Effects of a six-session introductory psychology programme on Year 9 pupils' interest in psychology and approaches to learning

Emma Norris, Tahirah De Aguiar Chaves & Sandra Dunsmuir

Psychology is a popular UK A-level, despite many pupils having no previous taught experience of it. Prior introduction to psychology teaching could help pupils make more informed choices to study it. This study evaluates a six-session introduction to psychology programme for 20 Year 9 pupils called 'Myth-Busting the Brain'. A pre-/post-programme questionnaire investigated pupil interest towards future psychology study, interest in the programme and approaches to learning. There was no significant difference between time-points in interest in psychology, nor the programme itself between pre-and post-programme assessment. Overall interest in psychology was significantly correlated with interest in the programme at pre- and post-assessment. No significant changes in learning approaches were found between assessment points. However, psychology and programme interest were significantly correlated to deeper pupil learning approaches. This suggests that introductory psychology programmes may be more appealing to students with deeper learning styles. A programme of this length may not be feasible in typical teaching; hence future research could assess the effects of single sessions on psychology interest.

Keywords: *widening participation; pre-university teaching; attitudes to psychology study.*

THE PSYCHOLOGY A-level is currently the fourth most popular in the UK, with over 55,000 full A-level and nearly 100,000 AS-level awards in 2013 (Joint Council for Qualifications, 2014b). Of these students, 31 per cent say they would like to continue studying the subject and 15 per cent say they would like a career in psychology (British Psychological Society, 2013). Psychology is also available at GCSE to a much smaller extent (Joint Council for Qualifications, 2014a). However, psychology is not taught routinely during Key Stage 3 (Toal, 2007). Although school support is provided to help students make course decisions (Jin, Murlel & Sibleta, 2010); having no prior taught experience of the subject before making GCSE and A-level choices currently makes psychology a relatively unknown subject for pupils. This paper presents the evaluation of a novel six-session programme introducing psychological concepts and critical thinking to Year 9 pupils within Science teaching time.

Current state of pre-tertiary psychology study

Although often placed in the Humanities department of schools (Toal, 2007), psychology is officially recognised as a Science subject (hence a Science, Technology, Engineering & Maths [STEM] subject) by the Science Council (Maras & Bradshaw, 2007; The Higher Education Academy, 2015). Females outperform and outnumber men three-to-one in A-level psychology (Joint Council for Qualifications, 2014b; Smith, 2011) with similar patterns at degree level (Trapp et al., 2011): making the subject an important route into science for women (Conway & Banister, 2007).

Despite this, A-level psychology is not listed as a 'facilitating subject' for access to Russell Group universities (McInerney, 2013; Paton, 2011; Russell Group, 2013). This reflects great debate as to the suitability of pre-tertiary psychology teaching (Banyard, 2014; Higton et al., 2012; Smith, 2010).

The psychology A-level has been objectively assessed as of middling difficulty (Coe et al., 2008): harder than English and Sociology but easier than STEM subjects of Biology, Chemistry and Physics. However, it should be noted that this report was written before 2008 specification changes increasing the difficulty of the psychology programme (OCR, 2008). Some argue its rigid specifications com-monly lead to teaching being focused on 'learning to pass the exam', rather than to develop evaluation skills and interest in psychology (Maras & Bradshaw, 2007; Rowley & Dalgarno, 2010).

Despite dissatisfaction in the current format of pre-tertiary education, psychology is still a hugely popular option for students (Joint Council for Qualifications, 2014b). Although schools typically provide advice on course content for newly-provided subjects like psychology (Jin et al., 2010), a lack of prior study may lead pupils to make under-informed choices on whether to study it. An introductory programme at Key Stage 3 to capture interest could help pupils make more informed choices for potential future psychology study and reduce drop-out rates.

Psychology study and approaches to learning

Psychology teaching encourages the development of a range of practical and social transferable skills (Halonen et al., 2003; Jarvis, 2011). The term 'psychological literacy' was hence coined to represent the core knowledge and skill set acquired through psychology study (Boneau, 1990). These skills are evidently broad; practical problem-solving, critical thinking, description and communication skills, alongside awareness of ethical and scientific values are key in psychology study at all levels (Halonen et al., 2003). More recently, psychological literacy has also been used in a more applied manner: representing students' developed insight into the behaviour and mental processes of others and oneself (Hulme, 2014; McGovern et al., 2010).

Unlike other STEM subjects such as Maths, psychology does not typically have one single 'right' answer: a concept pre-tertiary students can find hard to grasp (Toal, 2007). Understanding the variety of potential influences on behaviour and range of approaches to testing hypotheses arguably requires a flexible approach to learning and problem-solving (Jarvis, 2011). This seems allied to a deep approach to learning: where individuals are able to interlink a range of ideas and general principals, generally driven by their true interest in the subject at hand (Chin & Brown, 2000; Kember, Biggs & Leung, 2004). This is opposed to a surface approach, where individuals learn facts and ideas by rote, often as a desire to simply complete the course (Chin & Brown, 2000; Kember et al., 2004). Deep and surface approaches to learning represent what students do when they learn and why they do so. They are distinguished from 'learning styles': crude differences in how individuals process information (Murray-Harvey, 1994) that are frequently catered for in teaching strategies despite having no identifiable benefits for pupils (Howard-Jones, 2014). Exposure to the breadth and depth of psychological skills and values via introductory psychology teaching in novice students could encourage development of a deeper overall learning style. Accordingly, calls for a psychology curriculum from Key Stage 3 have emphasised psychology's capacity to facilitate critical thinking and deep learning approaches (Toal, 2007).

This study evaluated the effects of a novel, introductory psychology programme in Year 9 pupils.

The aims of this study were to:

1. Assess the effects of this programme on interest towards future psychology study.
2. Assess the interest of pupils towards the programme.
3. Assess the relationship between student approaches to learning and psychology interest.
4. Assess the relationship between student approaches to learning and programme interest.

Method

Design

This study comprises of a pre-, post-evaluation of an introductory psychology programme for Year 9 pupils. This project was run as the psychology arm of the University Learning in Schools (ULiS) project (Achievement for All, 2015; The Brilliant Club, 2014).

Participants and setting

A whole class of 24 Year 9 students (aged 13 and 14) from one second-set Science class in a London school received the programme. The class was selected by the University Learning in Schools (ULiS) project and the collaborating school. The school is one of a small proportion of UK schools providing Psychology from GCSE level (Joint Council for Qualifications, 2014a). The programme was delivered in 50-minute sessions, once a week over six weeks during the Spring term. Sessions were run in the student's Science classroom by a Psychology teacher in the place of typically taught Science teaching.

Procedure

The programme was developed by EN & TDAC during December 2014 to February 2015 and delivered by TDAC during February to March 2015. Informed consent forms were signed by pupils during the first programme session. This emphasised that participation in this evaluation was separate from the programme itself, with their decision to participate not effecting their involvement in the programme or their education. Evaluation measures were completed during the first and last programme session, taking around 10 minutes. Ethical approval for this study's evaluation of the project was granted from the UCL ethics board.

'Myth-Busting the Brain' programme

As part of the ULiS project, a six-session programme of 50-minute lessons was developed by EN (researcher) and TDAC (psychology secondary school teacher). A general brief from ULiS stated that programmes should be on emerging trends in psychology, influenced by current research and publications. The programme was developed drawing on recent publications showcasing the breadth of psychological myths embedded in education and popular discourse (Geake, 2008; Goswami, 2006; Howard-Jones, 2014; Jarrett, 2015). Each session introduced a range of psychological concepts and arguments via 'myth-busting' activities. Topics such as basic neuroanatomy, schizophrenia and the nature-nurture debate were introduced, with pupils encouraged to critically evaluate related myths common in popular culture (see Figure 1 for programme outline). Myths 'busted' included learning styles being beneficial in education and hemispheric dominance explaining learning differences: recently assessed as believed in 93 per cent and 91 per cent of UK teachers respectively (Howard-Jones, 2014). Students were provided with a workbook containing various class-based activities and readings. Explanation of topics covered at GCSE and A-level Psychology was given as appropriate moments arose during the programme.

This programme was also designed to provide an insight into academic working life. Critical thinking in the form of debates, small group work featured throughout. A final, optional 2000-word essay was set for students to extend their research and evaluation of a psychological myth of their choice, with feedback given (by TDAC). All students were introduced to essay formats, researching, referencing and plagiarism in preparation for this task.

Measures

A developed questionnaire assessed interest towards psychology, interest towards the programme itself and pupils' approaches to learning before and after the programme. Demographics of sex, ethnicity, English as a first language, free school meal status and current National Curriculum attainment levels in English, Maths and Science (Department for Education, 2012) were collected in the pre-programme questionnaire.

Interest in psychology

Interest in psychology was assessed with six items, presented as four-point Likert scales. Two items assessed wanting to learn more about psychology and four assessed intentions for further psychology GCSE, AS/A-level, degree study and psychological career. Responses indicated agreement from *strongly agree* to *strongly disagree* for items such as 'I intend to study Psychology at GCSE level'. Cronbach's α=0.94 for pre-test and α=0.95 for post-test showed excellent internal reliability of items (Kilne, 1999)

Interest in the 'Myth-Busting the Brain' programme

Interest in the programme's sessions was assessed with six items: one for each session of the programme. These were 10-point Likert scales to capture a wide range of interest levels. Responses indicated agreement from *extremely disinterested* to *extremely interested* for items such as 'Session 2: Myths about brain structure'. Cronbach's α=0.93 for pre-test and α=0.95 for post-test showed excellent internal reliability of items (Kilne, 1999)

Learning Process Questionnaire

Approaches to learning were assessed using the Revised Two-factor version of the Learning Process Questionnaire (R-LPQ-2F)(Kember et al., 2004). This 22-item, validated questionnaire assesses deep and surface approaches to learning with five-point Likert scales. An overall score for deep and surface approaches is calculated out of a maximum of 55, with greater scores indicating greater use of the associated approach. Responses indicated agreement from *This item is never or only rarely true of me* to *This item is always or almost always true of me*. Example items include 'I try to relate what I have learned in one subject to what I learn in other subjects' (deep approach to learning) and 'I see no point in learning material which is not likely to be in the examination' (surface approach to learning). Good Cronbach's alpha scores have been found for both deep (α=0.82) and surface (α=0.71) approach scales in secondary school pupils (Kember et al., 2004).

Data analysis

Data was analysed to assess the impact this programme had on students' interest in psychology and changes to their approaches to learning. Paired *t*-tests were used to compare pre-/post-programme responses in the overall group. Repeated measures ANOVAs were used to compare pupils with higher, lower and no difference in psychological interest and programme interest between time-points. Correlations in pre- and post-programme assessment were calculated.

Results

Twenty pupils completed both Time 1 and Time 2 questionnaires and were subsequently analysed. Fifty-five per cent (N=11) of pupils were male, 30 per cent (N=6) received Free School Meals and 75 per cent (N=15) described English to be their first language. 20 per cent (N=4) were white, 20 per cent (N=4) were Asian, 20 per cent were black and 35 per cent (N=7) described themselves of 'other' ethnicity. Mean current, self-reported National Curriculum attainment levels were 6.54 (SD=0.71) for English, 7.41 (SD=0.44) for Maths and 6.00 (SD=0.59) for Science, with Levels 5 or 6 expected for this year-group (Department for Education, 2014).

Effect of programme on interest in psychology

Scores ranged between 7 and 24/24 for psychology interest at pre-assessment and 6 and 24/24 at post-assessment. Mean scores for psychology interest at pre- and post-programme assessment are provided in Table 1. There was no significant difference in interest between time points in the overall sample, with no significant different in interest between any demographic groups. Overall interest in psychology at pre- and post-programme assessment were significantly correlated (r=0.76, p<0.001).

Table 1: Pupils' mean scores (SD) on pre (Time 1) – post (Time 2) measures.

	Time 1	Time 2
Interest in Psychology (four-point Likert scale)		
I would like to find out more about Psychology	3.30 (0.73)	2.95 (0.89)
I would like to have more lessons in Psychology	3.20 (0.77)	2.85 (0.93)
I intend to study Psychology at GCSE level	2.55 (0.95)	2.60 (1.14)
I intend to study Psychology at AS/A-level	2.20 (0.89)	2.50 (1.15)
I intend to study Psychology for a degree	2.15 (0.67)	2.20 (0.95)
I intend to pursue a career in Psychology	2.10 (0.79)	2.20 (1.01)
Overall	15.50 (4.20)	15.30 (5.53)
Interest in 'Myth-Busting the Brain programme' (10-point Likert scale)		
Session 1: What are common myths in Psychology?	5.63 (2.79)	5.11 (3.05)
Session 2: Myths about brain structure	6.32 (2.52)	5.05 (3.24)
Session 3: Brain myths in education	6.17 (2.81)	5.37 (3.15)
Session 4: Myths about mental health	6.68 (2.67)	5.84 (2.95)
Session 5: Myths of technology and the brain	6.05 (2.76)	5.53 (2.93)
Session 6: What have brain myths taught us?	5.79 (2.70)	5.26 (3.25)
Overall	38.29 (13.23)	31.59 (17.15)
Learning Process Questionnaire (maximum of 55)		
Deep approach to learning	34.75 (7.30)	34.05 (8.16)
Surface approach to learning	34.05 (6.78)	36.05 (6.53)

Within the sample, 40 per cent (N=8) increased their mean interest in psychology from pre- to post-programme, 30 per cent (N=6) decreased and 30 per cent (N=6) showed no difference (Table 2). To understand the effects of the programme on these three different interest groups, repeated measures ANOVA were performed. This found no significant main effect of time on mean psychology interest scores in the three psychology interest groups ($F(1,17)=1.21$, $p>0.05$ $\eta^2=0.07$). However, a significant interaction of time (pre- or post-programme) and interest group was found ($F(2,17)=19.07$, $p<0.001$, $\eta^2=0.69$).

Interest in programme

Scores of interest in the programme ranged between 12 and 56/60 at pre-assessment and 6 and 60/60 at post-programme assessment. There were no differences between demographic groups or learning approaches in programme interest at pre- or post-assessment.

No significant change in mean programme interest was observed between pre- and post-assessment (Table 1). Overall interest in psychology was significantly correlated with interest in the programme itself at pre- ($r=0.61$, $p<0.01$) and post-assessment ($r=0.59$, $p<0.01$).

Table 2: Mean (SD) scores of psychology interest according to change between pre (Time 1) – post (Time 2) measures.

Change in psychology interest	Time 1	Time 2
Increase (N=8)	15.63 (4.75)	18.38 (3.54)
Decrease (N=6)	13.83 (3.71)	9.50 (4.89)
No change (N=6)	17.00 (3.95)	17.00 (3.95)

Approaches to learning

Scores ranged between 23 to 47/55 for deep and 20 to 46/55 for surface approaches to learning at pre-programme assessment; and 22 to 46/55 for deep and 24 to 46/55 for surface approaches to learning at post-assessment. Females scored significantly higher overall in deep approach to learning (M=77.11/110, SD=12.69) compared to males (M=63.73, SD=10.89, $t(18)$=–2.54, $p<0.05$). There were no other demographic differences in learning approaches. No significant changes in mean group scores for Deep and Surface approaches to learning were found between pre- and post-programme measurement (Table 1).

Relationship between approaches to learning and interest in psychology

Interest in psychology was significantly correlated to a deeper learning approach at both pre- (r=0.47, $p<0.05$) and post-programme assessment (r=0.58, $p<0.01$; Table 3). Pupils who increased their interest in psychology after the programme rated themselves as significantly deeper learners (M=39.50, SD=5.63) compared to those who decreased their interest in psychology (M=27.00, SD=5.37; $F(2,19)$=6.25, $p<0.01$). Surface learning approach was not significantly associated with interest in psychology.

Relationship between approaches to learning and interest in programme

Programme interest was significantly correlated to a deeper learning approach at both pre- (r=0.74, p=0.001) and post-programme assessment (r=0.71, p=0.001). Surface learning approach was not significantly associated with programme interest.

Discussion

This evaluation of an introductory psychology programme for Year 9 pupils has provided mixed results. A minority of students (40 per cent) demonstrated an increase in psychology interest after the programme; however these changes were not significant overall or between demographic groups. No significant changes in mean programme interest were found between time-points. Programme and psychology interest were significantly correlated at both time-points. Deep and surface learning approaches in pupils did not change after the programme. A deeper learning approach was significantly associated with interest in psychology and the programme itself. Deeper learners were also significantly more likely to increase their psychology interest after the programme.

Table 3: Changes to pupils' interest in psychology according to post (T2) approaches to learning.

Change in psychology interest	T2 Deep Learning Score	T2 Surface Learning Score
Increase (N=8)	39.50 (5.63)*	36.88 (6.20)
Decrease (N=6)	27.00 (5.37)	34.50 (7.94)
No change (N=6)	33.83 (8.52)	36.50 (6.38)

*$p<0.01$, Bonferroni corrections showed significant mean difference scores between increased and decreased psychology attitudes groups (p=0.007).

Effectiveness of the programme

Although many pupils decreased or reported no change in their interest in psychology after the programme, this is not necessarily a negative finding. The programme did not aim to convert all pupils into psychology enthusiasts. In providing novice pupils with taught experience, it instead sought to enable them to make more informed decisions on potential future study of psychology. Information on topics covered in GCSE and A-level psychology were provided as appropriate during the programme, but the main focus was on taught content. A lack of significant change in psychology interest suggests that attitudes were not changed greatly by programme. The programme included a wide range of 'myth-busting' topics, across educational, neurological, clinical and health psychology. Although this breadth was intended to capture maximal interest, it may have instead been too general for pupils.

This issue of topic breadth may also be related to the lack of psychology interest and learning approach changes found over the programme. Although the programme content was designed to encourage psychology understanding through critical thinking and deeper learning (Jarvis, 2011), this was evidently not reflected in changes to pupils' own learning approaches. The range of topics covered over the six sessions may have been too varied for pupils to gain sufficient topic interest and develop improved deeper learning. Perhaps a deeper analysis of fewer psychology myths would have had more of an effect in this manner.

However, pupils already demonstrating deeper learning tendencies consistently reported both higher psychology and programme interest. This suggests that introductory psychology programmes may be more appealing to students with deeper learning styles. These findings also support previous research showing deeper learning styles to exist alongside greater interest in a given subject (Kember et al., 2004).

Despite females outnumbering men three-to-one in psychology A-level study (Joint Council for Qualifications, 2014b; Smith, 2011), no significant sex differences were found here in psychology interest at either time-point. This may be related to the deeper learning styles identified in female pupils, as in past research (Zeegers, 2001). With psychology requiring an understanding of complex influences on behaviour (Jarvis, 2011; Toal, 2007), a deeper learning approach would seem beneficial. Gender differences in psychology uptake may hence be related to learning approaches.

These results are inherently tentative as this novel programme has only been tested on one Year 9 class. High SDs were noted across all testing, due to the range of psychology and programme interest in this small sample size. Additionally, only intention to study psychology was measured, with no figures on actual GCSE psychology uptake available. The University Learning in Schools project that this programme arose from required current university-level research rather than careers information to be taught. However, outlining the content of GCSE/A-level psychology teaching or providing careers information could have had more of an impact on psychology intentions.

Future implementation

Delivered in a Year 9 class in the Spring term, this programme was provided at a key period for students ahead of making their GCSE option choices. Although available in the studied school, psychology is not commonly provided at GCSE level (Joint Council for Qualifications, 2014a). Future iterations of this programme should consider the choices available to students in each school, such as tailoring to Year 11 pupils ahead of A-level options. Alternatively, this programme could be used as a Science enrichment opportunity (Stake & Mares, 2001). Changes to psychological literacy during the programme could also be measured in future versions.

As part of the University Learning in Schools project, lesson plans and resources from the programme will be disseminated and made available to interested schools nationwide (see Achievement for All, 2015, for examples from 2014 cohort). It will ultimately be up to individual teachers and schools to decide how they implement this programme: whether the range of myths covered or number of sessions is changed. Given the time and scheduling issues, it is unlikely that a six-session programme may be feasible. However, single sessions or elements from a range of sessions could be taught instead. Future work could assess the effects of a single 'Myth-Busting the Brain' session on psychology interest, or filter pupils so the programme is provided to pupils already considering future psychology study. The effects on interest of a 'Myth-Busting the Brain' session versus a psychology careers session could also be examined.

Acknowledgements

This research evaluated the Psychology arm of the University Learning in Schools (ULiS) project, funded by the Mayor of London's Office. This project was managed by both the Brilliant Club: a widening participation charity and Achievement for All: an independent education charity. We would like to thank the participating pupils for their involvement and enthusiasm during the programme.

The Authors

Emma Norris
PhD Student,
Department of Epidemiology & Public Health,
University College London.
Email: e.norris.11@ucl.ac.uk

Tahirah De Aguiar Chaves
Head of Social Sciences and
SSAT Accredited Lead Practitioner,
Phoenix High School,
London.

Sandra Dunsmuir
Co-Director, Doctorate in Educational and Child Psychology,
Department of Clinical, Educational & Health Psychology,
University College London.

Correspondence

Emma Norris
University College London.
Email: e.norris.11@ucl.ac.uk

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