HEAD, HEART OR HANDS: HOW DO EMPLOYEES RESPOND TO A RADICAL GLOBAL LANGUAGE CHANGE OVER TIME?

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**HEAD, HEART OR HANDS: HOW DO EMPLOYEES RESPOND TO A RADICAL GLOBAL LANGUAGE CHANGE OVER TIME?**

To understand how recipients respond to radical change over time across cognitive, affective, and behavioral dimensions, we conducted a longitudinal study of a mandated language change at a Chilean subsidiary of a large U.S. multinational organization. The engineering focused subsidiary aiming to facilitate cross-border interactions embedded language acquisition experts to transition all employees from Spanish to English full-time. We gathered survey data and objective fluency scores from the language change recipients at five points over a period of two years. Using variable and person-centered exploratory analyses, our results suggest that recipients’ negative *affective* responses to the language change precede their *cognitive* responses or self-efficacy, predicting their current language learning. Further, we find that recipients’ cognitive and affective responses over time differentially influence two future behavioral outcomes: intention to leave the organization and willingness to adopt the change. While cognitive rather than affective responses over time drive recipients’ intentions to leave, affective responses influence recipients’ willingness to adopt English. Finally, we show that change recipients followed three trajectories of cognitive responses and two trajectories of affective responses over time. We discuss theoretical and practical implications to the literature on organizational change, emotions, and language in global organizations.

*Key words:* radical organizational change, language, turnover intention, adoption, emotions, latent class growth modeling

Radical change is integral to organizational life when firms globalize. Examples of radical change that motivate significant shifts in organizations include mergers, acquisitions, and technological disruptions. Radical change refers to “a qualitative alteration of an organization’s rules of organizing—the fundamental rules that members use to interact cognitively and behaviorally with the world around them” (Huy 2002: 31). One increasingly common form of radical change is replacing the native language of an organization’s home country with a relatively unknown *lingua franca* (common language), usually English. In fact, approximately 52% of global organizations have stipulated that a new corporate language facilitate global collaboration among their multilingual employees (Harzing and Pudelko 2013). Altering the language in which employees operate is a fundamental change because language affects every single aspect of workplace execution, from people’s sense of professional competence (Neeley 2013), task execution (Neeley and Dumas 2016), and social hierarchies (Vaara et al. 2005), to emotions and identity (Bordia and Bordia 2015, Reiche et al. 2015). Taken together, a language change can profoundly impact employees’ cognitive, affective, and behavioral experiences in the global workplace.

Organizational change scholars posit that individuals’ cognitive, affective and behavioral reactions to change are distinct, with little examination of their potential interrelationships (Oreg et al. 2011, Piderit 2000, Rafferty et al. 2013). A growing body of research has examined predictors and outcomes of various cognitive (e.g., Fugate and Soenen 2018, Martin et al. 2005), affective (e.g., Beaudry and Pinsonneault 2010, Huy et al. 2014) and behavioral (e.g., Kim et al. 2011, Shin et al. 2012) responses to organizational change. Language change studies have similarly examined employees’ cognitive, affective, and behavioral responses (e.g., Neeley 2013, Neeley and Dumas 2016, Vaara et al. 2005). The majority of research to date, however, either captures responses to organizational change at a single time point (e.g., Beaudry and Pinsonneault 2010, Martin et al. 2005, Neeley 2013) or, in the case of longitudinal studies, is limited to behavioral (e.g., Kim et al. 2011) or affective (e.g., Huy 2002, Vaara et al. 2005) responses. As a result, we know little about how, and with what consequences, employees’ cognitive, affective and behavioral responses interrelate over the course of a radical change mandate. Further, existing research shows that cognitions and emotions are neither monolithic initially nor do they evolve uniformly (Neeley 2013).

Our field study explores the responses over a two-year period of subsidiary employees to a mandated language change in a global organization. Specifically, we followed a Chilean subsidiary, ChileCo (*pseudonym)* of a U.S. based company. To augment its client base beyond Chile and facilitate cross-border interactions, the subsidiary mandated that all employees change their working language from Spanish to English. Because the language change was considered critical for performance success, the company hired full-time language acquisition experts for two years to provide daily language training and application activities. These experts recorded and provided us with detailed accounts of their instruction, as well as the employees’ progress, attitudes, and behaviors. In addition, we gathered self-report survey data from the change recipients, including an assessment of their English language self-efficacy and negative affective states, at five time points.

By employing both variable and person-centered approaches to data analysis, we make several contributions to the literature. First, in comparing cognitive and affective mechanisms that impact learning behaviors in a radical change context, our approach expands existing research by testing competing causal sequences of cognitive and affective responses to a radical change. Contrary to assumptions of appraisal theory (Lazarus 1991, Oreg et al. 2018, Rafferty et al. 2013), our data suggest that affective responses precede cognitive reactions to change. Drawing on emotional theories such as differential emotions theory (Izard 2007) or affective events theory (Weiss and Cropanzano 1996) can enhance our understanding of the interplay between cognition and affect during the course of a radical change. Second, we provide an analysis of change recipients’ distinct responses to radical organizational change over multiple time points. Although previous studies use repeated measurement designs (e.g., Kim et al. 2011, Shin et al. 2012), this work primarily adopts variable-centered analytical approaches that rarely trace how individual change recipients’ responses evolve over time. Consequently, analysis of intra-individual change remains limited (Kunisch et al. 2017, Oreg et al. 2011). Studies that analyze temporal data as trajectories (e.g., Bala and Venkatesh 2013, Ng and Lucianetti 2016) often draw on latent growth modeling methods, which force all data onto a common trajectory. While this approach has advanced scholarship in important ways, we know very little about how different trajectories develop. Third, we contribute to the emotions literature that largely focuses on the benefits of *positive* affect (e.g., Barsade and O’Neill 2014) and the counterproductive effects of *negative* emotions (e.g., Maitlis and Ozcelik 2004) by demonstrating that low levels of *negative* affect can positively influence the adoption of change. Fourth, we develop and test theory about language in global organizations as a context for radical organizational change. While previous research has examined the effects of language differences across heterogeneous groups of native and non-native speakers (Hinds et al. 2014, Reiche et al., 2015, Tenzer and Pudelko 2017), we conceptualize language mandates as consequential radical change that influences within-group cognitive, affective, and behavioral responses of non-native speakers. We draw from and build upon research showing that people appraise their language fluency relative to their peers (Tenzer et al. 2014). We also provide longitudinal insights into the language acquisition and adoption process of a homogenous group of non-native speakers.

Our study also speaks to managerial practice. Paying attention to emotional reactions to a radical change might reveal insights into people’s willingness to adopt change. Similarly, surveying cognitive perceptions to a radical change might inform people’s thoughts about leaving the organization. Finally, information about individuals’ trajectories could potentially enable managers to formulate person-specific prognoses for future development.

**THEORY AND HYPOTHESES**

The prevailing research on radical organizational change has focused on cognitive, affective, and behavioral responses to change as distinct dimensions (Oreg et al. 2011, Piderit 2000). The cognitive dimension defines people’s mental appraisal of a given change. People’s experience and adoption of a new language change is influenced by their subjective assessment of their fluency (Neeley 2013)—a form of self-efficacy. Scholars define self-efficacy as a perceived ability and confidence for handling change and achieving adequate job functioning in the new context (Martin et al. 2005, Oreg et al. 2011). Accordingly, we expect that individuals will vary in their level of *English* *language self-efficacy*. The affective dimension of a change reflects people’s emotional reactions. Evidence suggests that language change elicits negative emotional responses (Hinds et al. 2014, Neeley 2013, Neeley and Dumas 2016), characterized as distress and unpleasant engagement, such as anger, resentment, guilt, fear, and nervousness. Correspondingly, we assume that individuals will differ in their *negative affect towards English*.

In addition, we assess *current* and *future* behavioral responses to change. Current behavioral responses trace participation in change such as level of compliance (Fugate and Soenen 2018) while future responses anticipate behavioral intentions such as wanting to leave the organization altogether (Rafferty and Griffin 2006). Substituting to an unknown working language (e.g., English) is an all-encompassing and demanding shift for change recipients, which requires them to actively engage in *language learning* in order to communicate effectively at work. In line with the change literature (Oreg et al. 2011, Rafferty et al. 2013), we suggest that the adoption of and possible exit from a radical change reflect two anticipatory or future behavioral outcomes. We consider both employees’ adoption willingness, which we conceptualize as a general *willingness to communicate in English* (McCroskey and Richmond 1987), and employees’ willingness to leave the organization, which we conceptualize as their *turnover intentions* (Kelloway et al. 1999). Taken together, we theorize about how cognitive, affective, and behavioral responses to radical organizational change (1) interrelate and (2) evolve over time. In our first two hypotheses, we examine the causal sequence of cognitions and affect in predicting current behavior—English language learning. In Hypotheses 3-4, we develop predictions about the differential effects of membership in cognitive and affective trajectories over time for two future behavioral outcomes: willingness to adopt change and turnover intentions.

Although the literature has largely separated cognition and emotion for analytical purposes, we follow Lazarus’ (1991) acknowledgement that their relationship is interdependent and bidirectional. We therefore propose two competing hypotheses that account for the sequence of cognition and emotion in predicting English language learning. Scholars who examine the link between cognitive and affective responses typically assume that cognition precedes emotion (e.g., Fugate and Soenen 2018, Oreg et al. 2018), consistent with appraisal theory (Frijda 1986, Lazarus 1991). Appraisal theory predicts two paths. First, change recipients will assess a new event’s relevance and its consequences for their goals, including how a language change may impact their work interactions. Second, recipients will evaluate whether they have the adequate resources to cope with the language change. Therefore, sustained training from language experts should lead individuals to positively appraise their English language self-efficacy. Such perceptions will, in turn, evoke an affective response (Frijda 1986, Lazarus 1991). Specifically, to the extent that recipients perceive they possess higher levels of English language self-efficacy, their negative affect towards the language change will diminish. Appraisal theory also suggests that affective reactions ultimately evoke a behavioral response (Huy 2002, Oreg et al. 2018), such as actively engaging in English language learning. We would therefore expect that recipients’ English language self-efficacy predicts their English language learning by reducing their negative affect towards English. In line with appraisal theory, we propose the following causal sequence:

*Hypothesis 1: Change recipients’ negative affect towards English will mediate the positive relationship between their English language self-efficacy and their English language learning.*

At the same time, there are also reasons to believe that cognition may follow affect. Several theoretical arguments support the notion that affective responses may precede cognitive responses. Ample evidence suggests that when individuals are confronted with non-cognitive stimuli for eliciting their emotions, their responses will be cognitive in nature (Izard 1993, Parrott 2002). For example, differential emotions theory (Izard 2007) holds that emotions serve to differentially organize, motivate, and regulate cognitive responses to contextual stimuli. That is, emotional incidents at work, whether positive or negative in nature, can have a lasting impact on employees’ cognitive attitudes and related behaviors (Weiss and Cropanzano 1996). Accordingly, we would expect that language change, which can evoke negative affective reactions (e.g., Neeley 2013, Neeley and Dumas 2016) should reduce recipients’ cognitive perceptions of their English language self-efficacy, in turn leading them to engage less in English language learning.orgrtalf﷽﷽e emotional consequences of change, both in the organziatioanl searched!ller as skill development progresses, individuationalf We therefore propose the following alternative hypothesis:

*Hypothesis 2: Change recipients’ English language self-efficacy will mediate the negative relationship between their negative affect towards English and their English language learning.*

Hypotheses 1 and 2 predict the causal interrelation of cognitive and affective responses to a language change. Because continuous training and experience increase language competence over time, understanding the long-term impact of change recipients’ initial responses is also crucial (Balogun et al. 2015). In a qualitative study Neeley (2013) found that individuals following a language change could be categorized into low, medium, and high levels of language self-efficacy. However, we know little about how these categories (or classes in latent class growth modeling terminology, terms used interchangeably hereafter) evolve, nor how these ongoing assessments translate into future outcomes. Drawing on related research (e.g., Solinger et al. 2013), we expect that over time the initial categories lead to different groups of individual trajectories that share a specific temporal pathway (Jung and Wickrama 2008). We further assume that, rather than the initial responses, the experience of a particular temporal pathway relative to another differentially affects relevant organizational outcomes. In the following, we theorize about how individuals’ experience in different trajectories of English language self-efficacy and negative affect towards English over time influences two change-related behavioral intentions: turnover intentions and willingness to communicate in English.

The literature suggests that individuals assess their language fluency relative to their peers (Tenzer et al. 2014), and this can shape their change-related behavioral intentions. We assume that individuals will not significantly differ in their willingness to communicate in English at the conclusion of the training depending on the self-efficacy trajectory they are in, because it is likely that they all develop a broader set of language capabilities to navigate different communication contexts as a result of the sustained training (Freed et al. 2004). This is especially the case when language training can address individual differences in learning needs as we observed in our study.

By contrast, we expect that change recipients in a higher English language self-efficacy trajectory reveal higher intentions to leave the organization compared to their colleagues in a lower English language self-efficacy trajectory. Two theoretical mechanisms support our prediction. First, individuals will assess the likelihood that they can perform their work relative to their colleagues (Lazarus 1991). Over the course of the language change, those in a higher English language self-efficacy trajectory will likely perceive working with colleagues in a lower trajectory of English language self-efficacy as too challenging. In related research, Tenzer et al. (2014) showed that individuals attributed lower dependability and lower task competence to colleagues with relatively lower language proficiency, which reduced perceptions of trustworthiness. As a consequence, employees may be concerned about future collaborations and the ability to accomplish work tasks in a new language. Previous research holds that employees who have heightened workload expectations have higher stress and frustration (Mishra and Spreitzer 1998). Similarly, employees in a higher trajectory may be concerned about carrying a greater workload given the increasing demands for English interactions that they are relatively more equipped to perform. Moreover, higher trajectory employees are likely to contemplate avoiding the workload hike by leaving the firm because of their increased employability as advanced English speakers. Taken together, those in a trajectory of higher English language self-efficacy may be more concerned about the impact of the language change to their work requirements, leading to higher turnover intentions.

The second mechanism relates to the effects of sustained training of the language. Low change self-efficacy that is commonly associated with higher turnover intentions due to job insecurity (Bandura and Adams 1977, Bandura and Schunk 1981) will likely be offset by sustained training and the positive organizational signals this entails. Similarly, the more time and effort individuals invest in language learning, the more should their commitment to the organization (Staw 1981) and willingness to stay rise. Yet, those in a high self-efficacy trajectory may perceive their initial language advantage and corresponding self-efficacy decline as colleagues in a lower self-efficacy trajectory gain language fluency. Such a decline corresponds to research that has identified perception of status loss relative to lower category members (Neeley 2013). Consequently, it is likely that perceived diminution of status can increase intentions to leave the organization. Also, those in a higher English language self-efficacy trajectory may perceive themselves as more employable in the external labor market, where English fluency is a desired competence (Neeley 2017), especially in contexts with increased foreign direct investment. Taken together, we propose the following:

*Hypothesis 3: Change recipients in a higher trajectory of English language self-efficacy should have higher turnover intentions due to sustained language training compared to those in a lower trajectory.*

Scholars have highlighted that individuals’ decisions to adopt a foreign working language are influenced by negative emotional responses such as anxiety or perceived threat (Bordia and Bordia 2015, Vaara et al. 2005). However, recent research provides increasing evidence why negative emotions can generate functional rather than dysfunctional outcomes for the organization (Lebel 2017). For example, feeling dejected, depressed, or hopeless may positively relate to proactive goal regulation, a form of proactive behavior (Bindl et al. 2012). Negative affect can signal that the present situation needs changing (Carver and Scheier 1990), which may stimulate intentions to reduce the negative emotions (Baumeister et al. 2007). Negative emotions may also trigger a reframing of the negative-affect inducing event, and thus serve to regulate emotions (Gross 2008). Such reframing is more likely to occur if individuals have information, support, or other resources to reinterpret meaning and actively counter the psychological stress (Lebel 2017). Building on these findings, it is plausible that negative affect might promote adoption of the change, rather than a flight response from the organization.

We further predict that individuals in a lower trajectory of negative affect towards English (i.e., individuals who experience less negative emotions over time) will have a higher willingness to communicate in English given sustained language training compared to those in a higher negative affect trajectory for two reasons. First, the benefits of negative affect-reducing interventions, such as sustained language training, are likely weaker among individuals with high negative affect. For example, evidence suggests that individuals with high levels of negative affect are more resistant to positive affect stimuli in their judgments of job satisfaction compared to those low in negative affect (Brief et al. 1995). Second, individuals in a low negative affect trajectory should perceive fewer inhibitions to communicate in English because they will evaluate their difficulties to communicate in English as comparatively lower. Therefore, we propose:

*Hypothesis 4: Change recipients in a lower trajectory of negative affect towards English should have a higher willingness to communicate in English due to sustained language training compared to those in a higher trajectory.*

**METHOD**

To examine our hypotheses, we conducted our study at ChileCo, a division of a multinational organization. Founded in 1995, ChileCo grew to provide products and services to Chile’s metallurgic, mining, forestry, and transportation sectors, selling almost half of the high-current rectifiers used in the Chilean mining industry. ChileCo changed its working language from Spanish to English in order to: (1) be in step with the multinational organization’s move to an English common language to facilitate global business; (2) attract and serve non-Spanish speaking global customers that would expand ChileCo’s customer base outside of Chile (a need employees were well aware of); and, (3) standardize and facilitate communication with the U.S. headquarters. Employees could not opt out of the radical change; their participation was pivotal for the success of the company-wide language conversion.

**Sample and Data Sources**

To test our hypotheses, we collected data from all 60 ChileCo employees at five points in time over the course of two years. The ChileCo CEO hired three language acquisition experts to immerse every employee in the English language with the goal of unanimous working proficiency within the two-year period. A baseline assessment of the employees’ English competence with four testing tools, including an intake evaluation, a diagnostic test that targeted grammar, an employee self-assessment, and a standardized test, was collected. The diagnostic grammar test was then repeated four more times and, as detailed below, served as our measure of English language learning. Based on the baseline assessment results, the experts scheduled a preparatory module of 36 hours of language training for beginners, and three hours of regular weekly classes for all employees, creating twelve groups of employees of three to five people each. English language training during work hours gradually increased to a total of 25 hours per week halfway into the second year. Extracurricular activities were used as positive reinforcements to learn and practice English.

The language experts at ChileCo documented employees’ language learning experiences and responses through weekly open-ended memos they shared with us. The memos covered various teaching strategies, activities, and corresponding employee responses. For example, memos revealed an initial strategy to track vocabulary use in each department to ensure targeted content and instruction; highlighted informal activities such as dinners, movies, or karaoke nights held in English; and showed iterative progression in refining best practice strategies. The experts were proactive in translating new documents, labelling items or project folders with the English translation, conducting workshops to build functional vocabulary, and observing meetings and conference calls to further catalogue relevant material. The memos also demonstrated the experts’ increasing presence as they sat among employees, rotated departments, or rearranged seating to place those with stronger English language skills or more participation in close proximity to those with weaker skills or less participation. The experts took progressive steps to immerse company life in English. They created departmental glossaries for employees’ daily use—invoices, purchase orders, balance sheets, quality control documents, and engineering plans were all posted on ChileCo’s intranet. Within six months internal e-mail communication was transitioned to English only; after approximately a year, the experts helped employees conduct intracompany presentations and hold weekly meetings in English.

Our analysis of language experts’ memos portrayed cognitive, affective, and behavioral responses from employees. Cognitive responses included rationalizing a behavior, such as transitioning back to Spanish from English due to concerns that others would not be able to follow. We found ample evidence of negative affect prevalent during the change initiative. One memo noted that employees expressed dissatisfaction, anger, frustration, and fear of making mistakes as people attempted to get the job done while also learning English. Another group of employees with comparatively low English fluency participated in a highly technical quality control meeting with several native English-speaking U.S. counterparts, which resulted in communication failures and a disheartened feeling. Behavioral responses included engineers tracking their English language usage to increase awareness and use English more regularly.

In addition to data gathered from the language experts, we collected survey data from employees at five times during a two-year period. We tested our hypotheses on the effects of the English language self-efficacy and negative affect trajectories with the full sample of 60. We relied on 40 out of 60 surveys for our variable-centered mediation analysis because we did not have the five surveys for all 60 division members. Seven people responded four times, six people three times, five people twice, and the remaining two individuals only once. The respondent attrition is mainly due to nine employees leaving the company before the end of the two-year period. No employee left the company between the decision to change the language and the arrival of the language experts. Note that our results for the test of Hypotheses 3-4 do not change when using the smaller sample of 40.

**Measures**

Over the two years, we collected five standardized diagnostic tests of English language learning provided by the language experts, and five self-report surveys from employees, in English and Spanish. Our measurement intervals were unequally spaced because data collection was occasion-specific (Vermunt 2010), following training interventions or curriculum changes. Other studies have similarly used occasion-specific measurement points that are unequally spaced (e.g., Morin et al. 2011). Because the language experts recommended postponing surveys until sometime after employees had settled into their learning routines in order to avoid overburdening them, we conducted the first of five self-report surveys five months after the experts’ first diagnostic test. The remaining four survey data collection points then followed the experts’ diagnostic tests.

*Independent variables.* To measure employees’ *English language self-efficacy* we used Takeuchi, Yun and Russell’s (2002) five-item measure that assessed respondents’ level of confidence in writing, reading and understanding, speaking, listening to, and general use of English. An example item is “I feel confident using English in general” (1 = *Not true at all*, 7 = *Very true*). All five items were averaged to form a scale score, with reliabilities ranging from *α* = .88 to *α* = .90 over the five time periods. We also tested for measurement invariance across time. A principal component analysis showed that all five items loaded on a single factor at each of the five time points (*χ2*(10) = 143.08 to *χ2*(10) = 196.11). In line with our conceptualizations, we measured employees’ negative affective state towards English, drawing from Watson et al.’s (1988) Positive and Negative Affect Schedule (PANAS). Accordingly, we asked respondents to indicate the extent to which they *generally feel [add negative affect item] when thinking about English as the new company language*. To maximize response rate for five separate survey requests, we followed other research (e.g., Barsade and O’Neill 2014) that employs a shortened version of the PANAS, measuring five negative affect items (distressed, hostile, ashamed, nervous, and afraid; 1 = *Not at all*, 7 = *Very much*), which were representative of each of the co-varying item groups in the PANAS (Crawford and Henry 2004). We averaged the five items to form a scale score, with reliabilities ranging from *α* = .80 to *α* = .91 over the five time periods. Measurement invariance tests revealed that the five items loaded on a single factor at each of the five time points (*χ2*(10) = 77.83 to *χ2*(10) = 141.85) except for Time 1. However, since the second factor at Time 1 has an Eigenvalue of 1.06 and is therefore close to the cut-off value of 1, we conclude that measurement invariance over time is not a substantial issue for this variable.

*Dependent variables.* To measure employees’ *English language learning*, we drew on a diagnostic measure that the language experts developed and validated with over 1,000 Chilean English learners. The oral measure tests speaking and listening skills of English as a foreign language for adult professionals. The assessment is in a question-and-answer format to provide the information necessary to describe the current English level (differentiated into ten proficiency levels), and ranges from 0 to 100. Specifically, the measure has a mix of (1) simple questions which students are asked to answer in a full sentence (example of English proficiency level-2 question: “What time do you start work?”), and (2) more open-ended questions that elicit longer, more elaborated responses (examples of English proficiency level-2 question: “What are you currently working on? Are there other people working with you on this?*”*). While the former questions test major instructional grammar points, the open-ended questions enabled experts to observe fluency, grammatical consistency, and the capacity for more complex responses.

In line with the objectives of the broader organizational change at ChileCo and the extended language training, we measured individuals’ *willingness to communicate in English* at Time 5. We used a 20-item willingness to communicate scale (McCroskey 1992, McCroskey and Richmond 1987) and slightly modified the instruction of the original scale such that it asked respondents to think of 20 situations in which a person might choose to communicate or not to communicate *in English* (0 = *Never* to 100 = *Always*). An example item is “Present a talk to a group of acquaintances.” We averaged the 20 items to form a scale score (*α* = .98). *Turnover intentions* was measured at Time 5 with a four-item measure modified from Kelloway et al. (1999). A sample item is “To what extent do you intend to ask people about new job opportunities?” (0 = *Not at all* to 7 = *Very much*). We averaged the four items to form a scale score (*α* = .96).

*Covariates.* We controlled for five time-invariant covariates. Specifically, we accounted for whether an individual spoke languages other than English prior to the language change at ChileCo (0 = *No*, 1 = *Yes*), because learning a foreign language helps to develop mental models that are beneficial to further language learning (McLaughlin and Nayak 1989). Further, we controlled for gender (1 = *Male*, 2 = *Female*), age (in years) and educational level (1 = *High school*, 2 = *Bachelor’s degree (university or college)*, 3 = *Master’s or graduate-level degree*, 4 = *Doctoral degree*). We also controlled for job function. As the vast majority of non-managerial employees worked as engineers in what was a flat organization, we accounted for whether the individual was a manager or not (0 = *No*, 1 = *Yes*).

**Analytical Strategy**

To assess the causal interrelation of the effect of cognitions and emotions on individuals’ English language learning, we conducted a series of mediation analyses. Specifically, since we collected data at five points in time, there are ten possible combinations of mediated relationships between English language self-efficacy and negative affect towards English in predicting English language learning for each of the two competing causal sequences. We conducted the mediation analyses using STATA 15.0. To examine the significance of each mediation effect, we calculated the indirect effects for the relationship between the independent variable and the dependent variable through the respective mediator by utilizing bootstrapping procedures (Shrout and Bolger 2002). Specifically, we constructed a bias-corrected 95% confidence interval for the indirect effect, drawing 5,000 random samples with replacement from the sample. According to this methodology, mediation is present when the confidence interval does not contain zero.

To assess (1) how individuals’ English language self-efficacy and their negative affect towards English evolve over time and (2) relate to their willingness to communicate and turnover intentions, we analyzed our longitudinal data through latent class growth modeling (LCGM, Andruff et al. 2009, Nagin 2005). LCGM is a statistical approach that enables researchers to identify distinct subgroups (or so-called latent classes) of individuals that follow different development trajectories over time on a given variable. An important assumption of LCGM is that all individuals who form part of the same latent class follow the same development trajectory (i.e., no within-group variation), an acceptable approach given that individual differences are reflected by multiple trajectories included in the model. We conducted all LCGM analyses with the software package Mplus 7 (Muthén and Muthén 2012). Mplus uses a robust full-information maximum likelihood algorithm to account for missing data (Little and Rubin 2002). As MPlus does not allow for missing data on exogenous variables, in a couple of instances we verified missing data on our covariates through company sources.

In a first step, LCGM requires the researcher to specify the order of the polynomial. We estimated a quadratic polynomial function, which is acceptable for variables measured at more than three time points (Andruff et al. 2009). To account for the unequal spacing of our measurement intervals, we specified the appropriate factor loadings for the intercept and growth factors according to the unequal time intervals (in months) of our data collection points. Second, as is customary in LCGM, we determined the number of classes by comparing the relative performance of the one to five-group solutions. As latent class growth models may entail convergence to local, suboptimal solutions, we followed Jung and Wickrama (2008) to estimate each model (i.e., for each of our two independent variables) 100 times with different random starting values, and then corroborated that the estimates were replicated by comparing the order of best log likelihood values across different starting values. All of our final models converged on a replicated solution and can confidently be assumed to reflect ‘real’ maximum likelihood.

Consistent with recommendations in the literature (Nylund et al. 2007), we tested the relative performance of the models by finding the model with (1) the smallest Bayesian information criteria (BIC, see Schwartz 1978), (2) a significant Lo, Mendell and Rubin (2001) likelihood ratio test (LMR), and (3) a significant bootstrap likelihood ratio test (BLRT, see McLachlan and Peel 2000). The BLRT uses a resampling-based likelihood ratio test (100 bootstrap samples were drawn for each model) to compare an *n*-class model with an *n*–1-class model. A statistically significant BLRT suggests retaining the model with *n* classes. To assess the classification accuracy of the final solution, we also substantively interpreted the development trajectories, checked for the absence of small latent classes (i.e., ≤ 5 individuals), and ensured the final solution had a high entropy value and high posterior probabilities (Jung and Wickrama 2008, Nagin 2005, Solinger et al. 2013).

Upon choosing the final unconditional model, time-invariant predictors were incorporated to assess the construct validity of the extracted latent classes in relation to theoretically meaningful covariates (Morin et al. 2011). Direct inclusion of predictors is thought to lead to more accurate classifications (Lubke and Muthén 2007). Construct validity of the extracted latent classes can be assumed if the inclusion of predictors does not change the substantive interpretation of the latent classes. Note that this is a more stringent test of classification accuracy and extends other recent LCGM studies in the management field (e.g., Solinger et al. 2013). We estimated a conditional model in which predictors were first allowed to predict class membership through a multinomial logistic regression, and were then allowed to also predict the intercept and different growth factors. These models were compared based on the fit indices and likelihood ratio tests (LRTs), which are computed as minus two times the difference in the log likelihood of the nested models and are interpreted as chi-square with degrees of freedom equal to the difference in free parameters between both models (Morin et al. 2011).[[1]](#footnote-1)

By contrast, we did not incorporate our outcome variables of interest directly into the model as doing so would allow them to affect the nature of the latent classes. We used the BCH approach in MPlus (Bakk and Vermunt 2016), which estimates an ANOVA model with observed variables and relies on Wald chi-square tests to assess the equality of class-specific means. An advantage of the BCH approach is that it uses robust standard errors, which corrects for all kinds of misspecifications, allows controlling for covariates, and is recommended for continuous outcomes (Asparouhov and Muthén 2014).

Finally, given the study’s limited sample size, especially for our mediation analyses, we report p-curve analysis as a diagnostic of evidential value (Simonsohn et al. 2015). P-curve is the distribution of statistically significant p-values for a set of significance tests (p < .05). Since only true effects are expected to generate right-skewed p-curves—i.e. involving more low (.01s) than high (.04s) significant p-values—only right-skewed p-curves suggest evidential value (Simonsohn et al. 2014).

**RESULTS**

**Mediation Analyses**

As noted, to test Hypotheses 1 and 2, we adopted a variable-centered approach and conducted a series of mediated regression analyses. In our analyses, we excluded control variables that were uncorrelated with the endogenous variables in our study. Doing so avoids potential spurious effects that controls may have when they are significantly related to the predictor, but not the criterion variables (i.e., we decrease Type I error), and we do not unnecessarily reduce our statistical power (Becker 2005). Table 1 presents the standard deviations, means, and correlations between all variables in our study. Table 2 reports the indirect effects for all possible combinations of mediated relationships across the five time points of data collection, separated for our two competing hypotheses. Table 2 reveals that in none of the ten combinations does negative affect towards English significantly mediate the relationship between English language self-efficacy and English language learning. This leads us to reject Hypothesis 1.

By contrast, in eight of the ten combinations English language self-efficacy significantly and negatively mediates the relationship between negative affect towards English and English language learning. In addition, we analyzed our test statistics using the p-curve app v4.06 (http://www.p-curve.com/app4/). The p-value distribution is shown in Appendix 1. According to Simonsohn and his colleagues (2015: 1151) a “set of tests is said to contain evidential value if either the half p-curve has a p < .05 right skew, or both the full and half p-curves have p < .10 right-skew tests.” In our study, of the eight significant p-values, seven were below .025, a frequency significantly different to the four expected under the null hypothesis (one-tailed binomial test, p = .035). Binomial tests compare the observed proportion of significant results that are p < .025 (in our case: 88%) to the expected proportions when there is no effect (50%), and when studies have only 1/3 power (71%). Further, the continuous test with the Stouffer method shows that both the full p-curve (Z = -2.18, p = .015) and the half p-curve (Z = -1.31, p = .095) are significant at p < .10. The p-curve approach also gives a power estimate. The power of our indirect effect tests is 39% (90% confidence interval: 8%; 76%), leading us to reject the null hypothesis of 33% power. Taken together, our results support Hypothesis 2. Despite meeting Simonsohn et al.’s (2015) cutoffs, we acknowledge that the strength of our empirical evidence is limited.

-Insert Tables 1 and 2 about here-

**Latent Class Growth Modeling Analyses**

To test the remaining hypotheses, we disaggregated our data set and adopted a person-centered approach. For our two independent variables (English language self-efficacy, and negative affect towards English) we determined the number of latent classes using the above-mentioned fit indices. Table 3 indicates a three-class solution for English language self-efficacy, given this model has the lowest BIC, is the only model with a significant LMR, and has the highest entropy value. In addition, Table 3 indicates a two-class solution for negative affect, as this model has the lowest BIC, is the only model with a significant LMR, and has the highest entropy value. Further, for both variables the posterior probabilities were highest in the case of the final solution. The estimated patterns and shapes of the latent classes for both variables are shown in Figures 1-2.

-Insert Table 3 and Figures 1-2 about here-

Regarding English language self-efficacy, the three classes reflect low (N=13), medium (N=32) and high (N=15) language self-efficacy (see Table 4). While all three classes show a linear increase over time, the low self-efficacy (t2 = -.004, p = .026) and high self-efficacy (t2 = -.004, p = .037) classes also include a significant negative second-order term, with the negative second-order term for the medium self-efficacy class being marginally significant (t2 = -.003, p = .075). This suggests that the growth of English language self-efficacy slows over time. Figure 1 even points to a slight decline in the level of English language self-efficacy for all three classes in later time periods. Further, we find a low negative affect class (N=38; t = .06, p = .068) and a high negative affect class (N=22; t = .09, p = .079), both of which show a marginally significant linear increase over the five time periods. We then saved the class memberships for our two constructs as distinct variables to compute correlations (Jung and Wickrama 2008). Negative affect class membership correlates negatively with English language self-efficacy (*r* = -.46), indicating that individuals in the high negative affect class are more likely in a low self-efficacy class.

-Insert Table 4 about here-

To ensure the extracted latent classes reflect significant subgroups of individuals, we assessed their construct validity in relation to theoretically meaningful covariates. As a result, we estimated a conditional model in which our five covariates (languages other than English spoken, age, gender, educational level, being a manager) were allowed to first predict class membership, and then to predict the intercept and different growth factors. These analyses are reported in italics in Table 3. Specifically, for English language self-efficacy, allowing the predictors to influence class membership did not significantly improve model fit (*∆*= -14.20, *∆df*=10, *p* > .05), whereas allowing them to influence the intercept and growth factors did (*∆*= -39.72, *∆df*=15, *p* < .01). For negative affect towards English, neither allowing the predictors to influence class membership (*∆*= -9.86, *∆df*=5, *p* > .05), nor allowing them to influence the intercept and growth factors (*∆*= -19.05, *∆df*=15, *p* > .05) significantly improved model fit. Overall, the inclusion of these predictors did not result in any form of qualitative modification of the latent trajectories for either variable of interest, supporting the validity of our LCGM analyses.

The upper half of Table 5 reports the specific predictions of class membership, whereas the lower half of Table 5 reports the predictions for the intercept and growth factors. The results suggest that the predictors present meaningfully differentiated patterns of associations with the latent classes, intercepts and growth factors. The strong effect of other languages for self-efficacy class membership is explained by the fact that only respondents in the high self-efficacy class spoke other languages prior to the language change. Similarly, being a manager significantly decreased the intercept of the self-efficacy trajectories (*b* = -.72, *SE* = .22, *p* = .001) and significantly increased the intercept of the negative affect trajectories (*b* = .67, *SE* = .18, *p* = .000), possibly reflecting the increased pressure managers perceived as a result of the language change.

In a final step, we tested relationships between the latent trajectories of our two independent variables and our two outcome variables: willingness to communicate in English and turnover intentions. To do so, we relied on the BCH approach in MPlus (Bakk and Vermunt 2016), which allows us to account for the results from our previous covariate analyses. These results are reported in Table 6.

-Insert Tables 5 and 6 about here-

Hypothesis 3 predicted that change recipients in a higher English language self-efficacy trajectory should have higher turnover intentions compared to those in a lower English language self-efficacy trajectory. Table 6 indeed shows that respondents in the high English language self-efficacy trajectory reported significantly higher turnover intentions compared to those in the low English language self-efficacy trajectory (*χ2* = 4.03, *p* = .045), but not compared to those in the medium English language self-efficacy trajectory (*χ2* = 1.76, *p* = .185). This supports Hypothesis 3. Further, Hypothesis 4 predicted that change recipients in a low negative affect trajectory should have a higher willingness to communicate in English compared to those in a higher negative affect trajectory. As shown in Table 6, the results (*χ2* = 8.64, *p* = .003) provide support for Hypothesis 4. In addition, we ran analyses for *positive* affect towards English, which also produced a high and low trajectory over time. Results suggest that change recipients in a high positive affect trajectory (*Mean* = 35.12, *SE* = 6.11) reported a higher willingness to communicate in English compared to those in a low positive affect trajectory (*Mean* = 23.00, *SE* = 4.91) although the difference is not significant (*χ2* = 2.18, *p* = .140). Further, individuals in a low positive affect trajectory (*Mean* = 4.59, *SE* = .36) and those in a high positive affect trajectory (*Mean* = 4.48, *SE* = .39) did not differ significantly in their turnover intentions (*χ2* = .04, *p* = .844). Taken together, these results point in the same direction but also suggest that low negative affect towards English plays a more prominent role than high positive affect towards English.

**DISCUSSION**

This exploratory study generated several insights into how recipients’ cognitive, affective and behavioral responses to a radical change are causally interrelated, evolve over time and, in turn, have distinct effects on relevant work-related outcomes. Specifically, our longitudinal study of a radical change provides a glimpse into change recipients’ evolving reactions to and impact of the change, albeit in a limited sample size. Previous research on organizational change in general (e.g., Beaudry and Pinsonneault 2010, Kim et al. 2011) and language change in particular (e.g., Neeley 2013, Neeley and Dumas, 2016) has mainly occurred *after* the change was initiated. Tracking the efforts of employees over a two-year period allowed us to closely examine the differential effects of sustained language training across individuals in an entire business unit over time, thereby making several theoretical contributions to understanding the nature of change recipients’ responses to a radical organizational change.

**Theoretical Contributions**

Our first contribution provides some insights into the causal sequence of cognitive and affective reactions to radical organizational change. In particular, employees’ affective responses to change had received limited attention, as reflected in several recent calls for further research in this area (Kunisch et al. 2017, Rafferty et al. 2013). In contrast to studies that assume cognitive evaluations of a change event precede recipients’ affective reactions (Beaudry and Pinsonneault 2010, Oreg et al. 2018), we find some evidence that suggests the opposite causal order in predicting learning behaviors. Our findings indicate that a radical change, such as substituting a non-native common language for a native language, evokes negative affective reactions. This leads to cognitive appraisals of one’s change self-efficacy and in turn influences learning behaviors. Future studies on larger sample sizes would allow to test if these results are robust. From a theoretical perspective, research on radical organizational change can complement the current focus on appraisal theory (Frijda 1986, Lazarus 1991) with theories on emotions such as differential emotions theory (Izard 2007) or affective events theory (Weiss and Cropanzano 1996) to sharpen insights into the interplay between cognition and affect.

Relatedly, we contribute to the growing literature on emotions and organizational change. Our findings reveal that individuals in the low negative affect trajectory have a higher mean of willingness to communicate in English than their high negative affect counterparts. Interestingly, the low negative affect trajectory has a higher mean of willingness to communicate in English than any of the English language self-efficacy trajectories. We thus complement the majority of the emotions literature that primarily focuses on the benefits of positive affect (e.g., Barsade and O’Neill 2014) and the counterproductive impact of negative affect (e.g., Maitlis and Ozcelik 2004). Our findings underscore the existing literature by pointing to the beneficial role of low levels of *negative* affect, which may further confirm the need to engage in learning, seek new routines, and prime performance (Miller et al. 1994). In doing so, we provide some empirical support for recent conceptual accounts that discuss how negative emotions may elicit proactive behavior (Lebel 2017).

Second, by analyzing the same employees’ language training—a person-centered approach to data analysis—we demonstrate the differential responses to a radical organizational change. We identify varied trajectories of cognitive and affective responses to change over time using LCGM (Andruff et. al. 2009, Nagin 2005). Our data suggest that change recipients follow a limited set of trajectories. Further, because the trajectories are path-dependent, i.e. recipients follow the same trajectory rather than changing trajectories over time, membership in these temporal pathways has varied outcomes. We identified three trajectories of English language self-efficacy. Over time and through training, all three trajectories showed increases. At the same time, we also found that the self-efficacy levels declined for individuals in the high and low trajectories. We speculate that this decline could be influenced by social comparison as colleagues in the lower trajectory begin to narrow the language gap. Similarly, while individuals in the low trajectory may experience initial increases in their self-efficacy as a result of the continued training, they may later experience a decline as progress becomes more incremental and difficult. Further, our results show two trajectories of negative affect towards English with a marginally significant increase. Our findings regarding the decline across self-efficacy trajectories provide some insight into the dynamics of change processes that involve prolonged training and address recent calls to extend our understanding of the process of change (Kunisch et al. 2017). Our work could also inform previous research that identifies fatigue, loss of interest, struggles with persevering, and a satisficing mindset (e.g., Winter 2000) as barriers to sustaining change efforts over time.

Our study further explores what drives two organizational outcomes: change adoption and turnover intentions. Our findings suggest that change recipients in a higher self-efficacy trajectory have higher turnover intentions. We posit that they are likely to perceive difficulties working with colleagues who have lower English self-efficacy and over time may experience a potential diminution of status as others increase in language confidence, leading to increased intentions to leave. Our results also suggest that individuals in the low negative affect trajectory were more willing to communicate in English at the end of the training period compared to their high negative affect counterparts. While the differences are not significant, the pattern that willingness to communicate in English was lower in the high compared to the medium self-efficacy class is noteworthy. Neeley (2013) found that moderate-level nonnative speakers might experience the highest levels of anxiety as a result of a language change. However, our findings suggest that individuals in a high self-efficacy class may have similar apprehension because they eventually might encounter their linguistic limitations as nonnative speakers despite their advanced capabilities and self-efficacy. It is possible that those speakers may face more abstractions and nuances in the language, which may limit their willingness to communicate. In short, it is likely that the greater their initial English language knowledge, the more salient their limitations will become over time. Following the language change for longer than two years might allow researchers to observe if such tendencies continue to shift with time as language learners approach advanced fluency.

Third, the present study contributes to the bourgeoning literature on language in global organizations. Departing from the prevailing studies on language in global work (Neeley 2013, Neeley and Dumas 2016, Tenzer and Pudelko 2015), we conceptualize a language mandate as an impactful radical organizational change. Further, in contrast to studies that examine the effects of language differences across heterogeneous groups with emphasis on native and non native speakers (Hinds et al. 2014, Reiche et al. 2015, Tenzer et al. 2014, Tenzer and Pudelko 2017), our study examines subjective and objective language competence differences within a homogenous group of non native speakers (see Neeley 2013 as an exception). Our quantitative study captures longitudinal language training, complementing the more qualitative focus in extant language research (e.g., Hinds et al. 2014, Neeley 2013, Tenzer and Pudelko 2017, Tenzer et al. 2014, Vaara et al. 2005). We expand the literature on language in global organizations by exploring a causal sequence of the cognitive and affective responses and the experience of different temporal pathways for behavioral reactions to a radical language change. Further, while other studies capture mitigating forces such as leaders’ capacity to influence people’s willingness to adopt a new working language (Tenzer and Pudelko 2015), we provide some insights into the language acquisition and adoption process that enhance our understanding of the inherent factors. Future research is warranted to examine the robustness of our findings and to shed more light on the intersection of training and mitigating factors.

Finally, our study contributes to discourse about original linguistic identity as a barrier or facilitator for employees’ willingness to adopt a foreign lingua franca (Bordia and Bordia 2015). The present exploratory study can enhance Bordia and Bordia’s model by incorporating affective processing as an antecedent for language acquisition. Our examination of a radical language change over a two-year period provides the seed for future research to establish whether affective processing of the language learning experience can mitigate linguistic identity threat that stems from the loss of a cherished identity. In addition, our work also points to the need to more explicitly integrate affect-based mechanisms with extant psychological, linguistic, and communicative approaches considered in second language learning (e.g., MacIntyre et al. 1998).

**Managerial Implications**

Our findings provide provisional insights into change recipients’ reactions to radical organizational change. For example, our finding that change recipients with high self-efficacy may be more prone to leaving might suggest that managers identify self-efficacy levels to better engage and integrate those with high self-efficacy into the change process. Managers may need to also pay close attention to change recipients’ affective experiences as they assess their willingness to adopt change. One area to explore would be whether affective responses are hindering adoption more so than cognitive responses. Along with change management tools that an organization might rely on, assessing employees’ trajectories of cognitive and affective reactions to a radical change over time might help managers anticipate obstacles. Understanding which individuals form part of the higher negative affect trajectory might also help inform which employees may be less likely to adopt change. Managers also need to clearly delineate people’s starting baselines and provide training in homogenous groups, at least initially. Our work suggests that the relative comparison among learners can be intimidating in a radical change situation.

Our study can generalize beyond language change in global organizations. Our study could inform radical change initiatives that require employees to develop and apply new core competencies, e.g., a move from hardware to software engineering. Similarly, in an era of machine learning and artificial intelligence, non-technical employees will be increasingly required to develop fluency in coding, statistics, and data management. Our findings suggest that it will be important to understand people’s emotional states regarding the change to determine when and how to provide the necessary support. Our study also explores the extent to which organizations with radical change agendas need to actively influence how employees think about their capacity to navigate the newly required competencies. Consistent and long-lasting encouraging messages as well as generous training opportunities are examples of positively influencing perceptions.

**Limitations and Future Research**

Like all studies, our choice of data collection and analyses limit the claims we can make. While we were able to trace the language change of an entire business unit, with little respondent attrition, the number of employees in our sample is limited, thereby restricting our statistical power. In our sample of 40 respondents for which we had full data across the five time points, we found that English language self-efficacy mediates the negative relationship between negative affect towards English and English language learning for eight of the ten possible time combinations in our research design. Further, we report p-curve analysis to document the evidential value for our multiple testing of Hypotheses 1 and 2. Our analysis meets Simonsohn et al.’s (2015) cutoff criteria. However, we acknowledge that the strength of our empirical evidence is limited. Also, except for English language learning, our measures are survey-based and therefore likely contain measurement error. While our study finds some evidence that individuals’ negative affective responses towards English precede their cognitive responses for predicting English language learning, future research with multiple studies, replication in other settings, and a substantially higher number of observations can further strengthen these findings.

A larger sample and additional measurement occasions would have also allowed us to test whether the identified trajectories of our cognitive and affective variables and their shape are robust. The LCGM approach assumes that all individuals who form part of the same latent class follow the same development trajectory (i.e., no within-group variation). While this assumption can be relaxed in more complex growth mixture modeling, our limited sample size prevents us from doing so (Jung and Wickrama 2008). Similarly, a larger number of observations would have allowed us to examine in a more integrative fashion the evolution of cognitive and affective mechanisms through which a radical change initiative translates into change recipients’ learning as well as their adoption and turnover intentions.

Future research could explore how varying site characteristics influence outcomes. Factors to explore may include the organization’s overall size, age, and industry. Our research site was a relatively small firm in a slow-moving industry, supplying industrial electrical products to the Chilean mining sector. A significantly larger site might prove more demanding for the implementation of a radical language change, and additional research is required to understand how a similar change could be undertaken at scale (e.g., ratio of language experts to employees engaged in the change initiative). Also, the workforce we studied was predominantly composed of engineers. Future studies may explore how different employee functional compositions (e.g., sales, marketing, R&D) influence change adoption or turnover intentions or how other industries (e.g., technology) respond to radical change. We may expect that engineers, a highly sought-after talent, are more likely to find professional opportunities in other companies. This marketability may affect engineers’ turnover intentions, as driven by their change self-efficacy, when compared to other functional employee groups. We also encourage future research to examine differing types of assessments and training methods during a change process, and explicitly consider variations in individual pace of learning and competence development. Variation in these aspects likely impacts employees’ intentions to adopt the change and/or exit the organization. By understanding and attending to employees’ lived experiences and responses during the course of a radical change, scholars and managers may be better equipped to realize the transformation aspirations for organizations.

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**Table 1: Standard Deviations, Correlations, and Means of Study Variables**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Variable | Mean | SD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
| **1** | Willingness to communicate | 34.26 | 30.97 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **2** | Turnover intentions | 4.56 | 1.92 | .02 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **3** | Language learning T3 | 55.43 | 28.11 | .11 | .23 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **4** | Language learning T4 | 59.50 | 25.00 | .02 | .32 | .94\*\* |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **5** | Language learning T5 | 67.36 | 25.15 | .03 | .25 | .91\*\* | .95\*\* |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **6** | Language self-efficacy T2 | 4.24 | 1.27 | -.08 | .37\* | .65\*\* | .67\*\* | .66\*\* |  |  |  |  |  |  |  |  |  |  |  |  |
| **7** | Language self-efficacy T3 | 4.56 | 1.09 | .16 | .34\* | .69\*\* | .73\*\* | .68\*\* | .80\*\* |  |  |  |  |  |  |  |  |  |  |  |
| **8** | Language self-efficacy T4 | 4.42 | 1.19 | .31 | .28 | .72\*\* | .65\*\* | .63\*\* | .68\*\* | .81\*\* |  |  |  |  |  |  |  |  |  |  |
| **9** | Language self-efficacy T5 | 4.38 | 1.26 | .13 | .29 | .68\*\* | .66\*\* | .71\*\* | .67\*\* | .76\*\* | .78\*\* |  |  |  |  |  |  |  |  |  |
| **10** | Negative affect T2 | 1.99 | 1.08 | -.28 | .23 | -.24 | -.26 | -.34\* | -.35\* | -.27 | -.34\* | -.26 |  |  |  |  |  |  |  |  |
| **11** | Negative affect T3 | 2.29 | 1.20 | -.31 | -.09 | -.29 | -.32 | -.44\*\* | -.36\* | -.41\*\* | -.38\* | -.43\*\* | .49\*\* |  |  |  |  |  |  |  |
| **12** | Negative affect T4 | 2.49 | 1.38 | -.12 | .21 | -.24 | -.20 | -.28 | -.37\* | -.27 | -.25 | -.09 | .60\*\* | .50\*\* |  |  |  |  |  |  |
| **13** | Negative affect T5 | 2.53 | 1.30 | -.33\* | -.14 | -.43\*\* | -.33 | -.49\*\* | -.54\*\* | -.56\*\* | -.58\*\* | -.55\*\* | .42\*\* | .78\*\* | .67\*\* |  |  |  |  |  |
| **14** | Age | 34.35 | 7.48 | -.02 | -.50\*\* | -.28 | -.26 | -.32\* | -.32\* | -.37\* | -.17 | -.12 | -.09 | .15 | .03 | .13 |  |  |  |  |
| **15** | Gender | 1.25 | .44 | .11 | -.31 | -.27 | -.31 | -.35\* | -.26 | -.13 | -.17 | -.17 | -.08 | .22 | -.06 | .11 | .12 |  |  |  |
| **16** | Educational level | 2.9 | .67 | .21 | .17 | .32\* | .26 | .31 | .30 | .37\* | .49\*\* | .44\*\* | -.07 | -.06 | -.05 | -.21 | -.36\* | .00 |  |  |
| **17** | Other languages spoken | .05 | .22 | .15 | .06 | .34\* | .30 | .27 | .40\* | .35\* | .29 | .24 | -.21 | .14 | -.25 | -.17 | -.23 | -.13 | .21 |  |
| **18** | Manager | .20 | .41 | -.01 | -.23 | .06 | .16 | .12 | -.14 | -.04 | .12 | .22 | -.03 | .08 | .21 | .14 | .47\*\* | .00 | .17 | -.11 |

*Notes:* n = 40. Willingness to communicate and turnover intentions were measured at Time 5, the five controls at Time 1. T = time. \* p < .05; \*\* p < .01

**Table 2: Mediation Analyses**

|  |  |  |  |
| --- | --- | --- | --- |
|  | Self-efficacy 🡪 negative affect 🡪 learning |  | Negative affect 🡪 self-efficacy 🡪 learning |
|  | *Coeff. (SE)* | *Confidence interval* |  | *Coeff. (SE)* | *Confidence interval* |
| T1 – T2 – T3 | -.20 (1.23) | [-2.66; 2.16] |  | -2.69 (2.02)\*\* | [-9.41; -1.47] |
| T1 – T2 – T4 | -.10 (1.66) | [-3.42; 3.10] |  | -2.76 (2.16)\*\* | [-10183; -1.72] |
| T1 – T2 – T5 | 1.11 (1.26) | [-.98; 3.57] |  | -2.36 (1.91)\* | [-8.24; -.76] |
| T1 – T3 – T4 | .52 (.99) | [-1.42; 2.46] |  | -3.12 (2.74)\*\* | [-13.91; -3.18] |
| T1 – T3 – T5 | .80 (1.47) | [-1.71; 4.07] |  | -2.43 (2.64)\* | [-11.58; -1.23] |
| T1 – T4 – T5 | .48 (1.10) | [-1.63; 2.69] |  | -3.17 (1.73)\*\* | [-8.90; -2.09] |
| T2 – T3 – T4 | .73 (1.15) | [-1.41; 3.09] |  | -1.46 (2.56) | [-8.75; 1.29] |
| T2 – T3 – T5 | .84 (1.79) | [-2.01; 5.01] |  | -1.56 (1.93) | [-6.79; .76] |
| T2 – T4 – T5 | .32 (1.64) | [-2.68; 3.74] |  | -2.00 (1.81)\* | [-7.17; -.07] |
| T3 – T4 – T5 | .52 (1.65) | [-2.37; 4.09] |  | -2.51 (1.60)\* | [-7.14; -.88] |

*Notes:* n = 40. Coefficients for indirect (mediated) effects are shown. SE = standard error of the coefficient (the coefficient divided by its standard error is equivalent to a *t* score and indicates the significance of the effect). T = time.

\* p < .05; \*\* p < .01

**Table 3: Fit Indices from Alternative Latent Class Models**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **English language self-efficacy** | **LL** | **#fp** | **BIC** | **LMR** | **BLRT** | **Entropy** |
| 1 class | -417.433 | 8 | 867.621 | n/a | n/a | n/a |
| 2 classes | -360.328 | 12 | 769.788 | >.05 | <.001 | .806 |
| 3 classes | -322.673 | 16 | 710.855 | <.01 | <.001 | .946 |
| 4 classes | -314.921 | 20 | 711.729 | >.05 | <.05 | .901 |
| 5 classes | -311.470 | 24 | 721.205 | >.05 | >.05 | .832 |
| *3-class model P → C* | *-316.477* | *26* | *739.406* | *<.01* | *<.001* | *.952* |
| *3-class model, P → C, I-S-Q* | *-301.578* | *41* | *771.023* | *<.05* | *<.001* | *.950* |
| **Negative affect towards English** |  |  |  |  |  |  |
| 1 class | -402.662 | 8 | 838.078 | n/a | n/a | n/a |
| 2 classes | -339.521 | 12 | 728.174 | <.05 | <.001 | .937 |
| 3 classes | -333.208 | 16 | 731.925 | >.05 | >.05 | .782 |
| 4 classes | -327.314 | 20 | 736.516 | >.05 | >.05 | .791 |
| 5 classes | -324.181 | 24 | 746.626 | >.05 | >.05 | .821 |
| *2-class model P → C* | *-336.151* | *17* | *741.907* | *<.05* | *<.001* | *.945* |
| *2-class model, P → C, I-S-Q* | *-327.515* | *32* | *786.049* | *<.05* | *<.001* | *.962* |

*Notes:* n = 60. LL = Model log likelihood; #fp = number of free parameters; BIC = Bayesian Information Criterion; LMR = Lo, Mendell, and Rubin’s Likelihood Ratio Test; BLRT = Bootstrap Likelihood Ratio Test; P → = the predictors were allowed to influence…; C = membership into the latent classes; I = intercept of the latent trajectories; S = slope of the latent trajectories; Q = quadratic slope of the latent trajectories.

**Table 4: Time Parameters of the Latent Classes**

|  |
| --- |
| **English language self-efficacy** |
|  | High (N = 15) | Medium (N = 32) | Low (N = 13) |
| Intercept | 5.61\*\* (.14) | 3.96\*\* (.12) | 2.36\*\* (.27) |
| t | .09\* (.04) | .08\* (.03) | .12\* (.04) |
| t2 | -.004\* (.002) | -.003† (.002) | -.004\* (.002) |
| **Negative affect towards English** |
|  | High (N = 22) | Low (N = 38) |
| Intercept | 2.94\*\* (.18) | 1.42\*\* (.09) |
| t | .09† (.05) | .06† (.03) |
| t2 | -.002 (.002) | -.002 (.002) |

*Notes:* n = 60. Standard errors in parentheses; † p < .10; \* p < .05; \*\* p < .01

**Table 5: Results from the Multinomial Logistic and Multiple Regressions Predicting Class Membership, Intercepts and Growth Factors of the Trajectories**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | vs. **high self-efficacy** |  | vs. **medium self-efficacy** |  | vs. **low negative affect** |
|  | **Low self-efficacy** |  | **Medium self-efficacy** |  | **Low self-efficacy** |  | **High negative affect** |
| *Predictors* | *Coeff.* | *SE* |  | *Coeff.* | *SE* |  | *Coeff.* | *SE* |  | *Coeff.* | *SE* |
| Age | -.02  | .04 |  | -.04 | .04 |  | .02 | .03 |  | -.14\*\* | .05 |
| Gender | -1.01 | .83 |  | -.54 | .83 |  | -.47 | .69 |  | -1.32† | .79 |
| Manager | -1.94† | 1.06 |  | -.97 | .91 |  | -.98 | .85 |  | 1.81\* | .79 |
| Other languages | 23.19\*\* | 1.56 |  | 23.25\*\* | 1.56 |  | -.06 | 1.56 |  | -1.08  | 1.27 |
| Educational level | -1.36† | .79 |  | -1.19 | .77 |  | -.17 | .41 |  | -.66 | .55 |
|  | Intercept |  | Linear |  | Quadratic |
| *Coeff. (SE)* | *Coeff. (SE)* | *Coeff. (SE)* |
| *Predictors* | **Self-efficacy** | **Negative affect** |  | **Self-efficacy** | **Negative affect** |  | **Self-efficacy** | **Negative affect** |
| Age | -.02 (.01) | -.05\*\* (.01) |  | .00 (.00) | .00 (.00) |  | .00 (.00) | .00 (.00) |
| Gender | -1.09\*\* (.20) | -.17 (.17) |  | .07 (.04) | .06 (.06) |  | -.00 (.00) | -.00 (.00) |
| Manager | -.72\*\* (.22) | .67\*\* (.18) |  | -.05 (.06) | -.03 (.06) |  | .00 (.00) | .00 (.00) |
| Other languages | 2.04\*\* (.42) | -1.34\* (.62) |  | -.04 (.06) | .23 (.23) |  | .00 (.00) | -.01 (.01) |
| Educational level | -.29† (.16) | -.13 (.13) |  | .08\* (.03) | -.02 (.03) |  | -.00\* (.99) | .00 (.00) |

*Notes:* n = 60. SE = standard error of the coefficient (the coefficient divided by its standard error is equivalent to a *t* score and indicates the significance of the effect).

† p < .10; \* p < .05; \*\* p < .01

**Table 6: Relationships between Latent Class Trajectories and Outcome Variables**

|  |  |  |
| --- | --- | --- |
|  | **Willingness to communicate in English** | **Turnover intentions** |
| **English language self-efficacy** | *Mean (SE)* | *Mean (SE)* |
| Class 1: High self-efficacy | 26.63 (13.24) | 5.48\* (.51) >3 |
| Class 2: Medium self-efficacy | 38.92 (5.96) | 4.45 (.50) |
| Class 3: Low self-efficacy | 24.31 (6.81) | 4.18 (.39) |
| **Negative affect towards English** |  |  |
| Class 1: High negative affect | 17.78 (3.97) | 4.61 (.33) |
| Class 2: Low negative affect | 39.26\*\* (6.06) >1 | 4.46 (.40) |

*Notes:* n = 60. SE = standard error of the mean; \* p < .05; \*\* p < .01. The numbers in superscript indicate for which between-class comparisons the means differ significantly.

**Figure 1: Estimated Trajectories of English Language Self-Efficacy**

****

Level of English language self-efficacy

 High (N=15)

 Medium (N=32)

 Low (N=13)

Time

**Figure 2: Estimated Trajectories of Negative Affect towards English**

****

 High (N=22)

 Low (N=38)

Time

Level of negative affect towards English

**Appendix 1: P-curve Analysis for Mediation Analyses**



1. Since MPlus relies on the robust maximum likelihood estimator, the LRT has to be divided by its scaling correction composite, *cd*, where *cd* = (*p*0\**c*0-*p*1\**c*1)/(*p*0-*p*1), with *p*0 and *p*1 being the number of free parameters in the nested and comparison models, and *c*0 and *c*1 the scaling correction factors for the nested and comparison models (Satorra and Bentler 1999). [↑](#footnote-ref-1)