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Erich C. Dierdorff[1] & Eric A. Surface[2] & Reanna Poncheri Harman[2] & J. Kemp Ellington[3] & Aaron M. Watson[4]

Abstract

Goal orientation theory has long recognized both stability and variability in people's preferences for different types of goals in achievement contexts. However, empirical examination of this fundamental theoretical tenet about dispositional goal orientations remains an essential need in extant scholarship. In a field study of a multi-month, job-related training program designed to instruct foreign language capabilities ($N = 972$), we examined within-person fluctuations in dispositional goal orientations over time and the influences of this variability on multiple learning outcomes. The results of longitudinal measurement invariance analyses as well as latent growth models depict both stability and significant within-person variability in dispositional goal orientations over time. Our findings further indicate that this fluctuation holds consequences for both skill-based and affective learning outcomes. We discuss the implications of our findings for future goal orientation theory and research, as well as for training practice.

Keywords Learning · Goal orientation · Growth modeling · Language proficiency

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A wealth of research has examined the various antecedents and consequences of individual goal orientations, where goal orientation refers to individual preferences for different types of goals in achievement contexts (Dweck, 1986; Dweck & Leggett, 1988). One way these goal orientations have been conceptualized and studied in this literature are as relatively stable individual differences (i.e., dispositions) that reflect particular patterns of cognition and action (Button, Mathieu, & Zajac, 1996; DeShon & Gillespie, 2005). Goal orientations have often been operationalized in three forms: learning goal orientation, prove performance goal orientation, and avoid performance goal orientation (VandeWalle & Cummings, 1997). The empirical evidence from cross-sectional research on the impact of these dispositional goal orientations is substantial. For example, meta-analytic work has demonstrated significant effects on a host of outcomes related to learning and performance in both academic and work settings (Payne, Youngcourt, & Beaubien, 2007). Although much less prevalent in the literature, studies have also shown that dispositional goal orientation affects changes in knowledge and skill acquisition, metacognition, self-efficacy, and resource allocation (Chen & Mathieu, 2008; Dierdorff & Ellington, 2012; Schmidt, Dolis, & Tolli, 2009; Yeo & Neal, 2004). In sum, this body of evidence suggests that dispositional goal orientation is a key variable for understanding motivation and learning in academic and work settings (Beier & Kanfer, 2010).

Despite the breadth of inquiry on goal orientation, the extant literature remains limited in several ways. For example, although it is long recognized in theory that dispositional goal orientations will fluctuate over time and situations (Dweck & Leggett, 1988), there has yet to be direct empirical examination of within-person variability in dispositional goal orientations. The notion that dispositional goal orientation will therefore display both stability and change over time is an essential, but untested, assumption in the broader goal orientation literature (DeShon & Gillespie, 2005). The evidence that is used to indirectly support this speculation is derived instead from research on personality traits (e.g., Fleeson, 2001), measurement-oriented studies (e.g., Attenweiler & Moore, 2006), or from the handful of studies examining other conceptualizations of goal orientation such as domain-specific or state goal orientations (Beck & Schmidt, 2013; Converse et al., 2013; Fryer & Elliot, 2007; Muis & Edwards, 2009; Yeo, Loft, Xiao, & Kiewitz, 2009). While valuable, these studies cannot inform the theoretical supposition that dispositional goal orientation displays within-person variability over time, nor can they address the question as to how much consistency and fluctuation are present. Direct examinations are important, not only because they address the assumption of variability but also because the definitions applied by researchers to describe and measure goal orientation affects the inferences that can be drawn from empirical results (DeShon & Gillespie, 2005).

A second constraint in the existing literature is the manner with which change has been studied in previous research. Although studies have provided evidence of within-person variability in state goal orientations, none of these investigations provide evidence to allow adequate interpretation of the nature of the goal orientation change. This is because such research has failed to establish the longitudinal measurement invariance of the goal orientation constructs under examination, which is a precondition for testing within-person variability or the consequences of such variability (Vandenberg & Lance, 2000; Riordan, Richardson, Schaffer, & Vandenberg, 2001). The absence of this evidence prevents meaningful interpretation of within-person variability over time because longitudinal differences cannot be attributed to true changes in levels of goal orientation constructs (alpha change), but instead could simply reflect differences due to a recalibration of the measurement scale (beta change) or differences in the meaning of the constructs over time (gamma change; Golembiewski, Billingsley, & Yeager, 1976). This treatment of change significantly limits the study of within-person variability in goal orientation in general and, pertinent to the present study, calls into question the applicability of the findings derived from examinations of state goal orientation to potential within-person variability in dispositional goal orientation.

Regardless of whether goal orientations are conceptualized from a dispositional, domain-specific, or state perspective a final constraint of the literature is the paucity of research investigating the potential consequences of within-person variability in goal orientation. A review of the literature reveals only three studies that have examined consequences of within-person changes in goal orientation, with none investigating dispositional goal orientation. For example, Yeo et al. (2009) found changes in domain-specific goal orientation were associated with exam scores and task performance in a simulation, while Converse et al. (2013) showed that variability in daily (state) goal orientations was associated with exam scores. Beck and Schmidt (2013) also found that state goal orientations mediated the effects of perceived time pressure on subsequent exam scores. Again, while valuable for building an initial case for the impact of within-person changes on some conceptual forms of goal orientation, these studies cannot speak to the consequences of within-person variability in dispositional goal orientations. Thus, it is currently unclear how stable or variable dispositional goal orientation remains throughout the learning process and whether this variability holds consequences for learning and performance.

With these needs in mind, the present study investigates within-person variability in dispositional goal orientation over time, and the relationship between this variability and post-training outcomes. We therefore sought to provide new evidence of longitudinal change on a form of goal orientation not yet examined, include a more robust operationalization of change to allow meaningful interpretation of dispositional goal orientation variability, and extend prior investigations on the consequences of within-person variability on learning outcomes. Such evidence is also valuable to training practice because it informs how and when goal orientations are assessed, and the types of designs that might foster or limit the emergence of particular goal orientations (Ford, Kraiger, & Merritt, 2010). Study participants ($N = 972$) were individuals enrolled in a long-term job-related training program designed to instruct foreign language capabilities needed in the work context. Dispositional learning goal orientation, prove performance goal orientation, and avoid performance orientation were examined for within-person change across five measurement occasions, and this variability was examined for its effects on multiple post-training consequences spanning skill-based and affective learning outcomes (language acquisition, task-specific self-efficacy, and motivation to maintain skills). In the sections below, we first draw from goal orientation theory to describe reasons to expect both stability and variability in dispositional goal orientation over time. Next, we posit predictions for the differential effects of goal orientation variability on learning outcomes of training.

Change and Stability in Dispositional Goal Orientation

Much of the original theory on goal orientations recognized both stability and change in the conceptualizations of these constructs. For example, Dweck and Leggett (1988) described individuals as possessing predispositions for particular goal

types (learning or performance) that promote an ʙa priori probability of adopting a particular goal and displaying a particular behavior pattern^ (p. 269). These authors further posit that fluctuations in behavioral consistency are likely when individuals are examined over time or situations. Related empirical evidence also suggests both stability and change in dispositional goal orientation with studies supporting test-retest reliability and construct stability of goal orientation measurement scales (Attenweiler & Moore, 2006; Payne et al., 2007; VandeWalle, 1997). This evidence has led many researchers to characterize goal orientations as ʙrelatively stable^ in order to reflect the fact that these dispositional orientations might exhibit at least some variability (e.g., Colquitt & Simmering, 1998; DeShon & Gillespie, 2005; Farr, Hofmann, & Ringenbach, 1993).

One way that within-person stability and variability have been conceptually integrated is by viewing different dispositional goal orientations as reflecting an individual's chronic pursuit of particular goal types across time (i.e., learning goals, prove performance goals, or avoid performance goals). In this sense, individuals are likely to both adjust their goal orientations over time, situations, or goal types, as well as exhibit a high degree of consistency in their particular dominant or chronically active goal orientations. It is important to note that fluctuation in dispositional goal orientations is distinct from conceptualizing goal orientation from a state perspective. In previous scholarship, conceptualizations of state goal orientation emphasize specific inducements or experimental manipulations of particular goal types, with examinations capturing the effects of transitory goal-based perceptions on learning. Thus, the central expectation is that goal orientations are temporary and situationally contingent in these state-based conceptualizations, rather than reflecting chronically active dispositions that show *both* stability and fluctuation. The chronic pursuit of particular goal types that is represented by dispositional goal orientation is important for understanding motivation and learning because such activity manifests as distinctive patterns of behavior and cognition in achievement contexts. DeShon and Gillespie (2005) summarized how various distinctive patterns of behavior and cognition can be revealed by individuals' different goal orientations:

> It is important to emphasize that the study of goal orientation is fundamentally an examination of choice behavior in achievement contexts. Individuals must choose, either consciously or subconsciously, to engage in certain types of behaviors in achievement situations. The pattern of these behavioral choices provides insight into the goal orientation construct. For instance, faced with an achievement situation, individuals with high levels of mastery orientation may choose to engage in adaptive behavioral patterns such as selecting challenging tasks, setting difficult goals, and persisting when obstacles are encountered. In contrast, individuals high in performance orientation might choose to avoid challenging tasks, set low goals, and choose to engage in self-handicapping behavior when difficulties are encountered (p. 1105).

The patterns of behavior and cognition associated with different goal orientations are one reason for the predictive utility of dispositional goal orientation; namely, these between-person differences can account for variance in learning and performance (Cellar et al., 2011).

As noted earlier, however, goal orientation theory suggests that there is variability in these patterns. When examined over time, this variability in dispositional goal orientations is likely evidenced as within-person change. Such changes are due in part to the connection between the idiosyncratic experiences that learners have with the numerous tasks presented in learning environments and the learners' chronically active goals. This connection shapes the extent to which an individual's chronic goal orientation is ʙactivated^ or ʙaccessible^ (Bargh, 1999; DeShon & Gillespie, 2005). Thus, although dispositional goal orientations are relatively stable and capture reliable between-person differences, theory purports that meaningful within-person variability over time should occur in these dispositional attributes.

The different experiences that learners have during training, even within the same training setting, are likely to shape the extent to which certain dispositional goal orientations remain chronically activated. For example, dispositional learning goal orientation is likely to be more (less) activated when learning experiences are perceived by individuals as building (thwarting) task mastery or reinforcing the malleability (fixedness) of one's skills, as these features are indicative of the patterns of cognition and behavior that characterize learning goal orientation. When learning experiences are perceived by individuals as promoting (diminishing) their level of competence or facilitating (inhibiting) feedback that is self-enhancing, prove performance goal orientation is likely to be more (less) activated. Finally, learning experiences that are perceived as increasing (reducing) the exposure of one's incompetence or allowing (impeding) disengagement from task demonstration are likely to shape the extent to which dispositional avoid performance goal orientation is more (less) activated.

Considering that prior measurement-oriented research has provided evidence that dispositional goal orientation constructs can be reliably assessed over time (Attenweiler & Moore, 2006), the nature of within-person variability that reveals the chronic activation of dispositional goal orientations should manifest as true construct level fluctuations—known as ʙalpha changes^ (Riordan et al., 2001)—as opposed to differences in only scale recalibrations or construct conceptualizations. Consistent with the preceding theory and research,

we expected within-person variability in learners' goal orientations over time. Goal orientation theory does not purport that a particular type of dispositional goal orientation is more susceptible to change over time, as multiple goal orientations can remain chronically active and are part of a larger interdependent system (DeShon & Gillespie, 2005). We thus refrained from offering directional or relative hypotheses with regard to within-person variability in goal orientations over time.[1]

> Hypothesis 1a: There is within-person variability over time in learning goal orientation (LGO).
> Hypothesis 1b: There is within-person variability over time in prove performance goal orientation (PPGO).
> Hypothesis 1c: There is within-person variability over time in avoid performance goal orientation (APGO).

Consequences of Goal Orientation Variability

As discussed above, although cross-sectional research demonstrates the impact of goal orientation on a variety of learning outcomes, little is known as to the potential effects of within-person variability in goal orientation on such outcomes. There are several reasons to believe that within-person changes should impact learning. For example, goal orientation is thought to play a key role in self-regulatory processes (Button et al., 1996), as different goal orientations reflect different patterns of cognition and behavior across situations and time. Recent empirical evidence has supported the conjecture that goal orientations are associated with the extent to which individuals engage in self-regulated learning (Dierdorff & Ellington, 2012). Other scholars have noted that individuals' goal orientation could shift due in part to the various learning experiences encountered during training (Ford et al., 2010), suggesting that within-person variability in goal orientations over time reflect a dynamic self-regulated learning process. Such a characterization is also congruent with research supporting the reciprocal, cumulative nature of self-regulation in general (Schunk, 1990). Taken collectively, this theory and research suggest that the effects of goal orientation found in prior cross-sectional research are likely to accrue over time as the chronic pattern of behavior and cognition associated with a particular dispositional goal orientation emerge or dissipate (Dierdorff & Ellington, 2012).

For example, individuals high in LGO maintain motivation under difficult conditions or failure and seek to achieve a sense of task mastery (Brown, 2001; Fisher & Ford, 1998; VandeWalle et al., 2001). High LGO has also been linked to an increased use of learning strategies to gain task mastery (Payne et al., 2007), increased metacognition (Dierdorff & Ellington, 2012), and feedback-seeking behavior (Gong, Wang, Huang, & Cheung, 2017). Such evidence suggests that LGO is associated with more active engagement throughout the learning process. Thus, when within-person variability reflects increases in LGO over time, more adaptive and on-task processes should result that ultimately support effective learning. This expectation is consistent with resource allocation theory, which purports that continuing allocation of resources to on-task activities promotes successful knowledge or skill acquisition (Kanfer & Ackerman, 1989).

> Hypothesis 2: Increases in LGO over time are positively related to learning outcomes.

Although the results from cross-sectional research have been mixed, several studies have found deleterious effects of PPGO on motivation (Fisher & Ford, 1998), learner anxiety (Chen et al., 2000), and self-regulation over time (Dierdorff & Ellington, 2012). One reason for this detrimental effect is the increased emphasis on demonstrating competence rather than learning or developing skills (Chen & Mathieu, 2008). High PPGO individuals have also been shown to seek more self-enhancing feedback that can detract from overall performance effectiveness (Gong et al., 2017). These patterns of behavior and cognition can drain the cognitive resources needed for successful learning (Kanfer & Ackerman, 1989). Therefore, within-person increases in PPGO over time are likely to result in an increasing shift of attention away from core task activities (Beier & Kanfer, 2010; Yeo et al., 2009). This shift in attentional resources is likely to result in less task-focused self-regulation that accrues over time as learners engage in successive tasks and, ultimately, should detract from effective knowledge or skill acquisition.

> Hypothesis 3: Increases in PPGO over time are negatively related to learning outcomes.

Cross-sectional research has consistently found APGO to be associated with lower levels of learning and academic performance (Payne et al., 2007). These negative effects are generally thought to stem from the avoidance-related processes that are inherent to patterns of withdrawal from goal-directed behavior (Elliot et al., 2005). For example, high APGO individuals engage in less self-development (Porath & Bateman, 2006), seek less feedback (VandeWalle & Cummings, 1997), and engage in less self-regulated learning over time (Dierdorff & Ellington, 2012). High APGO individuals are also likely to experience more task distractions (Rawsthorne & Elliot, 1999) and take a less organized approach to learning (Elliot, McGregor, & Gable, 1999). Thus, a within-person variability

[1] Consistent with previous theory and our current conceptualization of dispositional goal orientations as individual differences that display both stability and change, from this point forward we refer to these quasi-traits simply as ʁgoal orientations.^

pattern of increasing APGO over time is likely to coincide with an increasing shift of attentional resources away from task mastery as well as an increase in more maladaptive learning processes, such as effort withdrawal (Yeo et al., 2009). These chronic patterns of cognition and behavior are likely to lead to less effective learning.

Hypothesis 4: Increases in APGO over time are negatively related to learning outcomes.

Method

Sample and Training Setting

Participants were 972 US military personnel participating in a required, job-related foreign language training program. The total length of training was 19–25 weeks depending on the specific language to which trainees were assigned.[2] Languages considered easier for native English speakers to learn (e.g., Spanish or French) received less training time compared to more difficult languages (e.g., Modern Standard Arabic). All courses were designed to achieve the same learning objectives in each language. The training was conducted in a classroom setting with a single instructor for 6 h per day (5 days per week), with class sizes generally ranging between 5 and 12 students. Two-hour language lab activities and homework assignments were also common on most days. Training was the only job responsibility for these personnel for the duration of the program. To successfully complete the foreign language requirement for their positions, trainees were required to demonstrate a pre-determined minimum level of proficiency on a standardized assessment at the conclusion of the course.[3] This minimum standard was constant across all training languages.

Measures

Dispositional Goal Orientations Learning, prove performance, and avoid performance goal orientations were assessed using a 13-item instrument developed and validated by VandeWalle (1997). VandeWalle and others (e.g., DeShon & Gillespie, 2005; Payne et al., 2007) describe these scales as measuring dispositional goal orientations. Sample items include ʙI enjoy challenging and difficult tasks at work where I'll learn new skills^ (LGO), ʙI'm concerned with showing that I can perform better than my coworkers^ (PPGO), and ʙI prefer to avoid situations at work where I might perform poorly^ (APGO). Items used a 7-point Likert-type response scale, ranging from 1 (strongly disagree) to 7 (strongly agree). Goal orientations were assessed at five different measurement occasions (pre, 25%, 50%, 75%, post). Coefficient alphas for the goal orientation scales ranged from .89 to .95 across the five measurement occasions.

Learning Outcomes Four specific outcomes were assessed spanning skill-based learning and affective learning. Skill acquisition was operationalized using the *listening* and *reading proficiency* portions of the Defense Language Proficiency Test (DLPT). The DLPT is a standardized assessment developed by the Defense Language Institute designed to measure language skill proficiency (Silva & White, 1993). The DLPT is divided into two assessment components: a listening test and a reading test. The DLPT consists of multiple-choice items developed to measure capability at various levels of proficiency using authentic listening and reading samples. The DLPT is scored on the Interagency Language Roundtable rating scale, which categorizes raw scores into 11 distinct levels from ʙno proficiency^ (lowest) to ʙfunctionally native proficiency^ (highest). Higher scores indicate greater skill proficiency.

Two affective learning outcomes were also assessed. The first was *task-specific self-efficacy*, which was measured using a 15-item scale that captured individuals' beliefs in their capacity to perform language-dependent job tasks. Items began with the prompt, ʙin the language being trained, I am confident in my current ability to…^ and included tasks such as ʙuse military-technical vocabulary,^ ʙread signs, graffiti, and maps,^ and ʙmaintain control in hostile situations.^ Coefficient alpha for this scale was .96. The second affective learning outcome assessed individuals' *motivation to maintain their language skills*, which is consistent with the skill maintenance focus emphasized by the US Department of Defense (Dierdorff & Surface, 2008). This outcome was operationalized using a 9-item scale, with sample items including ʙI am motivated to continue to develop the language skills that I have acquired^ and ʙI am motivated to give maximum effort to language training in the future.^ Coefficient alpha for this scale was .97. Both task-specific self-efficacy and motivation to maintain language skills were rated using a 7-point Likert-type response scale (1 = strongly disagree and 7 = strongly agree).

Control Variables Two control variables were included in the current study. The first was trainees' *general cognitive ability*. This variable was assessed using the Armed Forces Qualification Test (AFQT), which is a component of the Armed Services Vocation Aptitude Battery (ASVAB). Extensive validation efforts have supported the ASVAB as a valid and reliable measure of general and specific cognitive abilities (Segall, 2004; Welsh, Kucinkas, & Curran, 1990).

[2] The actual training time was 18 or 24 weeks. The 19th and 25th weeks were reserved for end-of-course proficiency testing.

[3] Successful demonstration of the standard was a requirement for completing the training pipeline, entering the career field, and holding a position in a unit.

Scores on the AFQT used in this study are a composite of the word knowledge, paragraph comprehension, mathematics, and arithmetic reasoning subtests of the ASVAB. The AFQT has been used as a measure of general mental ability in prior research (e.g., Ree & Earles, 1991; Tannenbaum, Mathieu, Salas, & Cannon-Bowers, 1991) and studied as a predictor of language learning (Stanhope & Surface, 2014). Each trainee's AFQT score was obtained from the training organization's official testing records.

The second control variable was *language difficulty* of the language being trained. A four-category government classification system was used to operationalize this variable. These categories reflect the increasing difficulty of a native English speaker to learn the focal language (Silva & White, 1993). For example, the Defense Language Institute classifies French as a Category I language, German as a Category II, Russian as a Category III, and Arabic as a Category IV. This system is frequently used for military and educational guidelines and policy. For example, the American Council on Education uses language difficulty in part to create recommendations for awarding college credit for language proficiency (Surface & Dierdorff, 2003). Dummy variables were created for language difficulty, with Category I as the baseline.

Procedure

Study control variables were assessed prior to training. Goal orientations were assessed at five measurement occasions using the same instrument. These measurement occasions were synchronized with the delivery of training. Measures were taken pre-training, at the 25, 50, and 75% completion points during training, as well as post-training. Although the total duration of training varied between 19 to 25 weeks due to respondents' assigned language, the program-of-instruction was standardized across languages. This standardization allowed us to conduct assessments at consistent completion points regardless of the trained language. Each participant's responses were linked across all occasions. Affective learning outcomes were assessed at the conclusion of classroom training. During the final week of training (week 19 or 25), reading and listening proficiency were assessed using the DLPT. As a standardized measure across the US Department of Defense, the DLPT content is not tailored to the specific content of each course. Test items require language skill proficiency demonstration in performance contexts that are similar, but not identical, to those encountered in training.

Analytical Strategy

Study analyses were conducted in three sequential stages. In the first stage, we assessed the longitudinal measurement invariance of the goal orientation measures. Confirmatory factor analysis was used to test longitudinal measurement invariance and recommendations from the relevant literature were followed (e.g., Vandenberg & Lance, 2000). Chi-square difference ($\Delta\chi^2$) tests were used in model comparisons of goodness-of-fit. Differences in the comparative fit index (ΔCFI) were also used to determine the statistical significance of nested model comparisons testing for metric and scalar invariance. For these tests, research suggests using ΔCFI as an alternative to chi-square difference testing for measurement invariance has notable advantages, including increased power to detect true lack of invariance, less sensitivity to sample size, and decreased type I error rates (see Cheung & Rensvold, 2002; Meade, Johnson, & Braddy, 2008). As recommended by Meade et al. (2008), a ΔCFI value greater than .002 was considered indicative of a significant decrease in model fit (i.e., lack of invariance).

Once measurement invariance of goal orientation was established, we proceeded to evaluate study hypotheses in the second and third analysis stages. All hypotheses were examined using a multiple indicator latent growth modeling framework. The second stage evaluated change in dispositional goal orientation over time, thus testing hypothesis 1. Finally, the third stage examined learning outcomes resulting from goal orientation change, which offered a test of hypotheses 2–4. Due to the logistical challenges associated with longitudinal field research, some trainees did not have complete data across all measurement occasions. Given the current study's context and the advantages and disadvantages of various methods of handling missing data in longitudinal research (see Little & Rubin, 1987; Schafer & Graham, 2002), we assumed data were missing-at-random and employed full maximum-likelihood estimation using available data. Models were implemented using Mplus (Muthen & Muthen, 1998-2010).

Results

Table 1 displays the means, standard deviations, and zero-order correlations for all study variables. Within each time point of assessment, LGO tended to be negatively correlated with APGO and positively correlated with PPGO (although LGO was unrelated to PPGO after Time 3). PPGO and APGO tended to be positively correlated within each time point of assessment. As would be expected, the three goal orientations were positively related at repeated measurements (e.g., time 1 LGO positively correlated with time 2 through time 5).

As for the zero-order correlations at any given time point between LGO and post-training language skills (listening and reading), these relationships tended to be positive (70% were significant, $p < .05$, mean $r = .09$). A

Table 1 Descriptive statistics and zero-order correlations

Variables	M	SD	1	2	3	4	5	6	7	8	9	10
1. Time 1 LGO	6.22	0.66										
2. Time 1 PPGO	4.52	1.30	.11**									
3. Time 1 APGO	2.82	1.26	−.35**	.30**								
4. Time 2 LGO	6.22	0.69	.52**	−.03	−.26**							
5. Time 2 PPGO	4.24	1.37	.07*	.60**	.23**	.08*						
6. Time 2 APGO	2.67	1.28	−.28**	.18**	.48**	−.32**	.35**					
7. Time 3 LGO	6.12	0.73	.44**	−.03	−.27**	.54**	.05	−.27**				
8. Time 3 PPGO	4.03	1.45	.00	.58**	.28**	−.01	.63**	.25**	.02			
9. Time 3 APGO	2.76	1.38	−.26**	.24**	.45**	−.25**	.26**	.49**	−.30**	.49**		
10. Time 4 LGO	6.17	0.75	.47**	−.03	−.27**	.52**	.02	−.27**	.52**	−.03	−.30**	
11. Time 4 PPGO	3.97	1.45	−.02	.51**	.21**	−.02	.62**	.32**	−.02	.69**	.34**	.00
12. Time 4 APGO	2.71	1.33	−.30**	.19**	.44**	−.24**	.22**	.53**	−.28**	.30**	.57**	−.38**
13. Time 5 LGO	6.16	0.71	.49**	−.06	−.26**	.56**	−.03	−.29**	.56**	−.09*	−.30**	.56**
14. Time 5 PPGO	4.00	1.43	.00	.53**	.19**	−.03	.56**	.28**	−.02	.67**	.41**	−.04
15. Time 5 APGO	2.74	1.31	−.22**	.23**	.46**	−.25**	.20**	.47**	−.25**	.31**	.55**	−.30**
16. Language difficulty	2.42	1.25	−.01	−.03	−.04	−.05	−.03	−.01	.00	−.09*	−.09*	.04
17. Cognitive ability	228.87	20.06	.04	−.04	−.07*	.04	.03	.00	.08*	.00	−.07	.04
18. Language skill (listening)	3.53	1.56	.09*	.09*	.05	.13**	.05	−.03	.06	.08*	.01	.08*
19. Language skill (reading)	4.09	1.55	.10**	.07	.06	.11**	.07	−.01	.09*	.12**	.04	.09*
20. Task specific self-efficacy	5.55	0.90	.29**	.05	−.12**	.21**	−.02	−.11**	.25**	.05	−.10*	.28**
21. Motivation to maintain skills	5.86	1.00	.30**	.10	−.16**	.34**	.02	−.10*	.26**	.01	−.14**	.40**

Variables	11	12	13	14	15	16	17	18	19	20
1. Time 1 LGO										
2. Time 1 PPGO										
3. Time 1 APGO										
4. Time 2 LGO										
5. Time 2 PPGO										
6. Time 2 APGO										
7. Time 3 LGO										
8. Time 3 PPGO										
9. Time 3 APGO										
10. Time 4 LGO										
11. Time 4 PPGO										
12. Time 4 APGO	.43**									
13. Time 5 LGO	−.08*	−.35**								
14. Time 5 PPGO	.73**	.34**	−.05							
15. Time 5 APGO	.34**	.61**	−.40**	.46**						
16. Language difficulty	−.12**	−.08*	.07	−.03	−.08*					

Table 1 (continued)

Variables	11	12	13	14	15	16	17	18	19	20
17. Cognitive ability	−.02	−.08*	.13**	.00	−.13**	.35**				
18. Language skill (listening)	.10**	−.03	.07	.05	−.05	−.39**	−.06			
19. Language skill (reading)	.11**	−.02	.08	.05	−.02	−.42**	.02	.74**		
20. Task specific self-efficacy	.09*	−.07	.26**	.06	−.08*	−.19**	−.10**	.32**	.30**	
21. Motivation to maintain skills	.07	−.09	.34**	.02	−.12*	−.07	−.04	.22**	.22**	.30**

*$p < .05$; **$p < .01$ (two-tailed)

similar trend was evident for PPGO, although there were fewer significant correlations (50% were significant, $p < .05$, mean $r = .08$). None of the correlations at any given time point between APGO and post-training language skills was significant. With regard to the correlations at any given time point between LGO and task-specific self-efficacy, all were positive and significant ($p < .05$, mean $r = .26$), whereas all were negative and significant between APGO and task-specific self-efficacy ($p < .05$, mean $r = -.10$). Only a single correlation between PPGO and task-specific self-efficacy was significant (time 4, $r = .09$, $p < .05$). Correlations at any given time point between LGO and motivation to maintain language skills were all positive and significant ($p < .05$, mean $r = .33$), whereas all were negative and significant between APGO and motivation to maintain language skills ($p < .05$, mean $r = -.12$). None were significant for PPGO.

Measurement Invariance Testing

Confirmatory factor analysis was used to assess (a) the equivalence of measurement properties of each goal orientation factor over the duration of training, and (b) changes in latent levels of each factor over time. Nested model comparisons were conducted, with each subsequent model imposing additional constraints holding specific measurement properties invariant across all (or a subset) of the five measurement occasions (Taris, Bok, & Meijer, 1998; Vandenberg & Lance, 2000). All results are shown in Table 2 and discussed below.

In model 1, the LGO, PPGO, and APGO factors were specified as latent variables using their corresponding items as indicators. In this baseline model, factor loadings, item intercepts, and residual variances were freely estimated across occasions and latent factor means were constrained to zero. For model identification and scaling purposes, factor loadings were fixed at unity for one item for each factor at each occasion. As is common in longitudinal invariance testing, error terms for each item were allowed to correlate across measurement occasions (Ployhart & Oswald, 2004). Latent factors at all occasions were also allowed to covary. This model is a test of the equality of factor structure across occasions (*configural invariance*; Horn & McArdle, 1992). Results indicated adequate model fit for the configural model (see Table 2).

To test for *metric invariance*, model 2 imposed equality constraints on all factor loadings (the Λ_x matrix) across measurement occasions. Comparison of model 2 to model 1 did not produce a significant decrement in fit (see Table 2), indicating that item loadings were invariant across all measurement occasions for the three goal orientation factors.

Table 2 Longitudinal measurement invariance results

Model	χ^2	*df*	CFI	TLI	RMSEA	Comparison model	$\Delta\chi^2$	Δdf	ΔCFI
1. Configural invariance	3392.18*	1780	.967	.961	.030	–	–	–	–
2. Full metric invariance ($\Lambda^g = \Lambda^{g'}$)	3447.70*	1820	.966	.962	.030	1	55.5	40	.001
3. Full scalar invariance ($\tau^g = \tau^{g'}$)	3644.93*	1860	.963	.959	.031	2	197.2*	40	.003[a]
3a. Partial scalar invariance	3590.32*	1858	.964	.960	.030	2	142.6*	38	.002
4. Invariant factor means ($\kappa^g = \kappa^{g'}$)	3721.22*	1870	.962	.957	.031	3a	130.9*	12	.002

CFI comparative fit index, *TLI* Tucker-Lewis index, *RMSEA* root mean squared error of approximation, *SRMR* standardized root mean squared residual

*$p < .05$

[a] Exceeds 0.002 cutoff for ΔCFI, indicating lack of invariance (Meade et al., 2008)

To test for *scalar invariance*, model 3 imposed equality constraints on all item intercepts (the τ_x matrix) across all measurement occasions. Comparison of model 3 to model 2 produced a significant decrement in fit (see Table 2), indicating all item intercepts were not invariant across all measurement occasions. Estimated item intercepts from model 2 indicated intercept differences were most pronounced in two PPGO items at the pre-training and 25% measurement occasions (ʙI'm concerned with showing that I can perform better than my coworkers^ and ʙI try to figure out what it takes to prove my ability to others at work^). Following others' recommendations (e.g., Ployhart & Oswald, 2004), the equality constraints for these four parameters were sequentially relaxed to test for partial scalar invariance. Freely estimating intercepts for these two PPGO items at the pre-training and 25% measurement occasions (model 3a) resulted in a non-significant ΔCFI, though $\Delta\chi^2$ remained significant. Given the sensitivity of $\Delta\chi^2$ to large sample sizes, we followed recommendations by Meade et al. (2008) to consider ΔCFI a more reliable indicator of true lack of invariance of the item intercepts. Results support full scalar invariance for LGO and APGO, and partial scalar invariance for PPGO. These results show that the measurement properties of all three scales were consistent over time and thus latent level changes (alpha changes) can be appropriately interpreted (Vandenberg & Lance, 2000).

Hypothesis Testing

Hypothesis 1a–1c predicted that there is significant within-person variability in goal orientation over time. To test this hypothesis, we conducted unconditional latent growth models to examine whether there was change over time (indicated by a significant slope parameter) as well as the nature of this change (linear and/or quadratic). As shown in Table 3, all models provided adequate fit. Of the total variance in dispositional goal orientation, 44% for LGO, 32% for PPGO, and 43% for APGO was within-person. Table 4 provides the growth parameters from these models. Results showed that both PPGO and APGO had significant linear and quadratic growth parameters, whereas LGO had only a significant linear growth parameter. These findings indicate that in our sample, LGO steadily decreased over time, as evidenced by the negative linear parameter. PPGO in our sample showed a linear decrease over time with a later upturn resulting in increased levels of PPGO, as evidenced by the positive quadratic parameter. APGO in our sample remained somewhat flat from a linear perspective, but showed a later increase as evidenced by the significant and positive quadratic parameter. Figure 1 graphs the mean changes over time in LGO, PPGO, and APGO. Particularly relevant to hypothesis 1 are the variance estimates for the growth parameters (see Table 4). The variance estimates were significant for each of the three goal orientations, thus fully supporting hypothesis 1a–1c and indicating that individuals' goal orientations fluctuate over time.

Hypotheses 2–4 deal with the learning consequences of longitudinal changes in LGO, PPGO, and APGO. Table 5 provides the fit statistics for these conditional growth

Table 3 Unconditional latent growth model goodness-of-fit results

Scale	χ^2 (*df*)	CFI	TLI	RMSEA	SRMR
LGO (no covariates, linear slope)	651.75 (257)**	.971	.966	.047 (.042–.051)	.056
PPGO (no covariates, linear + quadratic slopes)	609.80 (148)**	.959	.947	.066 (.061–.072)	.039
APGO (no covariates, linear + quadratic slopes)	416.51 (150)**	.978	.972	.050 (.044–.056)	.033

N = 840. *CFI* comparative fit index, *TLI* Tucker-Lewis index, *RMSEA* root mean squared error of approximation, *SRMR* standardized root mean squared residual; 90% confidence intervals in parentheses

**$p < .01$

Table 4 Unconditional latent growth model parameter estimates

	Intercept		Linear slope		Quadratic slope	
Scale	Mean	Variance	Mean	Variance	Mean	Variance
LGO	.00 (−)	.20 (.02)**	− .03 (.01)**	.01 (.00)**	–	–
PPGO	.00 (−)	.93 (.10)**	− .28 (.04)**	.30 (.07)**	.05 (.01)**	.01(.00)**
APGO	.00 (−)	.72 (.12)**	− .06 (.04)	.23 (.10)*	.01 (01)	.01 (.00)*

Mean of intercept factor constrained to zero for all models

*$p < .05$; **$p < .01$

models. Each model showed adequate fit to the data. Data were coded such that intercept parameters equaled the initial status of the goal orientation variables (i.e., time 1 measurements). Hypothesis 2 posited that increases in LGO over time are positively related to learning outcomes. Results shown in Table 6 indicate that although the initial levels of LGO were positively associated with all four learning outcomes (similar to prior cross-sectional research), increases in LGO were positively related to only one of the four learning outcomes (motivation to maintain language skills). As for increases in PPGO over time, hypothesis 3 predicted negative relationships to learning outcomes. This hypothesis received limited support, with increases in PPGO negatively associated with only one learning outcome (reading skill acquisition). Finally, hypothesis 4 predicted that increases in APGO over time are negatively related to learning outcomes. Results in Table 6 indicate partial support with increases in APGO negatively related to listening and reading skill acquisition, but not to affective learning outcomes (task-specific self-efficacy and motivation to maintain skills). Quadratic change in APGO was also significantly and negatively related to the skill-based learning outcomes, indicating that increases in APGO beyond the linear trend were further associated with skill acquisition decrements. This is due to the positive APGO quadratic term from the unconditional growth model (see Table 4). Finally, results indicated that initial levels of APGO were negatively associated with affective outcomes.

Discussion

In this study, we examined a central premise of goal orientation theory whereby individuals' dispositional goal orientations are thought to fluctuate over time and situations (Dweck & Leggett, 1988). We investigated these within-person fluctuations and their consequences in a large-scale field study comprising over 900 individuals participating in a multi-month, job-related training program designed to instruct foreign language capabilities. Study findings supported our supposition that stable, dispositional goal orientations exhibit significant within-person variability over time. Results further showed that this variability affected subsequent skill-based and affective learning outcomes. We discuss our results in the ensuing paragraphs, beginning first with the implications of within-person change in goal orientations over time and then detailing the consequences of this variability. We consider both supportive and non-supportive findings, as scholars have articulated the importance of ʙnon-findings^ for subsequent theory building (Kepes & McDaniel, 2013). We outline several areas in need of future empirical attention and end with a discussion of

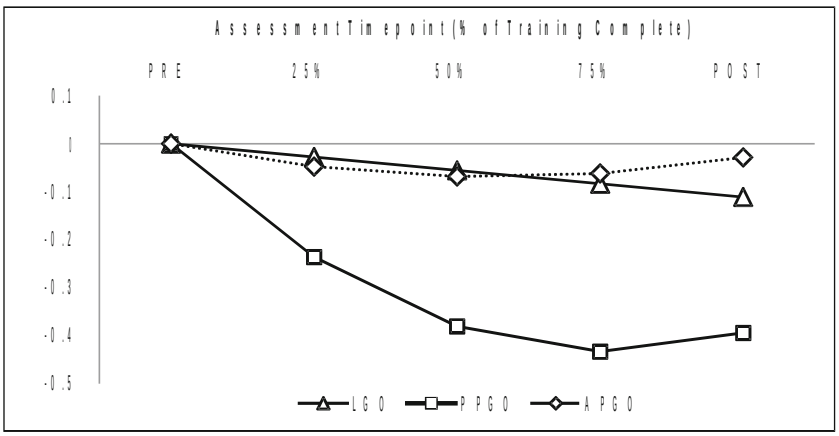

Fig. 1 Mean change in goal orientations over time. Latent mean estimates are unstandardized and obtained from partial scalar invariance model (model 3a)

Table 5 Latent growth outcome model goodness-of-fit results

Model	χ^2 (*df*)	CFI	TLI	RMSEA	SRMR
LGO					
Controls + 4 criteria	978.28 (441)**	.971	.966	.035 (.032−.038)	.045
PPGO					
Controls + 4 criteria	826.27 (284)**	.964	.953	.044 (.041−.048)	.030
APGO					
Controls + 4 criteria	634.90 (286)**	.978	.972	.035 (.032−.039)	.029

CFI comparative fit index, *TLI* Tucker-Lewis index, *RMSEA* root mean squared error of approximation, *SRMR* standardized root mean squared residual; 90% confidence intervals in parentheses

**$p < .01$

the practical implications of our findings as well as boundary conditions for our study's results.

Variability in Dispositional Goal Orientation Over Time

Our findings demonstrate that dispositional LGO, PPGO, and APGO each display meaningful within-person change over time. Study results supporting the measurement invariance of the goal orientation scales further tell us that this longitudinal variability cannot be simply attributed to imprecise measurement or changes in the way individuals conceptualize goal orientations (i.e., beta or gamma changes; Golembiewski et al., 1976). These results are important for three reasons. First, our study provides direct empirical evidence of the within-person variability in dispositional goal orientations that has previously been theoretically proposed by goal orientation scholars (e.g., DeShon & Gillespie, 2005). Second, our results

Table 6 Latent growth outcome model results

	Criteria			
Predictor	Skill acquisition (Listening)	Skill acquisition (Reading)	Task Self-efficacy	Motivation to maintain skills
LGO				
Lang. difficulty 1	1.90** (.38)	1.63** (.33)	− .07 (− .03)	.01 (.01)
Lang. difficulty 2	− .44** (− .12)	− .50** (− .14)	− .17 (− .08)	.05 (.02)
Lang. difficulty 3	− 1.59** (− .47)	− 1.79** (− .53)	− .41** (− .20)	− .29 (− .13)
Cognitive ability	.01** (.14)	.02** (.23)	− .01** (− .08)	− .00 (− .08)
Initial status	.44** (.13)	.46** (.14)	.72** (.36)	.70** (.32)
Linear slope	1.10 (.05)	.48 (.02)	1.07 (.08)	4.56* (.32)
R^2	.42**	.43**	.20**	.25**
PPGO				
Lang. difficulty 1	1.88** (.37)	1.67** (.33)	− .17 (− .06)	− .08 (− .02)
Lang. difficulty 2	− .41** (− .11)	− .47** (− .13)	− .14 (− .07)	.11 (.05)
Lang. difficulty 3	− 1.56** (− .46)	− 1.76** (− .52)	− .46** (− .23)	− .21 (− .10)
Cognitive ability	.01** (.15)	.02** (.22)	− .00 (− .05)	.00 (− .01)
Initial status	.06 (.04)	.01 (.01)	.04 (.04)	.08 (.07)
Linear slope	− .07 (− .02)	− .23* (− .08)	.28 (.16)	− .18 (− .09)
Quadratic slope	− 1.01 (− .07)	− 2.89 (− .20)	1.29 (.15)	− .65 (− .07)
R^2	.39**	.42*	.07**	.02
APGO				
Lang. difficulty 1	1.92** (.38)	1.63** (.32)	− .13 (− .05)	.03 (.01)
Lang. difficulty 2	− .45** (− .13)	− .52** (− .15)	− .15 (− .07)	.16 (.07)
Lang. difficulty 3	− 1.61** (− .47)	− 1.83** (− .54)	− .47** (− .23)	− .24* (− .11)
Cognitive ability	.01** (.14)	.02** (.23)	− .00 (− .06)	− .00 (− .03)
Initial status	− .05 (− .03)	− .01 (− .00)	− .18** (− .18)	− .20** (− .17)
Linear slope	− 1.29** (− .43)	− .95* (− .32)	.16 (.09)	− .39 (− .20)
Quadratic slope	− 5.53* (− .42)	− 3.90* (− .30)	.57 (.07)	− 3.07 (− .36)
R^2	.42**	.44**	.09*	.09*

$N = 972$. Lang. difficulty 1−3 are dummy coded controls for language difficulty (baseline = category 1 languages, e.g., French). R^2 values for controls only were .37 (listening), .39 (reading), .04 (self-efficacy), and .01 (motivation). Values in parentheses are standardized coefficients

* $p < .05$; **$p < .01$ (one-tailed)

theoretically and empirically extend the few studies that have focused on changes in other conceptualizations of goal orientation (i.e., state or domain-specific). Moreover, previous studies have not presented evidence of measurement invariance, which makes it difficult to derive valid interpretations of the observed within-person change over time (Riordan et al., 2001). Third, our results show that both stability and fluctuation in dispositional goal orientations matter to learning, as both initial levels and changes over time predicted multiple learning outcomes. Taken collectively, our data provide strong direct evidence for the theoretical notion that dispositional goal orientations reflect chronic patterns of cognition and behavior that ebb and flow as individuals engage in learning over the course of a training program.

Assuming that the within-person variability in goal orientation observed in earlier studies is indeed alpha change, comparing the proportions of intraindividual variance to those we find in our study reveals some interesting trends. For example, over the course of 7 days, Converse et al. (2013) found 19–22% within-person variance in learning, prove performance, and avoid performance daily (state) goal orientations. Yeo et al. (2009) presented results from two studies of domain-specific (academic) goal orientations. These scholars found that 12–15% of variance in learning, prove performance, and avoid performance goal orientations was attributable to within-person differences across a 2-hour time period, whereas 26–36% within-person variability was evident across a 16-week time period. In the present study, findings across a 19–25-week time period indicated that 44, 32, and 43% of total variance was attributable to within-person differences over time in dispositional LGO, PPGO, and APGO respectively. Considered collectively, it appears that lengthier examinations and those in field settings reveal more within-person variability. This increase may seem unsurprising; however, it is important to recognize that we operationalized goal orientations from a dispositional perspective, which construct definitional work and empirical evidence depicts as substantially more stable than state or domain-specific operationalizations (Button et al., 1996; DeShon & Gillespie, 2005).

One reaction might be to conclude that our data are merely exhibiting state goal orientation. That is, the within-person variability over time that we attribute to fluctuations in dispositional goal orientations is simply due to different goal-orientated situations. We believe that this interpretation is unlikely for at least two reasons. First, while embedded in the same goal-type phenomenology, state goal orientation is conceptually distinct from dispositional goal orientation. By definition, a state conceptualization is transitory and situationally contingent with no assumption of systematic within-person consistency over time. Second, beyond different measurement scales, state goal orientation is operationally distinct. This fact is reflected in the manner with which it is typically studied by using external inducements or experimental manipulations to specifically invoke different goal-orientated situations. For our data to reflect within-person fluctuations that were due to state goal orientation, it would mean that the focal training program incorporated distinct situations that were specifically aligned with distinct goal-type inducements. In other words, including learning modules designed to elicit particular goal-type perceptions or having conspicuous differences between the various modules that comprised the duration of the training program. This was not the case in our study where across time, trainees, and instructed languages the training program was standardized in terms of instructional techniques and settings, learning objectives, practice opportunities, and evaluation standards.

Perhaps most importantly, our study provides evidence that change over time in dispositional goal orientations matters across multiple types of learning outcomes. We find that within-person changes in LGO are positively related to motivation to maintain skills after training. This result suggests that gains in more approach-oriented mastery tendencies foster motivation around learning transfer. Considering that motivation is a key component of successful transfer of training (Blume et al., 2010), such findings point to the value of positive LGO change over time. We also find that within-person changes in dispositional APGO are negatively related to skill acquisition, indicating that increases in avoid-oriented tendencies are linked with learning decrements. These results are consistent with theory and research that has generally depicted avoidance tendencies as maladaptive to self-regulation and learning. That we find changes in APGO are linked to less skill acquisition (over and beyond main effects) provides further evidence of the deleterious effects of APGO in learning environments. Moreover, these data add to previous research that has hypothesized, but failed to support, the negative influences of within-person change in APGO on learning (Yeo et al., 2009). Finally, we find that within-person changes in PPGO are negatively related to skill acquisition. This result is consistent with the notion proposed in cross-sectional research (e.g., Chen & Mathieu, 2008) that an increased focus on external comparisons can detract from the attentional resources needed for task mastery and skill development.

Though we find several significant consequences of within-person variability in dispositional goal orientations, it is also interesting to note the absence of effects. For instance, we find that within-person variability in LGO is unrelated to skill acquisition. Cross-sectional research has regularly found positive effects for LGO on skill acquisition (Payne et al., 2007). Our results suggest that increases in LGO over time do not necessarily translate to skill gains. Consistent with cross-sectional research, however, we find it is the mastery orientation with which learners initially engage in learning that predicts learning outcomes. The significant and positive effects we find for individuals' initial statuses in LGO on subsequent skill acquisition supports this interpretation (see

Table 6). However, these trends are somewhat opposite for dispositional APGO. Here, results suggest that increases in avoidance tendencies over time result in decreased skill acquisition, not initial status. Lastly, we find that within-person variability in PPGO is mostly unrelated to learning outcomes, which is consistent with the rather equivocal effects of PPGO that have been shown in prior cross-sectional research (Payne et al., 2007).

In addition to revealing the consequences of variability over time in dispositional goal orientations, our data depict different longitudinal trends across the three goal orientations. The pooled results in Fig. 1 show that LGO slightly decreased over time, whereas PPGO more markedly decreased over time and then showed an upturn toward the end of the training program. APGO remained relatively flat across the training program, with a slight increase late in the program. These trends suggest that in this particular training setting, some forms of dispositional goal orientation were more or less likely to be chronically activated. This raises an interesting question as to why these trends were observed in our sample. As described earlier, the training program was highly standardized and the focal content (foreign language) represented a rather complex and difficult material to be learned. Trainees also had to regularly display their levels of learning to both instructors and peers during various exercises such as group discussions, dialog recitation, role plays, and so forth. Such program features made performance-related feedback readily available as well as highly visible to oneself and others.

Two explanations for the observed trends in goal orientation seem plausible when considering the training setting in light of other goal orientation research. For example, Gong et al. (2017) recently showed that different goal orientations are linked to different types of feedback seeking. More specifically, they found that both PPGO and LGO were related to increased self-positive feedback seeking, which entails a focus on obtaining information about performance success. Considering the complex nature of the training task, it may be that PPGO and LGO diminished over time due to high levels of learning difficulties or high rates of failure experienced by trainees. These experiences would provide more frequent negative feedback about oneself and, because PPGO and LGO are associated with a focus on self-enhancing (versus self-negative) feedback, these particular dispositional goal orientations could have become less chronically active over time. Gong et al. also found that PPGO was associated with other-negative feedback seeking, which pertains a focus on information about others' underperformance. This might additionally explain the observed upward turn of PPGO later in the training program. It may be that the feedback about others' learning difficulties is initially insufficient to activate PPGO, even perhaps counteracted by feedback about one's own learning failures, but *eventually* this other-negative feedback is enough to make PPGO more chronically active. This activation may have been further bolstered toward the end of training due to the scheduled proficiency test, which represents a chance to formally demonstrate one's proficiency.

A second explanation for the overall trends of change in goal orientations could be linked to self-regulatory focus that centers on either a promotion focus or prevention focus (Higgins, 1997). A promotion focus emphasizes ideal aspirations when regulating behavior, whereas a prevention focus emphasizes the lack of mistakes during behavior regulation. Individuals using a promotion focus view outcomes in terms of gains or non-gains, as opposed to a prevention focus that views outcomes as losses or non-losses (Forster, Grant, Idson, & Higgins, 2001). In relation to goal orientation, Johnson, Shull, and Wallace (2011) found that PPGO was associated with a promotion focus, whereas LGO was associated with a prevention focus. While both foci are informed by a reduction in task errors, the prevention focus associated with LGO may only tolerate errors in the short-term, as competence is ultimately defined as error-free mastery. The difficult nature of the training in our study could have extended error rates, thwarting the error-free orientation of LGO and lessening its activation over the course of training. As for PPGO, Johnson et al. argued that individuals high in dispositional PPGO prefer easier tasks because the promotion-based strategies they use require success; otherwise, their motivational intensity diminishes. The acquisition of foreign language capabilities is arguably difficult. Moreover, the training was a required part of the trainees' jobs, which meant participation was compulsory. Although this interpretation might not explain the late upward trend in PPGO, it does seem plausible for the general decrease in PPGO over the majority of the training program's duration—a decrease stemming from learner experiences that may have lessened the activation of PPGO.

Directions for Future Research

Given the current evidence of dispositional goal orientation stability and change over time, more research is needed to better understand the nature and influences of such consistency and fluctuation. First and foremost, studies that explicate antecedents of longitudinal changes in goal orientation are much needed. Traits associated with dispositional goal orientations in previous cross-sectional research, such as implicit person theories, core self-evaluations, and conscientiousness (Chang et al., 2012; Payne et al., 2007), could be useful variables on which to focus. Other traits that are associated with approach-avoidance tendencies and linked to learning would be interesting to examine, such as trait anxiety and need for achievement (Colquitt, LePine, & Noe, 2000). Action identification, which represents the extent to which an individual tends to conceptualize actions in terms of how they are performed as opposed to what purpose the actions serve (Vallacher & Wegner, 1985, 2012), has also been put forth

as a relevant individual difference variable for understanding goal orientation in training (Schmidt & Ford, 2003) and seems likely to account for goal orientation variability over time.

Beyond more stable trait predictors of within-person variability in goal orientations, another approach would be to more closely investigate the dynamics of learning over time. Here, studies that capture both self-regulatory processes and goal orientations over time and examine these factors together as time-varying covariates would be especially useful. For example, studies could examine how fluctuations over time for different components of self-regulation, such as self-evaluations (e.g., self-efficacy), self-monitoring (e.g., metacognition), and self-reactions (e.g., affective engagement) (Bell & Kozlowski, 2010; Kanfer, 1990), accompany fluctuations in goal orientations. Meta-analytic evidence has shown significant cross-sectional relationships between these self-regulatory components and goal orientation (Cellar et al., 2011). In addition, the influences of self-regulatory focus and the types of feedback seeking we discussed earlier are important to include in subsequent examinations. Finally, studies linking instructional designs (e.g., error correction, feedback techniques) to goal orientation change, self-regulation, and goal striving behavior could uncover the mechanisms influencing these changes.

In a similar vein, future research should examine longitudinal changes in goal orientations for effects on rates of knowledge acquisition, skill development, and performance across time. It would be interesting to tease apart the directions of influence between these variables. For example, the current study suggests that changes in dispositional goal orientation are likely to predict gains or losses in learning over time, which indicates a more antecedent positioning of goal orientation variability. However, success or failure across multiple learning situations is also believed to impact the types of goal orientations that are chronically active (DeShon & Gillespie, 2005), suggesting that changes in goal orientation could be consequences of an individual's idiosyncratic learning experiences. A meta-analysis by Sitzmann and Yeo (2013) found that within-person changes in affective learning (self-efficacy) are consequences of prior performance, thus depicting the possibility that established antecedents of learning can sometimes be important consequences of training. Such a postulation is consistent with those who have called for examinations of goal orientations as training outcomes (Ford et al., 2010). It is important to point out that any examination of goal orientations over time, whether they be state, dispositional, or domain-specific, must provide measurement invariance evidence that the longitudinal variability is due to interpretable level differences on the focal constructs rather than changes in the conceptualizations of those constructs.

Future research should also incorporate situational variables in the investigation of goal orientation variability. If within-person variability is viewed along a continuum, where much of the variability in dispositional goal orientation is prompted by contextual changes over the course of a learning event, such situational features are particularly salient. Even when changes in the learning context are not intentionally designed state goal orientation manipulations, they may still represent changing situations that trigger within-person shifts in goal orientation over time. Several aspects of context could be brought to bear. For example, informational and structural elements that reflect task context (Dierdorff, Rubin, & Morgeson, 2009), such as uncertainty and autonomy, have been found to impact the effects of goal orientation on performance and resource allocation over time (Schmidt et al., 2009; Yeo et al., 2009). Researchers examining the effects of goal orientation in team-based training (Dierdorff & Ellington, 2012) have also noted that features of the social context, such as interdependence and social density, are likely to impact goal orientations, especially those involving comparative judgments (e.g., APGO and PPGO). Other situational factors include the types of goals that are chosen or revised during the course of training, which could shape goal orientation variability and its consequences. Setting challenging and specific goals, for example, is thought to create ʙstrong^ situations that can mask individual differences (Adler & Weiss, 1988; Locke & Latham, 2013) as well as attenuate the influence of dispositional goal orientations (Seijts, Latham, Tasa & Latham, 2004).

Finally, although our primary focus was on intraindividual variability in dispositional goal orientations, our results also depict the existence of pooled trends over time. In our sample, dispositional LGO and PPGO showed average decreasing linear trends across all trainees, while APGO showed an average increasing trend. Converse et al. (2013) also found an overall trend in their study of state goal orientations, with average state APGO decreasing over time across student participants. These results point to an interesting area for future examination that investigates more collective shifts in goal orientations. That is, research that uncovers of the conditions and consequences of goal orientation variability at the class, cohort, or unit levels. Such examinations would be especially pertinent in learning situations, such as team training, where there is already burgeoning evidence that collective levels of individual goal orientations, as well as team-levels of goal orientation, affect both individual and team learning (Dierdorff & Ellington, 2012; LePine, 2005; Porter, 2008).

Practical Implications

Our study holds several implications for training practice. As Ford and his colleagues (Ford et al., 2010) explained, the way in which goal orientation is conceptualized (as a trait, quasi-trait, or state) has important implications for its use in training. According to these authors, if goal orientations operate like traits, then they should be assessed at

the beginning of training and this information used to adapt training to the learner in order to maximize effectiveness. If, however, goal orientations operate like quasi-traits, then this might be an indication of the learning that has resulted from training. From a state perspective, goal orientations are viewed strictly as manipulations of goal situations to induce particular goal frames (e.g., mastery or performance goals). Our results indicate that dispositional goal orientations meaningfully fluctuate over time and thus, training practitioners cannot ignore this variability across a given training event. Yet, our findings also show that across the three goal orientations, such variability exerted mixed effects on the four end-of-training outcomes we examined, after controlling for task difficulty, cognitive ability, and the typical cross-sectional effects found in prior goal orientation research. It might be that changes in dispositional goal orientation must be viewed in concert with goal revision and other factors in order to generate in-depth guidance for training practitioners.

Our findings more specifically suggest that bolstering within-person LGO over time is likely to increase learners' motivation to maintain their acquired skills, which is a critical factor in transferring training to the job context (Blume et al., 2010). Related research suggests that techniques designed to limit perceptions of time pressure (Beck & Schmidt, 2013) and promote a more learning-focused climate (Dragoni, 2005) may enhance the emergence of LGO by ensuring that these chronic patterns of cognition and behavior are activated. Our results also suggest that efforts to avoid increases in PPGO and APGO beyond the levels with which learners enter training are likely to yield greater returns on skill acquisition. Interventions that have been linked to approach-oriented tendencies, such as providing adaptive guidance (Schmidt & Ford, 2003), seem beneficial for stemming increases in APGO over time. Other research has found that self-efficacy can buffer the negative effects of APGO on learning and transfer (Dierdorff, Surface, & Brown, 2010). Thus, tactics for boosting levels of self-efficacy, such as providing information about training in advance, framing training as a learning opportunity, providing advanced organizers or preparatory training, or setting easier goals early in training (i.e., building ʙsmall wins^), appear relevant for mitigating the consequences of increases of performance goal orientations over time. Technology-delivered training may make it easier to adapt training content and experiences to individual differences by introducing these kinds of interventions and feedback when needed.

Study Limitations

Goal orientation was measured using the three-factor VandeWalle (1997) instrument, which includes scales for dispositional LGO, PPGO, and APGO. Some researchers (e.g., Elliot & McGregor, 2001) have argued for a bifurcation of mastery orientation into approach and avoidance domains, and a meta-analysis by Baranik et al. (2010) demonstrated the predictive utility of mastery avoidance. The current study did find a slight decrease in the LGO linear slope over time (see Table 4), which might be indicative of increasing mastery avoidance. Future research should incorporate other dispositional goal orientation conceptualizations.

Study data and analyses were correlational in nature, impeding our ability to make causal inferences. However, our study design aligned temporally with the theoretical and empirical specifications of the phenomena under investigation, which provides more confidence in our results. The fit statistic values for some growth models could be interpreted as suggesting only moderate fit (e.g., CFI and TLI values < .97). Future research should attempt to replicate these findings and test plausible alternative models. Additionally, we were unable to observe contextual factors or individual self-regulatory processes that might have affected dispositional goal orientation variability over time or its impact on learning outcomes. More research is needed to identify these types of factors and their relationships with changes in goal orientation and subsequent learning outcomes.

Study participants were military personnel studying a foreign language for 19–25 weeks in a required job-related training program. Characteristics of the sample and organization may affect the generalizability of results. For example, the work roles of military personnel entail activities not typically performed in other nonmilitary or civilian jobs. These characteristics could also foster a greater motivation to learn compared to civilian jobs because of the health and well-being consequences of skill proficiency. Yet, there are many nonmilitary occupations for which foreign language skill is equally pertinent to well-being such as paramedics, critical care nurses, emergency room surgeons, police officers, and so forth (Dierdorff & Surface, 2008).

The nature of the training was complex, the pace of the instruction was intensive, and the duration of the program was lengthy compared to most goal orientation research. Learning a foreign language is a cognitively demanding and challenging task. Foreign language instruction provides many opportunities to show capability and receive feedback. The training occurred in a classroom context where learners were constantly required to demonstrate newly learned skills and knowledge in the presence of peers. Because this context focused on constant demonstration of a difficult, observable skill in front of peers for a long duration, our data suggest trainees as an overall group reframed their preferences for demonstrating competence to others—revising it downward. Studies that replicate our results in other contexts and populations would lend further support to the notion that goal orientations reflect chronic patterns of action and cognition.

Conclusion

We find support for a fundamental tenet of goal orientation theory that purports fluctuations in dispositional goal orientations over time. Our results further indicate that this variability affects the outcomes of learning. Our study design did not address the underlying mechanisms as to why individuals' goal orientations shift over time. This remains an important question for future research to investigate. If goal orientations change as a result of training and such changes are related to learning, then instructional designers need research-based guidance on how to more effectively incorporate goal orientation fluctuations into the overall learning experience. It is our hope that the evidence from this study demonstrates a fruitful avenue for future research that can elucidate the mechanisms, conditions, and consequences of within-person variability in goal orientation over time.

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