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Innovation in the workplace has been claimed to be a key factor in organizational survival and success. As future workers, university students are a major source of future innovations in organizational settings. Before they enter the labour market, it is in the context of Higher Education that they start developing some of their long-term behaviours, such as innovation behaviours. This study aims to explore the main determinants of university students' innovation behaviours from a longitudinal perspective. The sample comprised 78 students of Psychology, Management, Fine Arts and Education. Our results show that previous innovation behaviours as freshmen, current levels of autonomy and cognitive demands are positively related with individual innovation among university students. Practical implications regarding how to foster innovation efforts in the context of Higher Education are discussed.

Keywords: Innovation; university students; first year experience; academic outcomes; academic context

Higher Education Institutions are the engines of countries' growth and development because of the innovation that they nurture (Crosling, Nair, and Vaithilingam 2014). Universities are producers of innovation, creating novel and improved products and services, and supplying training, expertise and human resources (i.e., potential innovators) to societies and organizations (Al-Husseini and Elbeltagi 2014). In fact, innovation in the workplace has gained recognition as a key performance output over

the last decades, although it is important to highlight that innovation may not necessarily always be beneficial and can sometimes even be counterproductive to other aspects of performance in the workplace (Anderson, Potočnik, and Zhou 2014). However, the intentional introduction of improved ways of doing things that innovation implies (West and Farr 1990) should enable organizations to respond and adapt to rapid market changes, and to operate effectively in their wider business environment (Schaltegger, Deke–Freund, and Hansen 2012). Such innovation capability of organizations relies largely on individuals (Ailing et al. 2013) working across all organizational levels (Axtell et al. 2000).

Today's undergraduates are tomorrow's employees; as such, they are one of the major sources of future innovations in organizational settings. Before these university students enter the labour market, it is in the context of Higher Education that they start developing long-term attitudes, values and behaviours as emerging adults (Bowman 2012), including innovation behaviours. Moreover, graduate outcomes or competences could be widely defined as the final product or result of the whole university experience, and innovation is one of those expected graduate outcomes. However, as Ailing et al. (2013) suggest, there is a lack of feasible means and methods to promote undergraduates' innovation capability. This could be due in part to the prevailing focus of the research on student innovation, mainly concerned with the study of university students' innovativeness. However, individuals' innovation could also be regarded as a behaviour that implies new ways of doing things, fostered, among other resources, by having autonomy in carrying out one's own tasks and assignments. In this context, this study investigates individual innovation behaviours among university students from a longitudinal point of view, trying to highlight its main influences, such as autonomy and cognitive demands. In so doing, this study can potentially speak to a broad academic

audience concerned with curricula design in Higher Education that aims to foster student innovation behaviours.

Main determinants of university students' innovativeness and innovation: A literature review

Literature to date has paid attention mainly to university students' innovativeness, particularly in the context of entrepreneurship. Innovativeness, frequently associated with entrepreneurial potential (Mueller and Thomas 2010), can be regarded as a personality trait that implies a 'willingness to change' (Hurt, Joseph, and Cook 1977). Despite the fact that studies conducted in this context have obtained interesting and relevant results (Mueller and Thomas 2010), individual innovation is more than just the propensity to think creatively. It can also be regarded as a behaviour that involves '*...the intentional introduction and application within a job of ideas, processes, products and procedures that are new to that job and which are designed to benefit it ...*' (West and Farr 1990, 9).

Previous research considering individual innovation from a behavioural perspective has found that innovation can be fostered by some job design characteristics, such as autonomy (Anderson, Potočnik, and Zhou 2014; Janssen 2000; Oldham 2012; West 1987a, 1989), and may be used by workers either as a mode of adjustment to work transitions (Van Maanen and Schein 1979) or as an active coping strategy to manage a high volume of job demands. Although innovation may not necessarily lead to positive outputs, research has suggested that innovation leads to a wide range of benefits, including improved psychological well-being (Bunce and West 1994; De Jong 2007; Munton and West 1995). For instance, several studies have

documented that individuals could introduce new ways of doing things in order to cope with job demands and therefore reduce stress (e.g., De Jong and Janssen 2005; De Spiegelaere et al. 2012; Janssen 2000; Martín, Salanova, and Peiró 2007; West 1987a; West 2002). There is also empirical evidence that supports the positive association between individual innovation and well-being (e.g., Bunce and West 1994; Dolan and Metcalfe 2012; Munton and West 1995).

Along these lines, we could consider individual innovation as an active coping strategy which might buffer the detrimental impact of demands that undergraduates face, such as cognitive ones, on their psychological distress, ultimately leading to improved psychological well-being. It is important to note that undergraduates' psychological well-being is not a minor matter. Indeed, it has been suggested as essential not only to meet the learning outcomes but also for their successful adaptation to university life (Bowman 2010). University life, especially in the first year, when transition takes place, has been often characterized as a crucial, and potentially stressful, period in people's lives (Maunder et al. 2013; Wrench, Garrett, and King 2013). This period can bring with it a plethora of new demands on undergraduates, which in turn might have a negative influence on their well-being, performance and adjustment.

Starting university could perhaps be considered as two sides of the same coin. On the one hand, and especially for first-year students, it could be an exciting time, full of new learning, experiences and relationships, and a newly found personal freedom far away from home (Mudhovozi 2012). On the other hand, it may also involve new academic, social and personal demands, and the need to become accustomed to the particular practices and academic expectations that higher education imposes (Maunder et al. 2013). From an academic point of view, undergraduates must face various potential sources of stress, including teaching pace, external pressure,

difficulty/complexity of learning activities, performing poorly at a task, work pressure, and sustained attention (Cotton, Dollard, and De Jonge 2002; Kember and Leung 2006; Petkar 2011; Tuomi et al. 2013). It is interesting to note that sustained attention – a construct related to mental load, defined as the ability to maintain attention on a specific stimulus to a high degree over a long period of time (Coull 1998) – has been identified as highly relevant in academic contexts (Hassanbeigi et al. 2011; Steinmayr et al. 2010). A high level of sustained attention provides the necessary resources for all steps of a complex processing plan (Schweizer and Moosbrugger 2004), such as problem solving, defined as the '*cognitive processing directed at achieving a goal when no solution method is obvious to the problem solver*' (Mayer and Wittrock 1996, 47). Although problem solving has been outlined as a key skill in academic settings as well as in the workplace (Klein, O'Neil, and Baker 1998; Layer, Karwowski and Furr 2008), it can also be a potential source of stress in terms of imposed cognitive demands. We could expect that cognitive workload – for instance, in terms of a high volume of academic tasks to be performed – might lead to students engaging in more innovative behaviours to cope with these demands.

The requirements of the academic tasks turn into demands if they are appraised by the individual as exceeding his or her capability and resources (Lazarus and Folkman 1984). Thus, stress could be conceived of as a continuous and dynamic exchange between a person and their environment, where the resultant appraisals depend simultaneously on both, and can change over time as a consequence, for example, of altered environmental requirements, coping efforts or improvements in personal resources (Schwarzer 1998). In work contexts, autonomy, or the amount of freedom individuals have in carrying out their assignments or scheduling their work, has been frequently identified as one of the most important resources in helping individuals cope

with their demands. In fact, research has widely supported the important role that such job control plays in relation to a great amount of positive psychological outcomes, such as motivation, satisfaction, innovation and well-being, on the basis of different theoretical frameworks, such as self-determination theory (Deci and Ryan 1985), Job Demands-Control Model (Karasek 1979), Job Demands-Control-Support Model (Karasek and Theorell 1990) and Job Demands-Resources Models (Demerouti et al. 2001). The last three models have suggested that autonomy could buffer the potential detrimental effect of demands on several psychological and behavioural outcomes (Bakker and Demerouti 2007). For instance, Martín, Salanova and Peiró (2007) find that employees working in demanding environments but with many resources exhibited the highest levels of innovation.

Autonomy has also been shown to positively contribute to a wide range of undergraduates' outcomes, such as intrinsic motivation, more effective learning, better academic performance, more effective coping with setbacks and failures, research self-efficacy and psychological well-being (Black and Deci 2000; Boud 1988; Fredholm et al. in press; Liu 2012; Overall, Dean, and Peterson 2011; Stewart and Podbury 2003; Tze, Klassen, and Daniels 2014; Vansteenkiste et al. 2004). For instance, Cotton, Dollard, and De Jonge (2002) have analyzed autonomy as a predictor of undergraduates' well-being using the Demands-Control-Support model (Karasek and Theorell 1990). Their results showed that students who perceived themselves as having low control over their environment experienced higher psychological stress. The authors concluded '*that attention needs to be given to enhancing performance through conducive student work environments*' (Cotton, Dollard, and De Jonge 2002, 160).

Following Cotton, Dollard, and De Jonge's (2002) suggestions, if what students do at university was conceptualized as "a job", it would be possible to examine

proposed links between work environment, well-being and performance, which could lead to practical recommendations about how to enhance undergraduates' well-being and performance, and ultimately their innovation behaviours. As we have noted, previous research on individual innovation in the workplace has clearly established that job autonomy fosters innovation behaviours. In addition, undergraduates, like employees, could use innovation behaviours as an active coping strategy to manage their demands and consequently improve their psychological well-being. However, as mentioned previously, means and methods to promote undergraduates' innovation competence are needed. There is very little research analysing the academic setting determinants of undergraduates' innovation behaviours, especially from a longitudinal point of view. Study of individual innovation at this level could improve our knowledge about the way in which innovation takes shape in a higher educational context.

Our work aims to fill these gaps by exploring determinants of undergraduates' innovative behaviours over a period of one year. We build this study upon findings of employee innovation behaviours, using the analogy that studying is the job of students, and the educational institution is their workplace (Tuomi et al. 2013). Specifically, we expect that autonomy and cognitive demands will foster undergraduates' innovation behaviours. Following the Job Demands-Resources model (Demerouti et al. 2001; Bakker and Demerouti 2007), we also explore whether autonomy and cognitive demands exert a joint effect on innovation behaviours.

Methods

Participants and Procedure

This study was conducted as part of a wider project exploring the transition of students to university, and their experience in a small university campus of approximately 1,200 students. At the time of data collection, the subjects taught at this campus were fine arts, management, psychology, education, and electrical and informatics engineering. The final sample of this study comprised 78 university students taking psychology, management, fine arts and education. The number of students enrolled in engineering courses was very low; unfortunately, we could not collect data on these students. We elaborate more on the implications this may have for our findings in the discussion section.

The first data collection was carried out at the beginning of the students' first academic year (October-November 2011, Time 1). The second data collection was done one year later (October-November 2012, Time 2). This time interval was chosen to avoid the exam periods, and seemed to be sufficient to evaluate potential changes in studied variables as well as to ensure that the seasonal influence was stable (Zapf, Dorman, and Frese 1996). Data was obtained using paper-pencil questionnaires which were administered to all students at the same time by one of the project researchers. Both professors and students gave us permission to access their classrooms. Participation was voluntary, written consent was obtained from all participants and data confidentiality was guaranteed. At Time 1, 251 students completed the questionnaire (73% females), yielding a response rate of 63%. Of the participants in Time 1, 13% were studying Psychology, 11% Management, 15% Fine Arts and 61% Education. Their average age was 20.1 years (SD = 4.6). At Time 2, 78 students of 251 freshmen from Time 1 completed the questionnaire, yielding a response rate of 31%. Similar response rates have been observed in past longitudinal field research (Endedijk et al. 2014; Rodríguez and Cano 2007). Of the participants in Time 2, 19% were studying

Psychology, 8% Management, 26% Fine Arts and 47% Education. Of these students, 73% were female.

Measures

Control variables. We controlled for the effects of age (in months) and gender (1= male, 0 = female), because these two variables have been frequently taken into account in examining individual innovation in work settings (West 1987a, b; Martín 2003; Martín, Salanova, and Peiró 2007). Also, we anticipated that the students' field of study could confound our explored relationships, either because students who choose to study a certain field, such as fine arts, may inherently be more creative and innovative, or because some fields use specific teaching and assessment methods that may impact the level of autonomy given to students or directly influence their innovation behaviours. Therefore, we controlled for this variable in our analyses using three dummy variables (Cohen and Cohen 1983): Psychology (1 = studying Psychology; 0 = Fine Arts, Management and Education), Fine Arts (1 = studying Fine Arts; 0 = Psychology, Management and Education) and Education (1 = studying Education; 0 = Psychology, Fine Arts and Management).

Autonomy. We have taken into account two facets of autonomy (or job control): job authority and scheduling autonomy. Job authority – the amount of discretion and influence undergraduates believe they can exercise in decisions about their academic work – was operationalized with three items of Van de Ven and Ferry's (1980) Job authority scale (e.g., "*Referring to the accomplishment of your academic work, how often do you determine what academic tasks you will carry out every day?*").

Scheduling autonomy was measured with two items from Breaugh's (1989) Scheduling autonomy scale (e.g., "*Referring to the accomplishment of your academic work, how often do you have control over scheduling your tasks and activities?"*). All items were rated on a 5-point scale ranging from (1) 'Never' to (5) 'Very frequently'.

Cognitive demands. A six-item scale from Salanova (2005) was used to assess the cognitive demands undergraduates experience in the accomplishment of their academic tasks (e.g., *"Referring to the accomplishment of your academic work, how often do you have to display a great amount of attention?"*). Response options ranged from (1) 'Never' to (5) 'Very frequently'.

Individual innovation behaviour. Individual innovation was measured applying Whitely's (1987) three-item scale of individual innovation behaviour adapted to the academic context. This scale assessed how frequently undergraduates tried out new ways of doing things in their academic work (e.g., "*Referring to the accomplishment of your academic work, how often do you try new ways (procedures or methods) to do your work (task or assignments)?*"). Response options ranged from (1) 'Never' to (5) 'Very frequently'.

Analyses

First, descriptive and correlational analyses were carried out. Second, a set of t-tests was conducted in order to examine any changes in the studied variables over time. Finally, we carried out hierarchical multiple regression analyses to test main and interaction

effects of cognitive demands and autonomy on innovation behaviours. Centred-mean scores were used in order to avoid multicollinearity problems.

Results

Preliminary and descriptive results

Table 1 shows the means, standard deviations, Crombach's alphas and Pearson's correlations among the studied variables. Our results show that undergraduates exhibited moderate levels of innovation behaviour, both at Time 1 and Time 2. Furthermore, the observed correlations varied from low (r = .22) to moderate (r = .49). Neither gender nor age significantly correlated with innovation, so we dropped them from further analyses.

The results show that Fine Arts students developed a higher level of innovation behaviours than other students, both at Time 1 and Time 2. Psychology students were found to be the least innovative students at Time 2. Innovation behaviours at Time 1 were significantly positively related with autonomy at Time 1 and innovation behaviours at Time 2. Innovation behaviours at Time 2 were positively related with autonomy at Time 2 and cognitive demands at Time 2. At Time 2, autonomy was also positively related with cognitive demands.

Insert Table 1 about here

In terms of changes in studied variables over time (see Table 2), our results show that cognitive demands decreased over time ($t(77) = 2.11$; $p < .05$). Other differences were not significant.

Insert Table 2 about here

Regression analyses results

Table 3 presents the hierarchical regression analyses results to examine the main determinants of undergraduates' individual innovation behaviours. We first explored the hypothesised relationships using only Time 1 measures. In the first step, we introduced the field of study to control for the effects this variable may have had on innovative behaviours. In the second step, autonomy and cognitive demands were entered to test their main effects on individual innovation. Finally, in the third step, an interaction term between cognitive demands and autonomy was added to the model.

Insert Table 3 about here

As can be seen in Table 3, the model was significant as a whole ($F=3.75$; $p<.01$), accounting for 24% of the variance in the undergraduates' innovation behaviours. We found that fine arts students were the most innovative ($\beta= .51$; $p<.01$). After controlling for the potential effects of the field of study, autonomy positively predicted innovation behaviour ($\beta= .40$; $p<.01$).

Next, we conducted regression analyses exploring the main determinants of undergraduates' individual innovation behaviours at Time 2 (see Table 4). We introduced the field of study in the first step. In the second step, we introduced individual innovation behaviours at Time 1 to account for a change in our dependent variable over time. In the third step, autonomy and cognitive demands at Time 2 were

entered, and in the fourth step, an interaction term between cognitive demands and autonomy, both from Time 2, was added to the model.

Insert Table 4 about here

The model was significant as a whole ($F = 12.89$; $p<.001$), accounting for 56% of the variance in the undergraduates' innovation behaviours at Time 2. Also, in this case fine arts undergraduates seemed to be the most innovative ($\beta= .80$; $p<.01$). Prior innovation behaviours accounted for a significant increment in the proportion of explained variance in innovation behaviours at Time 2 ($\beta= .27$; $p<.01$). After controlling for the field of study and baseline levels of innovation behaviours, we obtained support for the hypothesized positive effects of both autonomy ($\beta= .46$; $p<.001$) and cognitive demands ($\beta= .21$; $p<.05$) on undergraduates' innovation behaviours. As with time 1 analyses, we did not find a significant interaction effect between cognitive demands and autonomy on innovation behaviours at Time 2.

Discussion

The aim of this exploratory study was to examine individual innovation and its determinants among psychology, management, fine arts and education undergraduate students, using a longitudinal design. Our findings provide support for some of the hypothesized relationships. Firstly, it is interesting to note that background variables such as age and gender did not relate significantly with the undergraduates' innovation behaviour. This result is not in line with those from organizational settings in which women were found to be less innovative than men (Janssen, 2000; Martín, 2003). As a potential explanation for such observed differences, it has been suggested that men hold

a greater number of higher-level positions than women, and so probably have higher autonomy compared to women. There is no such hierarchy in undergraduates, where both male and female students carry out their academic work at the same level at their universities. This could explain the absence of gender differences in undergraduates' innovation behaviours.

Importantly, our results show that, over time, the main determinants of undergraduates' innovation behaviours changed to some extent. We observed that Fine Arts students seemed to be more innovative than others, and baseline innovation behaviours, current autonomy and cognitive demands were all significantly related with the introduction of novel ways of doing things by undergraduates fulfilling their academic requirements. These results confirm previous findings on the relationship between autonomy and innovation in the workplace, and suggest that autonomy is at the heart of individual innovation behaviours (Anderson, Potočnik, and Zhou 2014; Janssen, 2000; Martín, 2003; Martín, Salanova, and Peiró 2007; Oldham, 2012; West, 1987a, 1989; West and Farr, 1990). Moreover, it is interesting to note that the level of autonomy students perceived themselves as having at the very beginning of their first academic course was the main influence of their baseline innovation behaviours. This positive effect of autonomy on innovation was also found one year later, with autonomy as perceived at Time 2. In sum, our findings regarding the role played by autonomy in fostering individual innovation are as expected.

However, the relationship between cognitive demands and individual innovation behaviours seems to be more complex. Our results provide partial support for the hypothesized role played by individual innovation as an active coping strategy in response to academic cognitive demands. At Time 1, cognitive demands did not represent a significant influence on undergraduates' innovation behaviours. At Time 2,

cognitive demands were a positive predictor of innovation behaviours. Such main effects of cognitive demands and autonomy on undergraduates' innovation seem to be only additive, with no evidence for an interactive effect between demands and autonomy on innovation behaviours at either Time 1 or Time 2. In this sense, our study does not support previous research drawing on Job Demands-Resources Model that showed a buffering effect of autonomy on the potential detrimental effect of demands on several behavioural outcomes (e.g. Bakker and Demerouti 2007; Bakker et al. 2007; Martín, Salanova, and Peiró 2007). However, it has also been suggested that the extent to which control or autonomy plays a buffering role on such deteriorating effects of demands could even depend on other potential moderators. On this topic, Shultz et al. (2010) show that interaction effects between demands and control differed between younger and older workers, in that different facets of control buffered different types of job demands for the two types of workers. For younger workers, stressful experiences associated with the problem-solving demand were buffered only by one job-control mechanism (i.e., having enough time to get the job done). Academic work and success implies continuous striving in the face of distractions, seen in scenarios such as paying attention in class (Hassanbeigi et al. 2011), working with a lot of data and information, and searching for solutions, among others. Over time, this potential mental load could represent not just a part of expected and demanding academic requirements, but also an opportunity in terms of complex tasks and goals to attain which are not necessarily threatening and harmful for students' psychological well-being. Our results support the key role that such academic cognitive requirements play in fostering undergraduates' innovation behaviours over time.

Furthermore, we find a moderate positive correlation between cognitive demands and autonomy at Time 2. This is in line with Langfred and Moye (2004), who

found that high levels of job control were associated with increased demands and higher complexity. In other words, more demanding tasks require more autonomy in carrying them out, which is a characteristic of enriched jobs (Parker, 2014). Farr (1990) suggests that, in comparison to simplified work, enriched jobs are more challenging and require more thinking, which in turn should promote innovation. Following these arguments, the present study suggests that enriched academic tasks, characterized by higher cognitive demands and for which students are given increased autonomy in how to carry them out, could be expected to promote undergraduates' innovation behaviours.

Conclusion

One of the most notable findings of our study, especially from a practical point of view, is that our results highlight the importance of autonomy in fostering university students' innovation. Our results show that the main determinants of undergraduates' innovation behaviours changed over time, except for autonomy, which was the only determinant of innovation behaviours at both baseline and follow-up. As job control fosters employee innovation at work, autonomy in accomplishing academic tasks predicts undergraduates' innovation behaviours. These findings could be of help to educators concerned with promoting university students' innovation behaviours. Our findings suggest that educators should consider designing tasks and assignments that require higher autonomy from students as part of their curricula. We would also recommend that beyond first year, educators, in addition to providing autonomy, could also consider implementing tasks involving higher cognitive demands to further enhance student innovation. If this is done, we tentatively suggest that students would have to spend more time and put more cognitive effort into their academic work, in order to not only achieve higher overall academic performance but also to be more innovative during

their university years. In other words, higher education can play an important role in helping students develop the innovation competence that is in such high demand in current competitive labour markets. Universities can provide not only technical tools, but also encouragement to use new ways of doing things by giving students the necessary amount of autonomy. This strategy seems to be crucial at the very beginning of students' university life.

This study is not without limitations. Literature on individual innovation has highlighted the impact of different individual variables and personality traits, such as openness to experience, on innovation behaviour. Although this study is mainly concerned with environmental influences on innovation, future research should explore the role of individual characteristics on undergraduates' innovation behaviours, as well as different facets of control and different kinds of demands, in order to identify potential interactive effects on innovation. This line of research could provide novel insights into what might promote and foster undergraduates' innovation capability.

This study is based on a convenience sample of undergraduates at one university campus; therefore, the extent to which the results are generalizable to other higher educational settings is unknown. Also, given that our data was collected from students in only four fields of study, the implications of our findings for other subjects, such as medicine or engineering, should be interpreted with caution. However, there is research suggesting that autonomy is an important aspect of students' learning experience across different subjects (e.g. Boud 1988; Fredholm et al. in press; Tze, Klassen, and Daniels 2014), and therefore we tentatively suggest that our findings could be applicable to university students in general.

Another limitation of this study is the relatively small simple size, which could affect the sensitivity and power of the observed relations. However, despite a small

sample size, our findings illustrate significant influences on student innovation behaviours over a period of one year. If we take into account that on such a small sample we detected medium to strong effects, our findings might be considered even more conservative and valuable. Nevertheless, future research should validate our findings across different university subjects and on larger samples.

There are also some other avenues that future research could address to further enhance our understanding of student innovation behaviours. As argued earlier, not all innovation behaviours are necessarily related with beneficial outcomes. Some innovation attempts may be harmful or counterproductive, and more research is needed to uncover in which situations student innovation may result in such counterproductive outcomes. Regardless of the outcome of innovation, students will most likely have to expend effort and perhaps other resources in order to innovate. Future research could address what types of costs are associated with innovation to provide more specific guidelines for curricula design and help set clearer expectations to students regarding what is required from them to foster their innovation behaviours.

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Table 2. T-test results of changes in studied variables from Time 1 to Time 2

VARIABLE	Time	N	Mean	SD	T-test		
					T	Df	p
INNOVATION	T1	78	2.64	.77			
	T2	78	2.73	.78	-.99	77	.33
AUTONOMY	T1	78	3.28	.73			
	T2	78	3.38	.74	-1.04	77	.30
COGNITIVE DEMANDS	T1	78	3.53	.53			
	T2	78	3.39	.65	2.11	77	.04*

* $p \leq .05$

Table 3. Hierarchical regression analyses of undergraduates' innovation behaviours at Time 1 on autonomy and demands and their interaction at Time 1

SOURCE	β	ΔR^2 (R2 Increment)
Step 1		.11
FINE ARTS DUMMY	.51**	
PSYCHOLOGY DUMMY	-.14	
EDUCATION DUMMY	.01	
Step 2		.13
COGNITIVE DEMANDS (TIME 1)	-.10	
AUTONOMY (TIME 1)	.40**	
Step 3		.00
COGNITIVE DEMANDS x AUTONOMY (TIME 1)	-.07	
*Total R .24 (F = 3.82**)*		
***p<0.01*		

β are the standardized regression coefficients from the final stage of the regression analysis

Table 4. Hierarchical regression analyses of undergraduates' innovation behaviours at Time 2 on autonomy and demands and their interaction at Time 2, controlling for innovation behaviours at Time 1

SOURCE	β	ΔR2 (R2 Increment)
Step 1		.21
FINE ARTS DUMMY	.80**	
PSYCHOLOGY DUMMY	-.22	
EDUCATION DUMMY	.25	
Step 2		.10
INNOVATION BEHAVIOURS (TIME1)	.27**	
Step 3		.25
COGNITIVE DEMANDS (TIME 2)	.21*	
AUTONOMY (TIME 2)	.39**	
Step 4		.01
COGNITIVE DEMANDS x AUTONOMY (TIME 2)	-.10	
Total R .56 (F = 12.8; p<0.01)		

**p<0.05; **p<0.01*

β are the standardized regression coefficients from the final stage of the regression analysis