



Past, present, future time perspectives and maladaptive cognitive schemas: associations with student engagement and attrition rates in an online unit of study

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The aim of the current study was to investigate time perspectives and maladaptive cognitive schemas as predictors of students' academic engagement and unit withdrawal. Two hundred and sixteen students studying an online introductory unit in psychology completed an online questionnaire at the start of the unit. Their enrolment status was checked at the end of the unit. The strongest predictors of unit withdrawal were cognitive schemas and time perspectives associated with failure and hedonism. The strongest predictors of academic engagement were cognitive schemas and time perspectives associated with self-control and a focus on future outcomes. Based on these findings, psychological and pedagogical interventions aimed at increasing student engagement and reducing student attrition in online units of study are suggested.

Keywords: time perspective, cognitive schemas, academic engagement, attrition, online study

Online units of study provide numerous benefits to students, from both pedagogical and economical perspectives (e.g., Tatli, 2009). However, there are also limitations inherent to these modes of study, and this may be why attrition rates are relatively high. Attrition rates for students in online units of study vary, but are consistently higher than those reported for units run on-campus (e.g., Patterson & McFadden, 2009). The identification of factors that potentially influence academic engagement would be significant step forward in minimising student attrition in online units of study.

The learning experience may be different in an online study environment, and "may reduce rather than enhance the quality of learning" (Ramsden, 2003; p. 152). Basic principles of learning and predictors of quality learning interaction (e.g., nonverbal communication; White, 2011) are also potentially compromised in online study. At the tertiary education level, student motivation and engagement may be cued by eye-contact and other nonverbal gestures by the teacher (Zeki, 2009). These cues are compromised in an online environment and therefore may adversely affect student performance.

As well as the inherent limitations in online modes of study, there are student-related factors that may affect appropriate engagement with the learning process. Harrington and Loffredo (2010), for example, investigated personality and learning modality preferences (face-to-face or online) in 166 university students. Introverted participants reported preferring online instruction, whereas extroverted participants reported preferring face-to-face instruction. There appear therefore, to be important individual differences in preferred methods of learning.

Cognitive style is another prominent individual difference factor that has been shown to influence learning engagement in an online study environment. Cognitive style is defined as an individual's consistent approach to organising and processing information (Riding & Rayner, 2000). Information is interpreted through learning heuristics developed by individuals over time. Known as field independence and field dependence (Witkin & Goodenough, 1977), the former cognitive style refers to an individualistic and internally directed approach to learning, while the latter cognitive style refers to a collaborative approach to learning that favours external stimulation and motivation. Field dependent learners have been shown to experience greater learning difficulties than field independent learners in online learning environments (see Alomyan, 2004).

An important factor when looking at cognitive styles is the development of core beliefs, especially when related to the perceptions of self and, in the context of this paper, the effects of core beliefs on learning. The model of cognitive schema developed by Young (1999) adheres to the same cognitive psychology principles mentioned above, in that present experience is interpreted through heuristics developed by individuals over time. Young proposes that maladaptive schemas such as defectiveness, incompetence, entitlement, subjugation, and emotional inhibition are implicated in psychological distress. Young and colleagues (e.g., Young, Klosko, & Weishaar, 2003) have found that the family environment has a fundamental influence on the development of core belief or schemas. However, in contrast to Beck (1996) and in accordance with developmental theorists, they focus on the role of parents, siblings, and peers in relation to the development and maintenance of particularly debilitating maladaptive schemas that continue to affect the child's view of self, such as competence and defectiveness throughout the life-span.

While the focus of Young et al.'s (2003) work was predominantly clinical, it has been demonstrated that schemas also function in non-clinical populations. Baranoff, Oei, Cho, and Kwon (2006) for example, showed that depressive symptoms in an Australian university student sample could be predicted by the early maladaptive schemas of insufficient self-control and failure. As well as the predictive utility of maladaptive schemas for inferring depressive symptoms, it is conceivable that a student's cognitive biases may also affect the learning experience. Unpublished data from a study by Chivell (2009) indicated that, on average, students report an overall higher level of maladaptive schemas compared to community respondents. While there is little data to suggest that the presence of maladaptive schemas necessarily lead to poorer academic outcomes, there are several individual schema that would appear to negatively relate to academic engagement. For example, schemas concerning failure, unrelenting standards, entitlement, and insufficient self-control would appear to reflect a cognitive set in which goal-directed effort, self-efficacy, and diligence, traits that are important for academic success (e.g., Komarraju & Nadler, 2013), are uncharacteristic. It is likely that the presence of such maladaptive schemas extend to (lack of) success in online study.

A new and emerging area of study concerns students' characteristic time orientation. Zimbardo and Boyd (1999) proposed a model of psychological time orientation in which cognitive processes direct the evaluation of subjective experience into a multidimensional framework of time perspectives. Under this model, individuals are considered to occupy space along several dimensions relating to past, present, or future perspectives. Each dimension also incorporates an element of valence, with the 'past' perspective for example, having both positive and negative dimensions, and the 'present' perspective having hedonistic and fatalistic dimensions. A student's characteristic time orientation may have an impact on how much they value the learning experience. The ability to delay gratification, a hallmark of the future time perspective, is closely associated with academic success in traditional educational settings (Shoda, Mischel, & Peake, 1990). Horstmanshof and Zimitat (2007) showed that a future time perspective predicted greater student engagement, using measures of academic conscientiousness and endeavour, in a first-year undergraduate unit at an Australian university. While there are no published studies differentiating time perspectives between on-campus and online students, it is assumed that similar relationships between the future time perspective and academic engagement exist in online units of study.

The overarching aim of this project was to investigate several student factors (time perspective, cognitive schemas) as predictors of academic engagement and student attrition in an online unit of study. It was hypothesised that, consistent with Komarraju and Nadler (2013), higher levels of maladaptive cognitive schemas would be associated with a poorer academic outcome. It was also hypothesised that, consistent with the delayed gratification model of Shoda et al. (1990), a preference for the future time perspective would be associated with a better academic outcome. Finally, it was hypothesised that lower levels of maladaptive schemas and a future time perspective would be associated with greater academic engagement.

Method

Participants

A total of 356 students were enrolled in an online Introduction to Psychology unit at Week 1 of the study period. Two hundred and twenty-one students (62.1%) completed the unit and 135 (37.9%) failed to complete the unit (i.e., withdrew before the exam).

Two hundred and sixteen students (60.7% of the total sample) completed the questionnaire. Of these, 146 (67.6%) eventually completed the unit and 63 (29.2%) did not complete the unit.⁶ The average age of all students who completed the questionnaire was 32.40 years ($SD = 11.39$; range 18-66). There was a slight difference in age between those who completed the unit ($M = 33.55$, $SD = 10.56$) and those who didn't complete the unit ($M = 29.81$, $SD = 12.76$). The number of female students who participated in the questionnaire ($n = 163$, 78.7%) far outweighed the number of male students participating ($n = 44$, 21.3%). There was no significant association between sex and unit completion, $\chi^2(1, n = 207) = 1.86, p = .17$.

Measures

Zimbardo Time Perspective Inventory (ZTPI; Zimbardo & Boyd, 1999)

The ZTPI measures traits of subjective time experience, and includes dimensions of Past-Positive (e.g., "It gives me pleasure to think about my past"), Past-Negative (e.g., "I've made mistakes in the past that I wish I could undo"), Present-Hedonistic (e.g., "I try to live my life as fully as possible, one day at a time"), Present-Fatalistic (e.g., "My life path is controlled by forces I cannot influence"), and Future (e.g., "I complete projects on time by making steady progress"). The overall scale contains 56 items, each rated on a 5-point scale ranging from "very untrue" to "very true". Higher scores indicate greater levels of each trait. Psychometric testing has shown that the ZTPI demonstrates acceptable reliability and validity (Zimbardo & Boyd, 1999).

Young Schema Questionnaire – Short Form (YSQ-S; Young, 1998)

The YSQ-S measures 15 early maladaptive cognitive schemas across 75 items. Each item is measured on a 6-point scale ranging from "completely untrue of me" to "describes me perfectly". The current study used only those subscales that can be theoretically linked to academic engagement and/or student attrition (i.e., Failure, Unrelenting Standards, Entitlement, and Insufficient Self-control). Sample items from these subscales include "I'm not as talented as most people are at their work" (Failure), "I can't let myself off the hook easily or make excuses for my mistakes" (Unrelenting Standards), "I feel that what I have to offer is of greater value than the contributions of others" (Entitlement), and "I have a very difficult time sacrificing immediate gratification to achieve a long-range goal" (Insufficient Self-control). The YSQ-S has demonstrated good-to-excellent reliability, and acceptable validity (Oei & Baranoff, 2007; Waller, Meyer, & Ohanian, 2001).

Work Engagement Scale – Student (WES-S; Schaufeli, Salanova, Gonzalez-Roma, & Bakker, 2002)

The WES-S measures student engagement on a 24-item scale across three subscales – Vigour (e.g., "When I get up in the morning I feel like studying"), Dedication (e.g., "I am enthusiastic about my studies"), and Absorption (e.g., "Time flies when I am studying"). The original version has been adapted slightly for the current study so that it makes sense to an online student cohort. Items are scored on a 7-point frequency rating scale ranging from 0 ('never') to 6 ('always'). The WES-S has also demonstrated acceptable psychometric properties (Schaufeli et al., 2002).

Procedure

Students in Week 1 of the Study Period were invited to complete the questionnaire via the Opinio portal, at a time and location that was convenient to them. The link to the survey was made available on the unit Blackboard site. Students could also volunteer to take part in the second phase of the study in which attrition rates were measured. The attrition rate for the whole sample was determined by how many students chose to withdraw from the unit before the final exam.

⁶ Note that seven students deferred the exam and were not allocated to either the completers or the non-completers group.

Results

Data were screened for both univariate and multivariate outliers and deleted on a case by case basis. Distributional assumptions were also assessed and while there was some deviation from normality, raw scores were used in the majority of analyses in order to aid interpretation of relationships between predictors and outcomes. Descriptive statistics for predictor and outcome variables are presented in Table 1. It can be seen that all scales demonstrated good to excellent internal consistency.

Table 1: Means, Standard Deviations, and Cronbach's Alpha for the YSQ-S, ZTPI, and WES-S

Variable	Scale	Mean	Standard Deviation	Cronbach's alpha
Cognitive Schema	Failure	11.63	6.00	.93
	Unrelenting Standards	20.63	5.27	.79
	Insufficient Self-control	12.43	5.34	.72
	Entitlement	12.40	4.50	.86
Time Perspective	Past Negative	3.08	0.79	.81
	Past Positive	3.34	0.70	.79
	Present Hedonistic	3.29	0.58	.83
	Present Fatalistic	2.46	0.62	.75
Academic Engagement	Future	3.58	0.51	.75
	Vigour	24.22	6.05	.84
	Dedication	24.70	4.24	.85
	Absorption	23.60	7.67	.90

Table 2 presents the correlations between the predictor variables (ZTPI and YSQ-S subscales) and the outcome variables (WES-S subscales). Correlations in Table 2 are largely consistent with expectations based on theory and scale content. Future time perspective correlated positively with the Academic Engagement scales of Vigour, Dedication, and Absorption, and negatively with the YSQ-S scale of Insufficient self-control. Insufficient self-control also correlated negatively with the Academic Engagement scales of Vigour, Dedication, and Absorption. Consistent patterns of associations with the Academic Engagement scales were not observed for other variables, although Vigour correlated negatively with the Cognitive Schema scale of Failure.

Table 2: Correlation Coefficients Between Scales of the ZTPI, YSQ-S, and WES-S

	ZTPI						YSQ-S			WES-S		
	1 PN	2 PP	3 PH	4 PF	5 F	6 Fa	7 Us	8 Is	9 En	10 Vi	11 De	12 Ab
1	-	-.41*	.25*	.52*	.01	.30*	.05	.40*	.19	-.21	-.12	-.20
2		-	.10	.17	.15	-.15	.01	-.22*	-.05	.14	.15	.06
3			-	.35*	-.15	-.01	.07	.36*	.30*	-.15	-.10	-.26*
4				-	-.16	.29*	-.04	.36*	.20	-.18	-.17	-.13
5					-	-.04	.24*	-.42*	-.09	.37*	.33*	.38*
6						-	-.01	.34*	-.06	-.38*	-.19	-.18
7							-	-.04	.31*	.20	.17	.18
8								-	.34*	-.54*	-.39*	-.47*
9									-	-.06	-.15	-.16
10										-	.58*	.68*
11											-	.60*
12												-

Note. ZTPI = Zimbardo Time Perspective Inventory (PN = Past Negative, PP = Past Positive, PH = Present Hedonistic, PF = Present Fatalistic, F = Future); YSQ-S = Young Schema Questionnaire-Short Form (Fa = Failure, Us = Unrelenting standards, Is = Insufficient self-control, En = Entitlement); WES-S = Work Engagement Scale-Student Version (Vi = Vigour, De = Dedication, Ab = Absorption).

* $p < .001$

$N = 207$

Outcomes of regression analyses are presented in Tables 3 to 6. For all regression analyses, predictors were entered all at once. Four regression analyses were run – one standard logistic regression with unit completion

(yes/no) the outcome variable, and three standard multiple regression analyses with each of the WES-S scales (Vigour, Dedication, Absorption) as outcome variables. Results are presented below.

Table 3: Logistic Regression Coefficients for the Prediction of Unit Completion by Cognitive Schema and Time Perspective

Variables	<i>B</i>	<i>SE B</i>	Wald Chi-square	<i>df</i>	<i>p</i>	Odds Ratio
YSQ-S Fa	0.09	0.03	8.54	1	<.01	1.10
YSQ-S Us	-0.06	0.04	2.73	1	.10	0.94
YSQ-S Is	0.05	0.05	1.10	1	.29	1.05
YSQ-S En	-0.05	0.05	1.24	1	.27	0.95
ZTPI PN	0.04	0.30	0.02	1	.89	1.04
ZTPI PP	-0.24	0.29	0.67	1	.41	0.79
ZTPI PH	0.78	0.36	4.55	1	<.05	2.17
ZTPI PF	-0.77	0.35	4.84	1	<.05	0.47
ZTPI F	-0.46	0.42	1.19	1	.28	0.63
Constant	0.75	2.33	0.11	1	.75	2.12

Note. Four outliers with standardized residuals > 2.5 were removed from the analysis. Odds ratios > 1.00 indicate greater likelihood of unit withdrawal.

The full model containing all predictors was statistically significant, $\chi^2(9, n = 199) = 30.48, p < .001$, explaining between 14.5% (Cox and Snell R-square) and 20.9% (Nagelkerke R-square) of the variance in Unit Completion. Three of the predictors made a unique, statistically significant contribution to the model; YSQ-S Fa, ZTPI PH, and ZTPI PF. The odds ratios suggest that there was a lower likelihood of unit completion for those with higher levels of YSQ-S Fa and ZTPI PH, and higher likelihood of unit completion for those with higher levels of ZTPI PF.

Table 4: Standard Multiple Regression Coefficients for the Prediction of Academic Engagement (Vigour) by Cognitive Schema and Time Perspective

Variables	<i>B</i>	<i>SE B</i>	β	<i>sr</i> ²
YSQ-S Fa	-0.26	0.07	-0.26**	.05
YSQ-S Us	0.16	0.07	0.14*	.02
YSQ-S Is	-0.45	0.09	-0.40**	.08
YSQ-S En	0.02	0.09	0.02	.00
ZTPI PN	-0.22	0.58	-0.03	.00
ZTPI PP	-0.05	0.56	-0.01	.00
ZTPI PH	-0.10	0.67	-0.01	.00
ZTPI PF	0.90	0.67	0.09	.01

ZTPI F 2.03 0.79 0.17* .02

* $p < .05$

** $p < .005$

The model explained 39% of the variance in Academic Engagement (Vigour), $F(9,198) = 14.08, p < .001$. Significant individual predictors in the model were YSQ-S Fa, YSQ-S Is, YSQ-S Us, and ZTPI F. Higher levels of YSQ-S Fa and YSQ-S Is were associated with lower levels of Vigour, whereas higher levels of YSQ-Us and ZTPI F were associated with higher levels of Vigour. The effect sizes for all predictors were small (Cohen, 1992).

Table 5: Standard Multiple Regression Coefficients for the Prediction of Academic Engagement (Dedication) by Cognitive Schema and Time Perspective

Variables	<i>B</i>	<i>SE B</i>	β	<i>sr</i> ²
YSQ-S Fa	-0.08	0.05	-0.12	.01
YSQ-S Us	0.12	0.06	0.15*	.02
YSQ-S Is	-0.19	0.07	-0.24**	.03
YSQ-S En	-0.14	0.07	-0.15*	.02
ZTPI PN	0.42	0.46	0.08	.00
ZTPI PP	-0.05	0.44	0.09	.01
ZTPI PH	0.35	0.53	0.05	.00
ZTPI PF	-0.10	0.53	-0.02	.00
ZTPI F	1.54	0.63	0.19*	.02

* $p < .05$

** $p < .005$

The model explained 23% of the variance in Academic Engagement (Dedication), $F(9,198) = 6.48, p < .001$. Significant individual predictors in the model were YSQ-S Us, YSQ-S Is, YSQ-S En, and ZTPI F. Higher levels of YSQ-S En and YSQ-S Is were associated with lower levels of Dedication, whereas higher levels of YSQ-Us and ZTPI F were associated with higher levels of Dedication. Again, the effect sizes for all predictors were small (Cohen, 1992).

Table 6: Standard Multiple Regression Coefficients for the Prediction of Academic Engagement (Absorption) by Cognitive Schema and Time Perspective

Variables	<i>B</i>	<i>SE B</i>	β	<i>sr</i> ²
YSQ-S Fa	-0.13	0.09	-0.10	.01
YSQ-S Us	0.22	0.09	0.15*	.02
YSQ-S Is	-0.39	0.12	-0.27**	.04
YSQ-S En	-0.15	0.12	-0.09	.01
ZTPI PN	-1.23	0.77	-0.13	.01
ZTPI PP	-0.61	0.74	-0.06	.00
ZTPI PH	-1.40	0.90	-0.11	.01
ZTPI PF	2.05	0.89	0.17*	.02
ZTPI F	3.73	1.06	0.25**	.04

**p* < .05

***p* < .005

The model explained 32% of the variance in Academic Engagement (Absorption), $F(9,198) = 10.39, p < .001$. Significant individual predictors in the model were YSQ-S Us, YSQ-S Is, ZTPI PF, and ZTPI F. Higher levels of YSQ-S Is were associated with lower levels of Absorption, whereas higher levels of YSQ-Us, ZTPI PF, and ZTPI F were associated with higher levels of Absorption. Again, the effect sizes for all predictors were small (Cohen, 1992).

In summary, consistent findings were apparent for YSQ-S Is and ZTPI F, with the former being a significant negative predictor of all three aspects of academic engagement, and the latter being a significant positive predictor of all three aspects of academic engagement. YSQ-S Fa was a significant negative predictor of the Vigour subscale only.

Discussion

The results partially supported the hypotheses. Future time perspective was associated with greater levels of academic engagement, as predicted, but not with unit completion. Instead, Present Hedonism (negatively) and Present Fatalism (positively) were associated with higher levels of unit completion. The cognitive schema of Failure was associated with lower unit completion rates, as predicted, but no other schemas were associated with unit completion. Failure was also associated with reduced academic engagement in terms of vigour, but not with dedication or absorption. Insufficient self-control was the only schema to be associated with all three aspects of academic engagement.

The finding that Future time perspective was positively associated with academic engagement is consistent with theory and previous research. The ability to delay instant gratification in the pursuit of future (larger) rewards is a meaningful and consistent predictor of success across many fields of endeavour, but particularly education (Freene & O'Connell, 2010; Shoda et al., 1990). It is assumed that the mechanism by which the Future time perspective improves academic outcomes is through greater academic engagement in the short-term (see, for example, Horstmanshof & Zimitat, 2007), although this assumption has yet to be tested empirically.

The finding that Future time perspective was not associated with unit completion rates in the current study is inconsistent with previous research for all of the reasons described above. The Present Hedonistic time perspective on the other hand, was associated with lower unit completion rates, and this would appear to be

consistent with the research on delayed gratification. However, Present Hedonistic and Future time perspectives are not intended to be bipolar opposites (they correlate at $r = -.29$; Zimbardo & Boyd, 1999), so the fact that Future time perspective was not associated with unit completion rates is still an inconsistent finding. Further inconsistencies with previous research were observed in the positive relationship between the Present Fatalistic time perspective and unit completion rates. Present Fatalism has been associated with lower grades in several studies (see Zimbardo & Boyd, 1999), to which the current findings are in opposition. It is possible that those with a Present Fatalistic time perspective choose to continue their studies through to completion, regardless of their early performance in the unit, due to a “devil-may-care” attitude towards their grades. This possibility may be worthy of investigation in future studies if the current results are replicated.

The finding that the cognitive schema of Insufficient self-control was associated with reduced academic engagement is consistent with theory and previous research. This schema refers in part to an “inability to restrain expression of impulses or feelings” (Young, 1999; p. 75), which would appear to be counter to the dedication and absorption required for engagement in the learning process. As well, Komarraju and Nadler (2013) reported that goal-directed effort and diligence are particularly important for academic success, and such traits would not appear to be associated with a schema characterised by a lack of self-control. The cognitive schema of Failure was also associated with a lack of academic engagement, but only in terms of the level of vigour applied to academic study.

The cognitive schema of Failure was predictive of lower unit completion rates, also consistent with theory. According to Young (1999), this schema describes people who consider themselves “incapable of performing as well as their peers in areas such as career, school, or sports” (p. 74) and who “often do not try to achieve because they believe that they will fail” (p. 74). The lack of association between maladaptive schemas other than Insufficient self-control and Failure and academic engagement or unit completion rates may be reflective of the limited set of schemas investigated in the current study. There is scope in future research therefore, to investigate relationships between academic engagement and the remaining 11 schemas not considered in the current study. In particular, schemas such as Defectiveness/Shame and Dependence/Incompetence may be more useful candidates for association with academic success than some of those chosen in the current study.

The findings concerning cognitive schemas may have implications for students in other contexts and may help to guide interventions. For example, Insufficient Self-control and Failure could be addressed with psycho-education or, in extreme cases, counselling. It has been found that understanding the influence of these schemas and then addressing them can have profound and positive consequences for improving relationships, sense of self, and self-efficacy (Young et al., 2003). This may then flow onto a different attitude to learning that is not being undermined by maladaptive core beliefs. From a pedagogical perspective, the integration of simple yet challenging educational assessments (e.g., quizzes) early in the unit may engender confidence and competence in students who present with a schema of Failure, thus decreasing the chances of these students withdrawing from the unit.

The findings concerning time perspectives may also have implications for students in other contexts. Present Hedonism in particular is not only associated with poorer academic outcomes, but also worse health outcomes including risky sexual behaviour (Rothspan & Read, 1996), substance use (Keough, Zimbardo, & Boyd, 1999), and risky driving (Zimbardo, Keough, & Boyd, 1997). In the academic context, interventions such as goal-setting, progress reviews, and practicing delaying gratification may all help moderate Present Hedonistic thinking and behaviour (Zimbardo & Boyd, 1999). Integrating goal-setting exercises into the unit learning materials may be a useful way of encouraging a shift away from Present Hedonism.

Several limitations of the current study should be addressed in future studies. Firstly, only selected maladaptive cognitive schemas were investigated in this study. In a larger sample, all 16 of the schemas in Young’s model should be measured, even if only to test null hypotheses for those schemas not thought relevant to academic performance. Secondly, greater precision in students’ reasons for withdrawing from the unit may help reduce some of the unexplained error in the attrition outcome measure. Asking withdrawing students to complete an exit survey is one way of achieving this. Thirdly, personality was not measured in the current study. Extraversion (e.g., Alomyan, 2004) and Conscientiousness (e.g., Poropat, 2009) have been shown to be related to academic outcomes, and may explain a proportion of the variance in relationships reported here. Finally, the small effect sizes demonstrated in relationships between time perspectives, maladaptive cognitive schemas, and academic engagement temper somewhat the strength of conclusions that can be drawn.

In conclusion, the current study has demonstrated potentially useful relationships between time perspectives, maladaptive cognitive schemas, and academic outcomes in a cohort of online students for the first time. The

advantage of investigating time perspectives and cognitive schemas is that each is associated with empirically justified interventions that may help moderate cognitive biases that are counterproductive to academic success. Future studies should aim to implement such interventions and evaluate their effectiveness in retaining students in online units of study.

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