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**Developing autonomous learning in first year university students using perspectives
from positive psychology**

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Abstract

Autonomous learning is a commonly occurring learning outcome from University study and it is argued that students require confidence in their own abilities to achieve this. Using approaches from Positive Psychology, this study aimed to develop confidence in first year university students to facilitate autonomous learning. Psychological character strengths were assessed in 214 students on day one at university. Two weeks later their top three strengths were given to them in study skills modules as part of a psycho-educational intervention designed to increase their self-efficacy, and self-esteem. The impact of the intervention was assessed against a control group of 40 students who had not received the intervention. The results suggested that students were more confident after the intervention and that levels of autonomous learning increased significantly compared to the controls. Character strengths were found to be associated with self-efficacy, self-esteem, and autonomous learning in ways that were theoretically meaningful.

Keywords: character strengths, autonomous learning, self-esteem, self-efficacy, confidence

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Introduction

There is now a considerable history of research on self-directed or self-managed learning as an educational philosophy (Robbins 1988). Indeed Brockett et al. (2001) cite the topic as one of the most popular in educational publications between 1980 and 2000. A more recent review by Conner et al. (2009) confirms the continued popularity of the topic and suggests that this sustained interest over forty years attests to the its relevance in education in meeting the needs of society. Lambier (2005) argues that social changes particularly the speed of the growth of knowledge, and information and communication technology have created a need for lifelong learning. He points out that politicians and economists have been quick to adopted the necessity for lifelong learning in what has been called the "information society" (Marshall 1996, 268). Self-directed learning is seen to be crucial to the attainment of the lifelong learning to meet the fast changing needs of the global world where individuals assume responsibility in maintaining the currency of their knowledge and skills (March, Richards, and Smith 2001). Hence, at the heart of self-directed learning is the autonomous learner.

It is frequently claimed especially in the United Kingdom, that university study fosters autonomous learning in students (Bryde and Milburn 1990; Chemers, Hu, and Garcia 2001; Fazey and Fazey 2001; Stephenson and Laycock 1993). The UK Quality Assurance Agency for Higher Education includes independent or autonomous learning as graduate attributes, as does the Australian government amongst others (Channock, Clerehan, Moore, and Prince 2004). However, what is meant by autonomous learning is not always clearly defined. Holec (1981) first used the term autonomous learner in relation to the development of second language learning, defining it as the learner's ability to take charge of their

learning. Since Holec's ground-breaking work, a large literature has emerged examining the effects of various pedagogies on the development of autonomous learning, particularly with reference to second language learning. However, there is less research focusing on the personal qualities of university students which facilitate or impede their development as autonomous learners. We argue that autonomy in learning is not so much about methods of learning but about developing capabilities in students to enable them to become autonomous learners. This is in line with Holec's initial conceptualization of the process and Little's (2000) definition of autonomous learning as being about how the learner relates psychologically to the content and process of learning. These processes have variously been identified as involving students taking responsibility for their own learning, making decisions independently, feeling in control, and displaying intrinsic motivation to learn (Bandura 1989; Deci and Ryan 1985; Fazey and Fazey 2001; Holec 1981; Little 2000). Ponton, Carr, and Confessore (2000) outline the psychological requirements, suggesting that autonomous learning involves the application of personal initiative in engaging with learning and finding resources and opportunities for learning, persistence in learning, and resourcefulness. A core requirement underpinning all of these is self-confidence, belief in one's self and one's abilities to tackle these new learning requirements. However, Wright and Lopez (2005) have persuasively argued that academic assessment of individuals commonly utilizes a deficits model, and this is not conducive to building self-confidence. This study utilizes approaches developed from positive psychology with the aim of increasing student self-confidence to facilitate the development of autonomous learning in first year undergraduates.

Positive psychology is a rapidly growing relatively new area of research in psychology. It has emerged from an overview of the first 100 years of psychology undertaken by Seligman and Csikszentmihalyi (2000) for the American Psychological Association. This concluded that the focus has been on understanding psychopathology and while this has been

fruitful in terms of developing effective treatment interventions for many conditions, more needs to be done to examine how psychology can contribute to promoting the well-being of the wider population. Hence the name positive psychology, to emphasise its concern with recognizing and developing human potential as opposed to simply focussing on those with problems. Positive Psychology starts with the proposition that we all have personal assets that we can be encouraged to develop further or to use more effectively to improve our daily functioning, assist us cope in adversity, and to improve our subjective well-being/happiness. These are termed character strengths and research shows that individuals are frequently not aware of their own character strengths (Seligman and Csikszentmihalyi 2000). Our hypothesis was that by educating university students about the concept of character strengths and making them aware of some of their personal strengths, they would feel better about themselves and thereby boost their self-confidence to facilitate the development of their autonomous learning. While some of this approach is beginning to be applied in schools (Gilman, Huebner, and Furlong 2009) the university student population is under researched.

Much of the research on autonomous learners adopts a qualitative approach focusing on external aspects of the learning experience rather than on the qualities of the learner. The small amount of quantitative research on the characteristics of autonomous learners has tended to measure characteristics associated with autonomous learning such as motivation to learn and perceived competence (Fazey and Fazey 2001) rather than directly measure autonomous learning. This study assesses the psychological strengths that first year students bring with them and the confidence with which they are engaging in the learning process at university and examines how this relates to their achievement and levels of autonomous learning.

Within Positive psychology, Park, Peterson, and Seligman (2004) in a large internet study have identified 24 character strengths in a measure labelled the Values in Action

Classification of Virtues and Strengths (VIA). However, there is still some debate about the representativeness of this classification given that the sample had to have internet access to participate, already had an interest in positive psychology as evidenced by their location of the website, and although the sample is very large, older people and males are under represented. Peterson and Seligman (2009) have suggested that the VIA is likely to change as more empirical evidence accumulates. Currently support for some of the character strengths is sparse. On the basis of existing research, some character strengths are more relevant to the university learning context than others. There are also strengths such as optimism which are not included in the VIA despite a long history of empirical research demonstrating its importance. Selection of which strengths to assess was thus guided by the relevant literatures on character strengths and learning. For ethical reasons, we also did not want to assess strengths that have not been shown in the empirical literature to be capable of further development via psycho educational interventions as we planned to run these in future. Currently, there is empirical evidence for a relatively small number of interventions (Seligman et al. 2005). A final important consideration was the wish not to overburden students.

Defining psychological strengths selected

The considerations outlined above led to the selection of curiosity, gratitude, hope, and forgiveness which are all included in the VIA and optimism, where there is a significant body of research largely pre-dating the VIA.

Curiosity is defined as a dispositional tendency to recognise and wish to pursue novel, complex or challenging experiences or interactions with the world (Kashdan, and Steger 2007). It is core to intrinsic motivation focusing the individual's attention and behaviour towards activities that facilitate learning, competence, and self-determination (Berlyne 1960, 1967; Deci and Ryan 2000). Individuals' levels of curiosity can directly affect their

willingness and motivation to undertake new and difficult learning tasks and are a core component of critical thinking, hence its inclusion (Leonard and Harvey 2007).

Gratitude is defined as a character strength involving appreciation and thankfulness and operates as a moral or pro-social affect or personality trait (Hershberger 2005; McCullough, Emmons, and Tsang 2002; McCullough, Kilpatrick, Emmons, and Larson 2001; Miller 1995; Watkins, Woodward, Stone, and Koths 2003). Grateful individuals have a generalised tendency to recognise the positive even when faced with adversity and to respond positively (Neto, 2007). Research suggests that a grateful disposition enables flexible and creative thinking and facilitates coping with stress and adversity (Aspinwall 1998; Folkman and Moskowitz 2000; Wood, Maltby, Stewart, Linley, and Joseph 2008), therefore it should be relevant to the transition to university and the adaptation to new attitudes to learning that are required.

Traditionally, hope was defined as the belief that one's goals are achievable and that a pathway to achieving these goals is possible and can be mapped out (Menninger 1959; Melges and Bowlby 1969). However, Snyder and his colleagues have recently demonstrated a need to expand this definition to include the motivation to follow these pathways (Snyder, Rand, and Sigman 2005). Hope is now more comprehensively defined as a goal directed thinking process in which people believe they can produce a path to desired goals (pathways) and are motivated to use these pathways (agency). Pathways thinking, reflects the ability to perceive workable routes to desired goals, while agency thinking represents motivation, defined as a capacity to sustain movement along these pathways (Snyder, Rand, and Sigman 2005). Hope is associated with positive motivational states and emotions and successful academic achievement (Snyder, Cheavens, and Michael 1999). Research has indicated that hopeful individuals cope better with stressors, being more likely to perceive stress as part of daily life viewing it a challenge rather than a potential failure waiting to happen, and are

likely to achieve at higher levels than those who are less hopeful (Snyder 2000; Snyder, LaPointe, Crowson, and Early 1998; Snyder and Lopez 2005).

Forgiveness is included as the final VIA character strength as the ability to forgive perceived wrongs done to one is crucial to maintain effective social interaction both at a personal and larger group level. Transition to university entails the student making new friends and acquaintances, joining new social groups, and possibly having to live with individuals new to them. The potential for conflict to arise is high and research suggests that individuals who are more forgiving will experience less stress and have better mental health both conducive to learning (Maltby, Macaskill, and Day 2001; Maltby, Macaskill, and Gillet 2007). Forgiveness is conceptualised as involving giving up any right to retribution, letting go of negative affect directed towards the wrongdoer, so that revenge is not sought and the perpetrator is not avoided. The scale used is the Transgression-related Interpersonal Motivations Inventory (McCullough and Hoyt 2002) which measures the levels of motivation to forgive (benevolence), to avoid contact with the wrongdoer (avoidance), and the wish to seek revenge, the latter two being indicative of unforgiveness.

Dispositional optimism is defined as the tendency to expect predominantly good things to happen rather than bad things and while not in the VIA, has been shown to be very relevant to learning. Optimism affects the way that individuals approach problems and challenges and predicts how well they then cope (Carver and Scheier 2001). Optimists conceptualise negative situational outcomes as temporary and specific rather than being due to persistent and pervasive factors and this then increases their motivation to deal with them. In summary, dispositional optimists as well as appearing more positive, display more adaptive coping skills which should be relevant to the university experience (Cantor and Sanderson 1999; Carver and Scheier 1999; Deci and Ryan 2000; Koestner, Lekes, Powers, and Chicoine 2002; Park, Peterson, and Seligman 2004).

Measuring students' confidence in their ability to learn autonomously

Self-efficacy is defined as individuals' levels of belief that if they perform some behaviour that it will get them the desired positive outcome (Bandura 1989, 1994). It is a measure of confidence in one's own abilities to succeed in a particular context. Individuals have been shown to vary greatly in their levels of self-efficacy related to specific tasks. Bandura (1997) has shown that high self-efficacy significantly increases the likelihood of achieving success. Self-efficacy will influence whether a task will be attempted as well as the effort put into it and the persistence with which it is pursued in the face of difficulties or apparent lack of progress. As self-efficacy is domain specific, a measure designed for use in the context of university is used, the College Self-Efficacy Inventory (Solberg, O'Brien, Villareal, Kennel, and Davis 1993).

A self-esteem scale was included as the concept captures the individual's sense of self, of personal and social identity, and measures his/her feelings of self-worth or self-acceptance and self-confidence (Hewitt 2005). It is well established that high self-esteem is associated with greater educational attainment (Bachman and O'Malley 1977), task effort, and persistence (Felson 1984; McFarlin, Baumeister, and Blascovich 1984) and general coping ability (Taylor 1983). Finally autonomous learning was measured using a recently developed scale (Macaskill and Taylor 2010). Students gave permission for the researchers to access their university entry grades and end of year grades as objective measures of achievement, the hypotheses being that higher entry grades and higher levels of autonomous learning would be associated with higher end of year grades.

To summarise the hypotheses are that:

1. Higher levels of curiosity, gratitude, hope, forgiveness, and optimism and lower levels of avoidance and revenge seeking will be associated with higher levels of self-efficacy, self-esteem, and autonomous learning.

2. Levels of self-efficacy and self-esteem will increase after the educational intervention, as will autonomous learning.
3. Increases in levels of autonomous learning, self-efficacy, and self-esteem will be higher in the intervention than in the quasi-control group.
4. Higher entry grades and higher levels of autonomous learning will be associated with higher end of year grades.

Method

Participants

The participants in the intervention group were 214 first year psychology students (170 women and 44 men, mean age = 19.11 years, $SD = 3.33$), 195 were white British, 17 were British Asians and two were Greek. Of these, 212 completed the five month follow up measures of autonomous learning and self-esteem and 139 the self-efficacy scales a week later. The shortfall was the result of non-attendance, illness, or students declining, as they did not require course credits. The control group were 40 students, (9 males and 31 females) with a mean age of 19.06 years ($SD = 2.89$). Four were British Asians and the rest were white British. All were studying in a very large British modern university committed to widening participation, with over 30,000 students, 75% of whom are undergraduates.

Measures

Curiosity and Exploration Inventory (CEI) (Kashdan, Rose, and Fincham 2004) is a seven-item measure assessing two intrinsic dimensions of trait curiosity; exploration, defined as a strong desire for novelty and challenging experiences, *Everywhere I go I am looking for new things or experiences* [item7] and absorption, describing a tendency to become fully engaged and not easily distractible, *When I am actively interested in something, it takes a great deal to interrupt me* [item5]. Responses are scored on a seven-point Likert scale from 1

(*strongly disagree*) to 7 (*strongly agree*). The coefficient alphas (Cronbach 1951) are satisfactory, ranging between .63 and .73 for the Exploration subscale, .66 and .73 for the Absorption subscale, and between .72 and .80 for the complete scale. Test retest reliabilities are satisfactory (Kashdan, Rose, and Fincham 2004). High scores are indicative of greater curiosity.

The Gratitude Questionnaire (GQ-6) (McCullough, Emmons, and Tsang 2002) is a six-item measure of trait gratitude, assessing the intensity of gratitude *I have so much in life to be thankful for* [item 1], and the frequency with which it is experienced, *Long amounts of time can go by before I feel grateful to something or someone* [item 6] and the scope of gratitude events that elicit grateful emotion *I am grateful to a wide variety of people* [item 4]. Responses are scored on a seven-point Likert scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). The coefficient alphas (Cronbach 1951) are satisfactory ranging from .76 to .84 (McCullough, Emmons, and Tsang 2002). High scores on the GQ-6 are indicative of higher gratitude.

The Trait Hope Scale (Snyder et al. 1991) consists of 12 items with two subscales assessing agency, defined as beliefs that goals can be obtained through effort, *I energetically pursue my goals* [item 2] and a pathways subscale measuring the perceived ability to overcome obstacles, *Even when others get discouraged, I know that I can find a way to solve the problem* [item 8]. Higher scores indicate greater hopefulness. The alpha coefficients for the scales range from .74 to .88 (Snyder et al. 1991). The scale has undergone extensive, convergent and discriminate validation appearing stable across time, situation, and circumstances (Cheavens, Gum, and Snyder 2000; Snyder 2000).

Transgression-related Interpersonal Motivations Inventory (McCullough and Hoyt 2002). This is an 18-item scale with three subscales measuring interpersonal motivations

underlying forgiveness; avoidance measures the motivation to avoid contact with a specific transgressor, *I keep as much distance between us as possible* [item 2], revenge, *I'm going to get even* [item 13], and benevolence, *I forgive him/her for what he/she did to me* [item 14]. Items are rated on a five-point Likert scale from 1 (*strongly disagree*) to 5 (*strongly agree*). All three subscales have high internal consistency with Cronbach's alpha coefficients greater than .85 and evidence of good convergent and discriminant validity (McCullough et al. 2001). Higher scores indicate greater avoidance motivation, revenge seeking, and more motivation to forgive.

The Life Orientation Test (Scheier, Carver, and Bridges 1994) is a 10-item measure of dispositional optimism, *In uncertain times, I usually expect the best* [item 1]. Participants rated each item on a five-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). There are four filler items. These are questions not directly associated with the concepts being measured and they do not contribute to the scores, rather their function is to disguise the purpose of the scale and can be effective at reducing some of the sociable desirability sensitivity associated with responses to the true questions especially in short scales such as the one used here. Higher scores correspond with higher levels of optimism. Test retest validations range .56 to .79 for intervals over a 28 month period, with reported alpha values of .81 (Snyder et al. 2005).

College Self-Efficacy Inventory (Solberg et al. 1993) is a 19-item measure of how confident a student is that they can complete tasks related to their university course and being a student. There are three subscales rated on a nine-point Likert scale from 0 (*totally unconfident*) to 8 (*totally confident*) measuring the student's self- efficacy for the Course, *Research for an assignment* [item 5], self- efficacy for room mates which measures the ability to get along with room or housemates, *Divide space in your room/house/flat* [item 4],

and social self-efficacy measuring aspects of interpersonal and social adjustment at university, *Participate in class discussions* [item 18]. The coefficient alphas (Cronbach 1951) are .93 for the total scale and .88 for each of the subscales. Good convergent and discriminant validity are reported (Solberg et al. 1993). Higher scores indicated greater self-efficacy.

Rosenberg Self-esteem Scale (Rosenberg 1965; Rosenberg and Pearlin 1978) is a 10-item measure of self-appraisal, *I am able to do things as well as most people* [item 4], rated on a five-point Likert scale ranging from 1 (*completely disagree*) to 5 (*completely agree*). Higher scores corresponded with higher levels of self-esteem. This measure has been shown to have adequate reliability with Cronbach's alpha coefficients between .77 and .88 (Dobson, Goudy, Keith and Powers 1979). Good convergent and discriminant validity have also been demonstrated (Fleming and Courtney 1984).

Autonomous Learning Scale (Macaskill and Taylor 2010) is a 12-item measure with two subscales measuring independence of learning, *I take responsibility for my learning experiences*, [item 11] and study habits, *I plan my time for study effectively*, [item 9]. Responses are recorded on a five-point Likert scale from 1 (*very unlike me*) to 5 (*very like me*) with lower scores indicating higher levels of autonomous learning. The alpha coefficients are .82 for the total scale, .72 for Independent Learning and .80 for the Attitude subscale and the convergent and discriminant validity are satisfactory (Macaskill and Taylor 2010). Higher scores reflect greater levels of autonomy, more independence, and more positive attitudes.

Design and procedure

Educational intervention group

Students were given an information sheet and a verbal briefing about the project at small group induction sessions on their first day at university and volunteers requested, who

then completed the questionnaire measures. The character strengths data were entered into SPSS and transformed into z-scores to allow comparison of scores on different measures as the scales had different numbers of items and/or scoring scales. The top three strengths for each student were identified and a report describing the relevant strengths was generated for each student.

Two weeks after the initial assessment, the educational intervention began with students given briefings on positive psychology and character strengths and their application in study skills seminars. They then received personal reports describing their top three character strengths. In the following week time was allocated to allow students to reflect on their character strengths, have some group discussion about implementation of strengths, and then incorporate their strengths into electronic personal development portfolios that they were constructing. To ensure rehearsal of the strengths material, in a third session, students revisited their character strengths statements and had to reformulate them to consider how to include them in their curriculum vitae in a manner that would be persuasive to potential employers. These three sessions comprised the educational intervention.

Five months after the initial assessment, students completed the autonomous learning and esteem measures used in the first assessment followed one week later by the self-efficacy scales. The delay in assessing self-efficacy was due to a technical issue with the online programme being used. At the end of the academic year, student mean grades for the year were collected with the permission of each student. Student could be awarded credits as part of a research participation scheme for completing the study and almost 60% of the students claimed credits.

Quasi-control group

This was a convenience sample of 40 students on psychology joint honors degrees who had attended the same induction and volunteered to have their character strengths assessed on day one. These students had study skills delivered separately due to timetabling difficulties but they followed the same basic curriculum but with no educational intervention and no feedback on their character strengths until the research was completed. They completed the same follow-up assessments as the intervention group five months after the initial assessment. As there was no random assignment to this group, the small numbers in it, and the curriculum experience being slightly different, with half shared with psychology, the comparisons between the quasi-control and the intervention group need to be treated with caution.

Results

Baseline assessment in the intervention group

The means standard deviations, ranges, and coefficient alphas (Cronbach 1951) for all the variables measured are shown in Table 1. The coefficient alphas for all the scales were satisfactory being greater than the recommended .70 (Kline 2000). Participants with missing values on any measure were excluded from the analyses hence the different values of *N* that are reported. An alpha level of .05 was used for statistical tests unless otherwise stated.

- Table 1 about here -

To test the hypotheses that higher levels of curiosity, gratitude, hope, forgiveness, and optimism, and lower levels of avoidance and revenge seeking will be associated with higher levels of self-efficacy, self-esteem, and autonomous learning, a Pearson product moment correlation was computed. The results are in Table 2, and indicate that the hypotheses were not fully supported. Optimism was only significantly correlated with social self-efficacy and

the patterns were different for each of the other measures. The correlations between the character strengths are displayed in Table 3. Apart from the TRIM scales which measure concepts related to forgiveness, all the correlations between character strengths are positive being small to moderate in magnitude with only the subscales of the hope scale sharing a large correlation (Cohen 1988). TRIM benevolence (forgiveness) is positively associated with all the character strengths apart from absorption curiosity, while revenge seeking is negatively associated with gratitude and positively associated with avoidance. The only significant positive association for TRIM avoidance is with hope pathways.

- Table 2 about here -

- Table 3 about here -

To explore further the nature of the relationships between the statistically significantly correlated variables, a series of standard multiple regressions were computed. The results are summarized in Tables 4 and 5. From table 4, it can be seen that hope agency is the only significant unique predictor of course self-efficacy, with the model accounting for 24% of the variance ($F(5, 200) = 14.99, p < .001$). Exploratory curiosity was the only significant predictor of room mate self-efficacy, with the model accounting for 16.7% of the variance ($F(5, 200) = 9.24, p < .001$). For social self-efficacy, exploratory curiosity was the most significant predictor, followed by hope agency, hope pathways, and optimism with the model accounting for 39.2 % of the variance ($F(5, 200) = 17.49, p < .001$).

- Table 4 about here -

- Table 5 about here -

From Table 5, hope agency is the strongest predictor of autonomous learning, followed by exploratory curiosity, with the model accounting for 22.2% of the variance ($F(5, 200) = 12.70, p < .001$). Hope pathways is the strongest predictor of self-esteem, followed by

hope agency, then exploratory curiosity, gratitude, absorption curiosity, and avoidance with the model accounting for 37.8 % of the variance ($F(8,197) = 16.56, p < .001$).

Optimism correlated negatively with entry grades of students ($r = -.16, p < .05$), as did the benevolence aspect of forgiveness ($r = -.15, p < .05$) while course self-efficacy correlated positively ($r = .24, p < .001$) as did efficacy for room mates ($r = .21, p < .001$). However the coefficient of determination indicates that the amount of variance shared by each variable is low, being 2.56% for optimism, 2.25% for benevolence, 5.76% for course self-efficacy, and 4.41% for room mate self-efficacy, so these are not analyzed any further. For completeness, a Pearson product moment correlation was computed to examine the associations between the self-efficacy measures, self-esteem, autonomous learning, and entry grades are the results are displayed in Table 6. From this it can be seen that the level of autonomous learning at university entry is associated with course self-efficacy, self-esteem, self-efficacy for room mates and social self-efficacy.

- Table 6 about here-

Post-intervention assessment

To test hypothesis two, whether there will be significant differences in students' scores on autonomous learning, self-efficacy, and self-esteem from initial assessment to the post intervention 5-month follow-up a repeated measures Multivariate Analysis of Variance was computed and the hypothesis was supported. There were statistically significant main effects of time, Wilks' $\lambda = .51, F(1, 129) = 121.82, p < .001, \eta^2 = .49$, and scores on the measures Wilks' $\lambda = .02, F(2, 128) = 3928.65, p < .001, \eta^2 = .98$, and the interaction between time and measures Wilks' $\lambda = .55, F(2, 128) = 52.38, p < .001, \eta^2 = .45$. For autonomous learning, the increase from entry ($M = 28.60, SD = 6.66$) to the five month assessment ($M = 38.12, SD = 5.33$) was significant $t(211) = 11.72, p < .001, d = .62$, a medium sized effect.

The increase in confidence as measured by total self-efficacy from induction ($M = 101.83$, $SD = 19.94$) to the five month post intervention assessment ($M = 114.3$, $SD = 27.00$) was statistically significant $t(135) = 5.78$, $p < .001$, $d = .25$, a small effect. The increase in self-esteem from induction ($M = 20.03$, $SD = 4.39$) to the five month assessment ($M = 21.19$, $SD = 4.00$) was statistically significant $t(204) = 6.46$, $p < .001$, $d = .14$, a very small effect.

To test hypothesis 3, a 2 by 2 between-groups Analysis of Covariance to control for any differences in baseline scores was computed to compare the scores on autonomous learning and self-esteem between the intervention group and quasi-control over five months. There was a significant main effect of time Wilks' $\lambda = .57$, $F(1, 202) = 153.77$, $p < .001$, $\eta^2 = .43$, a significant difference in the scale scores Wilks' $\lambda = .11$, $F(1, 202) = 1653.80$, $p < .001$, $\eta^2 = .89$, and the interaction between time and scale scores was significant Wilks' $\lambda = .72$, $F(1, 202) = 80.06$, $p < .001$, $\eta^2 = .28$. At entry, the mean score on the autonomous learning scale of the intervention group ($M = 28.60$, $SD = 6.66$) was not significantly different ($t(276) = 0.65$) from that of the control group ($M = 27.99$, $SD = 6.45$). At the final evaluation the difference in means for autonomous learning between the intervention group ($M = 38.12$, $SD = 5.33$) and the control group ($M = 30.67$, $SD = 6.21$) was statistically significant, $t(276) = 9.43$, $p < .001$, $d = .54$, a medium effect, with the intervention group having significantly higher scores, supporting the hypothesis. For self-esteem at induction the difference between the intervention group ($M = 19.89$, $SD = 4.48$) and the control group ($M = 20.10$, $SD = 4.52$) was not significant but at the five month follow-up, the differences in means between the intervention ($M = 21.36$, $SD = 4.18$) and control groups ($M = 19.79$, $SD = 4.17$), was significant $t(276) = 2.64$, $p < .01$, $d = .19$, a small effect as predicted.

To test hypothesis 4 that higher entry grades and levels of autonomous learning will be associated with higher end of year grades a standard multiple regression was computed

with year mean grade as the criterion variable. As predicted, entry grades ($\beta = .31, p < .001$) were the strongest predictor of year mean grade followed by levels of autonomous learning ($\beta = .21, p < .01$) with the model accounting for 14.1% of the variance ($F(2, 182) = 16.04, p < .001$).

Discussion

The hypotheses that higher levels of curiosity, gratitude, hope, forgiveness, and optimism and lower levels of avoidance and revenge seeking will be associated with higher levels of self-efficacy, self-esteem, and autonomous learning is not completely supported for all the strengths, although there are significant associations for most of them. There is support for the hope agency subscale which measures the motivational belief that through hard work and application (hope agency) goals can be achieved. This seems logical and is in line with previous research (Snyder 2000; Snyder et al. 1998; Snyder, Cheavens, and Michael 1999; Snyder and Lopez 2005). The hypothesis is supported for exploratory curiosity, gratitude, and hope pathways in line with previous research (Berlyne 1960, 1967; Deci and Ryan 2000; Leonard and Harvey 2007). While the ability to immerse oneself in a task (absorption curiosity) is positively associated with course and social self-efficacy, self-esteem, overall autonomous learning, and independence of learning, the lack of an association with roommate self-efficacy is novel. However it is a relatively new measure and as yet there is not a lot of research on the subscales. It could be that while absorption curiosity is associated with intelligence and high achievement, it could be that it is not conducive at the age of eighteen to feeling confident to deal with fellow students and fit in well. This could be examined further in future.

For optimism, only the hypothesised relationship between being optimistic and having higher levels of social self-efficacy is supported. Dispositional optimism is associated with

more positive mood and more adaptive coping skills all helpful for dealing with new people and situations as in the university experience. However, some of the previous literature would predict positive associations between optimism and the other measures of self-efficacy and self-esteem (Cantor and Sanderson 1999; Carver and Scheier 1999; Carver and Scheier 2001; Deci and Ryan 2000; Koestner et al. 2002; Park, Peterson, and Seligman 2004). There has been some debate about the discriminative value of optimism, in response to which Scheier, Carver, and Bridges (1994) produced the revised measure used in this study. While the correlations between optimism and the other character strengths are not particularly large, future research could explore the concept further perhaps utilising a different measure of optimism as an explanatory style (Peterson and Steen 2005).

For the forgiveness, (TRIM benevolence) measure there is no association with course self-efficacy or autonomous learning but it is associated with more social measures of efficacy and self-esteem suggesting that forgiveness may be important for maintaining social interaction but unlike previous research it is not linked to learning (Maltby, Macaskill, and Day 2001; Maltby, Macaskill, and Gillet 2007). For the tendency to seek revenge, only the hypothesised negative associations with self-esteem and autonomous learning overall and the independence subscale hold. The tendency to deal with conflict using avoidance is negatively associated with being confident to deal with room mates', social-efficacy, and self-esteem as predicted but has no relationship with course self-efficacy or autonomous learning.

Character strengths are significant predictors of the outcome measures accounting for relatively large amounts of variance. Hope agency, that is, the belief that goals are attainable is the strongest predictor of autonomous learning, followed by exploratory curiosity, defined as a strong desire for novelty and challenging experiences. This fits with previous research suggesting that hope is associated with the creation of positive motivational states and

successful academic achievement (Snyder, Cheavens, and Michael 1999). The hopeful individual is more likely to see the drive towards achieving autonomous learning as a challenge rather than a stressor and to persist in their efforts as a result (Snyder 2000; Snyder et al. 1998; Snyder and Lopez 2005), while curiosity provides the motivation to seek out and engage with new experiences.

With self-esteem, a measure of confidence and well-being, hope agency, namely the belief that goals are attainable is the strongest predictor, followed by hope pathways, which measures the perceived ability of an individual to overcome obstacles. This is followed by gratitude which is about thankfulness and recognizing positives in situations, then exploratory curiosity, (the desire for challenge and new experiences) and absorption curiosity, defined as the tendency to become fully engaged and not easily distractible (Kashdan, Rose and Fincham 2004). These are all strengths which generate positive cognitions so that high levels being associated with higher self-esteem makes sense. Higher levels of self-esteem have previously been shown to relate to task effort and persistence (Felson 1984; McFarlin, Baumeister, and Blascovich 1984) as have higher levels of hope (Snyder 2000; Snyder et al. 1998; Snyder and Lopez 2005). The curiosity variables are very relevant to feelings of confidence and well-being (self-esteem) in the context of beginning study at university with the need for autonomous learning and the independent search for knowledge. Hope refers to beliefs that goals are achievable and can be achieved through persistence (Bandura 1989; Deci and Ryan 1985; Fazey and Fazey 2001; Holec 1981; Little 2000). Gratitude, the remaining variable is associated with maintenance of positive mood, quicker recovery from adversity, flexible and creative thinking and facilitates coping with stress which is an important aspect of resilience (Aspinwall 1998; Folkman and Moskowitz 2000; Neto 2007; Taylor 1983; Wood et al. 2008).

Self-efficacy measures the belief that individuals have in their own abilities to achieve desired outcomes and affects whether a task will be attempted and the confidence with which it is approached (Bandura 1989, 1994, 1997). From the character strengths measured, hope agency is the only significant predictor of course self-efficacy, suggesting that believing they can achieve their goals is positively motivating as indicated in previous research which also suggested that it is associated with successful academic achievement (Snyder, Cheavens, and Michael 1999). Exploratory curiosity is the only significant predictor of self-efficacy for room mates, although perhaps this was not the optimum time to assess this, as most students were in the process of getting to know the fellow students that they would be living in close proximity to. Being interested in meeting new people and having new experiences (exploratory curiosity) appears to be related to being more confident in these situations. For social-efficacy the variables predict a large amount of variance, with exploratory curiosity as the most significant predictor, followed by hope agency, then hope pathways. It is clear how these character strengths contribute to feeling confident coping with social interactions and situations. In curiosity, there is the wish to have new experiences and meet new people, while the hope strengths provide positive motivation and confidence in being able to manage situations, achieve goals, and the motivation to persist even in adversity (Snyder, Cheavens, and Michael 1999; Snyder 2000; Snyder and Lopez 2005).

The level of autonomous learning at university entry being associated with course self-efficacy, self-esteem, self-efficacy for room mates, and social self-efficacy is unsurprising given that self-esteem and efficacy measures reflect the underlying belief and confidence in their abilities that individuals have. This fits with the definitions and psychological constituents of autonomous learning contained in the research literature

(Bandura 1989; Deci and Ryan 1985; Fazey and Fazey 2001; Holec 1981; Little 2000; Ponton, Carr, and Confessore 2000).

The character strength of optimism was not found to be a significant predictor of any of the variables measured. This was somewhat surprising, given the previous literature linking optimism with motivation, positive coping with challenges (Carver and Scheier 1999, 2001; Park, Peterson, and Seligman 2004; Deci and Ryan 2000; Koestner et al. 2002). Many of the previous studies focussed only on the character strength of optimism whereas when additional character strengths are included the effect of optimism may be less as in this study and there may be measurement issues as discussed earlier.

Post Educational intervention

Statistically significant increases in course, social, and room mate self-efficacy after the educational intervention suggest that students had indeed become more confident in the university situation (Bandura 1989, 1994, 1997) supporting the second hypothesis. The most significant changes are for autonomous learning. This supports Holec's (1981) initial conceptualization of autonomous learning, Little's (2000) definition of it being about how the learner relates psychologically to the content and process of learning and our contention that confidence is necessary for autonomous learning. There is also a smaller significant increase in self-efficacy, which is important given that Bandura (1997) reported that high self-efficacy significantly increases the likelihood of achieving success by influencing whether a task is attempted as well as the effort put into it and the persistence with which it is pursued in the face of difficulties or apparent lack of progress. A significant increase in self-esteem is also found post intervention, reflecting a feel good factor (Hewitt 2005). Increasing self-esteem in students is desirable given that previous research has established that high self-esteem is associated with greater educational attainment (Bachman and O'Malley 1977), task effort,

and persistence (Felson 1984; McFarlin, Baumeister, and Blascovich 1984) and general coping ability (Taylor 1983).

The third hypothesis that increases in levels of autonomous learning, self-efficacy, and self-esteem will be higher in the intervention than in the quasi-control group is fully supported. As discussed previously however this result requires replication with a larger randomly allocated control group rather than the convenience sample control used in this study.

Entry grades and level of autonomous learning are the predictors of year mean grade although only a relatively modest proportion of the variance is explained. On reflection, a value added measure of achievement over the year would be a more accurate variable to assess rather than the mean average mark, as this would allow for differences in underlying ability. In this particular instance, scrutiny of the university exam board minutes indicated that due to changes in examination regulations, some students had been very strategic in addressing second semester assessment and had moderated their efforts simply to ensure that a pass mark was obtained. It was felt that the final marks were not necessarily a true reflection of ability in this instance. The results relating to final year grade therefore need to be treated with caution and require replication.

Conclusions

Commonly psychological and academic assessment of individuals utilizes a deficits model (Wright and Lopez 2005) which can undermine the confidence of the individual. The assessment of individuals from a positive psychology perspective is different in that it sends very positive messages about the psychological strengths that individuals have. Receiving this personalised positive assessment and being educated about strengths and encouraged to apply them in relevant ways within modules appears to have produced significant increases in

self-esteem and autonomous learning in first year students, when compared with a control group who did not receive the intervention. Character strengths were shown to be significantly associated with the measures of self-efficacy at university, self-esteem, and autonomous learning in ways that theoretically made sense. The character strengths underpin the generation of positive cognitions, emotions, and motivation, all of which are necessary for the development of autonomous learning. From the initial assessment of strengths, autonomous learning was predicted by hope agency and exploratory curiosity accounting for a reasonable amount of variance. The predictors for self-esteem were both elements of hope, gratitude and both aspects of curiosity, with these variables accounting for a large amount of variance compared with most individual difference variables. Exploratory curiosity, hope agency, and hope pathways were predictors of social self-efficacy again accounting for a large proportion of the variance. Hope agency was a predictor of course self-efficacy while exploratory curiosity was a predictor of room-mate self-efficacy. At university entry, students having higher levels of autonomous learning also have higher levels of all the self-efficacy measures and higher self-esteem, suggesting that confidence is associated with autonomous learning.

We have identified some of the psychological strengths associated with confidence as measured by self-efficacy and self-esteem and the relatively brief psycho-educational intervention has been shown to be associated with significant increases in these confidence measures and also with increases in autonomous learning when compared to a control group who did not experience the intervention. Future studies could usefully explore these links further with larger samples as this type of intervention offers a relatively inexpensive, yet effect contribution to the development of autonomous learning and introduces a real element of positive assessment into the curriculum.

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Table 1
Means, standard deviations, alpha coefficients, ranges for all the scales, and subscales

Scales	N	M	SD	α	Range
Exploratory curiosity	214	19.09	3.90	.76	4-28
Absorption curiosity	214	12.90	2.95	.74	3-21
Gratitude	214	33.96	5.07	.76	6-42
Hope pathways	210	22.29	4.33	.77	4-32
Hope agency	208	23.28	3.94	.70	4-32
TRIM avoidance	214	21.76	5.72	.83	7-35
TRIM revenge	214	11.58	3.98	.85	5-25
TRIM benevolence	214	18.49	4.77	.87	6-30
Optimism	213	19.32	4.12	.81	6-30
Course self-efficacy	210	43.11	8.78	.88	0-64
Room mate self-efficacy	212	18.16	3.74	.77	0-24
Social self-efficacy	212	41.59	9.90	.87	0-64
Total self-efficacy	214	101.83	19.94	.86	0- 152
Self-esteem	210	19.89	4.48	.85	10-40
Autonomous learning	212	28.60	6.66	.86	12-60
Entry grades	196	285.97	56.89	-	180-480

Table 2

Correlations of psychological strengths with self-efficacy (SE), self-esteem, and autonomous learning (AL) Scales

	Course SE	Room mate SE	Social SE	Self- esteem	AL
Exploratory curiosity	.25***	.39***	.50***	.43***	.32***
Absorption curiosity	.18**	.13	.31***	.14*	.11
Gratitude	.29***	.18**	.22***	.36***	.28***
Hope pathways	.33***	.31***	.54***	.50***	.28***
Hope agency	.51***	.29***	.50***	.52***	.45***
Optimism	.07	-.09	.20**	.04	.01
TRIM avoidance	-.05	-.15*	-.15*	-.21**	-.05
TRIM revenge	-.12	-.12	.01	-.19**	.16*
TRIM benevolence	.06	.18**	.21**	.23***	.12

* $p < .05$, ** $p < .01$, *** $p < .001$

Table 3

Correlations between all the character strengths ($N = 214$)

Psychological Strengths	Exploratory curiosity	Absorption curiosity	Gratitude	Optimism	Hope pathways	Hope agency	TRIM Avoidance	TRIM Revenge
Absorption curiosity	.37***	--						
Gratitude	.34***	.2**	--					
Optimism	.35***	.14*	.38***	--				
Hope pathways	.49***	.34***	.30***	.49***	--			
Hope agency	.41***	.28***	.35***	.43***	.60***	--		
TRIM avoidance	-.06	-.08	-.13	-.13	.25***	-.08	--	
TRIM revenge	-.10	.01	-.23**	-.13	-.01	-.11	.41***	--
TRIM benevolence	.19**	.11	.33***	.24***	.20**	.22**	-.63***	-.37***

* $p < .05$, ** $p < .01$, *** $p < .001$

Table 4

Regression analysis summary for psychological strengths predicting course, room mate, and social self-efficacy

Variable	Course self-efficacy			Room mate self-efficacy			Social self-efficacy		
	<i>B</i>	<i>SEB</i>	β	<i>B</i>	<i>SEB</i>	β	<i>B</i>	<i>SEB</i>	β
Exploratory curiosity	.01	.17	.01	.29	.07	.31***	.65	.17	.26***
Absorption curiosity	.08	.19	.03				.25	.20	.08
Gratitude	.21	.11	.12	.01	.05	.01	-.15	.12	-.08
Optimism							.32	.16	.13*
Hope pathways	.04	.16	.02	.06	.07	.07	.46	.18	.20**
Hope agency	.99	.17	.45***	.10	.08	.12	.55	.18	.22**
Trim avoidance				-.07	.04	-.11	-.11	.12	-.06
Trim forgiveness							.01	.16	.01
	$R^2 = .25 (N = 205, p < .001)$			$R^2 = .17 (N = 205, p < .001)$			$R^2 = .39 (N = 205, p < .001)$		

* $p < .05$, ** $p < .01$, *** $p < .001$

Table 5

Regression analysis summary for psychological strengths predicting autonomous learning and self-esteem

Variable	Autonomous learning			Self- esteem		
	<i>B</i>	<i>SEB</i>	β	<i>B</i>	<i>SEB</i>	β
Exploratory curiosity	.24	.12	.14*	.23	.07	.21**
Absorption curiosity				-.19	.09	-.13*
Gratitude	.10	.09	.08	.12	.05	.14*
Hope pathways	.11	.12	.07	.26	.08	.27****
Hope agency	.65	.13	.41****	.26	.08	.24****
TRIM avoidance				-.11	.06	-.15
TRIM revenge	.12	.10	.07	-.04	.07	-.04
TRIM benevolence				.08	.07	.09
	$R^2 = .22$ ($N = 205$, $p < .001$)			$R^2 = .38$ ($N = 204$, $p < .001$)		

* $p < .05$, ** $p < .01$, **** $p < .001$

Table 6

Correlations between course, room mate, and social self-efficacy, self-esteem, autonomous learning (AL) and entry grades

Measure	1	2	3	4	5
1. Course self-efficacy	--				
2. Room mate self-efficacy	.48***	--			
3. Social self-efficacy	.57 ***	.52***	--		
4. Self-esteem	.47***	.42***	.58***	--	
5. AL	.41***	.24***	.22**	.25***	--
6. Entry grades	.24***	.21**	.07	.11	.12

* $p < .05$, ** $p < .01$, *** $p < .001$