinal study of an intervention implemented and evaluated over the course of three years, allowed them to more clearly uncover the positive effects of the intervention. It may therefore be imperative not to evaluate an intervention too early.

Process Evaluations

Calls by researchers for evaluations of how interventions are implemented were mentioned briefly in the introduction of this thesis. In relation to this, Saksvik et al. (2015) write that whilst the outcome (or effect) of interventions may be evaluated, the implementation (or the *process*) of these interventions are seldom evaluated. Biron and Karanika-Murray (2014), in a review of organizational health programs, concluded that there is usually a rather single-minded focus on the evaluation of outcomes. They found that the effects of an intervention and the factors influencing a specific outcome are the most commonly studied issues while processes are rarely the subject of evaluation.

Nytrø et al. (2000, p. 214) define process as "individual, collective or management perceptions and actions in implementing any intervention and their influence on the overall result of the intervention". In short, process evaluations are more concerned with evaluating the mechanisms of change than with evaluating the outcome or effects. According to Saksvik

et al. (2002), the identification of key factors behind the implementation process is necessary to improve the success of future organizational health intervention studies, and several researchers now acknowledge that the process of implementation can be just as important as the intervention itself (Goldenhar, LaMontagne, Katz, Heaney, & Landsbergis, 2001; Hurrell, & Murphy, 1996). It has been suggested that the increased use of intervention process evaluation may elevate the quality and quantity of published intervention research (Semmer, 2006).

Pawson (2006) writes that “interventions are fragile creatures. Rarely, if ever, is the ‘same’ program equally effective in all circumstances” (p. 30). To add to this, research on interventions has largely failed in identifying key factors or aspects that lead to their success across different situations. It is possible that considering the intervention process and not just the intervention outcomes may aid in this search (Egan, 2013). Some researchers even note that such an approach has the potential of increasing transferability and make interventions more replicable (Cooper, Dewe, & O’Driscoll, 2001; Egan, 2013).

Nielsen and Randall (2013) have developed a model of process evaluation. Briefly put, this model is based on the assumptions that there are three factors that exert influence over the effects produced by an organizational health intervention: 1) The intervention’s design and implementation, 2) The context of the intervention, and 3) The mental models possessed by participants (Nielsen & Randall, 2013). The context and mental models of participants are seen as moderators between intervention exposure and intervention effects. Without discussing the Nielsen and Randall (2013) model further, this paper now delves into some research that in some way demonstrates why process evaluations may be a fruitful or even necessary approach to interventions. Some factors that potentially affect intervention process and evaluation are outlined below.

Participatory interventions and the role of participation. Participatory interventions are interventions in which participants themselves take an active part (Heany, 2011). Such interventions have increased in popularity over the recent years and some researchers state that organizational interventions can only succeed if participants play an active role in them (Mikkelsen, Saksvik, & Landsbergis, 2000). In accordance with this, a number of studies have found participation to be a crucial part of successful interventions (Nielsen, 2013; Nielsen & Randall, 2013). Since employees in one way or another essentially are the targets of organizational interventions, it intuitively makes sense that “having them aboard”, will benefit intervention efforts. Indeed, employee opposition to such efforts may have negative effects (Randall, Griffiths, & Cox, 2005).

Participation can take many forms. In some cases, the participation may only include answering a questionnaire or survey, whilst in other cases involves the development of action plans and/or employees having responsibility for the implementation of activities that constitute the intervention (Hurrell, 2005; Roskam, 2009). Employees can be somewhat involved in every phase of an intervention program (from initiation through to the evaluation), or their participation could, for example, be limited to only certain phases (Nielsen, Randall, Holten, & Gonzalez, 2010a; Nielsen et al., 2010b; Sørensen, 2013). Landsbergis and Vivona-Vaughan (1995) claim the involvement of the whole organization is crucial during the initial or planning phase. It is not unreasonable to assume that different levels of participation will influence the effects of an intervention. Regarding this, some researchers claim that participation is crucial at all stages of the intervention project (Nielsen, Stage, Abildgaard, & Brauer, 2013). Nielsen et al. (2010a) stress that sufficient opportunities for employees to influence the project is important for intervention outcomes. It has also been claimed that an intervention needs the involvement of *all* employees to reap the benefits of participation (Hurrell, 2005; Nielsen & Randall, 2012). It is common during interventions to establish a steering group consisting of representatives for both employees and managers (Nielsen et al., 2010a), but in cases where such groups do not function as intended they can have adverse consequences (Mikkelsen & Saksvik, 1999; Mikkelsen et al., 2000). Other researchers highlight the role of leadership, and Nielsen et al., (2010a) suggest leadership on all levels in an organization need to work with subordinate employees at all stages of an intervention project. Saksvik and Tvedt (2009) uncovered that middle managers who were successful in managing healthy change were pro-active and very much involved in the change process.

Employee participation has been found to have many benefits. Participation has for example been found to positively relate to employees' commitment to the organization and negatively relate to change resistance (Lines, 2004). Nielsen and Randall (2012) argue that participation may; a) ensure the integration of intervention activities into the existing structures and initiatives within an organization, b) ensure the use of participants' knowledge and foster ownership of the intervention, and c) empower the employees. Empowered workers will work actively to improve their own working environment, and this has been linked to intervention effects (Nielsen, Randall, & Albertsen, 2007). Employees who feel ownership of an intervention may be more motivated to see it succeed. Because the employees themselves often have a better grasp on what the issues in their workplace are, they can help develop initiatives that are more tailored to their particular situation and help make the intervention a better fit for the organization (Lamontagne, Noblet, & Landsbergis, 2012). Harden, Peersman,

Oliver, Mauthner and Oakley (1999), in an extensive review on the effectiveness of organizational interventions, note that only twenty-five percent of the interventions they reviewed were tailored to employees' specific needs. Participation may also lead to increases in participants' perceptions of job control, social support and autonomy (Nielsen & Randall, 2012) as well as satisfaction and well-being (Roskam, 2009). Evidence also suggests that a high degree of employee participation can lead to employees perceiving the intervention more favorably (Lines, 2004). Sørensen (2013) states that participation is thought to increase employee engagement and commitment to an intervention project by giving participants a chance to influence and control said intervention. Employee engagement is thought to be crucial for an intervention to succeed. It is therefore a possible hindrance that employees oftentimes have little faith that interventions will produce positive outcomes for them and perceive the intervention efforts negatively from the get-go (Hoff & Lone, 2014). Such skepticism greatly diminishes the likelihood of employees engaging in the intervention (Coyle-Shapiro, 1999). A possible way in which participation may increase the chance of engagement is by increasing participants' perceptions that the intervention is relevant to them (Egan et al., 2007).

Despite the amount of literature found on the benefits and advantages of participation, participatory interventions are still not common-place (Lamontagne et al., 2012). In fact, Harden et al. (1999), in their review, uncovered that as few as fourteen percent of those reviewed were of a participatory nature. This despite research stating that the chances of an intervention succeeding appear to increase in cases where it adopts a more bottom-up approach (Saksvik et al., 2002). It is possible the widespread view of employees as passive recipients is behind the frequent favoring of the more top-down approaches (Nielsen et al., 2010b). The lack of participatory interventions in research may also be due to the little available information concerning their development and implementation (Lamontagne et al., 2012; Nielsen et al., 2013).

Intent or purpose. An intervention's intent or purpose may also affect its outcome. As an example, Egan et al. (2007) found that employees' well-being/health is typically influenced negatively by interventions that have been designed to improve work performance, whilst the opposite goes for interventions designed to increase well-being/health. Interventions brought about to increase well-being were more likely to succeed than those carried out solely to meet law- or legislative demands (Egan et al., 2007).

The role of consultants. In instances where interventions are meant to have long-lasting effects, the role played by consultants is important (Dahl-Jørgensen & Saksvik, 2005).

Saksvik and Nytrø (2001) write that it is commonplace for consultants to be met with resentment and/or distrust from company stakeholders when they begin their work within an organization and, according to Kico and Saksvik (2015), disagreements or conflicts between employer and employees on how an intervention is formed and carried out by consultants may arise. Interventions that make use of external occupational health expertise may also derail under certain conditions, such as in cases where there are organizational or management changes or a change in project champion (Kico & Saksvik, 2015). The same authors claim more natural interventions (those initiated and conducted by the organizations themselves) may be preferable as they often are a result of employees and management agreeing that certain improvements are needed in the organization. The heavy involvement and initiative of management and/or employees, they claim, may reduce the risk of intervention derailment or failure. On the other hand, it is also possible that using an external hire will represent a positive for employees. Because an organization's employees of all levels have to work with the consultant actively in order to identify and rectify issues in their workplace, this may promote a sense of ownership of the intervention. Dahl-Jørgensen and Saksvik (2005) claim such ownership is important for a successful outcome.

Context. Context has to do with the existing environment in which interventions take place (Biggs & Brough, 2015). Johns (2006, p. 386) defines organizational context as “situational opportunities and constraints that affect the occurrence and meaning of organizational behavior as well as functional relationships between variables”. It seems aspects of the context may influence intervention outcomes. Nielsen and Randall (2013) mentions an intervention's length, fit, drivers of change, and participants as some contextual factors of possible significance. They also mention an organization's intervention experience, cooccurring organizational changes, failure to sufficiently integrate the intervention, and incompatible priorities as other such factors. Other researchers mention that organizational size and structure as well as the level of job demands can influence whether an intervention succeeds (Dahl-Jørgensen & Saksvik, 2005; Saksvik et al., 2002).

Concurrent events. Concurrent events (such as mergers) may also, according to Nielsen and Abildgaard, (2013), influence an intervention. Kico and Saksvik (2015) write that parallel events or inevitable changes that occur whilst an intervention project is ongoing can corrupt the sample. Other changes/interventions that have been implemented at the same time (and that are unrelated to the studied intervention) can influence the target outcomes of the study and make the effects produced by the actual intervention unclear (Kico & Saksvik, 2015). One possible solution to this issue is to do what Bourbonnais et al. (2011) did; to

examine differences in outcome variables between the group receiving the intervention and one/several control groups.

Participants' mental models, appraisals and perceptions. Nielsen and Randall (2013) claim participants' so-called mental models influence how they react and respond to an intervention. According to Daniels (2011), mental models will steer how persons interpret, react to, and cope with these situations. Such models are thought to explain key stakeholders' behaviors and roles during intervention programs (Nielsen & Abildgaard, 2013), and identifying different participants' perceptions of such interventions may uncover how they respond to them. In accordance with this, research has found that stakeholders often disagree on what constitutes a successful intervention (Saksvik et al., 2002). Nielsen and Abildgaard (2013), in a related vein, claim that participants' appraisal of intervention phases and activities can influence an intervention. Studies have indeed found that participants actively appraise the interventions they take part in, and that these perceptions can influence the intervention effects/outcomes (Nielsen et al., 2007; Tvedt & Saksvik, 2012). The perceptions participants have of the information and communication concerning an intervention project have also been found related to its outcomes/effects (Jimmieson, Terry, & Callan, 2004). It follows that the view of participants as passive receivers that can be manipulated as such may be inherently flawed. It should also be kept in mind that, whilst one potential source of stress can result in negative stress for one employee, the same potential stressor may not even be considered a threat to another (Bond & Bunce, 2001). Stress theory postulates significant individual differences within a group (Semmer, 2006), and an intervention aimed at eliminating or reducing one or several specific stressors may have little effect on the participants dependent on whether or not they consider these stressors *actual* stressors. Nielsen et al. (2010b) write that participants' appraisal of an intervention will likely be affected by knowing the rationale behind intervention activities and by being made aware of progress. This also highlights the role communication plays in shaping appraisals and mental models. When employees perceive interventions in a positive and beneficial way, chances of them engaging in the intervention increases (Nielsen, Randall, Brenner, & Albertsen, 2009).

Leaders and management. Studies have found that leaders/management are of crucial influence with regard to an intervention's effects (Saksvik et al., 2002). In examining the failure of an organizational intervention, Nytrø et al. (2000) found the leader to be the most significant reason in explaining this failure. Senior managers' attitudes (Dahl-Jørgensen & Saksvik, 2005) and their allocation of resources to the intervention process (Lindquist & Cooper, 1999) have been found to influence intervention outcomes. Line managers can

similarly halt and hinder interventions (both directly and indirectly) and oppositely aid them. In one study, line managers “sabotaged” intervention efforts by not allowing their employees the time off work to attend intervention activities (Dahl-Jørgensen & Saksvik, 2005).

Conversely, line managers who show responsibility and actively seek the involvement of their employees during the implementation of an intervention can help employees perceive it more positively and become more engaged in and committed to it (Nielsen & Randall, 2009).

Coyle-Shapiro (1999) similarly found that intervention participation increased when line managers appeared supportive of the program. Studying several investigations, Sørensen and Holman (2014) found that the study most successful in achieving change had line managers that worked to make the intervention salient and visible to their employees. Making use of line managers during the action-planning phase of an intervention can be useful in identifying stressors because these leaders often work closely with their employees (Thomas, Rick, & Neathy, 2004), but intervention agents also need to be mindful that the same leaders may themselves represent stressors in the psychosocial environment (Biron, Gatrell, & Cooper, 2010). It is fair to assume that leaders who in that way represent stressors for the employees can act as a hindrance to an intervention if they have too much involvement in it.

Information and communication. The type of information and communication participants receive during an intervention is also important (Nielsen & Randall, 2013). Communication seems to be a key factor in determining intervention effects/outcomes (Nielsen & Randall, 2009), and a process evaluation of several interventions found that the intervention reviewed which had succeeded in producing the most change also communicated about the intervention to a much higher degree than the others (Sørensen & Holman, 2014). Open communication during an intervention program also seems crucial in order to foster employee commitment to it (Nytrø et al., 2000). It is also possible that communication will be important to a larger and lesser degree during different phases of the intervention process, and Dahl-Jørgensen and Saksvik (2015) claim that open communication is of crucial importance during the phases of action-planning and implementation. Landsbergis and Vivona-Vaughan (1995) similarly claim the focus on effective communication between participants is essential during an intervention’s planning phase. The communication by management and leaders to participants of an intervention may also play a role in intervention outcomes. As an example, line managers in one study were found to have caused an intervention’s failure by not communicating to their employees essential information about the intervention (Randall et al., 2005). Nielsen and Randall (2009) write that successful interventions are characterized by an approach that combines top-down and bottom-up communication. Studies have demonstrated

that communication about the rationale behind and the progress of an intervention (Landsbergis & Vivona-Vaughan, 1995; Mattila, Elo, Kuosma, & Kylä-Setälä, 2006; Nytrø et al., 2000), the amount of communication about an intervention (Nielsen et al., 2007), and communication intended to give participants an understanding of their roles and responsibilities stemming from an intervention (Øyum et al., 2006) can influence their effects.

Other factors of influence. Organizational readiness for change/the intervention (Nytrø et al., 2000), participant characteristics (Saksvik & Nytrø, 2001; Nielsen, Fredslund, Christensen, & Albertsen, 2006), job type, and management and organizational strategies (Nielsen & Abildgaard, 2013) also represent potential factors of influence.

In sum, a host of different aspects and factors may influence the intervention implementation (process) and outcomes. It follows that an approach to intervention research that is not concerned with any such factors is overly simplistic and runs a serious risk of missing out on important information relevant to its study. Saksvik et al. (2015) conducted a process evaluation of one of the two interventions subject to this thesis. The results from this study are (briefly) outlined below.

A Process Evaluation of a Salutogenic Intervention

Saksvik et al. (2015) did one of few process evaluations conducted of organizational interventions when they evaluated the Employeeship Program (EP) implemented in the Norwegian University of Science and Technology's (NTNU) economy and real-estate unit (ERU). The writers dub the intervention salutogenic, and claim that the fact that it involved the whole organization and was based on the participation and involvement of all employees (which they consider necessary for intervention success) made this particular intervention suited for a process evaluation. This same intervention is included in the effect evaluation that is the objective of this master thesis. In their process evaluation, the researchers used a mix of methods that included both a quantitative (survey) and qualitative (interviews) part.

The survey uncovered that communication and leadership were the two main factors involved in the intervention process, and the same factors were found to be the most important in understanding the success of the intervention (when controlling for personality and engagement). Saksvik et al (2015) further found that participants generally responded positively to the intervention, and that the interviews partially reinforced this view. The interviews also uncovered that the intervention could have benefited from tighter meeting plans and from dealing with negative intervention attitudes employees held due to previous experiences. The authors argue that clear and precise information prior to the intervention will

be important for its final outcomes. Information about the intervention's relevance influenced how useful the intervention was perceived by the participants. Saksvik et al. (2015) writes that participants who fail to understand the need for a certain intervention are unlikely to engage in intervention behavior and that this in turn will decrease its chances of succeeding. Whilst organizational changes such as restructuring and downsizing effectively force these changes upon their employees, organizational health interventions rely on the employees *choosing* to act or change in ways desired by the intervention. It follows, like Coyle-Shapiro (1999) states, that it is important or even essential to gain participants' engagement and trust in the intervention project. The interviews further highlighted the importance of leadership and communication and the authors write that both of these represent crucial factors in the implementation process. They argue that leadership, through communication, create attitudes that are essential for intervention outcome. An interesting finding from the study is that the intervention generally was met with enthusiasm and interest. The hiring of an external consultant can be problematic in cases where organizational stakeholders then aren't sufficiently involved (Dahl-Jørgensen & Saksvik, 2005), but the consultants in the EP involved the leadership at an early stage. The leadership, in turn, then involved the employees. The immediate leader/supervisor was also found to be crucial to the intervention process. The results from Saksvik et al. (2015) show that the leaders in the EP did well in taking their employees through the intervention. Communication was also found to be especially important during the planning and implementation phase. The authors concluded that the intervention overall was a positive or successful one, and that leadership and communication are especially important for intervention success. Good implementation (involving leadership role and communication) also predicted employee satisfaction with the intervention.

Hypotheses

The data from the KIWEST survey used for the purposes of this thesis was collected by the central organizational staff at NTNU. It should be possible to evaluate the change over time on several issues for the EU and then compare it to the remainder of NTNU. If an effect is found in a target variable for the EU, and this effect is not found for the other units at NTNU, it is reasonable to assume this effect may stem from the intervention efforts. Conversely, an effect found in the EU that is also found in the other units (that were not subject to the intervention efforts), cannot reasonably be attributed to the intervention. This thesis' main research focus has been centered around the question "Did the intervention

efforts undertaken in the EU succeed in achieving their desired effects/outcomes?”. Whilst a crucial aim of the intervention efforts was a reduction in conflicts (a job demand), it was also aimed at promoting positive aspects of the workplace (job resources and work positives such as engagement) Based on the aim of the interventions (which are outlined in the “methods” section) and on extant theory and research, this thesis examines the following hypotheses:

Hypothesis 1: There has been a reduction in the level of interpersonal conflicts in the EU which may be attributed to the intervention efforts.

Hypothesis 2: There has been an increase in the level of social community in the EU which may be attributed to the intervention efforts.

Hypothesis 3: There has been an increase in the level of trust in management in the EU which may be attributed to the intervention efforts.

Hypothesis 4: There has been an increase in the level of empowering leadership in the EU which may be attributed to the intervention efforts.

Hypothesis 5: There has been an increase in the level of recognition in the EU which may be attributed to the intervention efforts.

Hypothesis 6: There has been an increase in the meaning of work in the EU which may be attributed to the intervention efforts.

Hypothesis 7: There has been an increase in the level of work engagement in the EU which may be attributed to the intervention efforts.

Hypothesis 8: There has been an increase in the level of commitment in the EU which may be attributed to the intervention efforts.

Methods

Study Design

The ARK Intervention Programme. The main data in this thesis comes from the ARK Intervention Programme. ARK is a working environment and working climate intervention tool developed by four of Norway's largest universities for use in the academic sector. It is based on theory and claims to be a valid and reliable tool useful for workplace surveys, interventions and research (Undebakke et al., 2014). It maps the psychosocial conditions in knowledge-intensive organizations in a systematic way and includes important psychosocial working environment factors with the aim to develop organizations' working environment and climate. The ARK consists of several parts: 1) A survey called the Knowledge Intensive Work Environment Survey Target (KIWEST), 2) Factsheets I and II, 3) a structured guideline for follow-up and feedback meetings regarding results of KIWEST, and 4) a database called The ARK Research Platform that stores data from previous surveys and is available for research. In taking a closer look at some of the parts of ARK, KIWEST examines employees' individual experiences in the work environment and is answered by all unit employees. The survey includes standardized and validated questions about organizational climate, work resources and work demands. Factsheet I is to be answered by the unit leader in cooperation with the unit's health and safety representative and covers the organizational conditions that are common to all employees in said unit. It deals with organizational matters that impacts the work environment. Factsheet II is also answered by the unit leader in collaboration with the health and safety representative, and contains questions about the whole ARK process after the fact (i.e. how the process worked, planned actions, implemented changes etc.). The ARK Intervention Programme divides itself into five phases consisting of 1) "Preparation" – a phase where the organization is prepared for the implementation and gets acquainted with the specifics of the ARK, 2) "Screening" – where Factsheet I is filled in and KIWEST is sent to all employees, 3) "Action Planning" – actions and initiatives are developed based on the survey results in a survey-feedback meeting that includes all employees, 4) "Implementation", and finally, 5) "Evaluation" – where Factsheet II gets filled in. The intervention does not end with the evaluation phase, however, the ARK Programme and the efforts to improve working conditions is to be considered a continuous process (Undebakke et al., 2014). In summation, the ARK can be regarded as a tool and base for work environment surveys, implementation of interventions, and research (Undebakke et al., 2015).

Data collection. In order to evaluate the effect of the intervention efforts on the EU, this thesis used data specifically from the KIWEST survey, taken at two points in time. The first dataset was collected using KIWEST I in the period from October 30th until November 21st 2012, and the second dataset, using KIWEST II, was collected at NTNU in the period from November 4th until November 25th, 2014. Every employee at NTNU with a 20% or more position with regular pay were sent the KIWEST questionnaire in a link via e-mail to be answered electronically. A page-long cover letter that explained the purpose of the questionnaire and ensured employees of confidentiality was also included. The questionnaire could be answered over a three-week period, in which time two reminders were sent out to invitees that had failed to respond. In KIWEST I, groups that did not have computer access as part of their work were given a content-identical paper version that was otherwise treated in the same way as the other responses. 46 paper-format questionnaires were received. Such paper forms were not used in KIWEST II.

Sample. The sample consisted of employees at a Norwegian university, NTNU, and therefore consisted largely of knowledge workers and academics. The whole of NTNU was expected to participate in the ARK KIWEST surveys in 2012 and 2014. A total of 5637 NTNU employees (EU included) were invited to participate in KIWEST I 2012, and of these 3066 responded. In the EU 60 employees were invited, of which 43 responded. The response rate of the NTNU sample (EU *not* included) was 54%, whilst it was 72% for the EU sample. Of the total sample, 51,2 per cent ($n = 1569$) were male, and 48,8 per cent ($n = 1497$) were female. In KIWEST II 2014 a total of 5237 NTNU employees (EU included) were invited to participate, and of these 3901 responded. In this round 63 EU employees were invited and 59 responded. The response rate of the NTNU sample (EU *not* included) was 74%, whilst it was 94% for the EU sample. Of the total sample, 52,2 per cent ($n = 2038$) were male, and 47,8 per cent ($n = 1863$) were female. To be part of the dataset the respondents had to have answered at least half of the test items in a scale, and minimum one scale.

Table 1.
Frequency Statistics of Participation in KIWEST

Group	Invitations	Responses	Response rate
2012 NTNU (EU not included)	5577	3023	54.2%
2012 EU	60	43	71,7%
2014 NTNU (EU not included)	5174	3842	74,3%
2014 EU	63	59	93,7%

Measures

KIWEST examines employees' individual experiences of psychosocial working environment factors (including demands and resources) that are seen as important for the university sector. It is based on standardized and validated measures from Nordic and European research. KIWEST I was used in 2012 and KIWEST II was used in 2014, and there were some differences in what scales these questionnaires used to measure certain factors. Scales used for the purpose of this thesis were interpersonal conflicts, social community at work, trust regarding management, empowering leadership, recognition, meaning of work, work engagement, organizational commitment, overcommitment and workaholism. See Appendix A and B for the total scales of the study variables.

Interpersonal conflict. A high score indicates that the respondents to a high degree are negatively affected by conflicts between colleagues. It consisted of three items from Näswall (2010). Item wordings were tweaked from KIWEST I to KIWEST II, but were assessed using questions like "Intrigues in my workplace impair the work climate", KIWEST I/"In my unit, intrigues impair the work climate", KIWEST II and "There is a great deal of tension in the workplace due to prestige and conflicts"/ "In my unit, there is a great deal of tension due to prestige and conflicts". Responses were measured on a 5-point scale ranging from 1 ("*Strongly disagree*") to 5 ("*Strongly agree*"). Cronbach's alpha for interpersonal conflict was found to be .90 pre-intervention and .86 post-intervention.

Social community at work. A high score indicates that respondents experience a high degree of social community with colleagues in their own unit. The scale is from COPSOQ II (Pejtersen, Kristensen, Borg, & Bjorner, 2010), and consisted of three items such as "Is there a good atmosphere between you and your colleagues?", KIWEST I/ "There is a good atmosphere between me and my colleagues", KIWEST II. Responses were measured on a 5-point scale ranging from 1 ("*To a very small extent*", KIWEST I/ "*Strongly disagree*", KIWEST II) to 5 ("*To a very large extent*"/ "*Strongly agree*"). Cronbach's alpha for social community was found to be .85 pre-intervention and .83 post-intervention.

Trust regarding management. A high score indicates a high degree of perceived trust in management. The scale is from COPSOQ II (Pejtersen et al., 2010), and consisted of four items such as "Can you trust the information that comes from the management?", KIWEST I/ "I can trust the information from my unit management", KIWEST II. Responses were measured on a 5-point scale ranging from 1 ("*To a very small extent*", KIWEST I/ "*Strongly disagree*", KIWEST II) to 5 ("*To a very large extent*"/ "*Strongly agree*").

Cronbach's alpha for trust in management was found to be .12 pre-intervention and .11 post-intervention.

Empowering leadership. A high score indicates that employees perceive management to be empowering. The scale comes from QPS-Nordic (Dallner et al., 2000). It consisted of three items. Item wordings were tweaked from KIWEST I to KIWEST II, but were assessed using questions like "Does your immediate superior encourage you to participate in important decisions?", KIWEST I/ "My immediate superior encourages me to participate in important decisions", KIWEST II. Responses were measured on a 5-point scale ranging from 1 ("*Very seldom/never*", KIWEST I/ "*Strongly disagree*", KIWEST II) to 5 ("*Very often/always*"/ "*Strongly agree*"). Cronbach's alpha for empowering leadership was found to be .87 pre-intervention and .90 post-intervention.

Recognition. A high score indicates that employees to a high degree feel that they are recognized and appreciated for their efforts. The scale is from COPSOC II (Pejtersen et al., 2010) and consisted of three items, including "Is your work recognized and appreciated by the management?", KIWEST I/ "My work is recognized appreciated by the unit management", KIWEST II. Responses were measured on a 5-point scale ranging from 1 ("*To a very small extent*", KIWEST I/ "*Strongly disagree*", KIWEST II) to 5 ("*To a very large extent*"/ "*Strongly agree*"). Cronbach's alpha for recognition was found to be .90 pre-intervention and .88 post-intervention.

Meaning of work. A high score indicates that respondents to a high degree experience their work as meaningful. The scale is from COPSOQ I and II (Pejtersen et al., 2010), and consisted of three items such as "Is your work meaningful?", KIWEST I/ "My work is meaningful", KIWEST II. Responses were measured on a 5-point scale ranging from 1 ("*To a very small extent*", KIWEST I/ "*Strongly disagree*", KIWEST II) to 5 ("*To a very large extent*"/ "*Strongly agree*"). Cronbach's alpha for meaning of work was found to be .89 pre-intervention and .89 post-intervention.

Work engagement. A high score indicates that respondents experience a high degree of work engagement. In KIWEST I, this was measured using the Oldenburg Burnout Inventory (OLBI) (Demerouti, Bakker, Vardakou, & Kantas, 2003), that was originally developed to assess burnout. It consisted of sixteen items, such as "I usually feel energized at work" and "This is the only type of work that I can imagine myself doing." Response alternatives ranged from 1 ("*Strongly disagree*") to 5 ("*Strongly agree*"). OLBI was removed in KIWEST II and replaced with the Utrecht Work Engagement Scale (UWES) (Schaufeli & Bakker, 2003). Here, engagement is seen as a relatively positive emotional state characterized

by vigour, dedication and ability to be absorbed in one's work. The scale consisted of nine items, such as "At my work, I feel bursting with energy", "When I get up in the morning, I feel like going to work", and "I am proud on the work that I do". Response alternatives ranged from 0 ("*Never*"), 1 ("*A few times a year or less*"), 2 ("*Once a month or less*"), 3 ("*A few times a month*"), 4 ("*Once a week*"), 5 ("*A few times a week*"), 6 ("*Every day*"). Cronbach's alpha for work engagement was found to be .34 pre-intervention (OLBI) and .93 post-intervention (UWES).

Organizational commitment. A high score indicates that respondents experience positive ties to their workplace. This scale was developed by Christensen et al. (2012) from Pejtersen et al. (2010). In KIWEST I, this scale consisted of four items. In KIWEST II, one of these items were removed. To ensure comparability, for the purpose of the analyses in this thesis, this item was also removed from the KIWEST I scale. Item wordings were tweaked from KIWEST I to KIWEST II, but were assessed using questions like "I gladly tell others about my workplace", KIWEST I/ "I am happy to tell others about my work place", KIWEST II. Responses were measured on a 5-point scale ranging from 1 ("*To a very small extent*", KIWEST I/ "*Strongly disagree*", KIWEST II) to 5 ("*To a very large extent*"/ "*Strongly agree*"). Cronbach's alpha for organizational commitment was found to be .86 pre-intervention and .80 post-intervention.

Overcommitment. Overcommitment was only measured in KIWEST I. The scale comes from Näswall et al. (2010), and measures to what extent work issues are on the respondents mind outside of work. It consisted of six items, such as "Those who are close to me say that I give too much of myself to my work" and "I can rarely let go of thoughts concerning my work". Responses were measured on a 5-point scale ranging from 1 ("*Strongly disagree*") to 5 ("*Strongly agree*"). Cronbach's alpha for overcommitment was found to be .66 pre-intervention.

Workaholism. Workaholism was only measured in KIWEST II. A high score indicates high addiction to the work. This scale is from the Dutch Workaholism Scale (DUWAS) (Schaufeli, Shimazu, & Taris, 2009). "Workaholism" refers to having a strong intrinsic drive to work hard that is often compulsory and exaggerated. It has been found to impact individuals' health and relationships negatively (Schaufeli et al., 2009, Thomas, Sorensen, & Feldman, 2007). It consisted of ten items, such as "It is important to me to work hard even when I do not enjoy what I am doing" and "I feel guilty when I take time off work". Response alternatives were 1 ("*Almost never*"), 2 ("*Sometimes*"), 3 ("*Often*"), and 4 ("*Almost always*"). Cronbach's alpha for workaholism was found to be .86 post-intervention.

Procedure

Intervention 1 – the “employeehip program” (EP). This intervention (dubbed the Employeehip Program, EP) was largely carried out by an external consultancy company, Kibu AS. This company is now known as Østlyng & Bjerke, but will be referred to as Kibu in this thesis, as that was the company name at the start of the intervention process. This company works with matters such as organizational-, employee- and leadership development.

NTNU’s economy and real-estate unit (ERU) consists of different departments (controller, real-estate, economy and operations), where all departments had challenges regarding their working environment that needed to be addressed. Of special concern was the conflict level among employees. Management therefore initiated an intervention program with the aim of improving employees’ psychosocial work environment, competence in interpersonal relationships and ability to take care of customers. The different departments carry out a wide range of tasks and have differing responsibilities, doing everything from cleaning to accounting. All 409 ERU employees were required to participate in the program. Efforts to improve or increase employees’ ability to take responsibility for their own work and working environment were made in the hopes of improving the unit’s psychosocial work environment. By also increasing employees’ expertise in (and knowledge of) customer communication and needs identification, management assumed an improvement in the quality of customer care would follow.

Section leaders in the different departments used section meetings to inform the employees about the intervention program a few weeks before its implementation.

The EP consisted of three full-day workshops that were held during working hours at a location outside the workplace. Due to the workshops taking place during working hours, all employees were required to participate. Every employee was to attend three workshops, and there were between 30 and 50 participants in each of these. The workshops were spread out over a period of about six to nine months for each department, and the different sections in the ERU participated together as a group as much as practically possible. The workshops consisted of the following activities: 1) The “Diversity Icebreaker”, a psychological test or survey that measures people’s preferences for communication, interaction and different problem-solving styles (Diversity Icebreaker Homepage, n.d.). Through this, employees can identify their strengths and challenges. From there, organizational strategies to rectify these weaknesses can be identified and planned. 2) Practical exercises in customer communication and collaboration done in groups. Although exercises were not done identically between groups, they all worked around a model going through the stages of planning,

implementation, reflection, identification of improvement, and identifying actions for transferring newfound insights to the everyday work. 3) A course in customer communication skills. Here, some groups practiced verbal and non-verbal communication with an actor, whilst others were taught communication methods and came up with communication plans for their sections. 4) Choir singing.

At the initiation of this master thesis, it was assumed that this initial intervention came about as a response to the ARK KIWEST I 2012 survey, as a reaction to the unit's inferior performance regarding the psychosocial work environment compared to the remainder of NTNU. However, the facts were somewhat more complicated. This intervention did in fact begin its implementation a good while before the ARK KIWEST I was conducted in October/November of 2012. The program from start to finish took about one year to be implemented for all employees; it began on February 15th, 2012, and ended March 20th, 2013.

Intervention 2 – the health, safety and environment project (HSEP). It was decided in the spring of 2012 to go through another intervention process to better the psychosocial work environment at a specific NTNU unit. This intervention took the form of a more general development of the work environment in one of ERU's sub-units (or departments), namely the economy unit (EU). The EU consisted of an accounting section, a section for hiring, a systems administration, and a wages section. This unit had already undergone the EP together with the rest of the ERU, but this follow-up intervention was aimed solely at the EU. The background for this intervention was the recently ended EP (where central persons involved in the program did not feel it had been a sufficient intervention for the issues found in EU), the EU's less-than-average performance compared to the other units at NTNU in the ARK 2012, NTNU's policy for unacceptable behavior, HSE-regulations, and a wish to develop leadership in daily work with psychosocial matters. It has however been confirmed that a main reason for the intervention were the interpersonal conflicts in the unit, and that central persons behind the EP saw these conflicts as an important reason for why they felt that the first intervention had been insufficient. The new intervention was also meant to "enforce" matters already dealt with in the EP. The HSEP was a collaboration effort between Kibu and NTNU's own HSE-department. In other words, external and internal forces were working together. The official main aim was to increase awareness and knowledge of the unit's HSE-work, with focus on the psychosocial work environment. Psychosocial work environment was at the core of every action undertaken in the intervention, and important goals were to increase employees' ability to handle psychosocial challenges and to create a comprehensive and systematic HSE-plan for follow-

up of the psychosocial environment. Kibu themselves have stated that they wanted the EU to end up with “engaged employees, visible leaders, and a healthy work environment”. The unit’s social community was to be emphasized throughout the whole project. Furthermore, Kibu mentioned “reduced conflict levels”, “increased trust in management”, and “increased role clarity” as success factors.

HSEP consisted of four phases: 1) “Clean up” – anomalies that were psychosocial in nature were managed continuously as they were discovered in order to prevent them from affecting the intervention process negatively. Throughout the project, conflicts were managed in accordance with NTNU’s policy for unacceptable behavior and extra resources were allocated to the guidance and counselling of persons involved. During a conflict situation, development work in the intervention was “paused” until it was resolved. 2) Training/ education – employees and leaders received training regarding laws, policies and roles at the work place. 3) Development – consisted of setting goals for the work environment, restructuring, competence and culture building, and the follow-through of efforts to reach the main aims. 4) Practice/training: employees and leaders received training in how to run the unit in accordance with goals and structures systematically over time. This phase emphasized leader training in an attempt to make leaders able to continue developing efforts.

The planning phase of the intervention was a relatively lengthy ordeal, culminating in a more “official” start-up of the intervention in August 2013, when a detailed project plan was approved and contracts were signed. Both leadership and regular employees were actively involved with the process. A steering group was established. A “work group” was also created amongst the employees to represent and give voice to these persons and to give advice to leadership. The group was given the opportunity to give input right from the start-up of the intervention. They had meetings every other week when it was possible to do so.

HSEP consisted mainly of four seminars where participation was mandatory. Seminars were held outside the workplace during working hours. In addition to these, leaders as a group received training throughout the program. This had to do with matters such as their understanding of the intervention, their roles, and their responsibilities. This training happened between all seminars and touched upon seminar themes. Individual guidance and support was also given to leaders when it was required or desired. The work group also received guidance and training continuously. Some seminars included both leadership and all unit employees in order to create a communal understanding of the project and a shared view of the realities in the unit. Other seminars divided the employees into section-wise groups to better meet each sections’ unique challenges. Seminars were varied in form to keep

employees interested and to enable them to contribute, and contained brief theoretic introductions and specially adapted visual models. There were activities such as group work on relevant case studies, short quizzes, rebus-races, walk and talks, and individual- and group reflections. External speakers were also hired. Leaders were expected to take an increasing responsibility in leading and running portions of the seminars.

The first seminar in autumn 2013 spanned over two days and involved the whole unit. The EU was taught about the psychosocial work environment, roles, responsibilities, laws and regulations so that they would share a common knowledge base. Participants' knowledge and awareness of how to manage psychosocial challenges at work, and of how to build a healthy psychosocial work environment, was increased. The seminar contained brief theoretic introductions and activities such as group reflections, case studies and group work. Some of these activities took place outdoors. For those who were unable to attend, a one-day summary seminar was held. The second seminar lasted half a day and involved all four sections of the EU. The seminar focused on teaching basic NTNU routines. Participants were taught NTNU's policy for unacceptable behavior and harassment, as well as conflict management routines. The third seminar was held for each of the four EU sections. The aim here was to establish specific psychosocial "rules" for the individual work places, and each section worked on their own to come up with solutions to their unique challenges. Basically, a "plan for action" for the development of the work environment was created for each section. Another aim was to strengthen and make leadership more visible. The fourth and final seminar, like the first, involved the whole unit. It took place in the autumn of 2014, and had to do with "the road ahead", adjustments, reflections and rules for the future.

This intervention program was initiated in May 2012 and ended in March 2015. ARK 2014 was conducted after all employees had partaken in the main intervention activities (the seminars), but before the official closing of the intervention program.

Statistical Analysis

At first, descriptive statistics were laid out to get an overview of the variables. Next, the reliabilities of the scales were checked using Cronbach's alpha. Then, to check whether there were significant changes between the four groups, multiple comparisons using Sheffe were used on the variables that had been measured in both 2012 and 2014. This test was chosen partially due to its flexibility. One potential drawback is that it is also quite strict, with bigger differences being needed for it to deem them statistically significant (Field, 2009). The large imbalance in sample sizes between the EU and NTNU was the main rationale behind

choosing this particular test. T-tests were used to check for significant changes on the variables that were only measured in either 2012 or 2014. To test hypotheses 1 through 8, assessing whether differences occurred before and after the intervention (both for each group separately and relatively to each other), two-way analyses of variance (ANOVAs) were conducted. Whilst a repeated-measures design ANOVA would typically be the logical approach, due to the information on participants' identities not having been collected, an approach using an independent samples ANOVA was decided upon. All analyses were conducted using IBM SPSS (IBM, 2015). Outputs of the ANOVAs can be found in Appendix C.

Results

Descriptive Statistics

Table 2.

Descriptive statistics for the variables chosen for analysis – EU

Variable and time	M	SD	SE	Min	Max	N
<i>Interpersonal conflicts 2012</i>	2.310	.99117	.153	1	5	43
<i>Interpersonal conflicts 2014</i>	2.034	.93221	.131	1	5	59
<i>Social community 2012</i>	3.617	.84863	.117	1	5	43
<i>Social community 2014</i>	4.158	.70699	.100	1	5	59
<i>Trust in management 2012</i>	3.625	.82771	.114	1	5	42
<i>Trust in management 2014</i>	3.627	.80056	.096	1	5	59
<i>Empowering leadership 2012</i>	2.873	.92848	.154	1	5	42
<i>Empowering leadership 2014</i>	3.345	1.06147	.132	1	5	57
<i>Recognition 2012</i>	3.381	.92724	.135	1	5	42
<i>Recognition 2014</i>	3.480	.96738	.114	1	5	59
<i>Meaning of work 2012</i>	3.897	.83472	.112	1	5	42
<i>Meaning of work 2014</i>	3.695	.72141	.095	1	5	58
<i>Work engagement(OLBI)2012</i>	3.480	.68643	.101	1	5	43
<i>Work engagement(UWES)2014</i>	4.146	1.14287	.151	0	6	57
<i>Organizational commit. 2012</i>	3.231	.87977	.121	1	5	43
<i>Organizational commit. 2014</i>	3.523	.78779	.105	1	5	58
<i>Overcommitment 2012</i>	2.484	.95878	.146	1	5	43
<i>Workaholism 2014</i>	1.921	.49997	.066	1	4	57

(M = Mean; SD = Standard Deviation; SE = Standard Error; Min = Minimum value; Max = Maximum value; N = Respondents)

Table 3.

Descriptive statistics for the variables chosen for analysis – NTNU

Variable and time	M	SD	SE	Min	Max	N
<i>Interpersonal conflicts 2012</i>	2.062	1.01619	.018	1	5	2978
<i>Interpersonal conflicts 2014</i>	2.255	.99495	.016	1	5	3825
<i>Social community 2012</i>	3.799	.78665	.014	1	5	3002
<i>Social community 2014</i>	3.983	.75725	.012	1	5	3836
<i>Trust in management 2012</i>	3.877	.73682	.014	1	5	2972
<i>Trust in management 2014</i>	3.913	.73982	.012	1	5	3824
<i>Empowering leadership 2012</i>	3.262	1.07310	.018	1	5	2948
<i>Empowering leadership 2014</i>	3.849	.93021	.016	1	5	3653
<i>Recognition 2012</i>	3.743	.91076	.016	1	5	2973
<i>Recognition 2014</i>	3.837	.84070	.014	1	5	3827
<i>Meaning of work 2012</i>	4.030	.76527	.013	1	5	2997
<i>Meaning of work 2014</i>	4.045	.68879	.012	1	5	3836
<i>Work engagement(OLBI)2012</i>	3.643	.66369	.012	1	5	2979
<i>Work engagement(UWES)2014</i>	4.618	1.05563	.017	0	6	3813
<i>Organizational commit. 2012</i>	3.608	.85270	.015	1	5	2986
<i>Organizational commit. 2014</i>	3.962	.74871	.013	1	5	3834
<i>Overcommitment 2012</i>	2.997	1.00599	.018	1	5	2987
<i>Workaholism 2014</i>	2.188	.57332	.009	1	4	3809

(M = Mean; SD = Standard Deviation; SE = Standard Error; Min = Minimum value; Max = Maximum value; N = Respondents)

Table 4.

Descriptive statistics for the total variables

Variable	M	SD	N	Variable	M	SD	N
<i>Interp. conflicts EU</i>	2.1502	.96251	102	<i>Recogn. EU</i>	3.4389	.94746	101
<i>Interp. conflicts NTNU</i>	2.1705	1.00880	6803	<i>Recogn. NTNU</i>	3.7960	.87320	6800
<i>Social commun., EU</i>	3.9300	.81163	102	<i>Meaning of w. EU</i>	3.7799	.77344	100
<i>Social commun., NTNU</i>	3.9025	.77563	6838	<i>Meaning of w. NTNU</i>	4.0383	.72332	6833
<i>Trust in man., EU</i>	3.6262	.80784	101	<i>Org. commit. EU</i>	3.3984	.83659	101
<i>Trust in man., NTNU</i>	3.8974	.73867	6796	<i>Org. commit. NTNU</i>	3.8074	.81500	6820
<i>Empo. leaders., EU</i>	3.1447	1.02938	99				
<i>Empo. leaders., NTNU</i>	3.5868	1.03842	6601				

(M = Mean; SD = Standard Deviation; N = Respondents)

Table 5.
Cronbach's alpha for scales early on (2012) and after (2014) the intervention efforts

Variables	2012	2014
<i>Interpersonal Conflict</i>	0.908	0.860
<i>Social Community</i>	0.848	0.828
<i>Trust in Management</i>	0.116	0.105
<i>Empowering Leadership</i>	0.868	0.895
<i>Recognition</i>	0.901	0.882
<i>Meaning of Work</i>	0.892	0.892
<i>Engagement</i>	0.339 (OLBI)	0.931 (UWES)
<i>Commitment</i>	0.857	0.801
<i>Overcommitment</i>	0.655	
<i>Workaholism</i>		0.863

Internal consistency describes the degree to which all items on a scale measure the same construct. Cronbach's alpha is a commonly used criterion for internal consistency, which produces an estimate of the reliability based on the inter-correlations of the measured variables (Hair, Hult, Tomas, Ringle, & Sarstedt, 2014). As Table 5 shows, most of the scales had a higher reliability than 0.7, which is usually considered the lowest acceptable (Tavakol, & Dennick, 2011). In fact, a Cronbach's score of between 0.8 and 0.9 can be considered good, whilst anything above 0.9 is excellent (George & Mallery, 2003). A low score indicates that one cannot be sure that the scales measured what they were intended to measure.

Unfortunately, due to the very low internal consistency in some of the scales (Trust in Management, OLBI Engagement, and Overcommitment), these were omitted from further analyses. One possible problem with having used Cronbach's is that it is sensitive to small scales that include less than five items (Cortina, 1993).

Effects of the Intervention

Interpersonal conflict. As seen in Tables 2 and 3, on average, the EU had higher scores in 2012 ($M = 2.310$, $SE = .153$) than NTNU ($M = 2.062$, $SE = .018$). In 2014, the EU had *lower* scores ($M = 2.034$, $SE = .131$) than NTNU ($M = 2.255$, $SE = .016$). Multiple comparisons using Sheffe interestingly did not find significant differences between the EU and NTNU before or after the intervention. There was, however, a significant increase of 0.193, $p = .000$, for NTNU from 2012 to 2014. Whilst there was a mean reduction in the EU, this was not deemed significant.

A two-way ANOVA had been conducted to assess the differences of change in interpersonal conflict between the EU and NTNU. This showed a significant interaction

effect, $F(1, 6901) = 5.376, p = .020$. Due to this interaction, main effects were not observed. The significant interaction implies that the groups changed differently over time. Looking at Figure 2 and the group means before and after the intervention (Tables 2 and 3), interpersonal conflicts increased in the NTNU group, whilst it decreased in the EU group. In other words, interpersonal conflicts had decreased over time for the EU whilst it had increased for the rest of the university sample. This indicates that the intervention efforts (which were conducted on the EU group) had a significant effect, namely a drop in interpersonal conflict both alone and relative to the NTNU group.

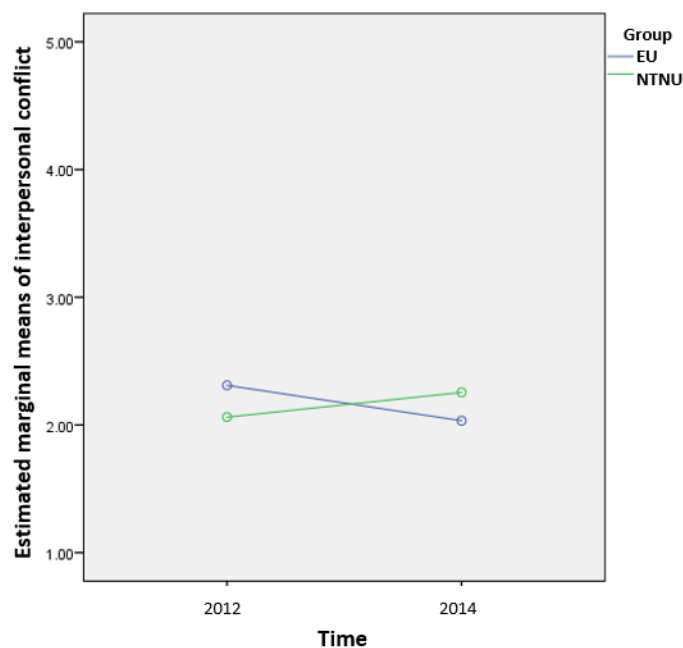


Figure 2. Interaction between group and time (2012 and 2014) on interpersonal conflict

Hypothesis 1 predicted a reduction in the level of interpersonal conflicts in the EU and that this reduction plausibly could be attributed to the intervention efforts. The aforementioned results support this hypothesis, even though the Post Hoc Sheffe failed to find the changes significant.

Social community. Looking at Tables 2 and 3, on average, the EU had higher scores in 2014 ($M = 4.158, SE = .100$) than in 2012 ($M = 3.617, SE = .117$). Sheffe found this difference, 0.541, to be significant $p = .006$. The same was found for NTNU, where 2014 mean scores were higher ($3.983, SE = .012$) than in 2012 ($M = 3.799, SE = .014$). This difference, 0.184, was also significant, $p = .000$. However, statistically significant differences between the EU and NTNU were not found before nor after the intervention.

To get an idea of how the groups changed over time, ANOVA was conducted. The ANOVA showed an interaction effect, $F(1, 6936) = 5.282, p = .022$. This suggests that the two groups changed differently over time. Since an interaction effect exists, main effects were not considered as the interaction would make their interpretation problematic. Figure 3 demonstrates the interaction and Tables 2 and 3 show the mean scores.

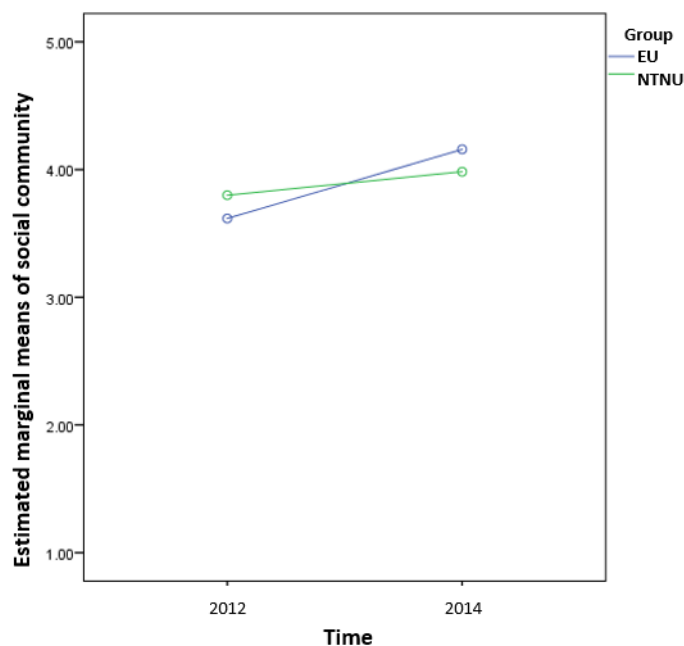


Figure 3. Interaction between group and time (2012 and 2014) on social community

The results indicate that social community in the EU increased to such a degree that it surpassed the NTNU group, despite having been lower than in the NTNU group at the beginning and despite the increase in social community found also within this group. This much larger increase found in the EU suggests that the intervention probably had a positive effect on social community. This provided support for Hypothesis 2, which predicted an increase in level of social community in the EU and that this reasonably could be attributed to the interventions.

Trust in management. On average, the EU had higher scores in 2014 ($M = 3.627, SE = .096$) than in 2012 ($M = 3.625, SE = .114$), but Sheffe did not find this difference significant, $p = 1.0$. There was no significant difference between the NTNU scores in 2012 ($M = 3.877, SE = .014$) and 2014 ($M = 3.913, SE = .012$) either, $p = .262$. The only statistically significant difference between the groups was that NTNU in 2014 had a higher score than the EU, $p = .034$. This was not the case in 2012, $p = .186$. Unfortunately, Cronbach's alpha for the trust

in management scale was found to be below the acceptable level (see Table 5). It was therefore decided not to conduct any further analyses on this variable, and Hypothesis 3 could not be investigated.

Empowering leadership. Sheffe showed no significant difference between the 2014 EU ($M = 3.345$, $SE = .132$) and the 2012 EU ($M = 2.873$, $SE = .154$), $p = .143$. There was, however, a significant positive difference, 0.5876, between NTNU 2012 ($M = 3.262$, $SE = .018$), and NTNU 2014 ($M = 3.849$, $SE = .016$), $p = .000$. In 2012, there was no significant difference between the EU and the NTNU, $p = .098$. In 2014, the difference between the two (0.540) had become significant, $p = .002$, with NTNU having a significantly better score than the EU. Even though the EU had a numerical increase from 2012 to 2014, due to a large SE, there was no significant difference between the scores. A less strict Post Hoc test, such as LSD, may have deemed this a significant increase.

The two-way ANOVA showed significant main effects of both group, $F(1, 6696) = 19.126$, $p = .00$, and time, $F(1, 6696) = 26.963$, $p = .00$, but found no significant interaction effect, $F(1, 6696) = 0.317$, $p = .573$. Looking at Table 4, the NTNU group ($M = 3.587$, $SD = 1.038$) had a higher score than the EU group ($M = 3.145$, $SD = 1.029$) both early in the intervention efforts and after their completion. This difference did not change significantly; while scores on empowering leadership increased for both groups, the discrepancy remained. This suggests that the change in the EU was not an effect of the intervention but rather of another factor or factors that affected the whole sample. Figure 4 demonstrates this.

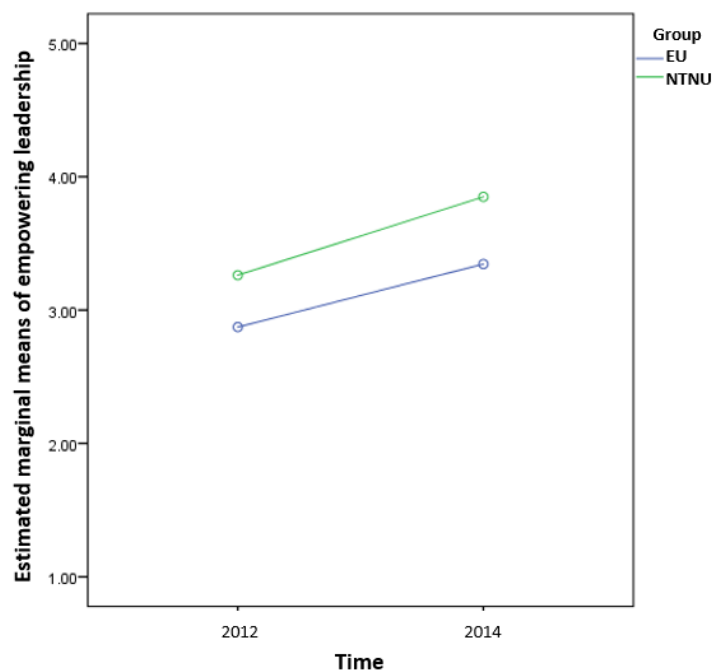


Figure 4. Mean change in the two groups from 2012 to 2014

Hypothesis 4 predicted an increase in the level of empowering leadership in the EU and that this could be a result of the interventions. This was partially supported. Whilst there had been a numerical increase in the level of empowering leadership in the EU, this was not significant and could not be attributed to the interventions.

Recognition. Multiple comparisons using Sheffe indicated that the mean score for EU in 2014 ($M = 3.480$, $SE = .114$) was not statistically different from the mean in 2012 ($M = 3.381$, $SE = .135$), $p = .957$. The mean for NTNU in 2014 ($M = 3.837$, $SE = .014$), however, represented a significant and positive change, 0.0937 , from the mean for 2012 ($M = 3.743$, $SE = .16$), $p = .000$. The increase found solely in NTNU resulted in the EU having a significantly lower recognition score, -0.3570 , in 2014 than the rest of the sample, $p = .021$, whilst this was not the case in 2012, $p = .068$.

Hypothesis 5 predicted an increase in the level of recognition in the EU that could be an effect of the interventions. The same procedure with ANOVA was conducted for recognition as for empowering leadership. A main effect of group was found, $F(1, 6897) = 16.398$, $p = .00$, but significant effects were not found of time, $F(1, 6897) = 1.175$, $p = .278$, nor interaction, $F(1, 6897) = 0.001$, $p = .977$. Looking at Table 4, The NTNU group ($M = 3.796$, $SD = 0.973$) had a higher score than the EU ($M = 3.439$, $SD = 0.947$) both before and after the intervention efforts. The absence of a main effect of time indicates that the sample as a whole did not change on this variable over from 2012 to 2014. Whilst Sheffe found a significant increase in NTNU from 2012 to 2014, the results of the ANOVA suggest that neither the intervention nor any outside factors affected recognition in the EU. Hypothesis 5 was hence not supported.

Meaning of work. For meaning of work, there was a decline, -0.2017 , for the EU from 2012 ($M = 3.897$, $SE = .112$) to 2014 ($M = 3.695$, $SE = .095$), but Sheffe did not find this decline significant, $p = .595$. Whilst not being significant, this likely still represents an actual decline. However, the SE was too large in the EU groups for this to manifest itself as statistically significant. There were no differences between the EU and NTNU in 2012. In 2014, EU had a significantly lower score, -0.3500 , than NTNU, $p = .004$. For NTNU, on average, scores were higher in 2014 ($M = 4.045$, $SE = .012$) than in 2012 ($M = 4.030$, $SE = .013$), but the difference was small and not significant, $p = .855$.

A two-way ANOVA showed a similar effect to that observed with the recognition variable. A main effect was found of group $F(1, 6929) = 10.672$, $p = .001$. Time $F(1, 6929) = 1.587$, $p = .208$) and interaction $F(1, 6929) = 2.163$, $p = .141$ showed no significant effects. The EU had lower scores ($M = 3.780$, $SD = 0.773$) than the NTNU group ($M = 4.038$, $SD = 0.723$)

both before and after the intervention. The intervention thus could not be claimed to have had a significant effect on the EU on this variable either. The absence of a significant effect of time suggests, as in the case with recognition, that the sample as a whole did not change over time on this variable. This implies that neither the intervention nor any outside factors had affected meaning of work from 2012 to 2014. Hypothesis 6, which predicted an increase in the meaning of work in the EU (attributed to the interventions) was therefore not supported.

Engagement. The t-test showed no significant differences between the EU and the NTNU group on engagement in 2012; on average, for engagement OLBI, EU had lower scores ($M = 3.480$, $SE = .101$), than NTNU ($M = 3.643$, $SE = .012$). This difference, -0.163 , was not significant $t(3020) = -1.60$, $p = .110$ (two-tailed). For 2014, the t-test found that the EU, on average, scored significantly lower ($M = 4.146$, $SE = .151$) than NTNU ($M = 4.618$, $SE = .017$). This difference, -0.473 , was significant $t(3868) = -3.35$, $p = .001$ (two-tailed).

Because engagement was measured differently in KIWEST 2012 and KIWEST 2014, any comparison between the two points in time would be considered somewhat of a guesswork. It would be difficult to draw meaningful conclusions without a thorough study of how the two measures of OLBI and UWES compare to each other. That would take more resources than were available to this thesis. As a result, Hypothesis 7 (which predicted an increase in the level of work engagement in the EU) could not be investigated.

Commitment. On average, the EU had higher scores in 2014 ($M = 3.523$, $SE = .105$) than in 2012 ($M = 3.231$, $SE = .121$), but Sheffe did not find this difference significant, $p = .345$. For NTNU, on the other hand, there was a significant increase from 2012 ($M = 3.608$, $SE = .015$) to 2014 ($M = 3.962$, $SE = .013$), $p = .000$. NTNU had a significantly higher score than the EU in both 2012 (0.3776), $p = .023$ and 2014 (0.3540), $p = .000$. The EU score in 2014 was not significantly different from NTNU in 2012, which suggests that the EU reached the level that NTNU was on in 2012, whilst NTNU progressed further.

A two-way ANOVA was conducted to determine differences between means of the groups before and after the intervention. The analysis showed that group, $F(1, 6917) = 25.626$, $p = .00$ and time, $F(1, 6917) = 16.016$, $p = .00$, had significant main effects. No significant interaction effect was found, $F(1, 6917) = 0.147$, $p = .701$. This suggests that there is a difference between the groups, but that this difference did not change over time. Even though the groups had changed, they changed in a similar way, and the discrepancy in their scores remained. Figure 5 demonstrates this relationship

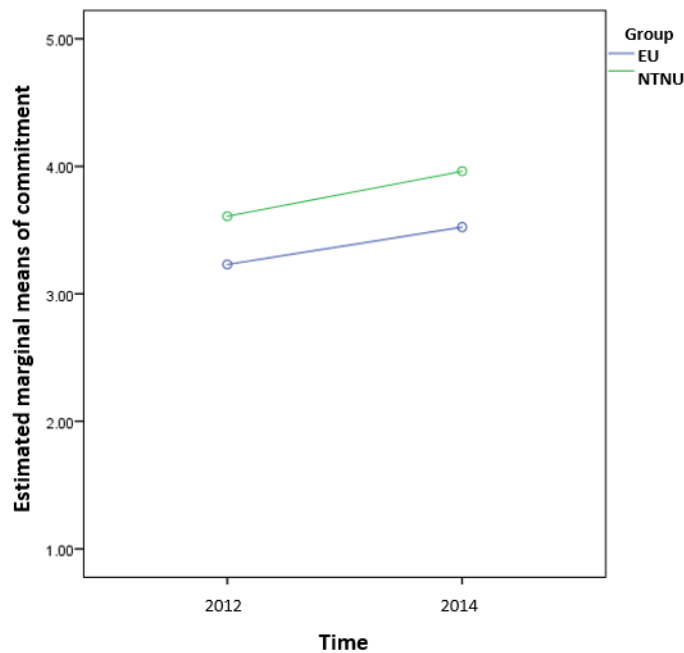


Figure 5. Change in commitment over time

The NTNU group had higher scores than the EU both before and after the intervention. Their average scores can be seen in Tables 2 and 3. This implies that the change in the EU was not an effect of the intervention but rather of another variable (or variables) that affected the whole sample. Hypothesis 8, which predicted an increase in commitment level in the EU due to the intervention efforts, was partially supported. Whilst level of commitment did increase in the EU (albeit not significantly), it did so also in the rest of NTNU. This meant that the increase in commitment could not reasonably be attributed to the intervention efforts.

Overcommitment and workaholism. On average, for overcommitment, the EU had lower scores ($M = 2.484$, $SE = .146$) than NTNU ($M = 2.997$, $SE = .018$). This difference, -0.513 , was significant $t(3028) = -3.32$, $p = .001$ (two-tailed). For workaholism, the EU again had lower scores ($M = 1.921$, $SE = .066$) than NTNU ($M = 2.188$, $SE = .009$). This difference, -0.260 , was significant $t(58.23) = -3.89$ (two-tailed). Even though the measures were different and therefore could not be compared further, these t-tests did indicate that the EU had significantly lower scores on two potentially unhealthy variables.

Final notes. Whilst the effects were generally too small to present as significant when using Sheffe or t-tests, the ANOVAs clearly showed that the interventions had the most significant effects on interpersonal conflict and social community. For these variables, changes in the EU that were different to the changes in the NTNU group were observed. In the case of interpersonal conflict, the observed change occurred in opposite directions for the

two groups; interpersonal conflict decreased in the EU while it increased in the NTNU group. In the case of social community, there was a change in the same (positive) direction, but this increase was significantly larger in the EU. These results suggest that the interventions had an effect on these variables. For some variables (empowering leadership and commitment), both groups changed over time, but the difference between the two remained relatively constant. For those variables it can therefore be assumed that something affected the whole sample, but that this “something” was not the intervention efforts. The remaining variables (recognition and meaning of work) did not demonstrate change over time. Here, the NTNU group had higher scores both before and after the interventions, and there were no significant changes in either of the groups. The grouped variables can be seen in Figure 6.

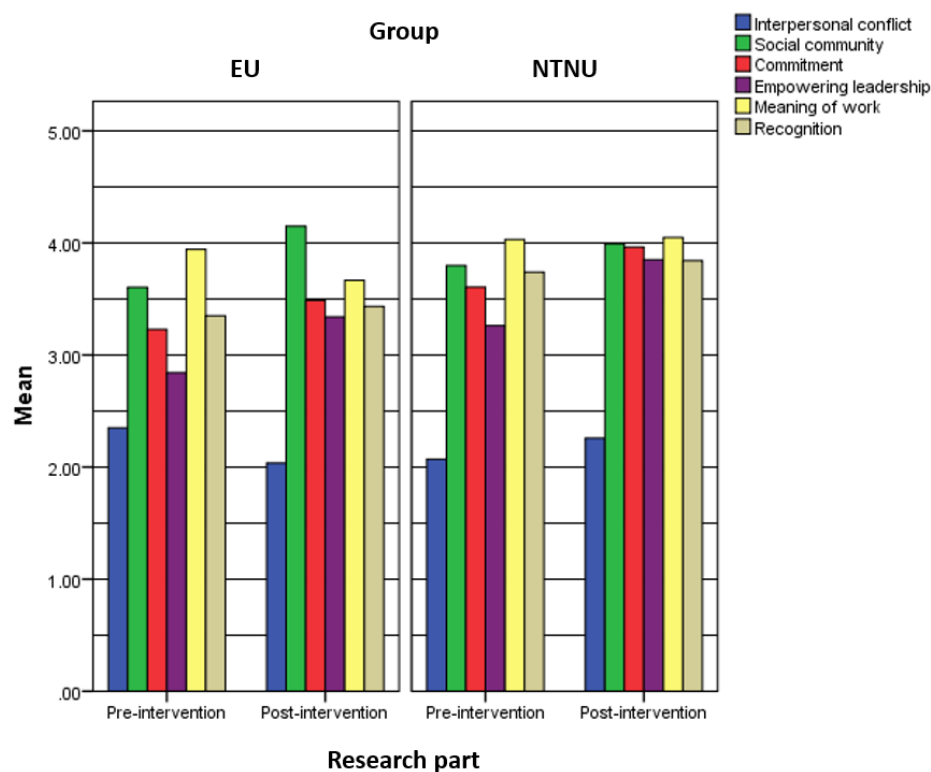


Figure 6. Summary representation of the changes in variables over time

Discussion

The aim of this study was to examine the effects of intervention efforts conducted in the Economy Unit (EU) at the Norwegian University of Science and Technology (NTNU). This was done mainly by testing several hypotheses using ANOVA. The results of the analyses do demonstrate that some positive effects could be found in the EU from the first point of measurement (KIWEST I, 2012) to the second (KIWEST II, 2014), and that the variables most affected were those at the core of the intervention efforts (interpersonal conflict and social community). However, effects in the EU attributed to the interventions were largely missing in the other examined variables. These results will now be discussed using theory and research, and possible reasons behind both the successes and failures in terms of effects are investigated. Study strengths, limitations and methodological concerns are also presented before a case is made for the use of effect evaluations.

The Effects of the Interventions

Due to the nature of this study, the effects are discussed using the ANOVA results as a basis for interpretation: Interpersonal conflicts at work had been chosen as a variable because the reduction of personal conflicts in the EU was the core aim of the intervention efforts. The results show that interpersonal conflicts decreased in the EU from 2012 to 2014. This reduction happened at the same time as there was an increase in the same variable in the remaining units at NTNU. A reduction on this variable suggests some success in improving the psychosocial work environment (which was a main goal for both interventions), and in creating a healthier (or at least less unhealthy) work environment. It also indicates improved competence in interpersonal relationships, which again was a goal in the intervention efforts. Overall, results suggest that the intervention indeed succeeded in accomplishing its main goal, namely to reduce the level of conflicts within the unit.

Social community was chosen as a variable because it is related to the concept of interpersonal conflict, and because the intervention efforts focused quite heavily on creating a better psychosocial environment for the employees in the EU. The results showed that the EU in 2012 experienced a lower degree of social community than the NTNU group, but that they in 2014 had experienced an increase large enough that they surpassed the rest of the university. This despite the increase also found in the NTNU sample. The reduction on the variable interpersonal conflict, taken together with the increase in social community indicates an improved collegial psychosocial climate in the unit. Social community was also an aspect that was emphasized throughout the entirety of the second intervention. The increase in this

variable also suggests that employees improved their competence in interpersonal relationships. Overall, results indicated that the interventions succeeded in increasing the experience of social community within the EU.

The variables trust in management, empowering leadership and recognition were chosen because these, according to the JD-R model, represent three (of many) job resources that can lead to positive employee outcomes. Job resources have been found to be the most important predictors of work positives such as motivation, engagement and enjoyment of work (Bakker et al., 2007; Bakker et al., 2010). Workers that have an abundance of job resources are thought to be better equipped to cope with job demands. Seeing as the EU had issues with conflicts in the workplace, these resources may act as buffers against this hindrance demand. With the intervention efforts undertaken in the EU taking a somewhat countervailing approach, it was of interest to also investigate if variables not necessarily directly targeted in the interventions still experienced an increase because of them. It also seems unlikely that such large and wide-ranging intervention efforts as those conducted on the EU would only affect a couple of select variables. In terms of the results, trust in management could not be analyzed. In the case of empowering leadership, results displayed a significant increase over time in both the EU and NTNU. NTNU perceived leadership as empowering to a significantly larger degree than the EU, both in 2012 and 2014, and the discrepancy between the two groups remained largely unchanged. This suggests that some other (unmeasured) factor affected the sample as a whole. It is difficult, then, to claim that the interventions had a positive effect on empowering leadership. Encouraging results were not found for the recognition variable either. Here, employees in the NTNU group to a larger degree felt recognized and appreciated than employees in the EU, both in 2012 and 2014. Furthermore, the results indicated that this variable did not change over time for either of the groups. In other words, the intervention efforts at the point of evaluation had not succeeded in increasing this variable.

The meaning of work, work engagement, and organizational commitment variables were chosen because they represent so-called work positives. According to the JD-R model, an increase in job resources should result in increases in such work positives. For meaning of work, the EU again displayed lower scores than NTNU at both measurement points. From 2012 to 2014 there appeared to be no significant change in either of the samples on this variable. Results therefore suggest that the interventions did not lead to an increase in employees' experience of having meaningful work. Engagement could not be analyzed. With organizational commitment, NTNU in both 2012 and 2014 had higher levels than the EU.

Although the variable changed in a positive direction for the EU, it did so too for the NTNU group, and the discrepancy between them continued. It follows that the observed increase in organizational commitment could not be accredited to the interventions.

Factors of Success

Process evaluation. It must first be noted that certain assumptions were made in this thesis when evaluating the overall intervention efforts. Saksvik et al. (2015) concluded that the EP constituted a successful intervention. A process evaluation has not yet been conducted of the HSEP, but assumptions about the HSEP's implementation success can still be made based on similarities between them and background information. For one, the same persons that were behind the EP were also the conductors of the HSEP. Additionally, before designing the second intervention, these persons reviewed the process evaluation of the EP. They took aboard findings concerning the importance of communication and leadership, and subsequently focused on these aspects in the follow-up intervention. They also tried to create meeting plans that were tighter than they had been in the EP because the process evaluation highlighted this as an area of improvement. Because of these factors there is reason to assume that the HSEP also constituted a successful process.

Participation. The fact that the interventions involved the entire organization and the participation of all employees could help explain the positive intervention outcomes. Saksvik et al. (2015) mentioned these conditions as prerequisites for organizational intervention success. The employment of a more bottom-up approach than what is typically the case with organizational interventions is likely a reason for the interventions' successes. It is likely that the active participation of both leadership and regular employees in the intervention programs contributed to the results that found improvements in the psychosocial work environment. This is in line with previous research that show participation is crucial for intervention success (e.g. Nielsen, 2013; Nielsen & Randall, 2013). In the interventions that are the subject of this thesis, participation was in fact mandatory for all employees. The fact that employees were given the opportunity to be involved right from the start (for example through the HSEP "work group") may account for some of the effects found in this evaluation. Nielsen et al. (2010a) notes that sufficient opportunities for employee influence is important for intervention outcomes, whilst Nielsen et al. (2013) claims participation is crucial at all stages of an intervention project. These conditions appear to be largely met by the Kibu interventions. By listening to, and involving, the employees in the development of the interventions, Kibu likely ended up with initiatives that were tailored to the situation in the

EU. The participants would likely also have felt that the interventions were relevant to them. As mentioned previously, Sørensen (2013) claims participation can increase engagement and commitment to an intervention. The considerable employee involvement in the EP and HSEP could have increased participants' sense of ownership of the intervention, which in turn may have made them more motivated to participate in the activities and to see the efforts succeed. Like Lines (2004) suggests, the high degree of employee participation may have also increased positive perceptions of the intervention programs. As outlined in the theory section, having employees on board appears to be crucial for positive intervention outcomes. Conversely, employee resistance or opposition is linked to negative outcomes (Randall et al., 2005). The interventions in the EU seem to largely have avoided these issues. As Saksvik et al. (2015) observed in relation to the EP, the intervention was generally met with enthusiasm and interest. Often participants perceive interventions negatively from the start (Hoff & Lone, 2014), and such perceptions are likely to hinder successful intervention outcomes.

The intervention intent or purpose. It may be a factor in the success of the interventions that they were initiated for the purpose of improving employees' psychosocial work environment; research has shown that interventions implemented to increase employee well-being are more likely to succeed than those carried out with an intent to simply to meet demands set by laws or legislations (Egan et al., 2007).

The role of consultants. The choice the EU made when they decided to hire external consultants is potentially problematic. Such consultants frequently face resentment and distrust from organizational stakeholders (Saksvik & Nytrø, 2001), and conflicts between consultants and employees can result from disagreements concerning the intervention program (Kico & Saksvik, 2015). Kico and Saksvik (2015) claim interventions initiated and conducted by the organizations themselves may be preferable. Such interventions will involve management and/or employees to a substantial degree and may promote a sense of ownership with the participants. However, in the EP and the HSEP, consultants made sure to involve the stakeholders and leadership in the process right from the start. The intervention efforts were also very much a collaboration between external and internal forces. By doing this it is likely that the interventions to a large degree avoided issues commonly related to the use of external consultants. Saksvik et al. (2015), in their process evaluation of the EP, noted that the methods and approaches employed by Kibu appear to have worked well. A risk that remains is that the intervention efforts will derail once the consultants withdraw their assistance and the efforts to improve the psychosocial work environment undergo a change in project champion.

The role of concurrent events. Parallel events or inevitable changes that have occurred during the interventions may have corrupted the sample, and it is possible that such unrelated changes influenced target outcomes. This will have made the effects produced by the interventions murky. In the current study, for example, it is not known whether the composition of the unit changed substantially during the interventions. If turnover was high in the EU between 2012 and 2014 it is possible that several employees only partook in parts of the total intervention efforts. These persons will not have been exposed to the intervention to the degree that was intended for EU employees. It is likely that they would not have reaped the same benefits as the rest of the employees and that this would have influenced the 2014 responses. As far as concurrent events go, by examining the differences in outcome variables between the EU and the remainder of NTNU, some of the issues of murkiness were avoided in this study. The results did show that some unmeasured factor or factors affected the total sample on certain target variables, but the research design allowed for this to be identified. In doing so, “fake” intervention effects were (hopefully) not taken for actual effects.

The role played by mental models. The fact that Kibu introduced the JD-R model as a theoretical backdrop for the participants in the interventions could have helped create shared mental models and visions among the employees regarding both the interventions and the psychosocial work environment. These mental models may in turn have helped employees perceive the interventions as both relevant to them and as a good fit for their situation. This could have contributed to the interventions’ apparent success regarding the achievement of main goals. How employees perceive an intervention will influence how they react and respond to it (Nielsen & Randall, 2013), and research suggests that the chances of employees engaging in intervention behaviors increase when employees view them favorably (Nielsen et al., 2009). The fact that participants mostly appraised the EP positively (Saksvik et al., 2015) will thus account for some of the positive effects identified in this study.

Involving the leadership/management. Another positive aspect with the Kibu intervention efforts is that it involved leadership on all levels working with their employees at all phases of implementation. This has likely influenced both the leaders’ and the participants’ attitudes towards the programs in a positive direction. Leadership was involved right away in both the EP and the HSEP and leaders received support throughout the entire process. Kibu highlighted leaders’ essential role in the interventions and aided them in their dealings with employees. Saksvik et al. (2015) found that line managers in the EP managed to do a respectable job guiding their employees through the intervention process. As line managers who show responsibility for the intervention and actively seek their employees’ involvement

can increase participants' positive perceptions, engagement and commitment (Nielsen & Randall, 2009), this is probably a crucial explanation for the target achievements uncovered in this thesis. The weight placed on the role of leadership by Kibu consultants may also have helped make leaders appear supportive of the interventions and made them visible to the employees, two conditions that have been found to increase participation and the chances of success (Coyle-Shapiro, 1999; Sørensen & Holman, 2014). In relation to this, Saksvik et al. (2015) claim that what leadership communicates to their employees, forms attitudes that are essential for intervention outcomes. The fact that the activities in the interventions were mandatory and happened during working hours also solved potential issues with line managers not allocating enough resources to the process or not giving employees the time off to participate.

Focus on information and communication. One of the most pronounced strengths in the interventions implemented in the EU is the focus it had on information and communication. The combination of top-down and bottom-up communication in the intervention efforts echo what Nielsen and Randall (2009) claim to characterize the most successful interventions. Information about the rationale behind the intervention was communicated clearly to employees, and information about its progress was dealt out periodically. This has previously been demonstrated to influence intervention effects (Mattila et al, 2006; Nytrø et al., 2000). Saksvik et al. (2015) write that employees need to understand the necessity of an intervention to engage in it. Because the consultants from initiation and continuously throughout both interventions were very aware of the importance of information, there is reason to believe that participants were given at least adequate amounts of information to where they could grasp the necessity of the them.

Investigating “Missing” Effects

Apart from the aim of decreasing interpersonal conflicts in the unit, which would imply that the programs fall within the category of primary psychosocial interventions, the interventions were more countervailing in nature. In other words, they intended to go beyond the aim of identifying and reducing negative work aspects which is typical for the traditional intervention triad (i.e. primary, secondary, tertiary). The aim was also to identify and promote positive work aspects. In fact, their main goal was the strengthening of the psychosocial work environment. In terms of the JD-R, which was used as a theoretical backdrop for the interventions, this would involve the promotion of job resources. In this study, on the variables that represent job resources in the JD-R model, social community was the only

variable with an increase that could “safely” be attributed to the interventions. The other resource variables could either not be studied (trust regarding management), did not display a significant increase (recognition), or had an increase that could not be attributed to the interventions (empowering leadership). The results found in this study thus point to the countervailing interventions not having fully succeeded in attempts to promote positive work aspects. As social community was the only resource variable studied that showed an increase, the possibility must be considered that, while the intervention succeeded in significantly reducing the hindrance demand interpersonal conflict, it failed to achieve its purpose as a countervailing intervention. The increase in social community may well be a symptom of the work environment becoming more positive because of fewer conflicts in the workplace, rather than be a result of the interventions’ attempts at promoting (positive) job resources.

Theoretically, countervailing interventions could be expected to also result in increased work positives such as meaning of work, engagement and commitment (seeing as these have been related to employee well-being). The results, however, showed no such increase in either meaning of work or commitment for the EU. Sadly, engagement could not be measured over time. It is possible that this would have yielded a more positive result considering ‘engaged employees’ was one of the outcomes the interventions set out to achieve. One thing that may speak to some intervention success in this area is the increase in the response rate in the EU from 2012 to 2014. Whilst 72% participated in KIWEST I (which was significantly higher than the 54% in the NTNU group), an impressive 94% of the EU participated in KIWEST II (again, significantly more than the increased 74% in NTNU). This suggests that the employees had become more engaged and that they were taking more responsibility for their own psychosocial work environment. Perhaps the intervention efforts increased their belief that they themselves have the power to impact their conditions. It is also possible that effects stemming from the promotion of resources and positive work aspects simply need more time to quantitatively manifest themselves than what is needed for the effects resulting from stressor reduction or removal.

The choice of variables. In retrospect, the choices of study variables could have been made more thoughtfully. Whilst the *most* important variable (interpersonal conflicts) was included in this thesis, other important variables were not. For one, the variable “social climate”, an important resource in the colleague fellowship, was not investigated. With the overarching theme of the interventions being improvement of the psychosocial work environment, this variable may well be the most suited for assessing the work environment overall. It contains items such as “The climate in my unit is encouraging and supportive” and

“The climate in my unit is relaxed and comfortable”. With the previously stated aims of the intervention programs, a successful intervention effort would most likely have produced a significant increase in this variable. As such, it is a shame that this variable was not included in the analyses. Another expressed factor of success (according to the consultants) would be an increase in role clarity. This variable was also not included in the analyses. Looking at the Saksvik et al. (2015) process evaluation of the EP, it might also have been smart to include some scales that dealt with communication and leadership. Omitting potentially important variables means that this thesis cannot safely draw conclusions about the overall success of the programs. It also means that large and/or significant effects of the intervention may have been missed as other (potentially positive) effects could have occurred in areas that were not examined. On the other hand, inclusion of interpersonal conflict and social community may be sufficient for tentative conclusions about the success (or failure) of the intervention programs’ main goals.

The time of assessment. The point at which this evaluation has been conducted may represent a problem regarding the accurate assessment of the effects. Kico and Saksvik (2015) write that the length of the evaluation period is significant as to whether or not an intervention is deemed successful. The authors even claim that evaluations conducted one year after an intervention has been implemented (as is common) may be premature. This is a concern in the current thesis; although it had been more than a year since the EP had been completed when the second dataset was collected in 2014, this intervention had been rather quickly followed by a second, the HSEP. The main activities that constituted the HSEP had just recently been completed when the employees were asked to fill in the KIWEST II survey. It follows that the intervention efforts had not been given much time to mature. Time is needed to see the effects of the interventions fully. One reason for this is that interventions themselves may represent stressors for the employees (Tvedt & Saksvik, 2012). Evaluations may therefore need to be conducted at a point in time when employees have gotten used to the “new normal”. With the long duration of the intervention efforts in the EU, it is a distinct possibility that they may have experienced this process as an extra job demand. It is plausible that this resulted in some more negative responses on the second survey seeing as it was conducted so close in time to the intervention activities. Desired effects that have not been identified in the current evaluation may display themselves at a later date. Kico and Saksvik (2015) go so far as to state that it may be imperative not to study an intervention too early. Parkes and Sparkes (1998) note that it is normal to wait one month from baseline to evaluation, but claim an eighteen-month lag may be necessary in complex interventions to notice effects. On the other

hand, the fact that the evaluation did reveal some crucial effects so soon after intervention implementation, suggests that the interventions were impactful. If (as has been found in previous studies), effects of the interventions continue to increase for the EU over time, it would be difficult to claim the efforts as anything other than successful.

The omission of target variables. It is unfortunate that some target variables could not be assessed. Increased trust in management and engagement were important goals of the interventions, so not being able to evaluate these over time means that outcomes deemed crucial were not assessed. The variable trust regarding management had been chosen as a target variable because Kibu mentioned that improved trust in leadership would constitute a success factor for the second intervention. It follows that an increase in this variable would have spoken to the interventions' successfulness. Sadly, due to the low internal consistency in this scale, it was decided not to conduct further analyses on the variable. As a result, an important factor of intervention success was not assessed, and it could not be determined whether the interventions succeeded in achieving the desired increase in management trust. In the HSEP, having 'engaged workers' was also seen as an intervention goal. Engagement was unfortunately measured with different scales in 2012 and 2014. Meaningful analyses of this variable over time could therefore not be conducted. This meant that it could not be assessed whether the intervention succeeded in increasing employee engagement. The variables overcommitment (KIWEST I) and workaholism (KIWEST II) were chosen because high scores on these scales can lead to employees experiencing problems, as they both can indicate an unhealthy relationship to work. Because these measures differed so much from 2012 to 2014, it was not seen as a productive pursuit to compare these results over time. It also did not help that overcommitment was found to have a very low Cronbach's alpha. As a result, these scales were dropped from further analyses. The omission of some of these variables makes it more difficult to make conclusive statements about intervention effects.

Study Strengths, Limitations and Methodological Considerations

Longitudinal data. Longitudinal data make it possible to examine whether changes have been made within the same group from one moment to another. Even though there was no true baseline, a strength of the study was the fact that data was collected on two occasions so that change over time could be assessed. The fact that participants were measured twice on all variables made it possible to make cause and effect inferences. A cross-sectional design would have made this difficult due the individual only having responded to the survey at a

single point in time (Spector, 1994). The fact that the research design in this study included both an experimental group and a control group represents another strength.

No true baseline. It is important to note that because the first survey (KIWEST I) was conducted a while after the first intervention had begun (but before it had been completed), it cannot truly be considered a baseline for the results of the second survey (KIWEST II). It is possible (and perhaps even probable) that the first intervention, at the first point of data collection, had already impacted the variables measured. This could be a reason as to why significant changes were not observed on some target variables. Did the interventions not affect these variables, or had changes already occurred? The sample may have had a lower (or higher) baseline than what has been used to compare with 2014 data. This could mean that significant effects failed to register. It is possible that the participants in 2012 filled in the self-reporting questionnaires more positively than they would have were they not being studied (similar to a Hawthorne-effect), or that the EP had already had some favorable effects on the employees in the EU. Regardless, it is safe to say that the data is biased due to the time at which it was collected. As a result, a true baseline with which to compare to the second dataset was not used in the analyses. The scale values from KIWEST I (whether it be in a positive or negative direction) would probably have been different if the questionnaires had been given to the EU before the intervention efforts began. This represents a serious limitation for this thesis. Not having a proper baseline makes it difficult to say anything with certainty about the effects of the intervention. The effects may be larger/smaller than the results of this study show, and certain significant effects may have failed to register altogether due to the biased baseline.

Not matching the participants. The results would carry more weight if the participants from 2012 and 2014 could be matched. If it could be said for sure that the same participants were compared over time, more confidence could be had in the observed effects. Unfortunately, it was not possible to match participants from the datasets because such identifiers were not collected. This represents a clear limitation of the data. With the participants not being matched, however, the sample sizes were larger than they inevitable would have been otherwise. It is also a limitation that little is known about the turnover rate within the EU and in NTNU as a whole. Without this information, it is difficult to say with certainty that the same groups are compared in 2012 and 2014. Matched participation would also have made it possible to conduct a “proper” repeated measures ANOVA, increasing the strength of the study.

“Contamination” of the control group. It must also be kept in mind that part of the control group (NTNU) could have been “contaminated”. The initial intervention, the EP, did not just include employees in the EU. A small portion of the NTNU sample had therefore undergone some of the same intervention efforts as the EU. Whilst this would lead to a certain degree of contamination, the overall NTNU group was large enough that the effects ought to be minimal.

The one method approach. Another limitation to this effect evaluation is that the evaluation is based solely on survey results taken at two points in time and on a process evaluation that was conducted on part of the intervention efforts. The survey included no open questions and the effect evaluation could have benefited from the addition of qualitative methodology. Interviews of employees would have added an extra dimension to the analyses, and valuable information regarding effects could have been uncovered. They could also have shed light on potentially important contextual factors. Using a survey or questionnaire may in itself pose problems; there is a chance that the employees were concerned about leadership having access to their individual survey answers, and that this influenced their responses. There is also the possibility that social desirability influenced answers (Donaldson & Grant Vallone, 2002). According to Meltzoff (1998) self-report surveys are oftentimes less reliable because of factors such as participants’ self-serving biases.

The issue with randomization. In the current research design, participants were not randomly placed into one experimental group and one control group. Randomization of participants into groups prior to an intervention is supposed to give researchers faith that any changes occurring between the experimental and control group following an intervention can be accredited to the intervention itself. This evaluation used more of a quasi-experimental design by using intact groups (the EU vs. the remainder of the university). These groups were thought to be similar as they both came from the same university sample, but they were likely not as similar as they would have been if random assignment was applied.

Assumptions. Although this thesis assumed that the second intervention also had a successful process, similar to that of the EP, there is the possibility that it in fact was not. If that were the case, then this thesis may have made some incorrect conclusions based on that assumption.

The KIWEST. The scales included in this study are based on standardized and validated measures (Innstrand, Christensen, Underbakke, & Svarva, 2015). They are also appropriate for the participants in university samples. This represents a strength of this study. On the other hand, the fact that most of the items in the scales have been worded differently in

KIWEST I and KIWEST II may have influenced the participants' scores. Furthermore, the scales in KIWEST had response categories that ranged from 1-5, 1-4 etc. This could have influenced the results of the study. Whilst the use of these scales makes data collection easier, it is also possible that the respondents favored certain response patterns and ticked answers accordingly, without considering the actual content of the survey. The KIWEST is also a rather comprehensive questionnaire that contains a lot of statements, and there is a chance that some bored respondents gave little thought to their answers. Finally, in 2012, participants who did not work with computers were given the option to take the survey on paper rather than electronically. The fact that paper surveys were not handed out in 2014 could mean that certain workers in NTNU were not given the chance to participate.

Implications for Future Research

Rather than list possible areas for future research, this paper makes a case for the continued use of effect evaluations. As has been noted earlier in this thesis, the literature on interventions has focused largely on effect evaluations (Biron & Karanika-Murray, 2014), and calls have been made for an increased focus on process evaluations. There is a risk, when only measuring whether there have been significant changes in select variables, that one ignores the complexities that characterize interventions. Evaluations of process may aid the search for successful interventions that can be replicated and transferred to other contexts. It can help find factors that constitute successful implementations across different situations and teach valuable lessons about areas of improvement and areas of success to change agents. It follows, then, that it is hard to disagree that the single-minded focus on intervention outcomes is flawed. However, it is also important to evaluate the actual effects of interventions. At the end of the day, whether the aim of an intervention is the removal of stressors or the promotion of resources, it matters if these goals are reached. If a process evaluation concludes that an intervention is successful, but the desired effects still did not result from it, this is of little help to the organization. It should be kept in mind that organizational interventions oftentimes are costly undertakings in terms of money, time and other resources. Those in charge of allocating these funds and resources will likely not spare such an expense if they do not believe that doing so will grant them tangible results; organizations will want their "money's worth", so to speak. That does not mean effect evaluations should be conducted as they always have been; this thesis attempted to go beyond the typical effect evaluation by making use of a process evaluation and established theory. It is suggested that future research do the same.

Conclusion

This thesis has explored the question of whether the interventions conducted on the EU have succeeded in achieving their desired effects. Despite some obvious limitations to this study, certain tentative conclusions can be made. It appears that the interventions have largely succeeded in improving the psychosocial work environment. The significant reduction in interpersonal conflicts, paired with the increase in social community within the unit, speaks to this success. It appears that the overriding goal of improving the collegial relationships has been met. Where the intervention efforts may have failed, however, is in their pursuits of being deemed countervailing in nature. There are few indications in the data to suggest that any increases in job resources or job positives (such as commitment or meaning of work) have resulted from the interventions. But here too one must be careful to draw conclusions; it is likely that this outcome evaluation would have found different results if it had been conducted at a later date. Important effects may also have been missed due to crucial outcome variables not being analyzed.

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Appendix A

Scales and Items of Study Variables, KIWEST I

Scale	Item	Response option
Interpersonal conflict	My work is hampered by the existence of power struggles and territorial thinking at my workplace	A
	Intrigues in my workplace impair the work climate	
	There is a great deal of tension in the workplace due to prestige and conflicts.	
Social community at work	Is there a good atmosphere between you and your colleagues?	B
	Is there good cooperation between the colleagues at work?	
	Do you feel part of a community at your place of work?	
Trust regarding management	Does the management trust the employees to do their work well?	B
	Can you trust the information that comes from the management?	
	Does the management withhold important information from the employees? (R)	
	Are the employees able to express their views and feelings?	
Empowering leadership	Does your immediate superior encourage you to participate in important decisions?	C
	Does your immediate superior encourage you to speak up, when you have different opinions?	
	Does your immediate superior help you develop your skills?	
Recognition	Is your work recognized and appreciated by the management?	B
	Does the management at your workplace respect you?	
	Are you treated fairly at your workplace?	
Meaning of work	Is your work meaningful?	B
	Do you feel that the work you do is important?	
	Do you feel motivated and involved in your work?	

Work engagement, Vigor - Exhaustion (OLBI)	During my work, I often feel emotionally drained (R)	A
	There are days when I feel tired before I arrive at work (R)	
	After work I usually feel worn out and weary (R)	
	I usually feel energized at work	
	After work I have enough energy for my leisure activities	
	Usually, I can manage the amount of my work well	
	After work, I tend to need more time than in the past in order to relax and feel better (R)	
	I can tolerate the pressure of my work very well	
Work engagement, Dedication - Disengagement (OLBI)	I am less interested in my job now than in the beginning (R)	A
	It happens more and more often that I talk about my work in a negative way (R)	
	Lately, I tend to think less at work and do my job almost mechanically (R)	
	I find my work to be a positive challenge	
	Over time, one can become disconnected from this type of work (R)	
	Sometimes I feel sickened by my work tasks (R)	
	This is the only type of work that I can imagine myself doing	
	I feel more and more engaged in my work	
Organizational commitment	I gladly tell others about my workplace	B
	I would recommend a close friend to apply for a position at my workplace	
	I seldom think about applying for a job elsewhere *	
	I feel that my work is of great importance to me	

Over commitment	<p>It often occurs that I wake up in the morning and think about work related problems</p> <p>When I come home, it is easy for me to switch off from work (R)</p> <p>Those who are close to me say that I give too much of myself to my work</p> <p>I can rarely let go of thoughts concerning my work</p> <p>Even in the evenings when I am free I think about work</p> <p>My work is on my mind even in the weekends</p>	A
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A: Strongly disagree, disagree, neither/nor, agree, strongly agree.

B: To a very small extent, to a small extent, somewhat, to a large extent, to a very large extent.

C: Very seldom/never, rarely, sometimes, often, very often/always.

* Item was removed from analyses

Appendix B

Scales and Items of Study Variables, KIWEST II

Scale	Item	Response option
Interpersonal conflict	My work is hampered by power struggles and territorial thinking in my unit	A
	In my unit, intrigues impair the work climate	
	In my unit, there is a great deal of tension due to prestige and conflicts	
Social community at work	There is a good atmosphere between me and my colleagues	A
	There is a good sense of fellowship between the colleagues at my unit	
	I feel that I am a part of a community at my unit	
Trust regarding management	My unit management trusts the employees to do their work well	A
	I can trust the information from my unit management	
	My unit management withholds important information from the employees (R)	
	It is possible for the employees at my unit to express their views	
Empowering leadership	My immediate superior encourages me to participate in important decisions	A
	My immediate superior encourages me to speak up, when I have a different opinion	
	My immediate superior contributes to the development of my skills	
Recognition	My work is recognized appreciated by the unit management	A
	I am respected by the unit management	
	I am treated fairly by the unit management	
Meaning of work	My work is meaningful	A
	I feel that the work I do is important	
	I feel motivated and involved in my work	

Work engagement, (UWES)	At my work, I feel bursting with energy	B
	At my job, I feel strong and vigorous	
	When I get up in the morning, I feel like going to work	
	I am enthusiastic about my job	
	My job inspires me	
	I am proud on the work that I do	
	I feel happy when I am working intensely	
	I am immersed in my work	
Organizational commitment	I get carried away when I'm working	A
	I am happy to tell others about my work place	
	I would recommend a close friend to apply for a position at my workplace	
Workaholism	I feel that my workplace is of great importance to me	C
	I find myself continuing to work after my co-workers have called it quits	
	It is important to me to work hard even when I do not enjoy what I am doing	
	I stay busy and keep many irons in the fire	
	I feel that there's something inside me that drives me to work hard	
	I spend more time working than on socializing with friends, on hobbies, or on leisure activities	
	I feel obliged to work hard, even when it is not enjoyable	
	I find myself doing two or three things at one time, such as eating lunch and writing a memo, while talking on the telephone	
	I feel guilty when I take time off work	
	It is hard for me to relax when I'm not working	

A: Strongly disagree, disagree, neither/nor, agree, strongly agree.

B: Never, a few times a year or less, once a month or less, a few times a month, once a week, a few times a week, every day.

C: (Almost) never, sometimes, often, (almost) always

Appendix C
ANOVA outputs

Interpersonal conflicts ANOVA

Tests of Between-Subjects Effects

Dependent Variable: Interpersonal conflicts

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	64.562 ^a	3	21.521	21.365	.000
Intercept	1838.325	1	1838.325	1825.020	.000
Time	.170	1	.170	.169	.681
Group	.018	1	.018	.018	.895
Time * Group	5.415	1	5.415	5.376	.020
Error	6951.314	6901	1.007		
Total	39536.603	6905			
Corrected Total	7015.876	6904			

a. R Squared = .009 (Adjusted R Squared = .009)

Group * Time

Dependent Variable: Interpersonal conflicts

Group	Time	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
EU	Pre-intervention	2.310	.153	2.010	2.610
	Post-intervention	2.034	.131	1.777	2.290
NTNU	Pre-intervention	2.062	.018	2.026	2.098
	Post-intervention	2.255	.016	2.223	2.287

Social community ANOVA

Tests of Between-Subjects Effects

Dependent Variable: Social community

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	64.372 ^a	3	21.457	36.164	.000
Intercept	5932.546	1	5932.546	9998.657	.000
Time	12.902	1	12.902	21.746	.000
Group	.001	1	.001	.002	.961
Time * Group	3.134	1	3.134	5.282	.022
Error	4115.367	6936	.593		
Total	109895.538	6940			
Corrected Total	4179.739	6939			

a. R Squared = .015 (Adjusted R Squared = .015)

Group * Time

Dependent Variable: Social community

Group	Time	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
EU	Pre-intervention	3.617	.117	3.386	3.847
	Post-intervention	4.158	.100	3.962	4.355
NTNU	Pre-intervention	3.799	.014	3.772	3.827
	Post-intervention	3.983	.012	3.959	4.008

Empowering leadership ANOVA

Tests of Between-Subjects Effects

Dependent Variable: Empowering leadership

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	587.746 ^a	3	195.915	197.208	.000
Intercept	4233.274	1	4233.274	4261.208	.000
Time	26.786	1	26.786	26.963	.000
Group	19.001	1	19.001	19.126	.000
Time * Group	.315	1	.315	.317	.573
Error	6652.105	6696	.993		
Total	93122.691	6700			
Corrected Total	7239.851	6699			

a. R Squared = .081 (Adjusted R Squared = .081)

Group * Time

Dependent Variable: Empowering leadership

Group	Time	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
EU	Pre-intervention	2.873	.154	2.571	3.174
	Post-intervention	3.345	.132	3.086	3.604
NTNU	Pre-intervention	3.262	.018	3.226	3.298
	Post-intervention	3.849	.016	3.817	3.882

Recognition ANOVA

Tests of Between-Subjects Effects

Dependent Variable: Recognition

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	27.608 ^a	3	9.203	12.069	.000
Intercept	5042.910	1	5042.910	6613.753	.000
Time	.896	1	.896	1.175	.278
Group	12.504	1	12.504	16.398	.000
Time * Group	.001	1	.001	.001	.977
Error	5258.883	6897	.762		
Total	104454.915	6901			
Corrected Total	5286.491	6900			

a. R Squared = .005 (Adjusted R Squared = .005)

Group * Time

Dependent Variable: Recognition

Group	Time	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
EU	Pre-intervention	3.617	.117	3.386	3.847
	Post-intervention	4.158	.100	3.962	4.355
NTNU	Pre-intervention	3.799	.014	3.772	3.827
	Post-intervention	3.983	.012	3.959	4.008

Meaning of work ANOVA

Tests of Between-Subjects Effects

Dependent Variable: Meaning of work

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	7.982 ^a	3	2.661	5.076	.002
Intercept	5893.820	1	5893.820	11243.193	.000
Time	.832	1	.832	1.587	.208
Group	5.594	1	5.594	10.672	.001
Time * Group	1.134	1	1.134	2.163	.141
Error	3632.267	6929	.524		
Total	116495.993	6933			
Corrected Total	3640.249	6932			

a. R Squared = .002 (Adjusted R Squared = .002)

Group * Time

Dependent Variable: Meaning of work

Group	Time	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
EU	Pre-intervention	3.897	.112	3.678	4.116
	Post-intervention	3.695	.095	3.509	3.882
NTNU	Pre-intervention	4.030	.013	4.004	4.056
	Post-intervention	4.045	.012	4.022	4.068

Organizational Commitment ANOVA

Tests of Between-Subjects Effects

Dependent Variable: Organizational commitment

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	229.117 ^a	3	76.372	120.419	.000
Intercept	4993.103	1	4993.103	7872.792	.000
Time	10.158	1	10.158	16.016	.000
Group	16.253	1	16.253	25.626	.000
Time * Group	.093	1	.093	.147	.701
Error	4386.918	6917	.634		
Total	104628.172	6921			
Corrected Total	4616.035	6920			

a. R Squared = .050 (Adjusted R Squared = .049)

Group * Time

Dependent Variable: Organizational commitment

Group	Time	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
EU	Pre-intervention	3.231	.121	2.993	3.469
	Post-intervention	3.523	.105	3.318	3.728
NTNU	Pre-intervention	3.608	.015	3.580	3.637
	Post-intervention	3.962	.013	3.937	3.988