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Modelling the links between students' interest in a domain, the tasks they experience and their interest in a course: Isn't interest what university is all about?

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ABSTRACT

In most formal educational contexts learning occurs through students' interaction with tasks embedded in courses representing learning domains. While current models of interest development describe how interest develops from an in-the-moment triggered state to a relatively enduring well-developed individual interest, this research investigates how interest develops across a set of tasks within a course defined by a specific knowledge domain. The current study examined the development of interest in the context of learning a second language at a Japanese university ($n = 218$) over one academic year. Predictive paths between prior interest in the domain, and competency beliefs at the outset of the course, were modelled in relation to successive course tasks and measures of course and domain interest recorded toward the end of the semester. Modelling included both variable-centred and person-centred perspectives. Accounting for prior interest, the results suggested a series of mediated relationships across task, course and finally domain interest. Self-concept and self-efficacy had different predictive effects on task interest early in the course. Theoretical and practical implications are discussed.

1. Introduction

The current research builds on the burgeoning literature on interest and interest development to explore relations between students' interest for a domain or study discipline, for a course, and for tasks within university studies, and how self-knowledge in the form of competency beliefs contribute to interest development. While the most commonly cited model of interest development (Hidi & Renninger, 2006) describes how interest develops from a triggered state to a relatively enduring well-developed individual interest, we focus on interest development within the context of a continuing university course. Students embark on a new university course with different levels of interest in the broad content domain, in the course itself, and have different levels of interest in the tasks they encounter. The current research takes novel approach to modelling the development of interest by incorporating all three levels: domain, course, and task. In addition, we examine how competency beliefs measured as self-concept and self-efficacy, contribute to this development. Relations between the three levels of interest, self-concept, and self-efficacy are modelled across a number of time points over an academic year in the context of a university course for learning English as a foreign language. This research thereby seeks to make a substantive contribution to our understanding of the role of key individual differences within student learning.

1.1. Nature and development of interest

Probably the most widely-cited model of interest and interest development is the Four-Phase Model of Interest Development (Hidi & Renninger, 2006; Renninger & Hidi, 2011) whereby interest is conceptualized as a multidimensional construct consisting of affect, value and knowledge components. Hidi and Renninger propose differences in the relative balance of these components across the four phases of interest development – triggered situational interest, maintained situational interest, emerging individual interest and well-developed individual interest. In the early phases, affective components are strong and across the course of development knowledge and value components become an increasingly important part of the structure of the developing interest.

Across adolescence and even into post-compulsory contexts, educators face a steady decline in the quantity (Frenzel, Goetz, Pekrun, & Watt, 2010; Jacobs, Lanza, Osgood, Eccles, & Wigfield, 2002) and quality (Lieberman & Remedios, 2007) of students' motivation to learn. This

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presents a challenge for researchers to identify critical points in interest development as it occurs within students' educational experience. However, while developmentally complex, interest is content specific (Krapp, 2003; Renninger & Hidi, 2011) and a number of researchers (e.g., Frenzel, Pekrun, Dicke, & Goetz, 2012; Hidi & Renninger, 2006; Renninger & Hidi, 2011) have called for more attention to interest development in specific domains.

1.2. Interest development in a university course context

Acknowledging the domain specific nature of interest is essential to enhancing interest in the context of tertiary education. Based on their classroom, tutorial, and independent study experiences, students make choices about further learning. Therefore the network of relations between interest at different levels of content specificity; domain, course, and task, require further investigation. While most contemporary perspectives emphasise that interest relates to a particular object or content, the specificity of content varies. For example, the intrinsic value construct in expectancy-value theory (Wigfield & Eccles, 2002) primarily refers to specific tasks or activities. The intrinsic motivation construct in self-determination theory (Deci & Ryan, 1985) is usually defined in relation to general classes of content. The POI theory distinguishes objects, activities and domains as interest contents (Krapp & Prenzel, 2011) but like Hidi and Renninger (2006), contents are not tied specifically to any one stage/phase of interest development.

We propose that the reciprocal relations between interest in domain, in course and in tasks are pivotal for understanding how tertiary students' learning experiences contribute to development of their interest in particular learning domains. Students come to their university experience with different levels of interest in the study domains available to them. Choice of a particular study domain often represents existing personal interests. In addition, some domains may be mandated for study and courses in these domains confront a wider range of students' initial domain interest as there will be some students with little or no interest in the domain. As students engage in courses within a domain their learning experiences consist of specific tasks and activities. Students attend lectures, tutorials and engage in a range of compulsory and/or self-directed study. We expect that interest generated and supported by the specific content of the activities and tasks that make up a course will impact on interest (or lack of interest) in the target course and in turn interest in the study domain.

The question for this research concerns how the three levels of domain, course, and task contribute to students' developing interest. At the more general level domain interest refers to students' interest in a defined body of knowledge; an interest in English language, for example. When students have a strong interest in a domain this is likely to be analogous to what Hidi and Renninger (2006) refer to as individual interest. However, knowledge of intensity of the interest and of the time over which this interest has persisted are needed to identify whether this might be a maintained situational, an emerging individual, or a well-developed individual interest.

Course interest refers to the interest students have for a defined course within their study program; Semester 1, Introductory English as a Foreign Language, for example. Students will vary in the phase of interest development that course interest represents, in part due to their level of interest in the domain. Where students have little or no interest in the domain, for example, when students are only taking the course because it is mandated, initial course interest is likely to be low. However, course interest is likely to be directly impacted by how students experience specific course tasks and activities and task interest in our model refers to interest triggered and/or maintained while participating in course-related activities such as practicing English language through interviewing a class partner. We expect that there will be cumulative impacts between these three levels across time.

In the current study the predictive effects across the three levels, domain, course, and task, will be modelled over time using successive measures completed by students studying English as a foreign language at a Japanese university. Domain interest assessed one week after the course commenced is expected to predict to interest in specific tasks and to course interest. Interest in specific tasks is expected to predict to interest in further tasks and to both course and domain interest at the end of the academic year. Course interest is more specific than domain interest and less specific than task interest and so is expected to predict to later measures of domain interest.

1.3. The role of competency beliefs in interest development

Renninger (2009) has suggested that understanding the relation between phases of interest development and self-representation is informative for thinking about how to support interest development in achievement domains. In arguing this connection Renninger used Harter's (2006) developmental model of self that includes students' own perceptions of their academic competencies accumulated from the social comparisons inherent in interactions with others. In recent research on relations between interest and competency beliefs, the latter have most commonly been examined as self-efficacy (Bandura, 1997) and self-concept (Marsh & Shavelson, 1985). Hence, in the current study we incorporated both self-efficacy and self-concept to investigate their contribution to the development of interest for tasks, course, and domain across one academic year.

A number of researchers (e.g., Bong, Lee, & Woo, 2015; Durik, Hulleman, & Harackiewicz, 2015) have considered relations between competency beliefs and interest in specific achievement domains, in particular mathematics and science. For example, using data collected from secondary students (Grades 7–10), Bong et al. (2015) reported strong positive associations between self-efficacy and interest in mathematics and science. Associations between competency beliefs and mathematics and science were stronger than associations with language arts. Other researchers investigating on interest in mathematics and science have focused on self-concept. Data from both secondary and post-secondary students highlights the role of differences in individual interest and self-concept for students' responses to instructional features designed to trigger interest in specific classroom tasks (Durik et al., 2015).

However, despite being closely related, self-concept and self-efficacy are not regularly researched together. What research does exist has demonstrated separate construct validity while suggesting that self-efficacy is an "active precursor of self-concept" (see Bong & Skaalvik, 2003). Recent investigations examining outcomes of both self-concept and self-efficacy research suggest they have disparate effects on learning. Jansen, Scherer, and Schroeders (2015) found self-efficacy to be the stronger predictor of current competency, while self-concept was more strongly predictive of career goals. Parker, Marsh, Ciarrochi, Marshall, and Abduljabbar (2014) observed that while self-concept and self-efficacy were consistent predictors of secondary school tertiary entrance ranks, they also had separate predictive effects. Self-efficacy predicted university entry while self-concept predicted undertaking studies in a STEM field. While these studies establish that self-efficacy and self-concept predict to similar and to disparate achievement outcomes, their shared and unique contributions to the development of interest across a specific tertiary course has not been sufficiently tested. This is a gap the current study seeks to address.

Both theory (Hidi & Renninger, 2006; Schiefele, 1991) and recent cross-lagged modelling (Marsh, Trautwein, Ludtke, Koller, & Baumert, 2005) agree that competency beliefs play a significant role in interest development. However, it is not clear which competency beliefs, self-concept or self-efficacy, are integral to the development of interest at the different levels of domain, course and task. The effect of competency beliefs may be directly related to the level of specificity, which is of

course the underlying difference between the two constructs. It is therefore worthwhile examining the predictive validity of these constructs for interest in domain, course and task.

1.4. A person-centred perspective

Modelling the development of interest at task, course and domain levels is an important step toward understanding interest development across university studies. However, this type of variable-centred design does not identify whether there are subpopulations with distinct developmental trajectories. A person-centred approach to modelling is necessary for this type of examination (Von Eye & Wiedermann, 2015). In the current study Latent Profile Analysis (LPA) was used to identify different trajectories of interest development linking measures of competency beliefs, domain, task, and course interest across one academic year.

1.5. The current study

The current study examined predictive relations between competency beliefs of self-concept and self-efficacy and three levels of interest (task, course and domain) across a year-long university course for learning English as a foreign language. Following these variable-centred analyses, person-centred analyses were used to identify specific trajectories in the development of student interest across a full academic year. Competency beliefs and prior domain interest were measured one week after course commencement. Task interest was measured over three successive tasks across two semesters of an academic year. Course interest and a post domain interest measure occurred during the two final classes of the second semester. Finally, a year-end competency assessment was undertaken during the course exam period (Fig. 1).

From the model presented in Fig. 1 the following specific predictions were derived. Prior domain interest was expected to significantly predict task interest across the course as well as course and post domain interest. Prior domain interest was also expected to predict post competency. Interest for each task was expected to significantly predict interest for later tasks, course interest, and post domain interest. In addition to an effect of task interest on post competency, mediated through course interest, a small direct predictive effect from the final task (Task C) was also expected. Course interest was expected to predict post domain interest.

Self-efficacy and self-concept were expected to predict task interest, and, in addition to potential mediated effects, self-efficacy and self-concept were expected to significantly predict course interest and post domain interest. Self-efficacy and self-concept were also expected to predict scores on post competency. Fig. 1 shows the full model of these predicted relations. With the exception of Tasks A and B, each modelled as predicting future tasks and course interest, modelling was fully-forward (i.e., predicting all future variables).

In addition to these specific predictions it was expected that the latent profile analysis would identify at least two distinct trajectories of interest development across task and course experiences.

2. Methods

2.1. Participants and procedures

Participants were first and second year students ($n = 221$; female = 46) at one mid-sized, private university in Japan. Students from five faculties (Engineering, Commerce, Fine arts, Management and Computer science) were enrolled in a mandatory English as a foreign language course which included two 90 min classes for 30 weeks across two semesters of an academic year (April to January). The curriculum was co-ordinated for all students with common weekly/year-end tests, textbooks, and e-learning resources (see Fryer, Anderson, Stewart, Bovee & Gibson, 2010; Bovee & Fryer, 2011; Stewart, Fryer & Gibson, 2013). The course focused on English vocabulary, listening and speaking skills. Teachers were recruited following an explanation of the project aims and methods. Four teachers (in addition to two authors) agreed to participate and administered the three tasks and the scheduled surveys. Prior to participation all students read an explanation of the study's general purpose (support students' interest in their studies), and were informed that participation was voluntary. For each survey, interest items were clearly targeted as referring to students' experiences during specific tasks, course, or domain.

On-line self-report measures of prior domain interest, self-efficacy and self-concept were administered after one week of classes (T1) and prior to the first assigned e-learning task (T2). All task interest data were collected during class on tablets immediately following a vocabulary review task developed to support students' preparation

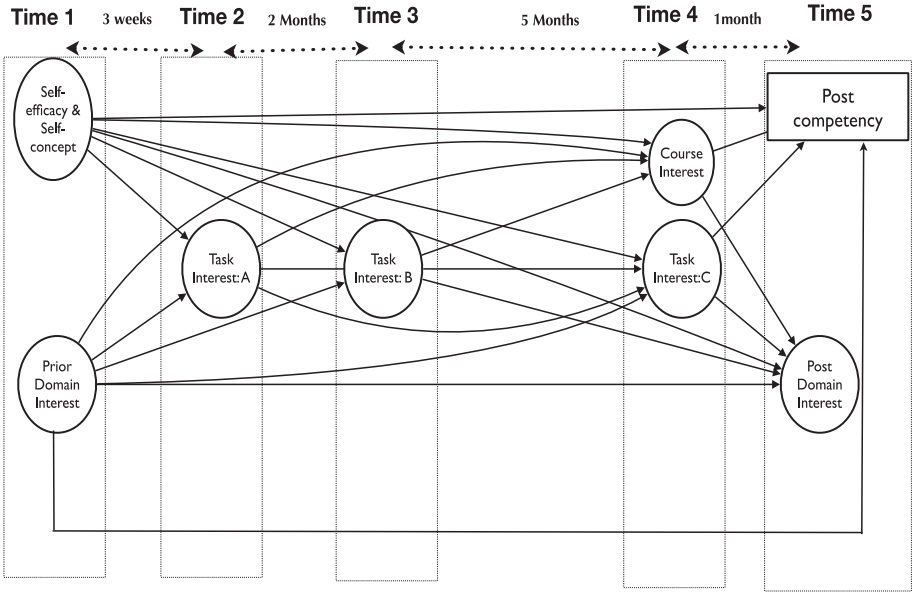

Fig. 1. Model of longitudinal relations between competency beliefs of self-efficacy and self-concept, domain, task and course interest, and English language competency.

for an upcoming test. The tasks (T2, T3 and T4) involved listening to and reading review questions focused on vocabulary learned in class during the previous weeks. The task was presented to the entire class using a projector, was timed and was identical across all participating classes providing a consistent experience for self-reported interest measures. Task interest C and course interest were recorded during the same class (T4) at the end of the year. The post domain interest measure and a standardised test of English language competency were completed during the end of the academic year exam period (T5).

2.2. Measures

The current study employed a mixture of established and new scales (Table 1). Three prior-post domain interest items and four self-concept items, used previously (Fryer, 2015; adapted from Ichihara & Arai, 2004). Five self-efficacy items were translated from self-efficacy items in the Patterns of Adaptive Learning Scales (Midgley et al., 2000).

Sets of task and course interest items, 10 and 12 items respectively, expressing affective, value and cognitive components of interest, were piloted prior to the current study. Split-half exploratory and confirmatory factor analyses produced a four-item course interest and a five-item task interest scale employed in the current study.

T1 scales (see Fig. 1) were seven-point Likert scales (1 = Totally unlike me and 7 = Totally like me). All T2 to T5 scales were six-point Likert scales (1 = Totally unlike me and 6 = Totally like me). T1 scales were completed online after the first week of classes. T2 to T 4 interest scales were completed in class. The T5 post domain interest scale was completed with the final competency assessment. Scores on all T1 scales were linearly transformed (SPSS, 2010) to a six-point scale for the descriptive interpretation of means (Table 2).

2.3. Analyses

All modelling and profiling analyses were conducted with M*plus* 7.0 using the MLR algorithm which is robust to non-normality issues common to Likert data. Missing data is a problem with all longitudinal designs but especially with data collected in varied settings: in class, online, and with examinations. Rather than list-wise deletion, which may skew results, the current study (17.8% missing data) employed Full Information Maximum Likelihood (FIML) model estimation which is widely recognized as the most comprehensive approach to handling missing data (Enders, 2006).

Table 1
Scale items.

	Items
Domain interest (prior and post)	I think that English is always interesting.
	I know that English arouses my curiosity.
	I like to learn new English topics.
Self-efficacy	I'm certain I can master the skills taught in class this year.
	I'm certain I can figure out how to do the most difficult class work.
	Even if the work is hard, I can learn it.
	I can do even the hardest work in this class if I try.
	I can do almost all the work in class if I don't give up.
Self-concept	My English grade in the high school was good.
	I have a good memory for English.
	I could understand English lesson at the past.
	I can use English.
Task interest (tasks A, B, and C)	This activity is personally meaningful.
	I enjoyed learning English in this activity.
	I liked using English in this activity.
	This activity was interesting.
	It was fun to review English in this activity.
Course interest	I am fully focused on learning English in this course.
	This English course is interesting.
	This English course is useful for me.
	This English course is personally meaningful.

Table 2
Fit for confirmatory factor analysis, longitudinal model, domain interest variance, and task interest variance.

	CFA (configural)	Pre/post domain interest invariance (T1, T5)	Tasks A, B, C invariance (T2, T3, T4)	Longitudinal model test (Fig. 3)
CFI	0.94	0.94	0.93	0.94
TLI	0.93	0.93	0.93	0.93
RMSEA	0.053	0.058	0.055	0.053
Chi-square	852.63	862.76	894.44	854.32
Degrees of Freedom	525	532	538	530

Prior to the main modelling, confirmatory factor analysis was undertaken to establish convergent and divergent construct validity of the study's latent constructs. Following this test, a longitudinal model based on Fig. 1 was constructed and tested. As Task C interest and course interest were measured at the same time (T4) no path linking them was included in this longitudinal model. For all latent modelling, fit was assessed employing multiple indices: Root Mean Square Error of Approximation (RMSEA) (Browne & Cudeck, 1992), with values <0.08 and <0.05 indicating acceptable and good fit respectively, and Confirmatory Fit Index (CFI) and Tucker-Lewis Index (TLI) with values >0.90 and >0.95 indicating acceptable and good fit respectively (see Marsh, Balla, & McDonald, 1988).

Interpretation of the β coefficient results were based on Peterson and Brown's (2005) recommendations and Hattie's (2009) guidelines for educational effect sizes. The current study employed three levels of β weights: for positive effects, small $\beta = 0.05$; moderate $\beta = 0.15$; and, large $\beta = 0.24$ and above; and for negative effects, small $\beta = -0.10$; moderate $\beta = -0.20$; and, large $\beta = -0.29$ and above.

Finally, to examine interest trajectories of latent subgroups, an LPA was conducted employing students' prior domain interest, self-concept and self-efficacy as the profiling variables. LPA results were assessed through the use of five fit indexes. The Vuong-Lo-Mendell-Rubin Likelihood Ratio Test (Vuong, 1989) and Lo-Mendell-Rubin Likelihood Ratio Test (Lo, Mendell, & Rubin, 2001) both provide a test of whether the identified set of latent groups was less significant than a solution with one group less, that is, whether the solution with one group less was a better fit for the data. Akaikes's Information Criterion (AIC; Akaike, 1987), the Bayesian Information Criterion (BIC; Schwartz, 1978) and the sample size-adjusted BIC model are selection criteria wherein lower values indicate the preferred model. BIC is generally seen as being the most useful guide for LCAs (Nylund, Asparoutiov, & Muthen, 2007). In addition, the relative size of the subgroups and their theoretical meaningfulness was also considered when deciding on a final solution. A MANOVA was then conducted to assess the variance in profiling variables. ANOVAs then assessed the differences between and estimated the variance explained by the latent groups for the other longitudinal model variables. Finally, pairwise differences between subgroups on each of the variables were tested (Tukey-Kramer's HSD).

3. Results

Results are presented in two sections: variable-centred and person-centred. Preliminary testing for gender effects (ANOVA) indicated no significant effects ($p < 0.05$).

3.1. Variable-centred modelling

3.1.1. CFA: convergent and divergent validity of measures

All variables were included in a confirmatory factor analysis to assess convergent and divergent validity and demonstrated acceptable fit (Table 2). Next, invariance for domain interest (T1 and T5) and task

Table 3
Correlations, means and standard deviations for all variables modelled in the current study.

		1	2	3	4	5	6	7	8	9
1	Prior domain interest									
2	Self-concept	0.67								
3	Self-efficacy	0.74	0.69							
4	Task interest A	0.52	0.45	0.30						
5	Task interest B	0.63	0.40	0.41	0.62					
6	Task INTEREST C	0.46	0.36	0.41	0.58	0.63				
7	Course interest	0.60	0.38	0.45	0.55	0.66	0.87			
8	Post domain interest	0.72	0.51	0.56	0.49	0.61	0.58	0.68		
9	Post competency	0.33	0.40	0.47	.14 ns	0.26	0.24	0.31	0.31	
	Cronbach's alpha	0.82	0.86	0.84	0.93	0.93	0.95	0.94	0.84	
	Mean	3.55	2.86	3.58	4.04	4.08	4.32	4.27	3.59	121.44
	SD	1.13	1.07	0.93	0.89	0.88	0.90	0.98	0.91	18.85

Note: All correlations >0.14 are significant $p < 0.01$.

interest (T2, T3, and T4) were assessed. Following Marsh, Nagengast, and Morin (2013), invariance testing for pre/post domain interest and task interest relied on CFI and RMSEA comparisons to assess the adequacy of the invariance between time points. The assumption of invariance is tenable if CFI does not change >0.01 and the RMSEA increases by <0.015 for the invariant model (Chen, 2007). Tests of invariance (task and domain interest) met these criteria.

3.1.2. Modelling interest for task, course and domain with competency beliefs

Correlations, reliability, and descriptive statistics are presented in Table 3. All reliability coefficients were acceptable (<0.70; Devellis, 2012). Except for the first task interest measure and competency ($r = 0.14$), all variables were positively related ($p < 0.05$). As noted earlier Task C interest and course interest were recorded at the same time, and although the inter-correlation was high ($r = 0.87$), it was below the standard cut-off for multicollinearity ($r = 0.90$; Tabachnick & Fidell, 2007).

The tested model and results are presented in Fig. 2. Large, moderate and non-significant β coefficients are distinguished and all paths included in assessing the model fit are shown in Fig. 2.

As expected, prior domain interest showed a large coefficient predicting post domain interest ($\beta = 0.40$; $p < 0.01$). Prior-domain interest also significantly predicted interest for Task A ($\beta = 0.60$; $p < 0.01$), and Task B ($\beta = 0.45$; $p < 0.01$). For the within course measures of task interest there were strong predictive paths linking Tasks A and B ($\beta = 0.43$; $p < 0.01$), and also Tasks B and C ($\beta = 0.42$; $p < 0.01$). The predictive effect of task interest A on task interest C was only partially mediated by task interest B as a significant direct effect of task interest A on task interest C remained ($\beta = 0.33$; $p < 0.01$). The predictive effects of prior-domain interest on task interest C and course interest were mediated by task interest A and in turn task interest B. In addition, task interest A had a moderate direct effect on course interest. Finally, task interest C did not significantly ($p < 0.05$) predict either post domain interest or post competency. On the other hand, course interest measured at the same time as task interest C (Time 4) significantly predicted both post domain interest ($\beta = 0.33$; $p < 0.01$) and post competency ($\beta = 0.18$; $p < 0.01$).

In sum, as expected, prior domain interest predicted later domain interest. In addition, prior domain interest predicted interest in on-course tasks and these in turn predicted students' expression of interest in the broader course. Simultaneously, students' course interest measured at the end of the course, predicted post domain interest. In terms of development of domain interest, across this course domain interest was maintained but did not significantly increase.

3.1.3. self-concept and self-efficacy as predictors of interest and competence

Self-concept and self-efficacy had distinctly different paths of influence in the model shown in Fig. 2. Self-concept significantly predicted task interest A ($\beta = 0.29$, $p < 0.01$) but did not make a unique contribution to prediction of any later measures of interest. On the other hand, self-efficacy was a strong predictor of task interest C ($\beta = 0.28$, $p < 0.01$) and post competency ($\beta = 0.44$, $p < 0.01$). In addition, self-efficacy had a significant negative relation with task interest A ($\beta = -0.35$, $p < 0.01$). In the light of the positive zero-order correlation between these two variables, this negative predictive effect suggests

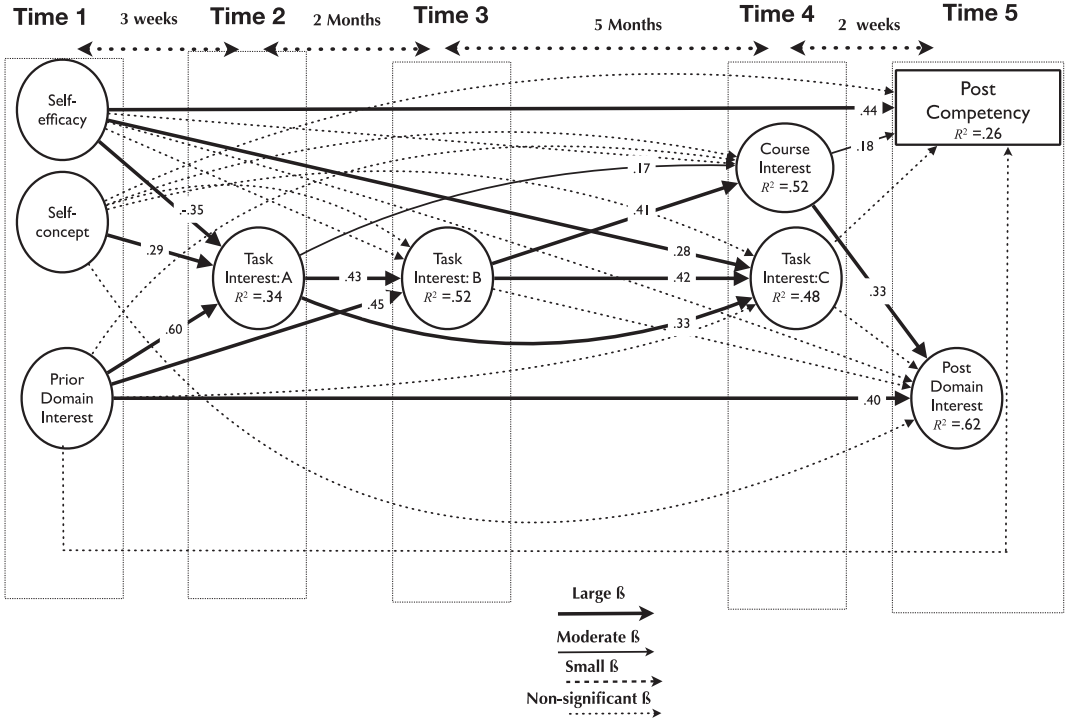

Fig. 2. Final model with significant effects presented. *Note*: All effects presented are significant $p < 0.05$. No significant small ßs were present in the modelling results.

Table 4
Fit indices for latent profile groups two through five.

Fit indices	2	3	4	5
Akaike (AIC)	1167.002	1147.408	1140.897	1137.894
Bayesian(BIC)	1190.946	1181.613	1185.364	1192.623
Sample-Size BIC	1168.761	1149.921	1144.163	1141.915
Entropy	0.786	0.717	0.757	0.768
Vuong-Lo-Mendell-Rubin likelihood ratio test	0	0.0476	0.0244	0.2113
Lo-Mendell-Rubin likelihood ratio test	0	0	0	0.2253
Parametric bootstrapped likelihood ratio test	0	0	0	1

Table 5
Differences between the three profiles.

	Low	Mid	High	*p*	F	R^2
Profiled variables (time-1)						
Prior Domain Interest	-1.62_a	-0.05_b	1.29_c	0.0001	294.19	0.73
Self-concept	-0.91_a	-0.02_b	$.71_c$	0.0001	30.85	0.22
Self-efficacy	-1.01_a	-0.05_b	$.90_c$	0.0001	50.54	0.32
Covariates (times-2–5)						
Task interest A	-0.72_a	-0.10_b	$.77_c$	0.0001	28.71	0.21
Task interest B	-0.73_a	-0.10_b	$.83c$	0.0001	31.98	0.23
Task interest C	-0.86_a	-0.03_b	$.70_c$	0.0001	28.37	0.21
Course interest	-1.01_a	-0.01_b	$.77_c$	0.0001	40.81	0.28
Post domain interest	-1.46_a	0.01_b	$.99_c$	0.0001	111.82	0.51
Post competence	-0.36_a	-0.07_b	$.59_b$	0.0001	10.31	0.09
Sample proportion	14%	65%	21%			

Note: z-scores are presented for low, mid and high groups results. Within row means with different letters are significantly different from each other.

that after accounting for students' prior domain interest and self-concept, higher self-efficacy for the domain predicted lower interest in the task. This will be examined further in the discussion.

The indices of explained variance for each of the interest variables in this model were substantial indicating the interdependence of the levels of interest: task interest A ($R^2 = 0.34$), task interest B ($R^2 = 0.52$), task interest C ($R^2 = 0.48$) and course interest ($R^2 = 0.52$). Domain interest at the end of the course had the most variance explained ($R^2 = 0.62$), On the other hand the proportion of variance explained for the end-of-course competency was considerably lower ($R^2 = 0.26$).

As expected, competency beliefs contributed to task interest in different ways. Self-concept positively predicted task interest early in the course while the more specific self-efficacy positively predicted task interest later in the course (task C).

3.2. Profiling results

In order to identify developmental trajectories of interest across the academic year, interest and competency belief measures recorded at the commencement of the course were entered into a LPA. Two, three, four and five latent subgroups were extracted in successive analyses and Table 4 shows the relevant fit indices for these solutions.

The three likelihood tests suggested that four groups was the most appropriate solution: Vuong-Lo-Mendell-Rubin likelihood ratio test ($p < 0.23$), Lo-Mendell-Rubin likelihood ratio test ($p < 0.77$), and Parametric bootstrapped likelihood ratio test ($p < 1$). However, BIC is the most trusted of criterion for subgroup fit. The lowest BIC was for three classes (Table 4), suggesting that three latent subgroups fit the population best. The three subgroups were of reasonable size (Low = 14%, Middle = 65%, high = 21%) and inspection of the profiles suggested a theoretically meaningful solution of three subgroups (high, medium, and low). Data points for standardised scores on the three profiling variables are shown on the far left of Fig. 3. Standardised scores for the three subgroups on all other variables, namely, task interest A, B, and C, course interest, post domain interest and competency make up the rest of Fig. 3. There is consistent separation between the three subgroups across the full set of measures.

The three subgroups solution was subjected to a MANOVA resulting in a significant Wilks' Lambda (0.62, DF = 418, $p < 0.01$). Separate univariate analyses indicated significant differences (Turkey-Kramer HSD, $p < 0.05$) between all three subgroups for all of the variables except post competency. The ANOVAs also generated an estimate of the amount of variance on each variable explained by the three subgroup profile (Table 5).

As can be seen from Fig. 3, prior domain interest provided the strongest differentiation between the three subgroups. At the beginning of

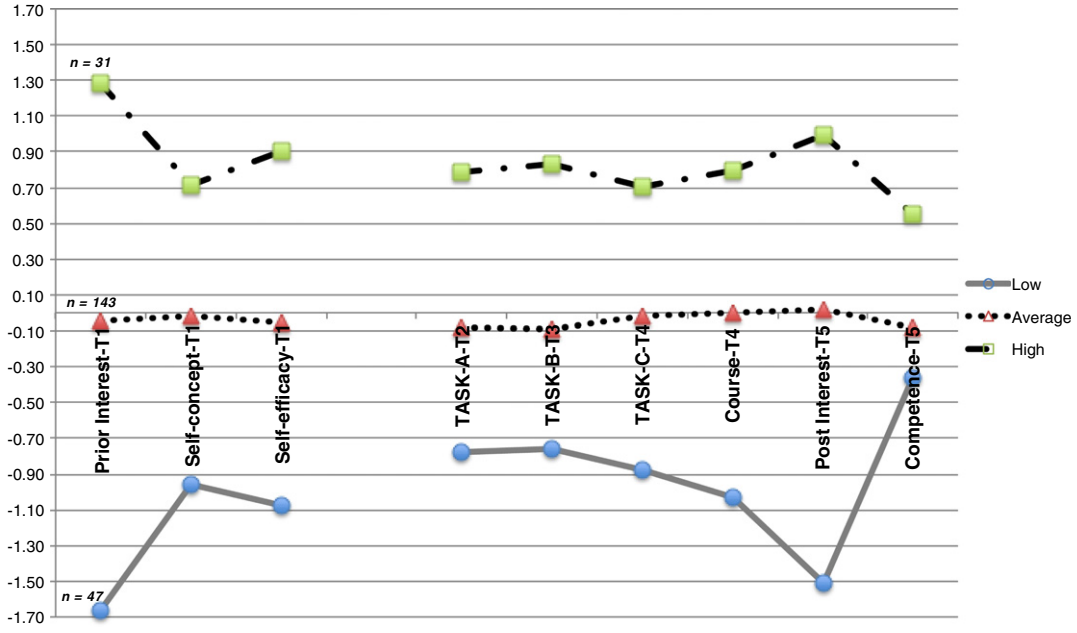

Fig. 3. Three class profile. *Note*: Prior domain interest, self-concept and self-efficacy were employed for the LPA. The remaining presented variables were covariates to the profiled variables.

the course, differentiating between these subgroups explained approximately 73% of the variance on domain interest. At the end of the course the corresponding estimate of explained variance in domain interest was 51%. Although the overall level of domain interest remained approximately the same across the course, there were some changes; the high group mean was slightly lower than at the beginning of the course and the low group mean was slightly higher than earlier. The profile for scores across the three task interest measures showed a relatively stable pattern both in terms of the level and the separation between the subgroups. The three task interest variables, course interest, and the two competency beliefs had similar proportions of variance explained by the differentiation into the three subgroups (21%–32%). Finally, differences between the three subgroups explained only a very small proportion of the variance in competency (9%).

4. Discussion

The current study tested a longitudinal model of interest at task, course and domain levels. Key competency beliefs of self-concept and self-efficacy were included in the modelling in order to assess their potential role.

4.1. Domain, course and task interest

As expected, prior level of domain interest was predictive of interest in tasks undertaken during the course, while also strongly predicting domain interest at the end of the academic year. Domain interest was a significant predictor of interest in task A and interest in task B. Further effects of domain interest on task, and course level interest were indirect effects operating through the strong predictive relation between task B interest and both task C and course interest. Hence domain interest had an indirect influence on task and course interest as the academic year progressed. It appears that by the end of their course, students' course-based experiences had a stronger impact on their interest in the course than their prior level of interest in the domain. In general, task interest predicted to course interest and through course interest to interest in the domain rather than predicting directly to interest in the domain. This pattern of relations suggests that while domain interest was relatively stable, interest generated by course tasks contributes to students' interest at the course level, which in turn contributes to maintaining interest in the domain.

Interest as measured at levels of domain, task, and course, had a significant but small predictive relation with competency scores at the end of the academic year operating primarily through levels of course interest. Students with higher levels of course interest were more likely to do well on the language competency test.

4.2. Competency beliefs and interest

Competency beliefs in the form of self-concept and self-efficacy had different effects on developing interest and on students' competency in the new language. These findings suggest important but different roles in the development of interest.

Self-concept significantly predicted only one of the steps in the longitudinal model, namely the first measure of task interest (task A). The more confident students felt about their general skills for learning English, the more interested they were in the first task. On the other hand self-efficacy significantly predicted task interest for two of the task measures, task A and task C but not task B. Self-concept and self-efficacy were not significant predictors of course or domain interest at the end of the semester. Hence, it appears from these findings that competency beliefs in the form of self-concept and self-efficacy directly affect interest at the more specific level of tasks rather than at the general levels of course and domain interest.

Of particular note was the negative relation between self-efficacy and interest for the task undertaken early in their English language course. The correlation between self-efficacy and interest for task A was lower than correlations between self-efficacy and other interest measures. It was also much lower than the correlation between self-concept and task A, despite self-efficacy and self-concept being strongly correlated. Furthermore, while the correlation between self-efficacy and task interest increased slightly across tasks, the correlation between self-concept and task interest declined. It is reasonable to suggest that students, who at the beginning of the course felt very confident of their general language skills (self-concept) and reported relatively high task interest, may have found subsequent tasks less enjoyable and challenging. Some evidence of this decline in task interest is clear from the high subgroup profile (Fig. 3). Later in the year when interest in task C was measured, students' self-efficacy, namely their initial confidence in being able to tackle tasks in the English language classes, was more closely aligned with their enjoyment and valuing of the task content. One way of interpreting this effect is to suggest that students who had begun with lower efficacy for the task and who perhaps initially found it novel, responded positively to task A. However, as the course progressed and the listening and reading review task followed the same format as earlier tasks but still required strong listening and reading skills for the new content, it was no longer novel. Under these conditions the lower self-efficacy students were more likely to report lower interest in task C. While speculative, this interpretation is partly confirmed by the decreasing trajectory of task interest evidenced by students from the low trajectory subgroup.

These results suggest that competency beliefs have an impact both at the level of students' experience during specific task engagements and at the more general level where it has often been modelled (e.g., Fryer, 2015; Marsh et al., 2005). Furthermore, self-efficacy rather than self-concept had a significant effect on English language competency at the end of the course. These results support recent meta-analytic findings (i.e., Richardson, Abraham, & Bond, 2012) suggesting that self-efficacy is the more important of the two self-competency beliefs for achievement outcomes.

4.3. Different trajectories of interest development

In addition to this overall pattern of relations for the development of interest, three trajectories were identified linking interest and competency belief measures. The three subgroups defined by these trajectories reported different experiences of the same tasks and course. By far the largest of these groups (Average) reported interest experiences in line with the overall group pattern that has been described. One of the smaller diverging groups (High) demonstrated a high level of domain interest maintained across the course and culminated in an increased level of domain interest. The Low trajectory subgroup diverged from the Average with significantly lower course and domain interest. These High and Low groups also showed parallel contrasts in the levels of self-concept and self-efficacy in relation to learning English as a foreign language. The major difference in competency scores for the three subgroups was the significantly lower scores for the Low trajectory students.

4.4. Implications for theory

The current study's provides evidence to support investigations of how development of interest at different levels of specificity (task, course and domain) contribute to students' course experience. Our results clearly support the cumulative effect of interest in class tasks for the development of course interest. Initial domain interest appears to affect interest for early tasks. As a course progresses, experiences of interest in on-course tasks build interest for the course and contribute to domain interest and achievement outcomes. This set of mediated effects makes it clear, that models of this kind are required if we are to understand how interest develops (or declines) during formal education.

Another important contribution of the findings from this study has been to separate the independent effects of self-concept and self-efficacy in the development of interest. Results from this study suggest that self-efficacy can play a different role in students' initial and their continuing experiences with on-course tasks. Some students come to tasks with high self-efficacy and may therefore find a task lacking in interest and challenge. Students with lower self-efficacy might, however, find it novel and hence interesting initially, but then when similar tasks recur, their interest declines. While somewhat counterintuitive to the strong positive relationship presented in early self-efficacy research (Bandura & Schunk, 1981), our findings do support the proposition that self-efficacy plays a variable role in the development of interest. Another plausible explanation for the differential effects of self-efficacy across the three on-course tasks might relate to potential changes in students' self-efficacy as the course progressed. Longitudinal measures of self-efficacy were not included in the design and may be an important improvement in further research.

Self-concept has been shown to have a consistent relationship with interest in past research but has not generally been modelled simultaneously with self-efficacy in the prediction of future interest. It was unexpected to find that self-concept was a significant predictor of interest only on the first task and that it was not a significant predictor of future course or domain interest. It appears that after accounting for interest in classroom tasks, and course interest, neither self-concept nor self-efficacy directly predicted course or domain interest. However, when students first engage with a new task, self-concept is a positive predictor of interest. Students who feel competent in a domain are responsive to new tasks in that domain, but this effect does not carry forward beyond the effect of interest in the task itself.

A further contribution from the findings of this study is the support provided for past assertions that self-efficacy, rather than self-concept, is the critical mechanism through which competency beliefs contribute to achievement. Self-efficacy is an integral part of the interest/achievement relation. Interest and achievement are two important outcomes of formal education that support life-long learning, and our findings suggest that self-efficacy is clearly central in this development.

4.5. Practical implications

For practitioners, probably the strongest implication to be derived from our findings is that tasks matter. The tasks students engage with have a large and cumulative effect on course interest and ultimately their interest in the domain. In addition, it is important to stress that individual differences also matter. As the current study demonstrates, groups of students can be differentiated on their profile of interest and competency beliefs. In this study there were students who are “kind of” interested and feel generally confident of their competency in the domain (average profile), others who are not interested and not very confident of their competency (low profile), and some who are very interested and are also very confident they can achieve in the domain (high profile).

5. Limitations

The chief limitation of this research is that it was undertaken at one university, within one domain of study and is primarily based on self-report. However, the findings suggest that longitudinal modelling of relations between these variables is an important direction for further research.

6. Conclusions

This study has reported a test of relations between competency beliefs and interest within a year-long university course. The model provided evidence of how interest develops from the domain interest students bring to the classroom, to the interest generated by class tasks, to interest in the course and the broader domain. Evidence from the current research supports predicted interconnections over time between students' task, course, and domain interest.

In sum, interest in both tasks and course are essential to understanding and improving student learning within formal education. Course interest and its relation with interest in the broader study domain, is central to students' progress and development as life-long learners.

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