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A Longitudinal Study Into The Effect Of Induction On The Development Of Burnout In Beginning Teachers

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1 Abstract

Induction research has mainly focused on the effect on turnover and although there are some positive results, findings are mixed and the effects appear to be small. The effect on burnout has, however, not been thoroughly examined and this was the study purpose. A sample of 1296 beginning teachers was surveyed annually during the first three years of employment. Data were analyzed using latent growth modeling. Induction had a buffering effect on initial levels of burnout, but did not affect change over time. The effects were small and the effects of demographics and workplace environment were of greater significance.

Keywords: induction, burnout, longitudinal, beginning teachers

2 Introduction

The transition from higher education to employment for beginning teachers involves testing skills and knowledge acquired during education in a real-life setting. This is a great challenge for many, and those who do not receive proper support during this period have likened it to a "sink or swim" experience (Johnson & Birkeland, 2003) that may ultimately lead to health-impairing consequences such as burnout. Strain associated with the initial period of employment for beginning teachers is a known problem, and it has been reported that the rates of turnover during the initial period of employment are as high as 40–50% (Ingersoll, 2012). A commonly suggested remedy to the problems associated with entering employment is an induction program that provides beginning teachers with sufficient support during this critical period. In a review on exemplary teacher induction it was concluded that it was crucial that beginning teachers had the opportunity to collaborate, reflect and acculturate into the profession and that the focus of induction should be on assistance rather than assessment. Furthermore, it was also found that successful induction programs also included support from trained mentors, comprehensive in-service training, and reduced teaching load (Howe, 2006). These findings are in line with those in another review on effective induction, additional components listed in this review were an orientation program of the work place and common planning time (Whisnant, Elliot, & Pynchon, 2005). The general idea is that successful induction programs will make the transition easier, reduce turnover, improve classroom practices, and improve student learning and performance. However, the evidence supporting the positive effects of induction is mixed and not always convincing.

2.1 Effects of induction

In a recent review on the effects of induction, 15 studies were identified that had investigated the effect of induction on turnover, classroom practices, and/or student achievement (Ingersoll & Strong, 2011). Although it was concluded that the effects of induction are positive, the results of the studies reviewed were mixed and in many cases there were no differences in the outcomes between teachers who participated in induction programs compared to non-participants (Ingersoll & Strong, 2011). In one study, it was found that teachers who received a more extensive induction program were less inclined to leave the profession compared to teachers who participated in a less extensive program (Kapadia, Coca, & Easton, 2007). The same study also found, however, that there were no significant differences regarding turnover intentions between teachers who received induction compared to those who did not (Kapadia et al., 2007). In another study on induction, the results showed that teachers who received induction had lower turnover rates (Henke, Chen, & Geis, 2000), but other variables that could have affected turnover rates were not controlled for making the results somewhat questionable (Henke et al., 2000).

Smith and Ingersoll (2004) found that two induction activities affected turnover, collaborative activities with colleagues reduced the risk of turnover whereas a reduced teaching schedule, surprisingly, increased the risk of turnover. Furthermore,

in their study other potentially influencing variables (e.g., teacher and school characteristics) were controlled for and it was evident that these variables had a greater effect on turnover compared to induction activities (Smith & Ingersoll, 2004). The most ambitious study on the effects of induction included a randomized controlled trial (Glazerman et al., 2010). The results showed that induction did not affect classroom practices, teacher satisfaction, preparedness, or turnover (Glazerman et al., 2010). There were results that showed that induction had a positive effect on student achievement, but this was only the case when the induction program lasted for two years and the effects were evident only in the third year (Glazerman et al., 2010). The conclusion from these studies is that induction appears to show positive effects, but the findings are mixed and the effects appear to be small. Thus, the advantages of induction programs remain unclear, and this provides a rationale for further research on the effects of induction.

2.2 Burnout

Apart from the overall effect of induction being unclear, little is known about the specific effect on burnout, a common problem among beginning teachers (e.g., Goddard & Goddard, 2006; Goddard, O'Brien, & Goddard, 2006). Given the focus on turnover of beginning teachers, burnout is a topic of interest considering that theory suggests that negative turnover is a behavioral response caused by an unsatisfactory work situation that is often characterized by strain (e.g., Currivan, 1999; Kim, Price, Mueller, & Watson, 1996; Mobley, 1977). Although it seems plausible that the implementation of induction programs can reduce the risk of turnover it seems reasonable that there is an indirect effect of induction on turnover rather than a direct effect. It has been suggested that the desire to quit ones job or profession comprises the climax of burnout and is preceded by feelings of disengagement/depersonalization and exhaustion (Friedman, 1993). Although burnout is not the only reason for voluntary turnover there is empirical support for the theorized relationship between burnout and turnover intentions suggested by Friedman. Burnout has been found to be positively related to turnover intentions (e.g., Goddard & Goddard, 2006; Lee & Ashforth, 1996; Schaufeli & Enzmann, 1998) and burnout has also been found to be mediate the effects of work conditions on turnover intentions (Leiter & Maslach, 2009). These findings imply that the assumed positive effect of induction programs on turnover also would be valid when it comes to burnout. Furthermore, burnout has also been found to be negatively related to teacher self-efficacy (e.g., Brouwers & Tomic, 2000; Schwarzer & Hallum, 2008; Skaalvik & Skaalvik, 2010). Considering the hypothesized relationship between induction and classroom practices (Ingersoll & Strong, 2011), this adds another motive to study the effect of induction on burnout.

The concept of burnout emerged in the 1970s when studying individuals with early career problems within the human service professions (Cherniss, 1980; Freudenberger, 1975; Kramer, 1974). Burnout was initially believed to be a problem restricted to employees in the human service professions (e.g., social workers,

nurses, and teachers), but is now recognized as a more general work-related problem (Maslach, Schaufeli, & Leiter, 2001; Schaufeli, Leiter, & Maslach, 2009). The most well-known definition of burnout is that suggested by Maslach and colleagues (Maslach & Jackson, 1986; Maslach, Jackson, & Leiter, 1996) who define burnout as "a crisis in one's relationship with work, not necessarily as a crisis in one's relationship with people at work" (Maslach et al., 1996, p. 20). In the definition put forth by these authors, burnout consists of three dimensions: emotional exhaustion (lack of energy and emotional overextension), depersonalization (detachment from work and the development of cynical attitudes towards one's work), and reduced personal accomplishment (feelings of inadequacy and reduced efficacy) (Maslach & Leiter, 1997; Maslach et al., 2001). Maslach and colleagues have developed the Maslach Burnout Inventory (MBI) to measure burnout (Maslach & Jackson, 1986; Maslach et al., 1996), and this is the most frequently used instrument when studying burnout (Schaufeli & Enzmann, 1998). The reduced personal accomplishment dimension of the MBI has, however, been found to have the weakest empirical support of the MBI dimensions (Schaufeli & Enzmann, 1998), and it has been argued that it develops independently from exhaustion and depersonalization (Lee & Ashforth, 1996). Consequently, the exhaustion and depersonalization dimensions are considered to be the "core of burnout" (Green, Walkey, & Taylor, 1991, p. 463), and the reduced personal accomplishment dimension is often excluded in current burnout studies.

Based on the view of a core of burnout, Demerouti and colleagues (2001) presented an alternative burnout measure called the Oldenburg Burnout Inventory (OLBI) that is based on two dimensions: exhaustion and disengagement. Exhaustion is assumed to be the result of intense physical, emotional, and cognitive strain. Disengagement refers to distancing oneself from work and developing negative attitudes toward the work object, work content, and work in general. Although there are conceptual differences between the OLBI and the original MBI, the dimensions of the OLBI correspond closely to the exhaustion and depersonalization dimensions of the MBI (Halbesleben & Demerouti, 2005). The OLBI is now an established and widely used measure in burnout studies.

2.3 The present study

The purpose of the present study was to investigate the effect of induction on the development of burnout in beginning teachers. More specifically, the following research questions were addressed:

- What is the effect of induction on the development of exhaustion and disengagement?
- Are there any induction activities that particularly affect development of exhaustion and disengagement?

- Is development of exhaustion and disengagement affected by the number of induction activities?

- Is development of exhaustion and disengagement affected by the length of induction?

- Is development of exhaustion and disengagement affected by the extent of induction?

Based on the theorized negative effect of induction on turnover (Ingersoll & Strong, 2011) and the positive association between burnout and turnover intentions (e.g., Friedman, 1993; Goddard & Goddard, 2006; Gold, Roth, Wright, & Michael, 1991; Leiter & Maslach, 2009), it was hypothesized that induction would have a positive effect resulting in lower levels of burnout. It has been found that the positive effects associated with induction appear to be contingent on the extensiveness of the program (Glazerman et al., 2010; Kapadia et al., 2007). Based on these findings it was also hypothesized that the effect on the development of exhaustion and disengagement would be greater for induction programs with more activities, longer induction programs, and more extensive induction programs.

2.3.1 Teachers in Sweden and induction.

The present study was carried out in Sweden and was based on Swedish data. This section provides the reader with a brief presentation of the work situation for teachers in Sweden. The idea is to place Swedish teachers in an international context and make the results more interpretable. As in many other countries, teaching in Sweden is a stressful occupation. In an evaluation of the work climate for teachers from 2002, it was reported that the most alarming issues in the psychosocial work climate for teachers were high workload and stress, feelings of inadequacy, and risk of burnout and long-term sick leave (Swedish work environment authority, 2002b). In more recent reports it has been found that teachers were one of the occupations with the highest levels of stress-related problems at work (Swedish work environment authority, 2010b), and that they had an overall poor psychosocial work climate (Swedish work environment authority, 2010a). It was found that teachers had a heavy workload that resulted in them often skipping lunch and taking work home with them, had little influence on deciding their pace of work, did not receive help or guidance in prioritizing their work, and had low levels of social support from their supervisors. In addition, teachers were one of the occupations where the employees experienced high levels of both quantitative and qualitative job demands, and where the employees felt that their work was psychologically demanding and work-related sleep problems. This is, however, nothing new, teachers have been one of the occupations repeatedly found to have a poor psychosocial work environment with the same recurring problems throughout the last decade (Swedish work environment authority, 2002a, 2004, 2006, 2008, 2010a, 2012). It thus feels safe to say that

teachers have a tough work climate and that they are vulnerable to work-related stress.

As previous international studies have shown there are many beginning teachers who experience strain during the initial period of employment (e.g., Cherniss, 1980; Goddard et al., 2006). This also appears to be the case in Sweden and in a study on teachers who had been working for approximately three years after their graduation there was about one third that had considered leaving the profession (Ministry of Education and Research, 2008). In 2011 the Swedish government decided that all beginning teachers in Sweden were to participate in a one-year induction program (The Swedish National Agency for Education, 2011). There are two main purposes of the program. The first purpose is to provide beginning teachers with support on a professional, personal and social level with the aim of stimulating their professional development. The second purpose is to ensure the quality of the beginning teachers, making sure that they are fit to work independently as teachers after the induction period is completed. The principal of the school is responsible for making a plan for the induction period that is adapted to the respective teacher's prior knowledge and qualifications. Each beginning teacher is assigned a mentor whose role is to aid them during the induction program. The professional competences and the professional progression of the beginning teachers are assessed three times during the program. After the induction period is completed there is an assessment made by the principal about whether the teacher is deemed as fit or unfit. The idea is that this system will provide beginning teachers with support during a period of trial and also ensure that only teachers that meet a range of stipulated qualification criteria will receive a teacher certificate and thereby ensuring the quality of teaching in Swedish schools. This of course all seems very good. However, based on the mixed findings in previous studies on the effects of induction there is a risk that success is not automatically guaranteed. Furthermore, induction programs have historically been a rare phenomenon in Sweden and structured evaluations of the effects of induction programs in Sweden are even rarer. It should be highlighted that the teachers in the present study had started working approximately three years before the decision of mandatory induction. It should also be noted that due to practical circumstances (e.g., lack of trained mentors and heavy administrative burden) the implementation of mandatory induction programs has been delayed.

3 Method

3.1 Sample and procedure

The data in the present study originated from a study called the Prospective Analysis of Teachers' Health (PATH). The PATH study had a longitudinal study design and data were collected during the teachers' final two years of higher education and first three years of employment. Initially 4067 student teachers from 21 different colleges/universities in Sweden were contacted, of whom 2809 (69.1%) gave informed consent to participate and thus constituted the cohort of the study. Data were collected using postal questionnaires and a total of five data collections were performed. The response rate varied between 77.8% and 57.5%, and a total of 1149 teachers participated in every data collection. Because the focus of the present study was the development of burnout after entering employment, the data collections during employment are labeled T1, T2, and T3, and the data collections during education are labeled T01 and T02. For a complete overview of the data collection process, see Figure 1. A total of 2117 teachers responded to at least one of the questionnaires during employment, and there were 1928 who responded to the burnout items at least once. During the final wave of measurement (T3) the participants were asked if they had received any formal induction during their first job as teachers and 1296 responded to this question. Criteria for inclusion were that the respondents had participated in at least one wave of measurement during employment and had responded to the question about receiving formal induction when entering employment. The sample thus comprised 1296 teachers.

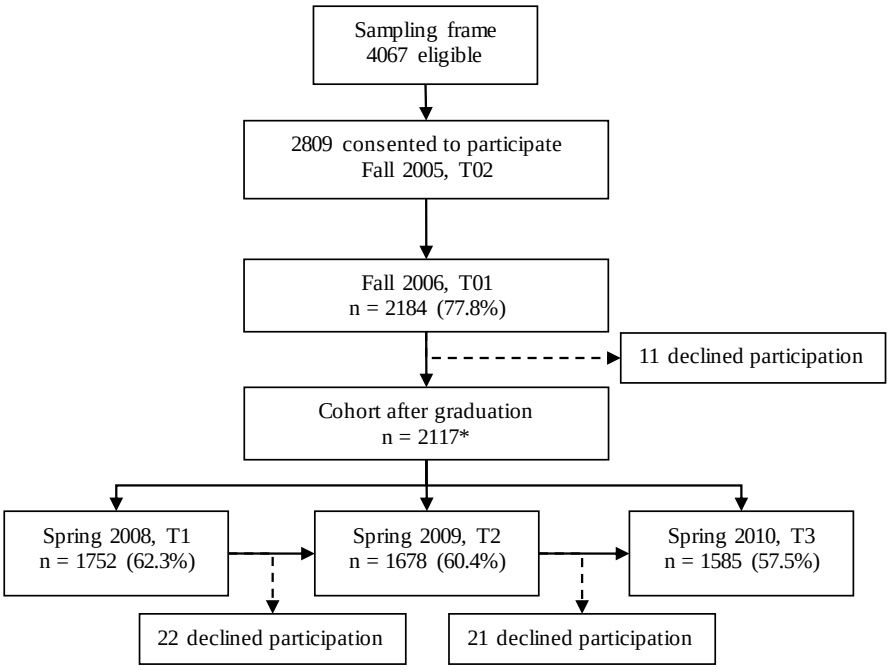

Figure 1
Overview of the data collection process of the PATH study

*Responded to at least one of the questionnaires during employment (T1, T2, or T3).

3.2 Measurements

Burnout was assessed using the Oldenburg Burnout Inventory (OLBI) (Demerouti et al., 2001) that measures the two dimensions exhaustion and disengagement. The OLBI consists of two subscales that assess the two core burnout dimensions of exhaustion and disengagement. Each subscale consists of eight items, of which four items are positively worded and four are negatively worded. Although the use of reversed worded items may be recommended to reduce acquiescence bias and response sets, it has been found that reversed items can be problematic. For example, it has been shown that respondents may calibrate reversed worded items differently (Bode, 2004). It has also been found when evaluating the factor structure of measures of psychological symptoms that include both positively and negatively worded items that there is a risk that these items do not measure the same construct (Betemps & Baker, 2004; Conrad et al., 2004). Moreover, there is reason to believe that the absence of psychological symptoms does not necessarily indicate psychological well-being (World Health Organization, 1946) because the operational definitions of 'psychological symptoms' and 'psychological well-being' do not assess opposing poles of the same dimension (Keyes, 2003). This topic has been discussed in the burnout literature (Maslach et al., 2001), and it has been demonstrated that burnout and its assumed opposite pole, work engagement, appear to be qualitatively different, but negatively correlated, phenomena (Demerouti, Mostert, & Bakker, 2010; Schaufeli, Salanova, González-romá, & Bakker, 2002). It has also been suggested that the negatively worded items of the OLBI can be used to assess work engagement (Bakker, Schaufeli, Leiter, & Taris, 2008).

Hence, although the idea of reducing bias by including positively and negatively worded items may be warranted in some cases, it does not appear to be suitable for the measurement of burnout. Consequently, only the positively worded items of the OLBI were used to assess exhaustion and disengagement. The items were rated using a four-point frequency response format (1 = Not at all, 2 = Some of the time, 3 = Most of the time, 4 = All of the time). The means of the two sub-scales were used when analyzing the data. However, at the first wave (T1) one exhaustion item was missing from the questionnaire. To examine the effect of the missing item, the three-item version and the four-item versions of the instrument were correlated at T2 and T3. The results showed that the correlation was .975 at T2 and .976 at T3. According to previously recommended cutoff scores for mean values of the OLBI, exhaustion levels ≥ 2.25 and disengagement levels ≥ 2.10 are considered to be high (Peterson, Demerouti, Bergström, Åsberg, & Nygren, 2008). These cutoff scores were used to estimate the prevalence and cumulative incidence of symptoms of high burnout levels.

During the final data collection (T3), the participants were asked whether they had received any formal induction during their first employment as a teacher after graduation. In addition, based on previous research on successful induction (Howe, 2006; Ingersoll & Strong, 2011; Whisnant et al., 2005) they were asked if any of the

following activities were included in their induction: (1) Introduction of the organizational values of the school, (2) Individual plan for professional development, (3) An assigned mentor, (4) Recurring time for reflection with mentor, (5) Recurring time for reflection with colleagues, (6) Reduced teaching load, (7) Support in planning teaching, or (8) Recurring evaluation of individual professional development. Based on these responses, a new variable (Sum of activities) was created with information about the total number of activities included in the teachers' inductions. They were also asked about the length of their induction, and this allowed for studying the effect of both length and the extent (i.e., sum of activities × length) of induction on burnout. Finally, demographics of the participants and their workplace environments were included to control for the effect of factors such as class size, type of employer, and type of employment. These variables were included to reduce the risk that any significant effects of induction were spurious. See Table 1 for a complete list of the organizational demographic variables.

Table 1 Descriptive statistics

variable	*N*	*N* items	Range	*M* (*SD*)	*α*	*M* (*SD*)	
ne variables							
haustion	1484	4	1-4	2.33 (0.63)	.73	2.29 (0.74)	
haustion	1504	5	1-4	2.33 (0.63)	.81	2.29 (0.72)	
haustion	1265	5	1-4	2.36 (0.64)	.83	2.34 (0.73)	
sengagement	1483	5	1-4	1.71 (0.71)	.83	1.70 (0.64)	
sengagement	1504	6	1-4	1.75 (0.64)	.82	1.73 (0.63)	
sengagement	1266	6	1-4	1.80 (0.65)	.83	1.82 (0.65)	
ndent variables							
= Female)	2809	1	0-1	0.84	-	0.85	
1	2809	1	23-62	31.28 (6.92)	-	32.12 (7.46)	
ing experience es)	2786	1	0-1	0.45	-	0.36	
tional program ounger students)	2809	1	0-1	0.72	-	0.73	
ducation				1-11		8.99 (1.23)	
pational redness				1-7		4.79 (1.27)	
oyer (1 = Public)	1507	1	0-1	0.84	-	0.85	
of employment ermanent)	1456	1	0-1	0.53	-	0.53	
oyment hours ll time)	1489	1	0-1	0.76	-	0.77	
l size	1464	1	1-6	2.22 (1.36)	-	2.26 (1.38)	
size	1456	1	1-7	3.23 (1.23)	-	3.22 (1.19)	
ning out-of field ect)	1483	1	1-4	2.90 (1.06)	-	2.98 (1.05)	
ning out-of field	1471	1	1-4	3.25 (1.11)	-	3.30 (1.09)	
tion (1 = Yes)	1296	1	0-1	0.44	-	0.44	
ty 1 (1 = Yes)	1251	1	0-1	0.28	-	0.29	0.66
ty 2 (1 = Yes)	1238	1	0-1	0.10	-	0.10	0.22
ty 3 (1 = Yes)	1261	1	0-1	0.26	-	0.27	0.62
ty 4 (1 = Yes)	1249	1	0-1	0.18	-	0.18	0.41
ty 5 (1 = Yes)	1251	1	0-1	0.20	-	0.21	0.47
ty 6 (1 = Yes)	1243	1	0-1	0.08	-	0.08	0.19
ty 7 (1 = Yes)	1247	1	0-1	0.14	-	0.14	0.32

List of induction activities: (1) Introduction of the organizational values of the school, (2) Individual plan for professional development, (3) An assigned mentor, (4) Recurring time for reflection with mentor, (5) Recurring time for reflection with colleagues, (6) Reduced teaching load, (7) Support in planning teaching, (8) Recurring evaluation of professional development.

3.3 Missing Data

Of the 1296 teachers in the sample, 884 participated in all three waves of measurement during employment and responded to the burnout items. Participants with complete data were compared to non-completers in regards to sex, age, immigrant background, parenthood (i.e., becoming a parent during the period of employment), educational program (younger versus older students), previous teaching experience, TSE during and occupational preparedness during the final year of education, and levels of exhaustion and disengagement at T1. The magnitude of the associations between the predictors and missingness (i.e., the effect sizes) is given in the correlation metric as estimated by tetrachoric or polyserial correlations. Missingness was negatively related to age ($r = -.119$, $p \leq .01$), educational program ($r = -.112$, $p \leq .05$), and previous teaching experience ($r = -.088$, $p \leq .05$) and positively related to disengagement ($r = .100$, $p \leq .05$). Hence, participants who were younger, studied to work with older students, had no previous experience of teaching, and were more disengaged when entering employment were less likely to participate in all assessments of burnout.

Current recommendations of an inclusive analysis strategy (i.e., not using listwise deletion) advocate the use of full information maximum likelihood (FIML) that can include missing data as a method of estimation, i.e., it is not necessary for the respondents to have participated in all waves of measurement. This allows for estimation of parameter estimates that are not biased factors related to missingness (as would have been the case if listwise deletion had been used). However, when adding covariates to the model as independent variables, it is required that the participants have complete data on the independent variables resulting in a reduction in sample size from 1296 to 865. The advantage of using FIML is then lost so it was, therefore, decided to impute missing data using multiple imputation (MI). To correct for systematic bias, the significant predictors of incomplete data (age, educational program, previous teaching experience and disengagement) were included as auxiliary variables in the imputation. This is in line with current recommendations of an inclusive analysis strategy of including auxiliary variables into the missing data handling procedure. This makes the assumption that the data is missing at random more plausible, and can improve the power of the analysis (Collins, Schafer, & Kam, 2001). In line with current recommendations for MI (Graham, 2009; Graham, Olchowski, & Gilreath, 2007), 100 new data sets were generated using the Mplus 6.1 software package (Muthen & Muthen, 2010). The results presented are the pooled estimates of the results for each dataset.

3.4 Data Analysis

Data were analyzed using latent growth modeling (LGM), a method that allows examination of both intra-individual (within-person) change over time and inter-individual (between-person) variability in intra-individual change (Preacher, 2008). A latent growth model includes an intercept and a slope. The intercept of the model represents the value on the outcome variable at the first measurement occasion and the slope represents the rate of change over the time period of interest. The most basic latent growth model requires data from three measurement occasions and includes an intercept (initial levels) and a linear slope (change factor). Non-linear change can also be modeled but this requires data from four or more measurement occasions. Given that there were only data available from three data collections, this only allowed for examination of linear change over time. The assessments of exhaustion and disengagement deviated from normality and, therefore, the Yuan-Bentler correction for non-normality (Yuan & Bentler, 2000) was applied using a FIML estimation with robust standard errors (labeled MLR in the Mplus software package). Because the χ^2 is sensitive to sample size, additional fit indices were used to evaluate model fit. These included the root mean-square error approximation of the mean (RMSEA), the standardized root mean-square residual (SRMR), and the comparative fit index (CFI). These fit indices were chosen based on their sensitivities to model misspecification and sample size (Hu & Bentler, 1998). Models with a RMSEA close to or lower than .06, a SRMR close to or lower than .08, and a CFI close to or higher than .95 (Hu & Bentler, 1999) were considered to have good model fit.

The analysis followed the same procedure for both exhaustion and disengagement. First, the development over time was analyzed. The variance of the intercept and the slopes were estimated to examine if there were individual differences regarding the initial levels of the variable and the change trajectories. In the second step of the analysis, given that significant variances of the intercepts and/or the slopes were identified, covariates were added to the model. First, the effects of sex, age, and the organizational demographics were estimated (Models 1a and 1b). These were included in subsequent analyses as control variables. Second, it was examined if there was any effect of receiving a formal induction (Models 2a and 2b). Third, the effect of the total number of induction activities was examined (Models 3a and 3b). Fourth, the effects of each of the respective induction activities were examined (Models 4a and 4b). Fifth, the effects of length of induction were investigated (Models 5a and 5b). Finally, the effect of the extent of induction was examined (Models 6a and 6b).

4 Results

Of the beginning teachers in this study, 43.5% received some form of induction when entering employment. The two most common induction activities were being introduced to the organizational values of the school and having an assigned mentor. The two least common activities were having individual plan for professional development and a reduced teaching load. Of the teachers who received an induction, the average number of activities was 3.15 and the average length was 7.32 weeks.

Table 2 Fit statistics of the LGMs

Variable Model	χ^2 (*df*)	RMSEA	SRMR	CFI
Exhaustion	2.859 (1)	.034	.009	.998
Model 1a	22.132 (14)	.020	.006	.994
Model 2a	26.586 (15)	.024	.006	.992
Model 3a	35.950 (22)	.021	.006	.990
Model 4a	25.250 (15)	.022	.006	.993
Model 5a	25.598 (15)	.018	.006	.994
Model 6a	22.550 (15)	.018	.006	.994
Disengagement	5.294 (1)	.056	.013	.995
Model 1b	31.308 (14)	.030	.007	.987
Model 2b	32.064 (15)	.029	.007	.987
Model 3b	43.384 (22)	.027	.006	.984
Model 4b	32.262 (15)	.029	.007	.987
Model 5b	27.129 (13)	.028	.007	.988
Model 6b	27.031 (13)	.028	.007	.988

df, degrees of freedom; RMSEA, root mean-square error of approximation; SRMR standardized root mean-square residual; CFI, comparative fit index

The longitudinal analysis showed that both burnout dimensions increased over time, and the increase in disengagement was greater ($\beta = .096$, $p < .001$) than the increase of exhaustion ($\beta = .039$, $p = .007$). Individual differences were found for exhaustion regarding the intercept ($s^2 = .550$, $p < .001$) and the change factor ($s^2 = .062$, $p = .010$). Individual differences were also found for disengagement regarding the intercept ($s^2 = .646$ $p < .001$) and the change factor ($s^2 = .084$, $p = .002$). These findings provided a rationale for the addition of covariates to the two models. There was no significant correlation between the intercept and the change factor for exhaustion ($r = -.094$, $p = .480$) but there was for disengagement ($r = -.326$, $p < .001$). This means that individuals with higher initial levels of disengagement had a more gradual increase over time. The fit indices of the two LGMs indicated good model fit

(Table 2). The one-year rank order stability ranged between .548 and .653 for exhaustion and .580 and .593 for disengagement (Table 3). Estimated levels of exhaustion ranged between 2.278 and 2.336, whereas levels of disengagement were somewhat lower and ranged from 1.690 to 1.813.

The prevalence and cumulative incidence of burnout results are presented in Table 4. About half of the teachers had high levels of exhaustion at each measurement wave, and about one in five teachers had high levels of disengagement at each wave. Teachers with concurrent high levels of exhaustion and disengagement (i.e., burnout) ranged between 17.5% and 22.8%. After three years, approximately three in four had experienced high levels of exhaustion, two in five had experienced high levels of disengagement, and one third had experienced high levels of burnout symptoms.

Table 3 Prevalence and cumulative incidence of exhaustion, disengagement, and burnout (based on MI).

	T1	T2	T3	Across all waves	Cumulative Incidence
Exhaustion	54.3%	54.7%	56.8%	33.3%	76.4%
Disengagement	22.8%	24.5%	29.1%	8.6%	44.7%
Burnout	21.1%	22.5%	27.5%	8.3%	41.9%

Table 4 Rank order stability coefficients (Pearson's *r*) based on imputed values. The coefficients of exhaustion are presented below the diagonal of the matrix and the coefficients of disengagement are presented above the diagonal of the matrix. All correlations were statistically significant, $p \leq .001$.

Exhaustion \ Disengagement	T1	T2	T3
T1		.58	.490
T2	.548		.593
T3	.525	.653	

Beginning teachers that were younger, felt less confident in their professional efficacy, had a full-time employment, and had a large number of students in their class had higher initial levels of both exhaustion and disengagement. In addition, beginning teachers who were males, had a permanent employment, and did not teach the subject(s) they were trained for also had higher initial levels of disengagement, but not exhaustion. Teachers who had previous experience of teaching, who felt less prepared for their future work as a teacher, had full-time employment had lower initial levels of exhaustion but this had no effect on disengagement. In regards to the effect on the trajectories, it was found that beginning teachers who had previous

teaching experience, did not teach the subject(s) they were trained for, and were employed by a private school had a more gradual increase in disengagement, and those who had previous teaching experience and had a full-time employment had a more gradual increase in exhaustion. These effects were consistent across all models and standardized parameter estimates are presented in Table 5 and Table 6.

The next step of the analysis was to look for the effects of induction. Simply receiving some form of induction did not have any effect on initial levels or development of exhaustion and disengagement. When investigating the effects of the different induction activities, it was found that teachers who had recurring time for reflection with colleagues had lower initial levels of exhaustion and disengagement. No activity had any effect on the change factors of exhaustion or disengagement. It was found that teachers with more induction activities included in their induction program also had lower initial levels of disengagement but not of exhaustion. The number of activities did not, however, affect the respective growth factors. There were no effects of length of the program or any effects of the extent of the program (i.e., length × sum of activities). The fit indices showed that all LGMs had good fit (Table 2), and standardized parameter estimates of the respective models are presented in Table 5 and Table 6.

Table 5 Effects of covariates on the intercept (initial levels) and the slope (change over time) of exhaustion.

	Model 1a		Model 2a		Model 3a		Model 4a		Model 5a		Model 6a	
	Intercept	Slope	Intercept	Slope	Intercept	Slope	Intercept	Slope	Intercept	Slope	Intercept	Slope
Sex	.005	.170	.004	.169	-.006	.176	.005	.170	.007	.180	.007	.183
Age	-.112**	.052	-.112**	.052	-.111**	.045	-.115**	.050	-.112**	.047	-.113**	.045
Teaching experience	.189*	-.343**	.188*	-.340**	.181*	-.333**	.190*	-.338**	.189*	-.349**	.188*	-.350**
TSE education	-.211***	.024	-.211***	.024	-.200***	.025	-.210***	.024	-.211***	.021	-.211***	.020
Occupational preparedness	-.090*	.008	-.087*	.007	-.095*	.006	-.088	.008	-.090*	.011	-.090*	.008
Educational program	-.034	.185	-.036	.183	-.044	.190	-.038	.184	-.033	.181	-.033	.182
Employer	.152	-.105	.148	-.105	.105	-.105	.140	-.109	.154	-.091	.154	-.096
Type of employment	.133	.172	.137	.170	.129	.146	.133	.169	.134	.181	.133	.175
Employment hours	.260**	-.448**	.262**	-.445**	.281**	-.450**	.266**	-.438**	.260**	-.443**	.261**	-.445**
School size	-.024	.075	-.018	.074	-.023	.068	-.017	.078	-.023	.083	-.022	.085
Class size	.123**	-.065	.124**	-.064	.122**	-.060	.123***	-.064	.123**	-.064	.123**	-.065
Teaching out-of-field (subject)	.096	-.047	.093	-.046	.100*	-.053	.090	-.049	.095	-.054	.095	-.055
Teaching out-of-field (age)	.023	-.047	.023	-.046	.020	-.051	.023	-.046	.023	-.045	.023	-.044
Induction			-.077	.018	-	-	-	-	-	-	-	-
Activity 1					-.014	.050	-	-	-	-	-	-
Activity 2					-.183	.131	-	-	-	-	-	-
Activity 3					.046	.233	-	-	-	-	-	-
Activity 4					.079	-.315	-	-	-	-	-	-
Activity 5					-.284*	.095	-	-	-	-	-	-
Activity 6					.064	-.050	-	-	-	-	-	-
Activity 7					-.040	-.379	-	-	-	-	-	-
Activity 8					.085	.008	-	-	-	-	-	-
Sum of activities							-.033	-.016	-	-	-	-
Length of induction									-.001	-.010	-	-
Extent of induction											< .001	-.003
R^2	.146***	.104	.147***	.103	.163***	.127*	.149***	.103	.146***	.112	.146***	.115

* $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$ List of induction activities: (1) Introduction of the organizational values of the school, (2) Individual plan for professional development, (3) An assigned mentor, (4) Recurring time for reflection with mentor, (5) Recurring time for reflection with colleagues, (6) Reduced teaching load, (7) Support in planning teaching, (8) Recurring evaluation of professional development.

Table 6 Effects of covariates on the intercept (initial levels) and the slope (change over time) of disengagement.

	Model 1a		Model 2a		Model 3a		Model 4a		Model 5a		Model 6a	
	Intercept	Slope	Intercept	Slope	Intercept	Slope	Intercept	Slope	Intercept	Slope	Intercept	Slope
Sex	-.211*	-.048	-.212*	-.047	-.221*	-.048	-.210*	-.048	-.207*	-.043	-.205*	-.045
Age	-.130***	-.017	-.130***	-.017	-.130***	-.019	-.133***	-.017	-.131***	-.020	-.132***	-.019
Teaching experience	.140	-.373***	.139	-.371**	.136	-.373***	.141	-.373***	.138	-.375***	.137	-.374***
TSE education	-.224***	.016	-.225***	.017	-.218***	.016	-.223***	.016	-.225***	.014	-.226***	.015
Occupational preparedness	-.083	-.036	-.079	-.038	-.084	-.031	-.080	-.035	-.081	-.034	-.082	-.036
Educational program	.134	.041	.137	.039	.143	.041	.139	.041	.133	.039	.133	.040
Employer	-.103	.383*	-.108	.386*	-.136	.383*	-.116	.380*	-.098	.390*	-.099	.385*
Type of employment	.159*	.145	.164*	.141	.155*	.145	.159*	.144	.162*	.149	.161*	.145
Employment hours	.080	-.187	.080	-.189	.096	-.187	.087	-.186	.081	-.185	.081	-.186
School size	.008	.056	.014	.051	.013	.054	.015	.056	.010	.059	.012	.058
Class size	.128***	-.079	.129***	-.079	.126***	-.069	.128***	-.079	.128***	-.079	.128***	-.079
Teaching out-of-field (subject)	.175***	-.194**	.171***	-.191**	.172***	-.190**	.168***	-.194**	.172***	-.197**	.171***	-.196**
Teaching out-of-field (age)	.001	.041	.001	.041	.001	.037	.001	.041	.002	.041	.002	.042
Induction			-.095	.072	-	-	-	-	-	-	-	-
Activity 1					-.069	.125	-	-	-	-	-	-
Activity 2					-.046	-.046	-	-	-	-	-	-
Activity 3					-.032	.056	-	-	-	-	-	-
Activity 4					.095	-.190	-	-	-	-	-	-
Activity 5					-.219*	.096	-	-	-	-	-	-
Activity 6					-.035	.347	-	-	-	-	-	-
Activity 7					-.029	-.269	-	-	-	-	-	-
Activity 8					.081	-.118	-	-	-	-	-	-
Sum of activities							-.075*	-.006	-	-	-	-
Length of induction									-.027	-.041	-	-
Extent of induction											-.042	-.026
R^2	.171***	.101*	.173***	.102*	.182***	.119*	.176***	.101*	.172***	.103*	.173***	.102*

* $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$ List of induction activities: (1) Introduction of the organizational values of the school, (2) Individual plan for professional development, (3) An assigned mentor, (4) Recurring time for reflection with mentor, (5) Recurring time for reflection with colleagues, (6) Reduced teaching load, (7) Support in planning teaching, (8) Recurring evaluation of professional development.

5 Discussion

The purpose of the present study was to examine the effect of induction on the change in burnout. It was hypothesized that beginning teachers who received induction would have lower levels of burnout, and it was also hypothesized that more extensive induction programs would have a more beneficial effect on burnout. The results showed that there was support for both hypotheses, but the results were mixed and the buffering effects of induction on burnout were small in magnitude and the increments in explained variance were small. The effects of induction on burnout are discussed below as well as the development of burnout in beginning teachers.

5.1 Effects of induction on burnout

The majority of the beginning teachers did not receive any form of induction. The induction programs generally only comprised three induction activities and were shorter than two months. When comparing these findings to international data, it can be concluded that the amount of teachers who receive induction in Sweden is equivalent to levels reported in 1990 in the USA (Smith & Ingersoll, 2004), whereas current levels of teachers receiving induction in the USA now exceed 90% (Ingersoll, 2012). It thus appears that teacher induction is still in an early developmental phase in Sweden and that induction is the exception rather than the norm. Given the prevalence and incidence rates of early career burnout reported in the present study, this issue needs to be addressed and perhaps induction could be a part of a solution to this problem. However, a program that lasts less than two months and only includes three activities is not something that can be considered to be a sustainable solution. The future for beginning teachers in Sweden, however, seems promising. Every beginning teachers will take part in a one-year induction program. When reviewing the content and structure of the program it is apparent that it will include many of the factors identified as success factors in reviews (e.g., Howe, 2006; Whisnant et al., 2005) on exemplary induction programs. These changes will probably improve the likelihood of success of the induction programs and will hopefully reduce the risk of early career burnout.

Providing induction for beginning teachers, however, is a societal investment associated with many costs and is thus expected to generate some type of return. Hence, before investing in implementation of induction it is reasonable to evaluate the effect of induction on relevant outcomes. This was the main purpose of the study in focusing on exhaustion and disengagement, and it was expected that receiving an induction would have an alleviating effect on these factors. Although there were some positive effects of induction, the results did not offer compelling support for this notion as there were no significant differences in exhaustion or disengagement at the end of the three-year study period between teachers who simply received some form of induction compared to those who did not (Model 2a and 2b). Furthermore, the length of the induction period (Model 5a and 5b) and the extent of the induction

program (Model 6a and 6b) did not have any significant effects on exhaustion or disengagement.

There were, however, some significant effects related to induction but these only affected initial levels of burnout and not change over time. It was found that the various induction activities influenced initial levels of burnout differently (Model 3a and 3b). Teachers who had recurring time for reflection with colleagues had lower initial levels of both exhaustion and disengagement. Furthermore, it also appeared that the number of induction activities was of significance (Model 4a and 4b), and teachers who participated in induction programs with more activities had lower initial levels of disengagement. Clearly, the aspect of induction that had the greatest effect on burnout was recurring time for reflection with colleagues and the significant effects sizes exceeded 0.20 and approaching medium in magnitude (Cohen, 1992). This is in line with the findings in Howe's (2006) review on exemplary induction suggesting that it was crucial to provide beginning teachers with the opportunity to collaborate and reflect about the professional practices and development. However, when comparing the amount of explained variance by the respective models, it was apparent that the addition of induction did not result in a great increment in explained variance in initial levels in either of exhaustion (largest increment = 1.7%) or disengagement (largest increment = 1.1%).

Previous research on the effects of induction has not conclusively demonstrated any positive effects of induction. There are findings indicating that induction can reduce the risk of teacher attrition and increase student achievement (e.g., Glazerman et al., 2010; Kapadia et al., 2007; Smith & Ingersoll, 2004), but these findings also show that simply providing beginning teachers with induction is not a solution to the problems they are facing when entering employment. The positive effects appear to be contingent on the specific type of activity and the extent of the induction program. In line with the previous findings, the results of the present study suggest that more is better when it comes to induction (Glazerman et al., 2010; Kapadia et al., 2007). In contrast to the findings of Glazerman et al. (2010), neither the length nor the extent of induction had any significant effects, but instead it appears that the decisive factor regarding the comprehensiveness of induction was a program comprising a high number of different activities. These findings are in line with those of Kapadia et al. (2007) and Smith and Ingersoll (2004). The results of the present study, however, also show that it is not simply a matter of the total number of activities but the success of induction appears to be contingent on a program that includes the "right" type of activities, indicating that quality prevails over quantity.

Recurring meetings with colleagues to discuss and reflect upon work reduced the risk of both exhaustion and disengagement. In a previous study on the effects of different induction activities on turnover, the only activities that significantly reduced the risk of turnover were having common planning time with other teachers and collaborating with teachers on issues of instruction (Smith & Ingersoll, 2004). These results suggest that collaborative activities that allow teachers to share and discuss

their experiences with colleagues in a constructive way have an alleviating effect on strains in the early stages of the teachers' careers. Research also shows that demographics and work place characteristics appear to have a greater influence on turnover than induction (Smith & Ingersoll, 2004). This was also the case in this study. Demographics, previous teaching experience, professional efficacy beliefs during education, and work place characteristics accounted for a more than nine times the amount of explained variance in exhaustion and more than 15 times the amount of explained variance in disengagement. Furthermore, the effect sizes of the significant control variables were about equal to or greater in magnitude than the significant effects of induction.

The findings of previous research and the results of the present study raise questions about the benefits and the effectiveness of induction. When the effects of induction are not consistently positive, and when the school environment seems to matter more than whether beginning teachers receive induction or not, it is only natural to reflect upon whether there are better ways to reduce burnout and turnover and improve classroom practices and student achievement. It could be argued that it might not be reasonable to expect to find significant effects given that the average induction program in the present study only lasted about seven weeks and comprised three activities. However, the most comprehensive induction program in the study by Glazerman et al. (2010) was two years long, but even this resulted in only small increases (effect sizes ranged between 0.11 and 0.20) in student achievement that were evident only after three years. Increased student achievement and learning is indeed the end goal of the theory of teacher development (Ingersoll & Strong, 2011) and in this sense the induction program was successful. But it is questionable if such a comprehensive program can be justified given the small magnitude of the associated positive effects, and perhaps scarce resources should be allocated differently.

The most commonly studied outcome variable in relation to induction is turnover (or turnover intentions) (Ingersoll & Strong, 2011). It thus seems that turnover is considered to be the main problem and that induction is assumed to be the solution. If teacher retention is the first goal of induction, then perhaps a more successful approach would be to address the issues related to why so many teachers choose to leave the occupation at such an early stage in their careers. For instance, predictor variables that are often included in turnover models (e.g., workload, role conflict, role ambiguity, and social support) are generally not included in studies on the effect of induction on turnover. Given that descriptive demographics and work place characteristics appear to have a greater effect on turnover than induction, it seems reasonable that including additional work-related variables could better help explain issues related to early career turnover among teachers. Furthermore, studying which factors influence desirable outcomes (e.g., teacher retention, classroom practices, student achievement, and work engagement) would likely also provide valuable insights for future work with induction programs.

5.2 Change in burnout

The results of the present study suggest that a substantial number of teachers experience strain during the first three years of employment, and that burnout is a problem during this early stage of the career. About one third of the teachers in this study experienced burnout at some point during the study period and nearly one in five teachers had already suffered from burnout during the first year. The results of the LGMs showed that the two burnout dimensions increased over time although less so for exhaustion compared to disengagement. Although both exhaustion and disengagement changed over time, the stability coefficients indicated that the rank order stability for both burnout dimensions were high, and these findings are in line with previous research reporting the stability of burnout over time (e.g., Schaufeli, Maassen, Bakker, & Sixma, 2011; Shirom, Oliver, & Stein, 2009; Taris, Le Blanc, Schaufeli, & Schreurs, 2005).

It was evident that the beginning teachers suffered from high levels of exhaustion throughout the first three years of their careers and the results also indicated that these levels would not diminish. Although the average levels of disengagement did not exceed the suggested cutoff of 2.10, there was an increasing trend and it may only be a matter of time before the teachers become dangerously disengaged. These findings are in agreement with previous longitudinal research on burnout among beginning teachers where it was found that beginning teachers on average had high levels of exhaustion whereas this was not the case for depersonalization (the dimension of the MBI that corresponds to disengagement in the OLBI) (Goddard et al., 2006). It thus appears that teachers initially struggle primarily with feelings of exhaustion rather than disengagement. The fact that exhaustion levels generally were higher and increased less over time compared to disengagement could be an indication of a hypothesized burnout process where it is assumed that individuals initially become exhausted and, to cope with this exhaustion, distance themselves from work and become disengaged (Leiter & Maslach, 1988; Maslach et al., 2001).

5.3 Limitations and suggestions for future research

Induction is still in a developmental phase in Sweden and it is likely that this affected the results. When comparing the descriptive information about the content and length of the induction programs in the present study with the future planned induction program for Swedish teachers it is apparent that there are great discrepancies and that future beginning teachers will receive a far more comprehensive induction. When induction is a more established phenomenon, and there is greater consensus about what a sufficient induction program should include, studies on the effects of induction will yield different and more promising results. A related study limitation is that there were no questions about satisfaction with the different aspects of the teachers' induction. Including such questions in future studies will perhaps lead to more positive results about the effects of induction on burnout and will also be valuable for identification of important induction activities. An additional potential

limitation was that the teachers responded to the questions regarding their induction during their third year of employment. Retrospective responses could, of course, be negatively affected by memory and the more time that has passed since their induction will likely further bias their responses. However, considering that the questions were primarily about specific induction activities, it seems likely that these responses were accurate because the respondents have either received them or not. The question regarding the length of induction is, however, more problematic and these responses could be affected by the time gap between the time of induction and the time of response. This could be one reason why there was no significant effect for length of induction.

One thing that might have impaired the results is that student teachers who were more engaged and felt confident in their professional competencies (i.e., higher levels of TSE and occupational preparedness during education) may have actively applied to schools with induction programs. If this was the case this would have resulted in that the teachers who needed induction the most and probably also were most vulnerable to burnout did not receive it. This could also explain why there were no evident effects of induction on burnout. To examine this possibility a logistic regression analysis were performed with induction as the outcome variable and sex, age, educational program, previous teaching experience, TSE and occupational preparedness as independent variables. The results showed that student teachers who rated themselves as more prepared for their future work were more likely to participate in induction (Odds Ratio = 1.15, $p = .008$). It thus seems as there might be some selection bias and that there is a risk that the buffering effect of induction on burnout might have been underestimated.

As with most longitudinal studies, the present study suffered from dropout rates that could bias the results, especially considering that the outcome variable was burnout. In accordance with recent recommendations of an inclusive analysis strategy, multiple imputation was used to handle missing data (Enders, 2010). Furthermore, variables related to missingness were included as auxiliary variables, making the assumption of missing at random more plausible (Collins et al., 2001). Although it would have been preferable to have complete data, the missing data analysis combined with the multiple imputation reduced the potential bias of the results of the study due to the missing data.

It should also be mentioned that only results from quantitative studies were discussed in regards to the present study. There are several qualitative studies on induction reporting positive effects, but these were not discussed because their study designs did not allow for estimation of the effects of induction. Results from quantitative descriptive studies of induction programs were also not discussed because these did not include a control group and it was, therefore, not possible to evaluate the effects of induction.

A strength of the present study was that it included demographics, indications of educational success, and work characteristics as control variables. This has previously been a common problem for studies on induction and has consequently limited the practical use of the study results. However, there is a range of work-related variables that were not included in the present study that probably would help to further explain variation in outcome variables of interest. Furthermore, previous studies on induction have mainly focused on turnover, but some have also focused on classroom practices and student achievement as outcome variables. Although these are all relevant variables, there are other outcomes that are of interest and the effects of induction on these variables remain unknown. Future studies on induction should, therefore, further evaluate the effects of induction on a wider range of outcome variables.

5.4 Conclusions

The results of the present study both expand and confirm the findings of previous research. The study evaluated the effect of induction on burnout, an outcome that previously had not been thoroughly studied in relation to induction. It was apparent that the teachers experienced strain during this period and that this was mainly related to exhaustion rather than to disengagement. Induction did not affect the development of burnout over time, but did reduce initial levels. Although the effects were small, induction appears to help beginning teachers manage their initial period of employment. The results, however, showed that descriptive work characteristics had a greater effect on burnout compared to induction, indicating that there might be more efficient ways to help beginning teachers manage the first years of employment. Future research should widen the scope when studying the effects of induction in regards to both independent and dependent variables. This would allow for a better estimation of the usefulness of induction, and hopefully lead to valuable insights about how to make the transition from higher education to employment easier for teachers. Making the transition easier will likely improve teacher retention, work engagement, classroom practices, and student achievements.

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