Investigating the Reciprocal Relationship Between Job Resources and Work Engagement Over Time

A Demonstration of Gain and Loss Spirals

Richard Tidemann Havdahl

Master thesis

Department of Psychology
UNIVERSITY OF OSLO

May 2017
Investigating the Reciprocal Relationship Between Job Resources and Work Engagement Over Time: *A Demonstration of Gain and Loss Spirals*

Richard Tidemann Havdahl

http://www.duo.uio.no
Acknowledgements

I would like to thank my supervisor, Sabine Raeder, Professor at the Department of Psychology at the University of Oslo (UiO), and Felix Anker Klein, Ph.D student also at the Department of Psychology at the UiO, who introduced me to the research project. Further, I would like to thank Raeder for constructive feedback and guidance in writing this thesis.

I would also like to acknowledge all the participants in this project. Without their efforts and commitment in participating over many months, it would of course not be possible to do this thesis and explore interesting research questions about development.

Lastly, I would like to thank classmates, friends, family, and especially my sister, Alexandra Havdahl, for your invaluable input, constructive feedback and brainstorming sessions.
Abstract
This study investigates the unknown terrain of how work engagement, employer inducements (consisting of four sub-components of job resources), and their reciprocal relationship develops over time. Through multilevel analyses of 125 participants and 342 waves of data, this monthly four-wave study aimed to determine: (1) the development of work engagement and employer inducements, (2) their reciprocal relationship over time, (3) potential lagged effects in this relationship, and (4) the existence of gain and loss spirals wherein those with higher levels of employer inducements and work engagement further increase their levels over time, while those with low levels further decrease their levels over time. Results showed that employer inducements and work engagement have both stable and varying components over time, and they are reciprocally related. The proposed patterns of gain and loss spirals were indeed demonstrated. Surprisingly, the lagged effects of both employer inducements on work engagement and work engagement on employer inducements were non-significant. As such, the primary direction of this relationship could not be determined.
# Table of Contents

Introduction ......................................................................................................................... 6  
Work Engagement ........................................................................................................... 7  
Job Resources .................................................................................................................. 10  
Reciprocal Relationship .................................................................................................. 12  
Gain and Loss Spirals of Engagement and Resources ....................................................... 13  
The Present Study ............................................................................................................ 15  
Method .............................................................................................................................. 16  
Results ............................................................................................................................... 21  
Part 2 – Page Numbers

Discussion ............................................................................................................................ 11  
Limitations ......................................................................................................................... 17  
Implications for Practice ................................................................................................... 19  
Conclusion ......................................................................................................................... 19
Introduction

In the taillight of the positive psychology movement (Fredrickson, 1998, 2004; Seligman & Csikszentmihalyi, 2000; Seligman, Steen, Park, & Peterson, 2005), work engagement has become subject to ever-increasing amount of research. Work engagement is an affective-motivational, work-related state of fulfillment (Xanthopoulou, Bakker, Demerouti, & Schaufeli, 2009a), considered an important aspect of employee well-being (Mäkikangas, Kinnunen, Feldt, & Schaufeli, 2016) and inherently associated with feeling good, enthusiastic and energetic. As such, work engagement is important in and of itself for employees, managers, companies and societies who value employees’ well-being and prosperity. Conveniently, work engagement is also linked with a broad range of important organizational outcomes (Christian, Garza, & Slaughter, 2011; Halbesleben, 2010), making it a potential key performance indicator for companies rather than just an employee benefit. Finding what drives work engagement has become an important endeavor in both research and practice.

While personality and other stable personal characteristics are related to work engagement, job resources are consistently found to be the most important external predictor (Christian et al., 2011; Halbesleben, 2010). Casting a wide net, job resources refer to those physical, social or organizational aspects of a job that are (1) functional in achieving work goals, (2) reduces work-related demands, or (3) stimulate personal growth, learning and development (Schaufeli & Bakker, 2004). A wide range of job resources have been linked with work engagement in a variety of samples, but most studies have been cross-sectional. Such studies can only conclude that employees who have more resources also tend to be more engaged. Recent theoretical, empirical and methodological advances have led a number of researchers to highlight three important avenues for future research: (1) the development of job resources and work engagement over time (Brauchli, Schaufeli, Jenny, Füllmann, & Bauer, 2013; De Lange, De Witte, & Notelaers, 2008; Mäkikangas, Bakker, Aunola, & Demerouti, 2010; Mäkikangas et al., 2016; Schaufeli, 2012), (2) the potentially reciprocal relationship between job resources and work engagement (Christian et al., 2011; De Lange et al., 2008; Salanova, Schaufeli, Xanthopoulou, & Bakker, 2010), and (3) the potential existence of gain and loss spirals whereby those with more resources and engagement continue to gain, while those with less continue to lose (Salanova et al.,
The present study aims to provide insight into all three arenas through longitudinal multilevel analysis of four monthly waves measuring work engagement and job resources at all occasions.

**Work Engagement**

Kahn (1990) is often recognized as the first researcher to theorize about work engagement. He defined engagement as “the harnessing of organization members' selves to their work roles; in engagement, people employ and express themselves physically, cognitively, and emotionally during role performances” (p. 694). Since then, work engagement has been subject to an impressive increase of academic studies. A search for articles in PsychInfo with “employee engagement” or “work engagement” in the title gives 860 results as of April 2017. Only 4 of them were published before the year 2000, and only 32 before 2008 (Bakker and Leiter 2010), illustrating the recency of research on this construct.

Since Kahn (1990), many definitions of work engagement have been developed, but Schaufeli and colleagues (2002) proposed what has arguably become the most used: “a positive, fulfilling, work-related state of mind that is characterized by vigor, dedication, and absorption” (p. 74). Vigor is characterized by high levels of energy and mental resilience while working, the willingness to invest effort into one’s work, and persistence even in the face of difficulties. Dedication refers to being strongly involved in one’s work, and experiencing a sense of significance, enthusiasm, inspiration, pride, and challenge. Absorption is characterized by being fully concentrated and happily engrossed in one’s work, whereby time passes quickly and one has difficulties with detaching oneself from work (Schaufeli & Bakker, 2010). As such, work engagement can be conceptualized as a positive work-related state, inherently connected to the higher-order construct of employee well-being (Mäkikangas et al., 2016). Research has shown that work engagement is different from related concepts like job embeddedness (Halbesleben & Wheeler, 2008), workaholism (Schaufeli, Taris, & Van Rhenen, 2008), job satisfaction and job involvement (Christian et al., 2011).

Work engagement has been found related to a range of organizational outcomes such as organizational commitment (Saks, 2006), role performance (Rich, Lepine, & Crawford, 2010), productivity (Masson, Royal, Agnew, & Fine, 2008), Organizational Citizenship Behaviour (OCB) (Babcock-Roberson & Strickland, 2010;
Rich et al., 2010), client satisfaction (Salanova, Agut, & Peiró, 2005), less frequent absenteeism (Schaufeli, Bakker, & Van Rhenen, 2009), and financial returns (Xanthopoulou, Bakker, Demerouti, & Schaufeli, 2009b). It seems everyone, from employees to boardroom executives, benefit from higher levels of work engagement. However, most studies have been cross-sectional and can only conclude about individual differences between employees. There is much less research on how work engagement develops over time. Of those studies that do exists, some have emphasized the consistently high stability coefficient (test-retest correlations) of work engagement over long time-periods (for a review, see Table 1 in; Seppälä et al., 2015). For example, in a seven year, three wave study, Seppälä and colleagues (2015) found stability coefficients of .67, .79, and .60 after three years, and .63, .69, and .59 after seven years for vigor, dedication and absorption, respectively. In other words, the rank-order differences in work engagement remained somewhat stable after three, and even seven years. In personality psychology, stability coefficients in excess of .60 have traditionally been interpreted as indicating a high degree of continuity (Robins, Fraley, & Krueger, 2009).

Other researchers interested in how work engagement develops over time have emphasized the considerable within-person variance it shows, at least over shorter time-periods (Bakker & Bal, 2010; Bakker & Sanz-Vergel, 2013; Sonnentag, 2003; Xanthopoulou, Baker, Heuven, Demerouti, & Schaufeli, 2008; Xanthopoulou et al., 2009b). Within-person variation refers to the degree to which individuals change or fluctuate over time. A larger proportion of within-person variation relative to between person variation suggest that individuals vary more over time than they differ from other each other in mean levels.

Daily diary studies, typically lasting around one week, consistently find within-person variations to account for more than one third of the total variance in work engagement (Sonnentag, 2003; Xanthopoulou et al., 2008; Xanthopoulou et al., 2009b). Further, two weekly studies lasting three and five weeks, found within-person variation to account for 40 % (Bakker & Sanz-Vergel, 2013) and 47 % (Bakker & Bal, 2010) of the total variance. Such studies suggest that work engagement is not a time-invariable “chronic” state, as some researchers have stated (Schaufeli, Bakker, & Salanova, 2006, p. 712).

Two rare studies examining the long-term development of work engagement comes from Seppälä and collaegues (2015) and Brauchli and colleagues (2013). Over
seven years and three-waves, Seppälä and colleagues (2015) found that 69-77% of the total variance in work engagement was explained by a stability component, and only 23-31% from a change component. In their three year, three-wave study, Brauchli and colleagues (2013) found work engagement to be somewhat less stable, with 54-66% of total variance accounted for by a stable component.

To summarize, existing research suggest that work engagement has both stable and changing components. However, very few studies have explicitly investigated the development of work engagement. In fact, a recent systematic review could only find six studies on work engagement lasting more than two weeks and having more than two measurement waves (Mäkikangas et al., 2016). Moreover, none of the six included more than three waves. Mäkikangas and colleagues (2016) are only the latest addition of researchers calling for more longitudinal research on the development of work engagement (e.g., Salanova et al., 2010; Weigl et al., 2010). In response to this gap in knowledge, the first research question of this study is:

Research question 1: how does work engagement develop over four monthly waves?

Both individual and situational factors are associated with work engagement (Christian et al., 2011). Among individual characteristics; a proactive personality, positive affectivity, conscientiousness, extraversion, and low neuroticism has been linked with a higher level of work engagement (Christian et al., 2011; Langelaan, Bakker, Van Doornen, & Schaufeli, 2006). The dynamic equilibrium model (Brauchli et al., 2013; Headey & Wearing, 1989; Seppälä et al., 2015) suggests that genetic predispositions and personality factors play important roles for whether work engagement is stable over time. The model proposes that every individual has a stable set-point of work engagement, determined by his or her genetic predispositions, stable traits and, importantly, stable environments. Individuals may fluctuate somewhat from their set-point, but sooner rather than later, work engagement levels regress back to this set-point. While placing emphasis on stable individual characteristics, the model does not reject the effect of situational factors. It only suggests that such effects are temporary. As seen in other arenas of life, winning the lottery or becoming paraplegic only has temporary effects on subjective well-being before returning to
normal, set-point levels (Brickman, Coates, & Janoff-Bulman, 1978). This is suggested to hold for work engagement as well.

**Job Resources**

For situational factors, the Job Demands-Resources (JD-R) model (Schaufeli & Bakker, 2004) is one of the most widely cited and supported theories linking work-related resources to work engagement (Bakker & Demerouti, 2007). In fact, job resources are consistently found to be the most important predictor of work engagement in empirical studies (for meta-analyses, see Christian et al., 2011; Halbesleben, 2010). Job resources are assumed to affect work engagement either intrinsically through fostering growth, learning and development, or extrinsically through its value in achieving work-related tasks or goals (Bakker & Demerouti, 2008). Autonomy, social support and feedback are among the most frequently studied job resources, but a large number and variety of categories have been found to predict work engagement (for reviews, see; Bakker, 2011; Christian et al., 2011). For example, Simpson (2009) found *professional status* to be among the most important job resources in predicting work engagement for medical-surgical nurses, while Salanova and Schaufeli (2008) found that *job control* and *task variety* were associated with work engagement in a cross-national study. Some studies have examined work engagement in relation to highly specific resources (e.g., organizational support for strengths use; van Woerkom, Oerlemans, & Bakker, 2016) while others have combined a range of resources into one higher-order category (e.g., Trépanier, Fernet, Austin, Forest, & Vallerand, 2014). In this study follows the second approach and studies job resources through the construct of employer inducements, comprising of four sub-categories of job resources.

**Employer Inducements**

Job resources are closely linked with the notion of psychological contracts, where the social exchange between employer and employee is emphasized. While the formal employment contract involves more or less clear-cut exchanges like salary and working hours, the psychological contract refers to “an individual’s beliefs regarding the terms and conditions of a reciprocal exchange agreement between that focal person and another party” (Rousseau, 1989, p. 123). This psychological contract is by nature subjective and may involve exchanges of more or less anything the employee
or employer value, expect or want from the employment relationship. For example, the employer may expect the employee to be effective, enthusiastic, show initiative, and treat coworkers and costumers with respect. On the other hand, the employee may expect the employer to provide and ensure a positive working environment, career opportunities, and regular feedback. The resources provided to the employee are often referred to as employer inducements. In this study, employer inducements is measured through four sub-categories of resources, namely, (1) security and retention, (2) support for career and skill development, (2) appreciation for performance, and (1) information and participation. Saks (2006) suggests that the reason job resources are related to work engagement is because employees want to repay their employers for resources provided. Following the rationale of the JD-R model and its abundant empirical support, the first hypothesis of this study is,

Hypothesis 1: monthly employer inducements has a positive effect on monthly work engagement.

This study further examines the development of job resources (i.e., employer inducements) in its own right. As with work engagement, research on job resources has often relied on cross-sectional associations. While some two-wave studies have demonstrated that job resources may increase or decrease over time (De Lange et al., 2008), longitudinal studies with at least three waves are needed to separate change from measurement error (Hoffman, 2015). The earlier mentioned dynamic equilibrium model (Headey & Wearing, 1989) suggests that both work engagement and job resources will remain stable around person-level set-points. While few studies have examined the development of job resources, Brauchli and colleagues (2013) found a stable component to account for 48-69% of total variance in job resources over three years. In their seven year study, Seppälä and colleagues (2015) found 46-49% of total variance in job resources accounted for by a stable component. This study aims to contribute to the limited research existing on the development of job resources.

Research question 2: how does employer inducements develop over four monthly waves?
Reciprocal Relationship

Traditionally, job resources have been conceptualized as the antecedent in relation to work engagement (e.g., Schaufeli & Bakker, 2004). However, more recently, several researchers have found support for a reverse effect of work engagement on job resources as well (Hakanen, Perhoniemi, & Toppinen-Tanner, 2008; Llorens, Schaufeli, Bakker, & Salanova, 2007; Simbula, Guglielmi, & Schaufeli, 2011; Xanthopoulou et al., 2009a). For example, in a three-wave, 8-month study, Simbula (2011) found work engagement to have both short- (4 months) and longer term effects on job resources. Further, in an 18-month study, Xanthopoulou and colleagues (2009a) found work engagement to be as good a predictor of job resources as vice versa. A reciprocal model showed best fit for the data.

Hakanen and colleagues (2008) have argued that engaged employees are “more capable of mobilizing and actively developing new job resources” (p. 88), and Christian and colleagues (2011) claim “as workers become more willing to engage in behaviors that facilitate the social context, they are also creating an environment conducive to further engagement of their peers (i.e., increasing social support)”. The existing research and theoretical rationale informs the second hypothesis of this thesis:

Hypothesis 2: monthly work engagement has a positive effect on monthly employer inducements.

Lagged Reciprocal Effects

While research finds growing support for a reciprocal relationship of work engagement and job resources, most studies rely on concurrent measurements (Christian et al., 2011). In other words, most studies can only conclude that job resources and work engagement co-varies within individuals, so that increases in one is associated with increases in the other. While experimental field studies would be optimal for investigating causality, such studies are difficult to do in an organizational context. Christian and colleagues (2011) have therefore called for future studies to investigate temporal separation between job resources and work engagement, by including lagged predictors. If earlier scores on the predictor can explain subsequent scores on the dependent variable, this supports a causal relationship. So, do employer inducements precede work engagement, or do work engagement precede employer inducements?
inducements? Existing research suggest both.

In their three-year, two-wave study, Hakanen and colleagues (2008) used lagged predictors and found that job resources and work engagement both influenced each other over time. Furthermore, the effect of work engagement on job resources was just as strong as the effect of job resources on work engagement.

Weigl and colleagues (2010) found a positive effect of job control and work relationships on work engagement one year later, and further, work engagement was a significant predictor of job control and work relationships one and a half years after. Both directions of the association were equally strong.

In a three-week, two-wave study with lagged predictors, Llorens and colleagues (2007) found a reciprocal relationship between task resources and work engagement, mediated by efficacy beliefs. Greater resources predicted greater efficacy beliefs, which in turn increased work engagement. Importantly, greater work engagement was also significant in predicting task resources, through efficacy beliefs.

These studies illustrate the seemingly lasting effects of job resources on work engagement, and of work engagement on job resources. Some have suggested these lagged reciprocal effects are mediated by efficacy beliefs (Llorens et al., 2007), job crafting (Bakker, Tims, & Derks, 2012), personal initiative (Hakanen et al., 2008), or optimism (Xanthopoulou et al., 2009b). Following these results, the third set of hypotheses in this thesis is:

Hypothesis 3a: Lagged (earlier) months of employer inducements have a positive effect on subsequent months of work engagement.

Hypothesis 3b: Lagged (earlier) months of work engagement have a positive effect on subsequent months of employer inducements.

If both employer inducements have lasting effects on work engagement, and work engagement has lasting effects on employer inducements, this suggests the existence of gain and loss spirals.

Gain and Loss Spirals

The Conservation of Resources (CoR) model (Hobfoll, 1989) and Broaden-and-Build (B&B) theory (Fredrickson, 1998, 2004) were not originally developed explicitly with job resources and work engagement in mind, but the gain and loss
spirals involved in both theories are often argued to apply for this relationship as well (e.g., Llorens et al., 2007; Salanova et al., 2010). According to the CoR model, people are motivated to protect their current resources and gain new resources (Hobfoll, 1989). Further, “those with greater resources are less vulnerable to resource loss and more capable of orchestrating resource gain. Conversely, those with fewer resources are more vulnerable to resource loss and less capable of resource gain” (Hobfoll, 2011, p. 117). With the reciprocal relationship between job resources and work engagement in mind, those with more resources, gaining even more resources, have been proposed to increase their levels of work engagement, which in turn may play a part in “orchestrating” further resource gains, effectively creating upward gain spirals. On the other hand, having low levels of resources, being more vulnerable to further resource loss, has been proposed to decrease levels of work engagement, which in turn may cause loss spirals (Salanova et al., 2010).

This process is in accordance with predictions made by the B&B theory (Fredrickson, 1998, 2004). Fredrickson suggests that (2004) positive emotions broaden peoples’ momentary thought–action repertoires and build enduring resources. Feeling good creates an urge to play, explore, socialize, experiment and try new things. This behavior fosters enduring resources like creativity, knowledge, and a greater and more supportive social network. In organizational psychology many researchers have suggested that the same process may be involved in the relationship between work engagement and job resources (e.g., Hakanen et al., 2008; Llorens et al., 2007; Salanova et al., 2010). Work engagement could create similar urges to explore, socialize and be creative in the work context. In response, the employee may be provided more job resources in terms of social support, good feedback from supervisors, or more challenging tasks. While a reciprocal relationship is necessary for gain and loss spirals to exist, it is not sufficient. Salanova argues:

For a gain spiral to exist, two conditions should be met: (1) normal and reversed causation (this is also called a reciprocal relationship); i.e., A → B and B → A; and (2) an increase in levels over time; i.e., AT2 > AT1 and BT2 > BT1.

(Salanova et al., 2010, p. 119)

For loss spirals the same idea should hold; there needs to be (1) a reciprocal relationship, and (2) a decrease in levels over time. While research has showed
growing support for reciprocal relationship between job resources and work engagement very few studies have examined the second condition of changes in levels over time (Salanova et al., 2010). A few studies have reported mean-level changes in their samples (Luyckx, Duriez, Klimstra, & De Witte, 2010; Weigl et al., 2010). For example, in a sample of young, employed adults, Luyckx and colleagues (2010) found that vigor tended to decrease over six months time before staying somewhat stable the next six months. However, dedication and absorption did not show significant change over time for either time-periods. Weigl and colleagues (2010) found that mean levels of work engagement first were stable over a one-year period (T1-T2) before declining slightly, but significantly the next one and a half year (T2-T3). However, these studies only reported mean level changes for the whole sample. The gain and loss spiral hypotheses refer to those with higher and lower levels of work engagement and job resources – not all employees. To investigate the presence of spirals, one needs to differentiate the development trajectories of those with higher and lower levels of work engagement and job resources. No studies, to my knowledge, have examined this process among work engagement and job resources. The present multi-wave study opens up a rare opportunity to do this.

Research question 3: How does the reciprocal relationship between job resources and work engagement develop among those with high and low levels of job resources and work engagement?

**The Present Study**

This longitudinal study explores monthly development in work engagement and employer inducements (consisting of four sub-categories of job resources) over four months. Multilevel analysis was used to disentangle between-person (BP) and within-person (WP) variation in both constructs (Hoffman, 2015). This made it possible to examine not only if individual differences in (BP) employer inducements was associated with individual differences in work engagement, but also if increases in monthly (WP) employer inducements was associated with increases in monthly work engagement. We all have off-days and -weeks where we have very little energy and motivation, and other days and weeks when we feel extra excited and completely absorbed in our work (Bakker & Bal, 2010; Xanthopoulou et al., 2009b). Does this also apply on a monthly level?
To examine reciprocal effects, employer inducements and work engagement were examined as predictor or outcome variable in two separate analyses. Further, by using lagged predictors, this study explored the temporal ordering of the reciprocal effects. The presence of such lagged effects would support the existence of a causal, and not mere correlational, relationship (Christian et al., 2011). Finally, the multi-wave data allowed a rare opportunity to examine the proposed developmental patterns of gain and loss spirals between job resources and work engagement. Are individual differences in BP predictors (i.e., employer inducements and work engagement) related to systematic change over time in the outcome variable?

Method

Procedure

Data for this study was collected over a period of six months, by two researchers and three Master students from the University of Oslo (UiO), connected to the greater project “Dynamics and Development of Employee Behavior, Attitudes and Well-Being: A Longitudinal Analysis”. Participants were recruited through the UiO webpages, Facebook ads, as well as the researchers and Master students personal networks. This recruitment strategy was chosen in order to attain a varied sample with participants from a range of occupations, within different psychosocial work environments. Participants were required to be working in Norway, speak Norwegian, and have at least a 50 % employment contract. Further, managers were only eligible for the study if they themselves reported to a manager.

Potential participants interested in joining the study were contacted by e-mail with further information about the practicalities and ethical issues regarding the study. This included the length of the study, and the researchers treating the data with confidentiality. Those who still wanted to participate received monthly online questionnaires.

In the first preceding survey (PS) demographic and time-invariant variables were collected. In all following questionnaires, time-varying variables (e.g., work engagement and employer inducements) were measured. Participants created their own, unique identification codes that were used to link subsequent responses. After distributing monthly questionnaire, the researchers out reminders to respond after 14 days. Participants who did not respond to some questionnaire(s) were still encouraged to respond to later questionnaires.
The recruitment of new participants continued over a six-month period, so that new groups of participants were included every month. In this study, data from the first three groups are included. Because the groups followed different scheduling, only two groups provided usable responses on wave 4. Further, there were some monthly discrepancies in when surveys were sent out, so one small group of participants (N=19) had two month gap between wave 3 and 4.

Sample

In total, 176 people volunteered, and were eligible, to participate in the study. However, non-responses, attrition, and the inclusion of lagged predictors reduced the number of usable responses. In order for lagged predictors to be included, responses had to be completed at both one wave (T) and its preceding wave (T-1). This led to a final sample of 125 participants with a total of 342 completed waves (M=2.74 waves). In total, 41 participants (32.8 %) completed all four waves, 34 (27.2 %) completed three waves, 27 (21.6 %) completed two waves, and 23 participants (18.4%) completed only one wave. Table 1 and 2 provide an overview response rate and participation.

Table 1

Total Usable Responses by Wave

<table>
<thead>
<tr>
<th>Time</th>
<th>Total administered surveys</th>
<th>Total usable responses</th>
<th>Total response rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wave 1</td>
<td>176</td>
<td>103</td>
<td>59 %</td>
</tr>
<tr>
<td>Wave 2</td>
<td>176</td>
<td>96</td>
<td>55 %</td>
</tr>
<tr>
<td>Wave 3</td>
<td>176</td>
<td>85</td>
<td>48 %</td>
</tr>
<tr>
<td>Wave 4</td>
<td>113</td>
<td>58</td>
<td>51 %</td>
</tr>
</tbody>
</table>

Table 2

Participation in Number of Waves (N=125)

<table>
<thead>
<tr>
<th>Number of waves</th>
<th>Number of participants</th>
<th>Percentage of total participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 wave</td>
<td>23</td>
<td>18 %</td>
</tr>
<tr>
<td>2 waves</td>
<td>27</td>
<td>22 %</td>
</tr>
<tr>
<td>3 waves</td>
<td>34</td>
<td>27 %</td>
</tr>
<tr>
<td>4 waves</td>
<td>41</td>
<td>33 %</td>
</tr>
</tbody>
</table>
In accordance with the recruitment strategy, participants included in the study varied in a range of demographic variables. In the final sample, 85% were full-time employees and only seven participants (6.5%) worked less than 80%. Age ranged from 22 to 65 (M=43, SD=10) years. Tenure ranged from 0 to 40 years (M=8.3, SD=8.3), and 22% was working in a management position, while a total of 91% had a higher education (college or university). In total, 97 participants (79%) were female, and 28 were men. Lastly, 75% worked in public sector.

Measures

Work Engagement:
The 9-item Utrecht Work Engagement Scale (UWES-9; Schaufeli et al., 2006) was used to measure work engagement on a 5-point Likert scale. In this questionnaire, participants were asked to what degree they had experienced the three components of work engagement in the last month. Vigor, dedication and absorption were measured with three items each and sample items include: (1) The last month I have felt bursting with energy at work (vigor), (2) The last month I have been enthusiastic about my job (dedication), and (3) The last month I have been immersed in my work (absorption). Responses were aggregated into an overall work engagement measure. With all items included the Cronbach’s alpha for the work engagement scale ranged from .92 to .97.

Employer Inducements:
This 13-item measure has been developed and validated by Raeder and colleagues (2009). It has been translated into Norwegian by two of the researchers and has been tested in earlier studies in Norwegian contexts (e.g., Neraasen, 2016). The phrasing of questions were modified to account for the monthly measurement, and participants responded on a 5-point Likert scale to what degree they had received each of 13 resources from their employer in the last month. While considered aggregated in this study, the 13 employer inducements can be grouped into 4 sub-categories of resources; (1) security and retention (sample item: the last month my employer has given me a positive organizational culture), (2) support for career and skill development (sample item: the last month my employer has given me opportunities to use my skills), (3) appreciation for performance (sample item: the last month my employer has given me recognition for good performance), and (4) information and
participation (sample item: *the last month my employer has given me the opportunity to participate in decision making*). Cronbach’s alpha for the full employer inducements scale ranged from .93-.95 for all waves.

**Control Variables**

The control variables for this study include age and gender. Age was measured in years at the first wave of the study. Gender was coded 0 for female and 1 for male.

**Data Analysis**

All data was analyzed in SPSS version 24. Means, standard deviations, frequencies, and reliability were calculated for each variable. Two participants did not respond to the question of age. To keep their data on monthly work engagement and employer inducements in the analysis, their missing values of age were replaced with the respective sample mean (42.67 years).

In accordance with Singer and Willet (2003), exploration of the data through growth plots and visual representations should be done before delving into statistical analysis. To give a better understanding of the data for the readers, I also include some of these visual aids in a preliminary results section.

Next, our four-wave longitudinal data can be viewed as multi-level data, with monthly waves nested within individuals. This leads to a two-level model, with monthly waves at level 1 (N = 343 study-occasions), and individuals at level 2 (N = 125 participants). Multilevel analysis was performed in accordance with Hoffman (2015). As there were two outcome variables (i.e., work engagement and employer inducements) the multilevel investigation was done in two separate analyses. The steps taken towards the final multilevel models are described next.

First, a null model was constructed, whereby no predictors were included. The resulting unexplained within- and between-subject variance was used to calculate the Intra Class Correlation coefficient (ICC). The ICC is an estimate of the proportion of variance attributable to between-person differences.

In the next step (Model 1), monthly wave was entered as both fixed and random effect to examine changes in work engagement over time. The fixed effect can be interpreted as the effect across all participants, while the random effect concerns individual differences in the effect. For example, it may be that work engagement is stable over time across all participants (non-significant fixed effect of
wave), but that participants vary significantly in their development over time (random effect of wave). Monthly wave was coded with a meaningful value for zero (first wave=wave 0) to give an interpretable intercept. The intercept can, in this model, be interpreted as the estimated dependent variable at wave 0.

In Model 2, control variables (i.e., age and gender) were included as predictors, as well as their interaction with wave. Age was centered on the grand mean (42.67 years) and gender was coded 0 for female, 1 for male. The intercept could then be interpreted as the estimated dependent variable at wave 0 for 43-year-old women.

In the next step (Model 3), the within-person (WP) component of the predictor and its interaction with time were included. Following the rationale of Hoffman (2015), each individual’s score on the predictor was centered on that individual’s person mean score. This procedure, called person mean centering, is used to remove all between-person variance from the predictor. In the WP predictor, every individual participant has a mean score of zero, and only fluctuations from his or her own person mean contribute to variation. This model then represents the added explanatory value of only the WP part of the predictor.

In the next step, a supplementary model was added to those recommended by Hoffman (2015). Specifically, in Model 4, the WP predictor and its interaction with time were removed, while the BP predictor and its interaction with time were included. This was done to clarify and contrast the potentially different explanatory value of WP and BP components of the predictor. The BP predictor, consisting of only BP variance in the predictor, is represented by the person-mean on the predictor. This person-mean is invariant across time for each individual, and will only contribute to explain between-person variance in the dependent variable. In accordance with Hoffman (2015), the BP predictor was centered around the grand mean to give a meaningful value of the intercept.

In Model 5, both the BP and WP predictor, and their interaction with time were included. As both BP and WP components are likely to have explanatory value, this model is hypothesized to fit the data better than every earlier model.

In the lagged model (Model 6), the WP predictor is removed from the model, and the lagged WP predictor and its interaction with time is included. The lagged WP predictor is just the WP predictor on the previous wave. As only within-person components of the predictor changes from month to month, this is the only
component that needs to be lagged. The effect of this WP predictor is interpretable as
the effect of previous months changes in the predictor on the current month dependent
variable. If significant, a further model including both lagged and current WP
predictors will be estimated to examine if changes in the predictor on previous months
has a significant effect above and beyond changes in the predictor on current months.

Finally, in Model 7, non-significant predictors were removed, and only
significant predictors kept. While explained variance may actually be reduced in this
model, reducing the complexity of the model makes it more parsimonious and is
hypothesized to result in the best fitting model.

For each model, explained variance was calculated as the squared correlation
between predicted values and actual values on the dependent variable. This approach
gives “a true R2 given that it is based on the total original outcome variance”
(Hoffman, 2015, p. 293). Models were compared according to the Akaike information
criterion (AIC) wherein a lower score indicates a better fit (Hoffman, 2015).

**Results**

*Descriptives*

Table 3 shows means, standard deviations, internal reliability and intercorrelations for
all study variables. Internal reliabilities (i.e. Cronbach’s alpha) ranged from .93 to .97
for work engagement, and from .93 to .95 for employer inducements. Further,
stability coefficients (test-retest correlations) ranged from .56 to .80 for work
engagement, and from .69 to .84 for employer inducements. Correlation between
work engagement and employer inducements measured at the same wave ranged from
.54 to .79.

*Preliminary Exploration of the Work Engagement Data*

Non-parametric trajectories in work engagement were summarized into one
growth plot to illustrate differences in trajectories between subjects. The resulting
graph is shown below in Figure 2.

In the next step, parametric analysis of trajectories was done in order to
summarize individual growth regressions. Here ordinary least squares (OLS)
regression is used as a common parametric model for each subject. The resulting
graph is shown below in Figure 3.
Table 3  
Means, Standard Deviations, and Intercorrelations for Study Variables

<table>
<thead>
<tr>
<th>Variables</th>
<th>M</th>
<th>SD</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>42.67</td>
<td>10.09</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender (0=F)</td>
<td>0.20</td>
<td>0.40</td>
<td>-.09</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Work Engagement</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time 0</td>
<td>3.33</td>
<td>0.99</td>
<td>.16</td>
<td>-.14</td>
<td>.95</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time 1</td>
<td>3.26</td>
<td>0.86</td>
<td>.26**</td>
<td>-.03</td>
<td>.72**</td>
<td>.93</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time 2</td>
<td>3.35</td>
<td>1.00</td>
<td>.08</td>
<td>-.11</td>
<td>.66**</td>
<td>.66**</td>
<td>.96</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time 3</td>
<td>3.24</td>
<td>0.95</td>
<td>.11</td>
<td>-.16</td>
<td>.56**</td>
<td>.60**</td>
<td>.72**</td>
<td>.95</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time 4</td>
<td>3.17</td>
<td>1.12</td>
<td>-.05</td>
<td>-.14</td>
<td>.67**</td>
<td>.63**</td>
<td>.78**</td>
<td>.80**</td>
<td>.97</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Employer Inducements</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time 0</td>
<td>3.10</td>
<td>0.93</td>
<td>.10</td>
<td>.02</td>
<td>.56**</td>
<td>.46**</td>
<td>.44**</td>
<td>.38**</td>
<td>.56**</td>
<td>.94</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time 1</td>
<td>3.10</td>
<td>0.85</td>
<td>.08</td>
<td>.07</td>
<td>.47**</td>
<td>.54**</td>
<td>.46**</td>
<td>.35**</td>
<td>.50**</td>
<td>.84**</td>
<td>.94</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time 2</td>
<td>3.11</td>
<td>0.85</td>
<td>.00</td>
<td>-.09</td>
<td>.56**</td>
<td>.50**</td>
<td>.66*</td>
<td>.51**</td>
<td>.65**</td>
<td>.78**</td>
<td>.81**</td>
<td>.93</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time 3</td>
<td>2.95</td>
<td>0.83</td>
<td>.01</td>
<td>-.02</td>
<td>.44**</td>
<td>.43**</td>
<td>.55**</td>
<td>.67**</td>
<td>.72**</td>
<td>.69**</td>
<td>.70**</td>
<td>.79**</td>
<td>.93</td>
<td></td>
</tr>
<tr>
<td>Time 4</td>
<td>3.07</td>
<td>0.97</td>
<td>.01</td>
<td>-.08</td>
<td>.62**</td>
<td>.52**</td>
<td>.71**</td>
<td>.59**</td>
<td>.79**</td>
<td>.73**</td>
<td>.73**</td>
<td>.82**</td>
<td>.83**</td>
<td>.95</td>
</tr>
</tbody>
</table>

*Note:* Pairwise Ns range from 58 to 117. Cronbach’s alpha values are in italics on the diagonal.  
*Time 0 values were only used as lagged predictors in this study.
Figure 2: Non-parametric analysis of individual growth trajectories for work engagement.

Figure 3: Parametric analysis of individual trajectories with mean development highlighted in red.

In sum, exploration of the work engagement data shows that individuals differ in their development trajectories. Some are stable, some fluctuate, some are decreasing, and some are increasing in their work engagement over time. The parametric analysis showed that the average regression line was somewhat flat.
**Preliminary Exploration of the Employer Inducements Data**

As with work engagement, descriptive exploratory analysis of the employer inducements data was performed before fitting statistical models. The resulting graphs are shown below in Figure 4 and 5.

**Figure 4**: Non-parametric analysis of individual growth trajectories for employer inducements.

**Figure 5**: Parametric analysis of individual trajectories in employer inducements, with mean development highlighted in red.
As with work engagement, some score very low, others score very high, while the greater proportion score somewhat in the middle on their experience of monthly employer inducements. Compared to the same plot of work engagement, visual inspection indicates that employer inducements scores are somewhat more concentrated than work engagement scores.

The parametric analyses of trajectories shows that individual differences in development is varied, with some subjects showing increases in employer inducements over time, while others decrease, and yet others stay the same. The average regression line indicates a small decrease in monthly employer inducements in the sample over time.

**Multilevel Analysis Predicting Work Engagement**

A series of multilevel models predicting work engagement were tested and compared. These multilevel models are shown in Table 3, and described in detail below. The results from all models give insight to the first research question of this thesis, regarding the development of work engagement.

Without any predictors included in the Null Model, the intercept of work engagement was estimated to 3.29. Here, this value can be interpreted as the mean of work engagement over all subjects over all time-points. The Intraclass Correlation was .69, indicating that 69% of total variance in monthly work engagement can be attributed to BP factors and 31% to WP factors.

Model 1, including wave as fixed and random effects, had a slightly better fit than the Null Model, measured by drop in AIC values. However, the fixed effect of wave was close to zero and non-significant. In other words, when considering the mean development across all subjects, work engagement did not change significantly over time. Further, the random effect of wave was also close to zero and non-significant, indicating that the effect of wave does not vary significantly between individuals.

In Model 2, age had a small, but significant effect on work engagement (.02), while gender was non-significant. This model had a better fit than both previous models and explained 7% of total variance in work engagement.

To summarize, the three first models showed that around a third of total variance in monthly work engagement is attributable to within-person changes or fluctuations. However, the average development in work engagement was stable.
The Effect of Monthly Employer Inducements

Hypothesis 1 asserted that monthly employer inducements has a positive effect on monthly work engagement. As employer inducements was divided in WP and BP components, results from both Models 3 and 4 are related to this hypothesis.

Model 3 showed that WP employer inducements had a considerable and significant effect on work engagement (Est. = .64), while its interaction with time was non-significant. In other words, experiencing increases in monthly employer inducements was associated with increases in monthly work engagement. The findings are in line with Hypothesis 1. The model explained 14% of total variance in work engagement, 7% more than Model 2.

Model 4, including the BP component of employer inducements and its interaction with time improved the model fit from all earlier models and could explain 40 percent of total variation in work engagement. BP employer inducements were a highly significant predictor (Est. = .55), fully supporting Hypothesis 1.

To summarize, both WP and BP components of employer inducements had a positive effect on monthly work engagement.

The Effect of Employer Inducements on Development

Research question 3 concerned the existence of gain and loss spirals. Model 3 gives insight into the relationship between BP employer inducements and the development of work engagement. This model showed that BP inducements interacted significantly with wave (Est. = .10) in predicting monthly work engagement. In interpreting the theoretical meaning of interaction effects, figures are often very helpful. In this study, Modgraph (Jose, 2013) was used to create an illustration of three categories of BP employer inducements in interaction with wave. The Modgraph application (Jose, 2013) separates wave in three categories as well, but the figure is still useful for interpretation of the interaction effect.

Figure 6 shows that high BP employer inducements was linked with increasing levels of work engagement over time. Having medium levels of BP employer inducements was linked with close to zero change in work engagement over time. Finally, low levels of BP employer inducements was linked with decreasing levels of work engagement over time. These patterns of development are in line with the theory of gain and loss spirals of interest in Research question 3.
Table 3: Multilevel Analyses Predicting Work Engagement

<table>
<thead>
<tr>
<th>Fixed effects</th>
<th>Null model</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
<th>Model 5</th>
<th>Model 6</th>
<th>Model 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>3.29 (.08)**</td>
<td>3.30 (.08)**</td>
<td>3.22 (.09)**</td>
<td>3.19 (.09)**</td>
<td>3.28 (.08)**</td>
<td>3.26 (.08)**</td>
<td>3.28 (.07)**</td>
<td>3.25 (.06)**</td>
</tr>
<tr>
<td>Wave</td>
<td>-.01 (.03)</td>
<td>.00 (.03)</td>
<td>.02 (.03)</td>
<td>.01 (.03)</td>
<td>.03 (.03)</td>
<td>.01 (.03)</td>
<td>.01 (.03)</td>
<td>.01 (.03)</td>
</tr>
<tr>
<td>Age</td>
<td>.02 (.01)**</td>
<td>.02 (.01)**</td>
<td>.01 (.00)**</td>
<td>.01 (.00)*</td>
<td>.01 (.00)**</td>
<td>.01 (.00)**</td>
<td>.01 (.00)*</td>
<td>.01 (.00)*</td>
</tr>
<tr>
<td>Wave*Age</td>
<td>-.00 (.00)</td>
<td>-.00 (.00)</td>
<td>-.00 (.00)</td>
<td>-.00 (.00)</td>
<td>-.00 (.00)</td>
<td>-.00 (.00)</td>
<td>-.00 (.00)</td>
<td>-.00 (.00)</td>
</tr>
<tr>
<td>Gender</td>
<td>-.06 (.16)</td>
<td>-.07 (.17)</td>
<td>-.13 (.14)</td>
<td>-.15 (.14)</td>
<td>-.13 (.14)</td>
<td>-.15 (.14)</td>
<td>-.13 (.14)</td>
<td>-.13 (.14)</td>
</tr>
<tr>
<td>Wave*Gender</td>
<td>-.03 (.07)</td>
<td>-.05 (.06)</td>
<td>-.02 (.06)</td>
<td>-.04 (.05)</td>
<td>-.02 (.06)</td>
<td>-.04 (.05)</td>
<td>-.02 (.06)</td>
<td>-.04 (.05)</td>
</tr>
<tr>
<td>WP EI</td>
<td></td>
<td>.64 (.14)**</td>
<td>.68 (.14)**</td>
<td>.67 (.08)**</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wave*WP EI</td>
<td></td>
<td>.00 (.08)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BP EI</td>
<td></td>
<td>.55 (.08)**</td>
<td>.60 (.08)**</td>
<td>.56 (.08)**</td>
<td>.60 (.08)**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wave*BP EI</td>
<td></td>
<td>.10 (.03)**</td>
<td>.08 (.03)*</td>
<td>.10 (.03)**</td>
<td>.07 (.03)*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lagged WP EI</td>
<td></td>
<td></td>
<td>-.12 (.14)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wave*Lagged WP WI</td>
<td></td>
<td>.03 (.08)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Random Effects**

<table>
<thead>
<tr>
<th>WP unexplained</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimation</td>
<td>.28 (.03)**</td>
<td>.27 (.03)**</td>
<td>.27 (.03)**</td>
<td>.22 (.03)**</td>
<td>.27 (.03)**</td>
<td>.21 (.02)**</td>
<td>.26 (.03)**</td>
<td>.21 (.02)**</td>
</tr>
</tbody>
</table>

| BP Unexplained |          |          |          |          |          |          |          |          |
| Interception   | .63 (.09)** | .49 (.09)** | .42 (.08)** | .50 (.09)** | .24 (.06)** | .29 (.07)** | .23 (.06)** | .30 (.07)** |
| Intercept, wave| .05 (.03)*  | .05 (.02)*  | .03 (.02)  | .02 (.02)  | -.00 (.02)  | .02 (.02)  | -.00 (.02)  | -.00 (.02)  |
| Wave           | .01 (.01)  | .01 (.01)  | .00 (.01)  | .00 (.01)  | .00 (.01)  | .01 (.01)  | .00 (.01)  | .00 (.01)  |

**AIC**

Null model 782.983
Model 1 779.906
Model 2 771.682
Model 3 723.231
Model 4 711.023
Model 5 653.706
Model 6 714.043
Model 10 647.428

* p<0.05, ** p<0.01
### Table 4: Multilevel Analyses Predicting Employer Inducements

<table>
<thead>
<tr>
<th>Fixed effects</th>
<th>Null model</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
<th>Model 5</th>
<th>Model 6</th>
<th>Model 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>3.09 (.07)**</td>
<td>3.13 (.07)**</td>
<td>3.01 (.08)**</td>
<td>3.02 (.09)**</td>
<td>3.04 (.07)**</td>
<td>3.02 (.07)**</td>
<td>3.02 (.07)**</td>
<td>3.07 (.05)**</td>
</tr>
<tr>
<td>Wave</td>
<td>-.03 (.02)</td>
<td>-.03 (.02)</td>
<td>-.03 (.02)</td>
<td>-.02 (.02)</td>
<td>-.03 (.02)</td>
<td>-.02 (.02)</td>
<td>-.02 (.02)</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>.01 (.00)**</td>
<td>.01 (.00)*</td>
<td>.00 (.00)</td>
<td>.00 (.00)</td>
<td>.01 (.00)</td>
<td>.00 (.00)</td>
<td>.01 (.00)</td>
<td></td>
</tr>
<tr>
<td>Wave*Age</td>
<td>-.00 (.00)</td>
<td>-.00 (.00)</td>
<td>-.00 (.00)</td>
<td>-.00 (.00)</td>
<td>-.00 (.00)</td>
<td>-.00 (.00)</td>
<td>-.00 (.00)</td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>.14 (.15)</td>
<td>.10 (.16)</td>
<td>.22 (.14)</td>
<td>.19 (.14)</td>
<td>.23 (.14)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wave*Gender</td>
<td>.01 (.05)</td>
<td>.02 (.04)</td>
<td>.01 (.04)</td>
<td>.02 (.04)</td>
<td>.01 (.05)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WP WE</td>
<td>.31 (.07)**</td>
<td>.32 (.07)**</td>
<td>.35 (.04)**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wave*WP WE</td>
<td>.02 (.04)</td>
<td>.02 (.04)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BP WE</td>
<td>.50 (.08)**</td>
<td>.54 (.08)**</td>
<td>.49 (.08)**</td>
<td>.56 (.07)**</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wave*BP WE</td>
<td>.08 (.02)**</td>
<td>.06 (.02)*</td>
<td>.09 (.02)**</td>
<td>.05 (.02)*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lagged WP WE</td>
<td>.05 (.08)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wave*Lagged</td>
<td>- .09 (.05)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WP WE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Random effects

<table>
<thead>
<tr>
<th>WP Unexplained</th>
<th>Residual</th>
<th>.15 (.01)**</th>
<th>.13 (.02)**</th>
<th>.13 (.02)**</th>
<th>.10 (.01)**</th>
<th>.13 (.01)**</th>
<th>.10 (.01)**</th>
<th>.12 (.01)**</th>
<th>.10 (.01)**</th>
</tr>
</thead>
<tbody>
<tr>
<td>BP Unexplained</td>
<td>Intercept</td>
<td>.59 (.08)**</td>
<td>.55 (.09)**</td>
<td>.48 (.08)**</td>
<td>.52 (.08)**</td>
<td>.33 (.06)**</td>
<td>.35 (.06)**</td>
<td>.35 (.06)**</td>
<td>.37 (.06)**</td>
</tr>
<tr>
<td></td>
<td>Covariance</td>
<td>.01 (.02)</td>
<td>.02 (.02)</td>
<td>-.00 (.02)</td>
<td>-.01 (.02)</td>
<td>-.02 (.01) m</td>
<td>-.02 (.02)</td>
<td>-.03 (.02)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Wave</td>
<td>.01 (.01)</td>
<td>.01 (.01)</td>
<td>.01 (.01)</td>
<td>.00 (.01)</td>
<td>.00 (.01)</td>
<td>.01 (.01)</td>
<td>.01 (.01)</td>
<td></td>
</tr>
<tr>
<td>AIC</td>
<td>612.199</td>
<td>615.809</td>
<td>609.802</td>
<td>557.051</td>
<td>543.308</td>
<td>485.712</td>
<td>541.524</td>
<td>483.961</td>
<td></td>
</tr>
<tr>
<td>Explained variance</td>
<td>.01 ns</td>
<td>.06</td>
<td>.11</td>
<td>.43</td>
<td>.48</td>
<td>.44</td>
<td>.46</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: WP=Within-Person, BP=Between-Person, EI=Employer Inducements. * p<0.05, ** p<0.01
In Model 5, both BP and WP employer inducements were included as predictors, as well as their interactions with time. As the two components of employer inducements are uncorrelated by definition (Hoffman, 2015), all previous significant effects remained significant. A point increase in WP employer inducements was associated with a .68 increase in monthly work engagement. A point increase in BP employer inducements was associated with a .60 increase in work engagement. BP employer inducements in interaction with time also remained significant (Est. = .08). This model greatly improved fit compared to all previous models. This model could explain 47 percent of total variance in work engagement.

The Lagged Effect of Employer Inducements

Hypothesis 3a asserted that there was a lagged effect of monthly employer inducements on subsequent months of work engagement. This was investigated in Model 6, where lagged WP employer inducements and its interaction with time were
included as predictors. Surprisingly, the fixed effect of lagged WP employer inducements was not statistically significant. Therefore, hypothesis 3a was not supported. Fluctuations or changes in earlier monthly employer inducements did not predict subsequent fluctuations or changes in monthly of work engagement.

**Final Model**

In the final model (Model 7), non-significant effects were removed to represent the most parsimonious model. Only age, WP employer inducements, BP employer inducements and its interaction with time were included as predictors. This model showed better fit than all other models and kept the explanatory power of the most complex model (Model 5), explaining 46 percent of total variation in work engagement.

In conclusion, monthly work engagement entailed both BP and WP variance, and employer inducements had strong and significant effects. Including WP employer inducements as a predictor added 7 percent of explanatory value above and beyond control variables in predicting work engagement. The BP component of employer inducements had the greater explanatory power, adding around 33 percent explained variance compared to the model including only control variables. Surprisingly, lagged WP employer inducements did not have a significant effect on monthly work engagement. Interestingly, BP employer inducements had a significant interaction with time, showing some support for the theory of gain and loss spirals.

**Multilevel Analyses Predicting Employer Inducements**

In order to explore the potential reverse effect of work engagement on employer inducements, multilevel models were run with employer inducements as the dependent variable. Results are shown in Table 4. All models are relevant in answering Research question 2 regarding the development of employer inducements.

The Null Model showed that 80 percent of the variation in employer inducements over time could be attributed to BP factors (ICC = .80), and 20 percent to WP factors. Compared to work engagement, total variation in monthly employer inducements could somewhat less be attributed to within-person variation.

Model 1 showed that wave was not a significant fixed or random effect in predicting employer inducements. Adding control variables in Model 2 showed a
slight improved fit compared to previous models, with age being the only significant predictor (Est. = .01).

_The Effect of Monthly Work Engagement_

Hypothesis 2 asserted that monthly work engagement has a positive effect on monthly employer inducements. As work engagement was divided in WP and BP components, results from both Models 3 and 4 are related to this hypothesis.

In Model 3, WP work engagement and its interaction with wave were included as predictors. This model showed greatly improved fit and could explain 11 percent of total variance in employer inducements, 5 percent more than the previous model. The fixed effect of WP work engagement (Est. = .31) was highly significant, in line with Hypothesis 2. Changes or fluctuations in monthly work engagement were positively related to changes or fluctuations in monthly employer inducements.

Model 4 showed improved fit and explained a full 43 percent of total variation in employer inducements. The fixed effect of BP work engagement (Est. = .50) was highly significant, in line Hypothesis 2. In other words, the person-mean level of work engagement was positively related to the person-mean level of employer inducements.

_The Effect of Work Engagement on Development_

Model 3 gives further insight into the relationship between BP work engagement and the development of employer inducements. This relates to Research question 3 concerning the existence of gain and loss spirals.

In Model 3, the interaction between BP work engagement and wave was significant (Est. = .08). In interpreting this effect, modgraph (Jose, 2013) was used to create Figure 6. This illustrates that low levels of BP work engagement was linked with a decrease in employer inducements over time. Medium levels of BP work engagement was linked with a near zero change in employer inducements over time. High levels of BP work engagement was linked with an increase in employer inducements over time. This is in line with the theory of gain and loss spirals.
In Model 5, both BP and WP work engagement were included as predictors, as well as their interactions with time. This model greatly improved fit compared to earlier models, and could explain 48 percent of total variance in employer inducements. The fixed effect of WP work engagement (Est. = .32), BP work engagement (Est. = .54), as well as BP work engagement in interaction with time (Est. = .06) all remained significant.

The Lagged Effect of Work Engagement

Hypothesis 3b asserted that there was a lagged effect of monthly work engagement on subsequent months of employer inducements. This was investigated in Model 6, where lagged WP employer inducements and its interaction with time were included as predictors. The fixed effect of lagged WP work engagement was not significant, and so Hypothesis 3b was not supported. In other words, earlier months of changes or fluctuations in work engagement did not relate to change or fluctuations in

Figure 6
A representation of the interaction effect between BP work engagement and wave on employer inducements.
subsequent months of employer inducements.

**Final Model**

In the final model (Model 7), non-significant effects were removed. Only WP work engagement, BP work engagement, and BP work engagement in interaction with time remained in the model. This more parsimonious model showed better fit than all previous models, and explained 46 percent of total variation in work engagement.

In conclusion, monthly employer inducements entail both BP (80%) and WP (20%) variance, and both WP and BP work engagement are strong and significant predictors of employer inducements. The BP component of work engagement have the greater explanatory power, adding around 37 percent of explained variance compared to the model only including control variables. As was the case when predicting work engagement, lagged effects were non-significant in predicting employer inducements. Finally, there was support for the theory of gain and loss spirals as BP work engagement had a significant interaction with time. Figure 6 showed that person mean levels of work engagement had an effect on the development of employer inducements over time.

**Discussion**

The first aim of this study was to explore the development of work engagement and employer inducements across monthly measurements. The results showed that there was significant within-person variation in both constructs over monthly waves. This extends previous daily and weekly studies, showing that significant within-person variation is present at the monthly level. However, there was no common trend in development across participants as the fixed effect of time was not significant.

The second aim of the study was to examine the inter- and intra-individual reciprocal relationship between employer inducements and work engagement. In line with previous research on job resources and work engagement, both between- and within-person components of predictors had strong and significant effects for both dependent variables. At the between-person level, person-mean levels of monthly employer inducements and work engagement were good predictors of monthly work engagement and employer inducements, respectively. At the within-person level,
monthly deviations from one's person-mean in employer inducements and work engagement were good predictors of monthly work engagement and employer inducements, respectively.

The third aim of this thesis was to examine lagged reciprocal effects between employer inducements and work engagement. While still being correlational in nature, lagged effects would support the notion that the constructs are causally related. Interestingly, none of the lagged effects were significant. In other words, earlier months of within-person employer inducements and work engagement were not related to subsequent months of work engagement and employer inducements, respectively.

The final aim of this study was to explore the presence of gain and loss spirals whereby between-person differences in predictors interact with time to predict development in dependent variables. Results showed that a higher person-mean level of employer inducements was linked with a positive, increasing development in work engagement. Having a lower mean level of employer inducements was related to a negative, decreasing development in work engagement. The reverse effects, with employer inducements as the dependent variable, were also significant. However, this interaction effect was small in both directions, adding less than a percent of explained variance.

**Contributions**

This study answers the call for more multi-wave, person-oriented research on work engagement (Mäkikangas et al., 2016) and provides important insight into its dynamic longitudinal relationship with job resources. While earlier research have shown that job resources and work engagement are reciprocally related (e.g., Bakker & Bal, 2010; Llorens et al., 2007), this is the first study able to demonstrate the specific developmental patterns of gain and loss spirals predicted by the Conservation of Resources (Hobfoll, 1989) and Broaden-and-Build (Fredrickson, 2004) theories. As such, this is also the first multi-wave longitudinal study able to properly examine, and subsequently refute, some contradictory predictions made by the dynamic equilibrium model (Headey & Wearing, 1989). To be clear, the results refute the proposition that all employees have stable set-points for work engagement and only show temporary fluctuations from this mean level. Instead, employees in this study showed systematically different developmental trajectories in work engagement and
employer inducements predicted by their person-mean levels of employer inducements and work engagement, respectively.

On a more general level, the findings contribute to our limited knowledge about the development of work engagement and job resources, both separately and in relation to each other. The findings extend earlier daily and weekly studies by showing that there is considerable within-person variation in work engagement also on a monthly basis. Validating earlier research, findings supported a reciprocal relationship on both the between- and within-person level. However, and contrary to earlier research (e.g., Llorens et al., 2007), lagged variables were not significant predictors in the reciprocal relationship between work engagement and job resources.

**The Development of Work Engagement**

While no systematic changes in work engagement were found across all participants as a whole, the ICC showed that 31% of total variance was due to within-person variation over time. The explorative analyses also showed that developmental trajectories varied widely between participants. Some decreased their levels of work engagement over time, others increase, some stayed somewhat stable, and yet others fluctuated. While previous studies have found within-person variation in work engagement on a daily and weekly basis, this is the first study demonstrating it with monthly measurements. Interestingly, daily and weekly studies have found somewhat higher proportions of within-person variation than in this study (Bakker & Bal, 2010; Kühnel, Sonnentag, & Bledow, 2012; Xanthopoulou et al., 2008), suggesting that work engagement increases in stability when measured over longer time-periods. In line with this notion, in a three wave, seven year study, Seppälä and colleagues (2015) found greater degree of stability in work engagement in comparison with this study, with 69-77% of the variance being attributed to a stability component.

Why does work engagement seem to increase in stability over longer time-lags, from days, to weeks, to months, to years? One reason may be that, in accordance with the dynamic equilibrium model, fluctuations from a persons mean work engagement are temporary before returning to those mean levels. As such, an individual may experience some days or even weeks with uncharacteristically high or low levels of work engagement, but regression to the mean makes it less likely to experience similar uncharacteristic levels of work engagement at the monthly or yearly level.
Another reason may be that daily, weekly, monthly and yearly measures of work engagement actually measure different things. It has been argued, for example, that daily measures of work engagement rely less on retrospective recall (Bakker, Schaufeli, Leiter, & Taris, 2008) since questions relate to the participants perceptions and feelings the same day. For monthly measurements, participants may not accurately remember (or even try to remember) their perceptions and feelings of engagement the last month. They may instead give a ballpark estimate, perhaps based upon a more stable perception of their work engagement in general.

*The Development of Employer Inducements*

As with work engagement, this study found no systematic change in employer inducements across all participants as a whole. Still, 20 percent of total variance in employer inducements could be attributed to within-person variance, and explorative descriptive analyses showed a variety of developmental trajectories among the participants. These findings extend previous daily and weekly studies, showing that employer inducements show within-person variation over monthly waves as well.

Diary studies have found within-person variation to account for 32-59 % of total variation in job resources (Xanthopoulou et al., 2008). The proportion of within-person variation was less for employer inducements in this study (20 %) suggesting that, as with work engagement, job resources increase in stability over longer time-lags. However, in their three wave, seven year study, Seppälä and colleagues (2015) actually found less degree of stability in job resources in comparison with this study, with only 46-49 % of total variance being attributed to a stability component.

*Reciprocal Effects*

This study found strong and significant reciprocal effects between employer inducements and work engagement. Both within- and between-person components had significant reciprocal effects. Specifically, (1) person-mean levels of work engagement (Est. = .60), as well as monthly deviations from this person-mean (Est. = .67), were significant predictors of monthly employer inducements, and (2) person-mean levels of employer inducements (Est. = .56), as well as monthly deviations from this person-mean (Est. = .35), were significant predictors of monthly work engagement. This is in line with growing research consistently finding a reciprocal
relationship between job resources and work engagement (Bakker & Bal, 2010; Hakanen et al., 2008; Xanthopoulou et al., 2009a, 2009b).

The explained variance for the different models showed that between-person predictors entailed greater explanatory value. Specifically, in predicting work engagement, the model with between-person employer inducements (Model 4) explained an additional 33% variance compared to the model only including control variables (Model 2), while within-person employer inducements (Model 3) only explained an additional 7%. In predicting employer inducements, between-person work engagement (Model 4) added an additional 37% to the explained variance, while within-person engagement (Model 3) only added 5%. These results suggest that while within-person changes have an effect on dependent variables, the real big differences lie between people.

**Lagged Effects**

Contrary to Hypothesis 3a and 3b, no lagged effects were found significant in this study. Earlier research has found lagged reciprocal effects in the relationship between job resources and work engagement (Hakanen et al., 2008; Reis, Hoppe, & Schröder, 2015; Xanthopoulou et al., 2009a, 2009b). However, some studies have not separated between- and within-person components of the predictors (Bakker & Bal, 2010). As such, significant lagged effects may have been caused by the between-person component of the predictors. Out of curiosity, I added a new multilevel model where I did not separate within- and between-components of predictors. In this case, lagged effects of monthly employer inducements had a significant effect (Est. = .28) on subsequent months of work engagement, and lagged effects of work engagement had a significant effect (Est. = .11) on subsequent monthly employer inducements. This illustrates how between-person components of the predictors can be responsible for the lagged effects. However, between-person components of the predictors are by definition time-invariable (Hoffman, 2015) – it is an estimation of the stable, average level over time. Therefore, I argue, when lagged variables are of interest we should aim to examine the within-person, time-varying component of the predictor.

That said, however, a few studies have indeed examined within-person lagged effects (Xanthopoulou et al., 2008; Xanthopoulou et al., 2009b). Xanthopoulou and colleagues (2008) found within-person lagged effects of colleague support on subsequent work engagement in a sample of flight attendants. Further, Xanthopoulou
and colleagues (2009) found within-person lagged effects of day-level autonomy, supervisory coaching, and team climate on subsequent days work engagement among employees in a fast-food company. While finding a reciprocal relationship between job resources and work engagement, they unfortunately did not examine the reverse lagged effect of within-person work engagement on job resources. Further, both of these studies had very small sample sizes (N=42 and N=44) and examined very specific types of subjects and resources. One reason lagged within-person effects were non-significant in the present study may be the more diverse sample and higher-order category of employer inducements. However, another reason could be that job resources and work engagement does not have lagged within-person reciprocal effects when measured on a monthly time-lag. Daily diary studies have shown that job resources and work engagement has a day-level relationship – getting more resources one day, makes employees more engaged that same day. This shows that the relationship between job resources and work engagement is quite immediate, and suggests that delayed effects are unlikely. It is also possible that within-person changes in job resources do not have lasting effects on work engagement, and vice versa. For example, a big monetary performance bonus, being asked to take part in an important decision, or a month of good and constructive feedback from the supervisor may and should have immediate effects on an employees work engagement, but not necessarily on subsequent months work engagement if resources are no longer kept on a high level. When job resources remain on a high level over time, however, the present study suggest employees increase in work engagement over subsequent months.

Gain and Loss Spirals

Perhaps the most important contribution of this study is the demonstration of gain and loss spirals between employer inducements and work engagement over time. Very few multi-wave studies have examined the reciprocal relationship between job resources and work engagement, and no previous studies I know of have examined the interaction effect between predictors and time in this relationship. There is also no consensus among researchers about how this reciprocal relationship develops over time, with some favoring a stability perspective and others favoring a change perspective. This study found a significant effect of between-person predictors in interaction with time, suggesting that high (or low) person-means in work
engagement and employer inducements are related to systematic increases (or decreases) in employer inducement and work engagement, respectively. The graphic representation in Figure 5 and 6 clearly showed how this interaction gives support to the idea of gain and loss spirals.

As mentioned, very few studies with comparable results exist, but there is at least one exception. In a 12 week, three-wave study, Mäkikangas and colleagues (2010) used latent growth modelling to explore different development patterns in job resources and flow. Comparable to the results in this study, “The levels of job resources and flow correlated strongly with each other, and also their changes over time associated providing evidence for a mutual cycle of change as proposed by the COR theory” (Mäkikangas et al., 2010, p. 808). Further, they found four latent classes of development that differed from each other in terms of their level and/or the direction of mean-level change in job resources and flow. However only one class showed systematic change over time, while the three other classes remained somewhat stable at low, moderate and high job resources over time. In fact, mean-level changes only occurred among a quarter of the participants.

In contrary to assumptions of loss spirals, the latent class declining in job resources was moderate in mean levels of job resources. The class with the lowest mean level of job resources did not show development in line with loss spirals. These results are contrary to those presented in this study. Among differences from the present study was that they had a homogenous sample of employees from only one company (an employment agency) facing difficulties in terms of high rate of resignation and absenteeism. In contrast, the present study included a heterogeneous sample with employees from a variety of industries and companies. However, these differences do not really explain why gain and loss spirals would not be present in both studies. The apparent inconsistency across the two studies suggests that the demonstration of gain and loss spirals needs to be replicated by further studies.

Limitations

There are several limitations that should be taken into account in relation to this thesis. First, all measures where collected exclusively through self-report, and may be vulnerable to common method bias (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). This may cause an artificial correlation because there is a common source of rating on both measurements. It may be that personality or other stable
factors have an impact on how participants answer surveys. On the other hand, some argue participants should be considered subject-experts when it comes to their own work engagement (Kompier, 2005). However, including more objective measures, especially of job resources, should be considered in future research. Self-reported job resources is perhaps only an estimation of actual job resources, while work engagement is inherently subjective and should be closest to actual work engagement precisely by self-report.

Second, while being a longitudinal multi-wave study is an obvious strength of this thesis, effects are still based on correlational relationships and are not sufficient for making causal conclusions. While lagged variables can establish temporal ordering of the effects, the lagged effects in this study were non-significant. I have found no intervention studies where job resources are systematically increased in order to affect work engagement. This would be an important contribution to the field for future research to consider.

Third, several factors led to a smaller sample size of both participants and usable measurement waves. For one, attrition is a common problem in longitudinal research and was so in this study as well. Second, the inclusion of lagged variables led to further reduction in available waves and participants. Finally, as this thesis was part of a bigger research project, practical scheduling meant that only a small number of participants were surveyed on the last month included in this study. Still, the final sample of 125 participants and 342 waves is sufficient and is larger or of similar size in comparison with several other studies examining similar research questions (e.g., Bakker & Bal, 2010).

Fourth, there was very little within-person variance in employer inducements over time. This construct may be more stable and non-fluctuating in comparison with other job resources. For example, perceptions of security and retention inducements are unlikely to show major within-person variance in a matter of only months. Future research should consider including job resources not only on basis of the sample, their jobs and organizations, but also the time-lags between measurements. For example, social support, feedback, and coaching may be more varying resources and appropriate for studies with shorter time-lags, while career opportunities, and perceived security and loyalty from the employer may be more appropriate for studies with longer time-lags.
Fifth, the aim of the recruitment strategy was to attain a heterogeneous sample, as most other similar studies have participants from only one organization. While our sample turned out varied in many aspects, there were a much greater proportion of women (79%) and employees working in the public sector (75%), and almost all participants had a higher education (91%). This raises issues of generalizability of the results to groups that differ from this sample.

Finally, while having four waves of measurements is a clear strength of this study, future research should try to include even more waves in order to get a more comprehensive idea of the reciprocal longitudinal relationship between job resources and work engagement. While this study demonstrated gain and loss spirals over four months, future research should examine if and how these spirals develop over shorter and longer time-periods.

**Implications for Practice**

The results from this study have several implications for practice. The demonstration of gain and loss spirals should further motivate employers to help increase their employees work engagement. The detrimental effect of letting employees fall into loss spirals should be avoided, and the beneficial effect of getting employees into gain spirals should be sought. The findings suggest that increasing monthly employer inducements is likely to increase monthly work engagement, but this effect will likely not last if employers do not keep up this level of inducements up.

On an individual level, the reciprocal effects demonstrated should encourage employees to find self-serving ways to be more engaged as this is likely to invoke greater resources in return. Results suggest that both employers and employees can initiate the reciprocal relationship between employer inducements and work engagement.

**Conclusion**

This study answers the call for more person-oriented multi-wave studies on the longitudinal relationship between job resources and work engagement (Mäkikangas et al., 2016). Both employer inducements and work engagement showed within-person variation over four monthly waves. Further, both constructs were reciprocally related on both within- and between-person levels. The dynamic within-person effects
seemed to be immediate within months, as lagged predictors did not show significant effects. Finally, the study demonstrated the development trajectories predicted by theories of gain and loss spirals. More specifically, (1) having greater (or fewer) resources over time was related to increasing (or decreasing) levels of work engagement over time, and (2) having higher (or lower) levels of work engagement over time was related to increasing (or decreasing) levels of employer inducements over time.
References


Mäkikangas, A., Bakker, A. B., Aunola, K., & Demerouti, E. (2010). Job resources and flow at work: Modelling the relationship via latent growth curve and


Schaufeli, W. B., Taris, T. W., & Van Rhenen, W. (2008). Workaholism, burnout, and work engagement: three of a kind or three different kinds of employee


