Addressing unrealistic optimism with counterfactual reasoning in an employability module in higher education.

Abstract

Previous research has illustrated that people are unrealistically optimistic in regard to the outcomes of tasks or events related to their own personal futures. This paper examines unrealistic optimism about assessment performance by students on an employability module and the application of counterfactual reasoning to improve predictive accuracy and improve student performance and attainment. Using an experimental design, the study compared the module performance of those who generated reasons why they would and would not achieve a series of specific grades. A control group who did not generate any reasons also took part. It was found that generating reasons why they might not achieve a high grade on the module assessment reduced unrealistic optimism and increased assessment performance compared to the control group. The findings are considered in relation to the theory of possible selves and the possibility of applying this technique in wider educational settings to improve student performance and attainment.

Introduction

This paper examines whether students who engage in counterfactual reasoning about predicted grades on an employability module can improve their performance and attainment. A key component of most, if not all, degrees in the U.K today is the development of the student's employability so that they can delineate the best potential career pathway and develop the skills to navigate this effectively. Often this is done through modules within programmes, the grades for which count towards the final degree, thus employability modules serve two beneficial functions for students: firstly, they support the development of vital awareness, knowledge and skills relevant to personal futures (i.e. facilitate

Sensitivity: Internal

employability) and, secondly, they contribute to overall degree classification. Such outcomes are also beneficial to the university which is assessed on the degree classifications and destinations of its graduates.

This paper considers one approach to mitigating a problem which has been observed in Hanson and Lees (2012), Tomlinson (2007) and Jerrim (2007) which is that some undergraduate students continue to over-estimate their employability and future prospects. They demonstrate what has been referred to as 'unrealistic optimism' (e.g. Hoch, 1985; Coelho, 2010), which is an unrealistic cognition (cognitions are aspects of thought concerned with processing information and directing behaviour). Unrealistic cognitions regarding personal futures are unlikely to be helpful in the long term - research has demonstrated the negative consequences for students who hold unrealistic cognitions which include reduced retention (e.g. Charlton, Barrow & Hornby-Atkinson, 2006; Lowe & Cook, 2003) and poorer attainment (Nicholson, Putwain, Connors & Hornby-Atkinson, 2013). Neither of these outcomes are advantageous for the student, nor indeed the university, and so it seems fruitful to investigate approaches to shifting cognitions from unrealistic to realistic with a view to improving performance and attainment on an employability module. This should mean that students experience two beneficial outcomes: improved employability through producing a better standard of portfolio assessment (which requires multiple employability skills) and higher attainment which contributes to their overall degree classification.

Literature Review

Exploring student experience and performance in Higher Education (HE) from an educational sociological perspective has been popular over the last two decades. Research examining the role of structural inequalities has demonstrated the importance of ethnicity and race (e.g. Richardson, 2008; Ianelli & Huang, 2014; Wallace, 2016; Sardone, 2018), age and gender

Sensitivity: Internal

(e.g. Richardson & Woodley, 2003; Newman-Ford, Lloyd & Thomas, 2009), social class (Bathmaker, et al., 2016; Reay, 2018), school and socio-demographics (e.g. Thiele, Singleton, Pope & Stanistreet, 2014) and disability (e.g. Richardson, 2009) in performance. The social structures which underpin inequity in employability and performance continue to exert a significant influence – often these social structures are examined through the forms of capital, introduced by Bourdieu (2004), and extensions of this conceptual tool from Tomlinson (2017). However, individual agency and the way in which it may interact with social structures, is a key driver influencing practice. Individual agency, arguably, is more readily amenable to short-term intervention. This paper consequently adopts an educational psychology approach to the issue of student's performance in HE, whilst it acknowledges the importance of social structures on individuals, it also recognises that this approach does not always adequately consider the agent themselves and instead risks "central conflation" (cf.Archer, 1996; Baker, 2019). This paper concerns itself with individual level metacognitive, cognitive and motivational variables that are related to expectations, confidence and optimism. In particular, it considers the phenomenon of unrealistic optimism which can occur when individuals attempt to predict outcomes in their personal future and whether counterfactual reasoning can correct this. Acting as a proxy for future attitudes toward the graduate labour market, this paper examines undergraduate performance on an employability module, specifically, it examines the ability of employing counterfactual reasoning to improve student performance and attainment on an employability module assessment.

Unrealistic metacognition and cognition

Whilst cognition is a term which encompasses all aspects of thought concerned with processing information and directing behaviour, metacognition essentially refers to the act of thinking about thinking – it is defined as "any knowledge or cognitive process that is

Sensitivity: Internal

involved in the appraisal, monitoring or control of cognition (Niemeyer, Moritz & Pietrosky, 2013, pp. 119) and has been conceptualised as being comprised from two components: self-regulation of one's own cognition (for example awareness of comprehension) and knowledge of oneself as a learner (for example effective strategies for your learning) (Lai, 2011). The development of the capacity for metacognition is considered important for learning (e.g. Jans & Leclerq, 1997) but is subject to individual differences in accuracy (e.g. Kelemen, Frost & Weaver, 2000). Metacognitive inaccuracy can occur in two main ways: through calibration and through resolution (Koriat, 2007). Resolution refers to an individual's ability to discriminate between aspects of a task that will be more, or less, difficult. Calibration refers to the actual accuracy of metacognitive judgements about performance and the performance on a task itself. It can reveal if an individual has an overconfidence bias or an under-confidence bias. This bias in predicting our performance on tasks is now explored in more detail.

Unrealistic Optimism

Coelho (2010) in their research examining unrealistic optimism demonstrated that people are unable to make accurate predictions about their ability on tasks or events related to their own personal futures. Furthermore, individuals will maintain both unrealistic confidence and unrealistic optimism in their judgements even when they do not achieve predicted outcomes (e.g. Hoch, 1985; Coelho, 2010). Unrealistic confidence and unrealistic optimism are similar in that they both involve making metacognitive judgements about outcomes. However, whilst unrealistic confidence is 'an unfounded excessive precision in forecasting' (Coelho, 2010, p.399) it is distinct from unrealistic optimism; 'an underestimation of the likelihood of experiencing negative events and an overestimation of the probability of experiencing positive events' (Coelho, 2010, p.399), where subjective and objective probabilities diverge. It is unrealistic optimism which is the focus of this paper.

Sensitivity: Internal

Weinstein and Klein (1996) make it clear that unrealistic optimism is quite distinct from optimism (which is not necessarily a bias or illusion, Coelho, 2010), and is also distinct from high self-esteem. Whilst self-esteem concerns only consideration of the self, unrealistic optimism is concerned with predictions of the future that take into account consideration of the self (Coehlo, 2010). Jefferson, Bortolotti and Kuzmanovic (2017) consider unrealistic optimism to be a cognitive state rather than a metacognition *per se*. They suggest that it is one of a number of 'positive illusions' that individuals hold, and, according to Shepperd, Klein, Waters and Weinstein (2013), it can be either comparative (involving outcome judgements in comparison to other individuals) or absolute (involving judgements about objective outcomes such as grade on an assessment). In either case, unrealistic optimism involves beliefs that are not convincingly evidenced and provide the person with a more positive outlook than is reasonable (Jefferson et al, 2017). This reliance on faulty predictions can be to an individual's detriment – as Jefferson et al point out it can lead to them failing to take adequate action to avoid negative outcomes.

Why does unrealistic optimism occur?

Unrealistic optimism occurs for many events, but not all, and the extent to which it occurs differs drastically as well. However, Coelho (2010) notes this is because the situation or context determines unrealistic optimism. Aspects of the context influence the cognitive biases and motivational processes which individuals are prone to. Motivational processes are deliberate distortions of information by individuals which serve a specific purpose – predominantly the curation of self-esteem (Coelho, 2010). Cognitive biases include the illusion of control, the overestimation of small risks/underestimation of big risks and past experience (where lack of experience encourages optimism) (Coelho, 2010).

Sensitivity: Internal

Having considered the evidence for a variety of motivational processes and cognitive biases, Coelho (2020) concluded that both motivation and cognition explain unrealistic optimism and that specifically two things must be present for unrealistic optimism to occur. Firstly, the events are perceived to be controllable. Secondly, there is a degree of commitment or emotional investment in the outcome (Weinstein, 1980). It is feasible that different contexts and situations are subject to variation in how they are perceived by different individuals and this may be a consequence of individual agency, structural factors or the interplay between them. However, it is argued that in the present context of an employability module, it is more likely than not that both of the necessary conditions for unrealistic optimism will be present.

Firstly, higher education, by the second year of an HE degree (when this employability module takes place), is something that students are familiar with and as such they better understand the mechanisms within a university and have an increased sense of agency toward their degree(i.e. they have considerable past experience). Our assertion of students feeling in control is further supported by the presence of human capital narratives woven throughout the educational landscape (Reay, 2017; Waller, Ingram & Ward, 2018) culminating in in the concept of "graduateness" (Tomlinson, 2007) where university students construct their graduate identity by amassing resources and skills required by the market. While there are well documented structural barriers to graduates developing and using these resources (Burke, 2016; Clarke, 2018; Crew, 2018) these structural barriers are not clear to all students (Burke, Scurry & Blenkinsopp, 2019). Undergraduates who have been inculcated via human capital narratives can manifest a strong sense of personal responsibility and the ability to develop the necessary skills to successfully enter the labour market. They may believe these skills will be supported through the higher education curriculum alone (Harvey, 2005; Pegg, Waldock, Hendy-Isaac & Lawton, 2012) because they are more likely to equate the well documented meritocratic credentialism of qualifications (Burke, 2016) with skills

Sensitivity: Internal

development, rather than understanding that a good degree alone does not necessarily equip you with all the capital to enter the labour market where you might desire to.

Secondly, students are also likely to be emotionally and financially invested because the assessment on the module contributes to their final degree classification. Whilst there may be variations in the extent to which they believe they need to engage with the module activities in order to build employability, there is likely to be some degree of commitment to the outcome of obtaining a good grade.

A third and final reason for this module being able to elicit unrealistic optimism is that successful performance is less dependent on academic or cognitive ability than a traditional business module such as finance, economics or management theory. This employability module is concerned with developing employability and career management skills, which are not wholly dependent on cognitive ability – academic skills may be important (e.g. Blaxell & Moore, 2012), but so might factors such as emotional intelligence (e.g. Coetzee & Beukes, 2014), human capital aspects (skills, competencies and work experience, e.g. Clarke, 2018) and personality variables, adaptability and flexibility (e.g. Clarke, 2018). These are more likely to be perceived to be amenable to development, and therefore control, than cognitive ability. It is these contextual factors can lead to students holding unrealistically optimistic views about their ability to attain a high grade on the module with these unrealistic cognitions then impacting negatively on their actual performance and attainment as demonstrated by (Nicholson, Putwain, Connors & Hornby-Atkinson, 2013).

Unrealistic Optimism and Counterfactual Reasoning

Sensitivity: Internal

Hoch (1985) attempted to understand how the phenomenon of unrealistic cognitions may be manipulated to improve accuracy of predictions about future personal events; this is important since having more realistic expectations is linked to achieving better outcomes (e.g. Nicholson et al, 2013). Participants in Hoch's study were university students due to graduate in nine months and who were beginning to search for jobs. Hoch presented them with personal events linked to their future jobs and asked them to make probability judgements about how likely they were to achieve them, for example: "What is the probability your starting salary will exceed XXX amount?" The difficulty of achieving the outcomes was varied amongst the participants, with 3 different levels of difficulty:

- low base rate (very difficult to achieve, e.g. a very high starting salary)
- medium base rate (moderately difficult to achieve)
- high base rate (easier to achieve e.g. a low starting salary).

Participants were also asked to generate reasons why they might (pro) or might not (con) achieve these outcomes. The experiment had four conditions for this: some participants produced no reasons (the control group), some produced only pro reasons (reasons why they might achieve the salary), some produced only con reasons (reasons why they might not achieve the salary) and some produced both pro and con reasons. Hoch used official records from the university as a measure of the actual outcomes achieved by the students and compared them to the probability judgements made earlier. Production of pro reasons lead to higher probability judgements about all the events i.e. the students felt they were more likely to achieve them, as compared to students who produced only con reasons. The students made more accurate predictions when the events were less desirable (i.e. high base rate events, for example a low starting salary) and when generating con reasons. There was also a significant difference between those who did and did not generate con reasons across the different base rates. Firstly, those who generated con reasons were equally accurate regardless of whether

Sensitivity: Internal

they were making predictions about achieving a high grade or not. However, those who did not generate any con reasons became less accurate in their predictions as the base rates changed from high, through medium to low. Students made more accurate predictions about their outcomes when they were:

1. Making predictions about their ability to achieve easy outcomes (low grades) and
2. When they generated con reasons (reasons why they might not achieve a grade), i.e. they engaged in counterfactual reasoning.

Aims

The present study combines and extends Weinstein's (1980) and Hoch's (1985) research. It aims to test the effects of using counterfactual reasoning on student performance and attainment in an employability module. It does this by:

1. Establishing whether unrealistic optimism in prediction of ability to attain specific grades on portfolio assessment on an employability development module actually exists

2. Examining whether counterfactual reasoning can be used to improve student performance and attainment on the module assessment.

It was hypothesised that:

1. The students would demonstrate both over confidence and unrealistic optimism in relation to their attainment on the assessment

2. Generation of reasons why they might fail (con reasons) to attain good grades would improve predictive accuracy.

3. Generation of con reasons would improve assessment attainment.

Method

Sensitivity: Internal

Design

The study used an experimental questionnaire design, the independent variables being:

1. The base rate of attainment goals (high, medium and low)
2. The kind of reasoning the participants were asked to generate – control group, pro, con and pro and con - in accordance with Hoch (1985).

The high base rate refers to events that occur for the majority of subjects (e.g. achieving a pass or above grade) and the low base rates refers to events that occur for a minority of the subjects, for example achieving a very high grade.

The dependent variables were:

1. Unrealistic optimism
2. Probability judgements
3. Predictive accuracy
4. Assessment grade

The independent variables were randomly mixed throughout the group of participants and there was also a control group who were not asked to generate any kind of reasoning for their predictions. A paper questionnaire was used to assess unrealistic optimism levels and reasoning (Hoch, 1985; Hevey, French, Marteau & Sutton, 2009).

Participants and module

The final sample of the data which was analysed within this study consisted of 210 university Level 5 undergraduate students registered on business programmes - the final sample included 85 female and 125 male participants all between the ages of 19-26 (mean age was 21.46). Sixty-five percent of the students were British and the remaining 35% were from

Sensitivity: Internal

countries in Europe, Asia, North America and Africa. The students were studying a module designed to develop employability through exploration of self-awareness, identification of relevant jobs, development of an action plan to achieve necessary skills and production of an application for an actual job. An employability module was chosen for several reasons. Firstly, performance on an employability development module, assessed through a portfolio, meets both conditions Weinstein argued were necessary for unrealistic optimism to occur: that the events are perceived to be controllable and that there is a degree of commitment or emotional investment in the outcome. High performance on this kind of module is less related to innate academic ability and is more concerned with knowledge of the self therefore is more likely open to greater personal control. Performing well on the module not only feeds into degree classification, it also potentially feeds into employment after graduation; students are likely to be emotionally invested in these.

Measures

A questionnaire was used which included:

1. Two predictive questions asking the participant how likely they would be to achieve a specific grade on the assessment compared to a typical student on a scale of 1 (significantly less likely) to 7 (significantly more likely to). This assessed the participant's unrealistic optimism.
2. One question asking the participants to generate reasons why they might (pro) or might not (con) achieve the outcome
3. Three questions relating to the probability of the events occurring on a scale of 0.0 (absolutely will not occur) to 1.0 (absolutely will occur). These were the participants probability judgements

The assessment for the module was a written employability portfolio which included:

Sensitivity: Internal

a. Reflective discussion of the individual's personality, aptitudes, skills, knowledge and career values, interests and opportunities
b. A covering letter and completed application for a graduate level job of their choosing but which needed to align with their graduate self as discussed in the reflective discussion section
c. An action plan detailing how they would gain the skills, qualifications, experience and knowledge to be able to move into their chosen job

This was assessed using clear grading criteria which was available to the students in the module handbook. These grading criteria allow the grader to arrive at a final grade on a scale of 0 to 100% where:

- 0-39%: fail
- 40-49%: 3rd grade
- 50-59%: 2:2 grade
- 60-74%: 2:1 grade
- 75-100%: 1st class

Procedure

Early in the Autumn Semester (week two of lectures), level 5 business students who were undertaking the module were invited to participate in the research. The questionnaires, which varied on base rates and reason generation groups, were randomly assigned in the lecture. Participants filled in and returned the questionnaire, data was then collated and entered into SPSS. When assessments were completed, graded and externally moderated, the grades of the participants were accessed from the PeopleSoft software and entered into SPSS for analysis.

Results

Sensitivity: Internal

1. The students would demonstrate both over confidence and unrealistic optimism in relation to their attainment on the assessment

Table 1 presents the mean and standard deviations for the measures of:

- Unrealistic optimism (scale of 1 to 7 where 1 = significantly less likely and 7 = significantly more likely)
- Probability judgements (scale of 0.0 to 1.0 where 0.0 = Absolutely will not occur and 1.0 = absolutely will occur)
- Actual performance scores for each assessment; the written element and then the oral element (scale of 0 to 100%)

Table 1. Mean Scores and SD's for unrealistic optimism, probability judgements and assessment grade

	Mean	*Standard Deviation*
Unrealistic optimism	5.15	1.11
Probability judgement	.765	.202
Assessment grade	59.59	13.85
Predictive accuracy	-0.01	0.43

On average participants recorded optimism scores of 5.15 (out of 7) which indicates they believed they were more likely than others in their class to achieve the specified grade. Mean probability judgement score was .765 indicating a good degree of confidence that they would achieve the specified grade. Probability judgements were skewed towards the higher level with 59 participants predicting they would absolutely achieve the grade specified, no participants predicting they absolutely would not achieve the grade specified and only 2 predicting that it wasn't very likely. The overwhelming majority of students, regardless of whether the grade specified in their questionnaire was high, medium or low, felt they might

Sensitivity: Internal

achieve the grade. Mean assessment grade was 59.95, just under the cut-off grade for a 2/1 classification, however the SD was 13.85 indicating grades varied significantly around the mean (although both the median and mode = 60).

The predictive accuracy of the probability judgements was calculated using Hoch's (1985) approach. The distance between the probability score (0.0 = absolutely will not occur, to 1.0 = absolutely will occur) and whether or not the outcome was achieved (0.0 = did not occur and 1.0 did occur) is calculated:

Predictive judgment - outcome = predictive accuracy

The resulting scores can therefore range from:

- -1 = the student did not expect the outcome to occur, but it did
- Through 0 = they did fully expect the outcome and they did achieve it
- 1 = they did expect the outcome but did not achieve it

Thus, predictive accuracy scores that are positive indicate the student did less well than they predicted, and a negative score indicates they did better than they predicted, whilst a score of 0 indicates they did exactly as predicted. As table 1 shows, predictive accuracy for the assessment was close to accurate with a very slight bias towards students doing better than they predicted.

For hypothesis 1 then students did indicate high scores on unrealistic optimism in relation to assessment grades and their probability judgements were also very positive. Unrealistic optimism did not vary by reason generation type (pro, con both pro and con, no reason). However, predictive accuracy across the sample was actually very good – although this might have been the result of generation of reasons influencing the grades attained. A one-way

Sensitivity: Internal

ANOVA to test for this did reveal that the grades of those who generated con reasons were significantly higher (63.9%) than those who generated no reasons (56.9%).

2. Generation of reasons why they might fail (con reasons) to achieve good grades would improve predictive accuracy.

The effect of base rate (high, medium and low) and reason generation (pro, con, pro & con, no reasons) on probability judgements and predictive accuracy was assessed using two-way between-groups analysis of variance (ANOVA). Recall that participants were randomly divided into three different base rates - low base rate (grade of 60% or higher), medium base rate (grade of 50% or higher) and high base rate (grade of 40% or higher). Mean scores across base rates and by reason generation type for probability judgements, actual grades and predictive accuracy are shown in Table 2. For those students who were asked about the probability of achieving a grade of greater than 60%, probability judgements were highest for students who generate pro reasons and lowest for those who generated con reasons. For those in the medium base rate group (asked to make judgements about achieving 50% or higher) the highest judgements were made by those in the control group (who did not generate any reasons). Again, the lowest probability judgements were made by those who generate con reasons. For the high base rate group (those asked to make judgements about achieving 40% or higher) the highest probability judgements were made by those who generated con reasons. The lowest were made by those who generate no reasons.

Sensitivity: Internal

Table 2: Average probability scores, grades and predictive accuracy by base rate and reason generation group.

	Reason Type	*Average probability judgement*	*Average actual grade*	*Average predictive accuracy*
	Low base rate (grade of 60% or higher)			
	No reasons	0.72	52.05	0.36
	Pro	0.78	62.78	0.02
	Con	0.68	63.29	0.01
	Pro + Con	0.72	56.77	0.41
	Medium base rate (grade of 50% or higher)			
	No reasons	0.85	63.57	-0.01
	Pro	.070	57.33	-0.09
	Con	0.59	64.15	-0.42
	Pro + Con	0.75	58.90	0.08
	High base rate (grade of 40% or higher)			
	No reasons	0.80	56.61	-0.20
	Pro	0.87	60.90	-0.08
	Con	0.89	64.50	-0.11
	Pro + Con	0.87	55.52	0.01

For actual grades achieved, the students who achieved the highest grades, regardless of base rate, were those who generated con reasons. The lowest grade achievers differed in each base rate group; in the low base rate group it was those who did not generate any reasons (controls), in the medium base rate group it was those who generated pro reasons and in the high base rate group it was those who did not generate any reasons.

Inferential statistical analyses

Probability Judgements

Sensitivity: Internal

The differences in probability judgements and prediction accuracy described above were tested using inferential statistics (two-way between groups ANOVA) to see if they were statistically significantly different. The dependent variables were, in turn, probability judgements, grades and prediction accuracy. The two independent variables were base rate (three levels – high, medium, low) and reason generation (four levels – pro, con, pro & con, no reasons).

Results from the two way ANOVA examining the effect of base rate and reason generation on probability judgements revealed a significant main effect of base rate on probability judgement, $F(2,211) = 13.24, p = .000$. Partial eta squared = .116. This indicates a medium to large effect; (Pallant, 2010). Tukey HSD post hoc tests revealed that the low base rate group ($M = .71, SD = .16$) and the medium base rate group ($M = .71, SD = .21$) both had significantly lower probability judgements than the high base rate group ($M = .87, SD = .19$), p =.000. Thus, those who were asked to make judgements about achieving at least a grade of 60% or 50% made lower probability judgements than those asked about achieving a grade of 40% or more.

There was no main effect of reason generation on probability judgements but the interaction effect was significant, $F(6,211) = 2.855, p = .011$., partial eta squared = .079, indicating a small to medium effect size. As Figure 3 shows, the pattern of findings for participants in the low and medium base rate groups across reason generation groups is quite different to that for the participants in the high base rate group. Participants who were both high base rate and generated con reasons gave higher probability judgements regarding likelihood of achieving the grade than participants in the control, pro and both pro and con groups. However, for participants in the low and medium base rate groups the pattern of findings across reason generation groups was quite different. Here participants in the con reason generation group

Sensitivity: Internal

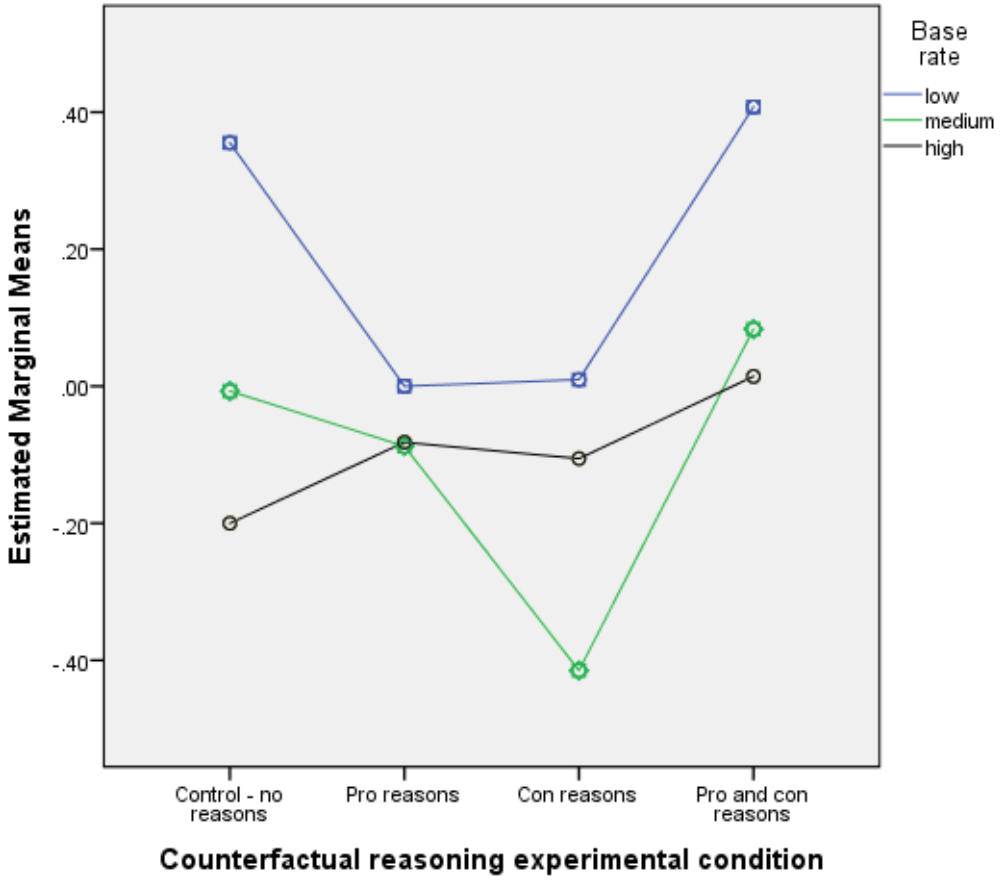
gave *lower* probability judgements than in the other reason generation groups. These results suggest that base rate influenced probability judgements but that the form of this influence was dependent on the reason generation group of the participant.

Predictive accuracy

The means for predictive accuracy by reason generation and base rate are plotted in Figure 1. Recall that negative scores indicate the student did not predict the positive outcome (but did achieve it), 0 indicates the student achieved exactly what they predicted they would and positive scores indicate they expected a positive outcome but did not achieve it.

Sensitivity: Internal

Figure 1 Two way ANOVA of reason generation and base rate on predictive accuracy



For predictive accuracy there was a statistically significant main effect of base rate, *F (2, 211) =9.94 p <.001* with a medium effect size (partial eta squared = .08). Post-hoc comparisons using Tukey HSD test showed that there was a significant difference between the high base rate group *(M=.182, SD= .495)* and the low base rate group *(M=-.081, SD=.319)* on predictive accuracy. It also indicated that the medium base rate group *(M=-.118, SD= .413)* differed significantly from the high base rate group on predictive accuracy. There was no significant difference between the medium base rate group and the low base rate group. The results show firstly that those in low base rate group had better predictive accuracy than those in the high and medium base rate groups. Secondly these results indicate that those in the low and medium base rate groups were more likely to

Sensitivity: Internal

underestimate their assessment grades (i.e. do better than predicted) than those in the high base rate group who were more likely to overestimate their grade (i.e. do less well than predicted).

There was a statistically significant main effect of reason generation, $F\ (2,211)\ =6.44\ p\ <.001,$ with a medium effect size (partial eta squared = .08). Post-hoc comparisons using Tukey HSD test showed that there was a significant difference between the con reason generation group *(M=-.170, SD=.396)* and the control group *(M=.088, SD=.436)* on predictive accuracy. It also showed a significant difference between the con reason generation group and those in the group which generated both pro and con reasons *(M=.117, SD=.460)* on predictive accuracy. The pro reason generation group *(M=-.071, SD=.367)* did not significantly differ from any other group. These results show that those within the control group had better predictive accuracy, compared to those in the con reason generation group and those in the group which generated pro and con reasons. However, whilst those in the con group technically had poorer predictive accuracy, this is because they underestimated how well they would do. Those in the pro group also had poorer predictive accuracy and this was because they overestimated how well they would do.

The interaction effect between reason generation and base rate was not statistically significant, $F\ (2, 211)\ =1.98\ p\ >.05.$

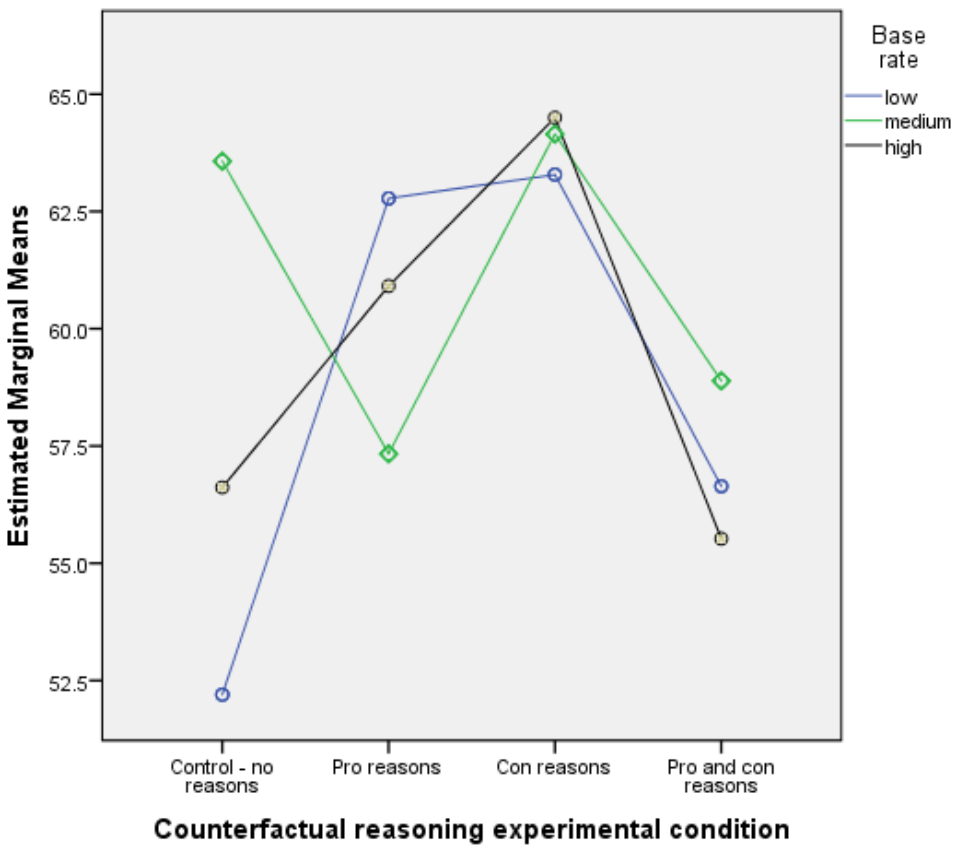
To summarise, generation of reasons and base rate had an effect on predictive accuracy. Those in the con reason generation group and those within low and medium base rates recorded the lowest predictive accuracy because they significantly underestimated how well they would do.

3. Generating con reasons would improve assessment grade

Sensitivity: Internal

A two-way between-groups ANOVA was also conducted to explore the effect of reason generation and base rate on assessment grade (results shown in Figure 2). The main effect of base rate did not reach statistical significance, $F\ (2,\ 211)\ =.478,\ p\ >.05$. There was a statistically significant main effect for reason generation, $F\ (2,\ 211)\ =2.96,\ p\ <.05$ however effect size was small (partial eta squared = .02).

Figure 2 Two way ANOVA of reason generation and base rate on assessment grade



Post-hoc comparisons using Tukey HSD indicated that the mean assessment grade for the con reason generation group (M=63.95, SD=10.51) was significantly greater than the mean for the control group (M=56.85, SD=18.17). The post hoc tests also indicated the con reason generation group scored significantly higher assessment grades than the group which generated both pro and con reasons (M=57, SD=15.18). The pro reason generation group (M=59.65, SD=10.54) did not significantly differ from any other group. The interaction

Sensitivity: Internal

effect between reason generation and base rate was not statistically significant, $F(2, 211) = 1.12$, $p > .05$. The results suggest then that reason generation did have an effect on assessment grade with those in the con reason generation group performing significantly better than those in the group which generated both con and pro reasons.

Discussion

Participants revealed a tendency to demonstrate unrealistic optimism regarding assessment outcomes in the context of the employability module. However, generating reasons why they would, or would not, obtain specific grades on their assessment influenced their probability judgements and altered their ability to accurately predict how well they would perform. These findings are broadly in line with those of Hoch's despite his research being conducted 35 years ago in the United States of America and using different outcome measures of employability.

The study aimed to test three hypotheses:

1. The students would demonstrate both over confidence and unrealistic optimism in relation to their attainment on assessments

2. Generation of reasons why they might fail (con reasons) to achieve good grades would improve predictive accuracy.

3. Generation of con reasons would improve assessment grades.

The results for hypothesis 1 showed that students did typically demonstrate over confidence and unrealistic optimism. Optimism in the control group was not typically warranted, these participants did less well than they predicted. The first hypothesis was therefore supported and these findings suggest firstly, that the students perceived assessment performance on the employability module to be controllable, and secondly, that there was emotional investment

Sensitivity: Internal

in the outcome – the two prerequisites for situations to elicit unrealistic optimism (Coelho, 2010). This has implications for HE staff involved in the delivery of employability modules where students may overestimate their employability and/or their capacity to demonstrate it in assessments. Without intervention, students may continue to ignore or underestimate the challenges and fail to perform at their predicted level. Two issues arise here that warrant further attention. Firstly, what factors, specifically, influence students in their assumptions regarding controllability in employability modules and how do these vary across different individual or societal differences? This is considered in more detail later. Secondly, do other, more academic modules also elicit unrealistic optimism or is it restricted to those modules which are less a function of cognitive ability and more dependent on skills which can be developed?

The second hypothesis was also supported. Generating pro and/or con reasons effected the probability judgements students made and their predictive accuracy. It was hypothesised that generating con reasons would improve predictive accuracy. This hypothesis was partially supported; those who generated con reasons and made predictions about a low base rate grade (i.e. a grade of 60% or more) did show good predictive accuracy (it approached 0). However, those who generated *pro* reasons in the low base rate group also demonstrated improved predictive accuracy. Importantly though, predictive accuracy for con reason generation in the *medium* and *low* base rate groups was such that they *underestimated* how well they would perform (i.e. they did better than they expected). Thus students who were asked to produce reasons why they would not score a good grade of 60% were less unrealistically optimistic, underestimated how well they would perform, but were more likely to have attained those high grades.

It was not a surprising finding that students in the pro reason generation and low base rate group made high probability judgements - this was anticipated - however what was surprising

Sensitivity: Internal

was that these students ended up with good predictive accuracy because they performed well on the assessment. In Hoch's original study, generating pro reasons had no effect on accuracy of predictions. A potential explanation for this is individual differences in accuracy of prediction. Boud and Falchikov (1989) examined student's ability to rate their own performance. They found that high performing students demonstrated more criticality and underestimated how well they had performed and low performing students overestimated not just how well they had performed but to a *greater extent* than the higher performers underestimated. More recently Lew, Alwis and Schmidt (2010) have shown that students with greater academic success previously were more able to accurately self-assess their performance. These studies, however, looked at student's ability to self-assess academic work already done as opposed to accurately predict how well they will do on future assessments of employability which as previously stated is likely dependent upon different skills and abilities Nonetheless, there could be significant implications here in relation to the work readiness of students when they shift from education to life after graduation. If students are using previous educational success to predict successful future employment trajectories, there is not going to be the same predictive accuracy as when a student predicts performance on a piece of submitted coursework using performance on a previous module as a guide. Employment success is not (solely) a function of academic success and furthermore the prediction is not based on an assessment of performance on an activity already done – it is predicting performance on a yet to be encountered activity.

The third and final hypothesis was that generating con reasons would improve grade performance since more realistic cognitions are associated with better performance (Nicholson et al, 2013). This hypothesis was supported. Those who generated con reasons performed significantly better than those in the control group. In generating the reasons why they might fail to achieve a good grade, these students may have flagged potential problems

Sensitivity: Internal

in advance. This advanced warning might cue approaches to circumventing these problems before they arise.

Implications

These findings offer further evidence that students are unrealistically optimistic regarding their future performance and attainment on employability modules which has two negative consequences for them: firstly, they do not develop employability skills to the level they might, and secondly, it impacts upon their overall degree classification. However, the findings here also suggest that engaging students in counterfactual reasoning at the start of term can mitigate the effects of unrealistic optimism. Generating reasons why they might not achieve a good grade actually serves to protect them from this happening.

While this paper has been considering these process at an individual level, it is also important to consider the implications of this research within the context of structural inequalities. We suggest that these findings have particular implications for widening participation students. The high levels of unrealistic optimism found in this cohort can be problematic for students who do not have resources or capitals to employ in order to soften the transition to an objective reality at odds with an individual's subjective expectation. Previously, Burke et al. (2019) have illustrated classed levels of understanding of the graduate labour market due to generational experience. This gap in understanding the labour market, the authors continue, may be further exacerbated through unrealistic optimism. Returning to Coelho (2020), unrealistic optimism is facilitated when there is investment in an outcome of an action, which in the context of widening participation students is that higher education is an opportunity for increased life chances. In addition to personal investment, Coelho also identifies a sense of control in facilitating unrealistic optimism. The human capital narratives running through higher education discourse and policy resonate with widening participation students in that it charts a meritocratic trajectory and offers a sense of control: investing in yourself. Educational success and entry into higher education through "educational capital" provides a buffer between

Sensitivity: Internal

individuals and the harsher conditions/relations within a context or field. Upon graduation, their future pathways and employability will be driven by a complex amalgam of individual attributes, capitals and market conditions (Burke, 2016; Clarke, 2018) which are not equal across different social classes and backgrounds.

To further unpack findings reporting that participants with lower levels of optimism achieved higher modular performance, we draw on Markus & Nurius' (1986) concept of Possible Selves and in particular Oyserman et al. (2006) concept of plausible possible selves. Markus and Nurius explain that possible selves 'represent individuals' ideas of what they might become, what they would like to become and what they are afraid of becoming...' (1986, pp. 954) and as such can serve as a theoretical link between cognitions and motivation They represent a form of self-knowledge derived from past experiences creating a series of potential possible selves, both desirable and undesirable.

The possibility of an undesirable possible self can be a significant influence. Individuals who have balanced possible selves - a possible self they are working towards *and* a possible self they fear (i.e. are trying to avoid) - demonstrate greater self-regulatory effort because they then have behavioural strategies which support movement towards the desired possible self and movement away from the feared possible self (Oyserman & Markus, 1990). Individuals will commit more effort to attainment of a possible self when it is balanced and when it contains behavioural strategies for obtaining it (Oyserman, Bybee & Terry, 2006; Oyserman, Bybee, Terry & Hart-Johnson, 2004). Possible selves vary in their ability to exert an influence on self-regulatory control over behaviour and it has been shown that possible selves which are underpinned by behavioural strategies (which facilitate achievement of underlying actions needed to achieve the possible self) are more likely to be realised (Oyserman et al, 2006).

Sensitivity: Internal

When possible selves are underpinned by these behavioural strategies they become 'plausible' possible selves (Oyserman et al, 2006). Plausibility affords automatic cuing of behavioural strategies which results in measurably different outcomes - Oyserman et al (2004) have shown that students who held plausible possible selves were able to improve grades over the course of an academic year whereas students who only held possible selves were not. Engaging in counterfactual reasoning should highlight the difficulties that students might face in doing well on an assessment, prompting them to consider behavioural strategies to overcome them and thereby supporting achievement of a possible self which involves attainment on the module (Oyserman et al, 2004). It is possible then that in the present study, due to an individual's expectation of a less desirable possible self being conjured by counterfactual reasoning, behavioural strategies were put in place to augment action to increase the potential for an alternative possible self, a more desirable future. In the context of this study, rather than behaviour strategies simply leading to increased attainment they also lead to increased career readiness.

Returning to widening participation, Scurry *et al.* (2020) discuss the friction between 'maintaining the promise without killing the dream' of higher education, in other words the need to support individuals as they invest in their human capital but also not allow students to assume that the labour market is inherently meritocratic. This dual process, the authors argue, will provide students with an accurate understanding of the labour market and inform their undergraduate strategies. Harrison (2018), in his application of the theory of possible selves to the widening participation agenda, makes explicit Crawford (2014) and Crawford and Greaves (2015) premise that the best way to increase participation in HE is to improve their attainment at 16. If counterfactual reasoning could be employed within schools then all learners, regardless of background, may be able to increase levels of attainment. Further to this, in terms of career planning, counterfactual reasoning can provide a reflexive rebuttal to

Sensitivity: Internal

the dominant human capital narrative and create bespoke future plans and strategies to meet an individual's goal.

Limitations

In the present study previous academic ability or self-perceived employability were not controlled for and both may play some role in probability judgements, predictive accuracy and assessment performance (see for example Newman-Ford et al, 2009). Whilst the module and the assessment here concern themselves less with academic ability and more with employability, academic ability could influence the construction and presentation of the portfolio. Differences in employability, such as self-awareness, might also be important for this. The present study did not consider the nature of the reasons generated nor whether students had relevant possible selves or behavioural strategies.

Further Research

Replications of this study should control for previous academic performance and self-perceptions of employability in order to explore the impact these have on probability judgements, performance and predictive accuracy.

In order to test the hypothesis that engaging with counterfactual reasoning might facilitate behavioural strategies and help the fulfilment of possible selves, a next step would be to identify the possible selves students have regarding their degrees and employability and what, if any, behavioural strategies they have to facilitate the attainment of them. To continue the experimental nature of the research, it would be beneficial to explore the impact of asking participants to generate behavioural strategies, or not, on predictive accuracy and performance. In relation to this it would be interesting to explore whether there are gender differences in goal setting and strategy formation. Pirmohamed, Debowska and Boduszek

Sensitivity: Internal

(2017) found differences in the extent to which goal setting and self-efficacy were able to predict achievement. For males, significant predictors were study time, active learning strategies and performance goals predicted male's achievement, but only self-efficacy predicted female's achievement.

One final approach to furthering this area of study would be to explore the suitability of counterfactual reasoning on increasing attainment across other types of modules. Unrealistic optimism is more likely to arise when individuals feel they have a high degree of personal control over the outcome and it would be interesting to see the extent to which this is the case for modules of a more academic nature. Should there be unrealistic optimism for more academic modules then the application of counterfactual reasoning and the development of behavioural strategies for movement towards desired possible selves and away from feared possible selves could be a valuable tool in a much broader range of education settings.

Conclusions

Improved degree classifications and employability are beneficial to students and HE institutes, however, students can and do hold unrealistic cognitions about their ability to perform well. This study suggests that engaging students in counterfactual reasoning regarding their performance on an employability portfolio assessment influences what they believe probable regarding their performance. It is posited that this may occur via the notion of possible selves which provide a link between cognition and motivation, and between motivation and volition, through what are variously referred to as behavioural strategies. Generating con reasons may prompt individuals to consider possible and feared selves and begin the formation of behavioural strategies which support the management of difficulties, such as attending all classes, starting work on assessments earlier or engaging with formative feedback. Further research is needed to verify this and to explore the feasibility of using

Sensitivity: Internal

counterfactual reasoning in a broader range of educational settings, however, this work, which extends Hoch's work from the 1980's, holds clear implications for students and tutors in HE: students can improve their performance and attainment on employability modules by explicitly recounting the barriers they perceive to that performance.

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