The Perceived Role of Task Difficulty and Effort in the Expectations and Values of A-level Students

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Abstract

Based on Eccles' expectancy-value model of achievement motivation this study used questionnaires to explore the relationships between students' perceived task demands (perceived task difficulty of A-levels and required effort) and their expectations and values attached to A-level achievement. Although it has been tested extensively in the US, and more recently in other countries such as Germany (Trautwein et al., 2012) and Australia (Guo, Parker, Marsh, & Morin, 2015; Hood, Creed, & Neuman, 2012), this model has not been previously investigated in the context of high stakes A-level examinations in the UK and the sample in this study therefore comprised of 930 students from 12 Oxfordshire schools. The students in this study perceived A-levels to be difficult and thought they would have to apply effort to their studies to do well in them. Expectations and values were influenced by the required effort associated with A-levels although task difficulty was only related to the overall subjective task value in the year 12 sample. Students who perceived A-levels to be difficult were less interested in them, and in the year 12 sample found them less useful. When greater effort was perceived to be required students placed more value on attainment and utility. These findings were largely consistent with Eccles' expectancy-value model. Girls perceived A-levels to be harder and require more effort and this is an area for further exploration.

Introduction

GCE advanced levels (A-levels) are the main form of high stakes examinations for university entrance in England and are available in over 45 subjects (Department for Education, 2015b). At the time of data collection students studied four AS level subjects (in year 12) and went on to study three of these at A-level (in year 13). They were awarded a grade on a six point scale, A*-E (Office of Qualifications and Examinations Regulator, 2011).

The premise that task difficulty and effort play a role in motivation is not a new one, for example Weiner identified ability, effort, task difficulty and luck as the most important achievement attributions and classified these in three causal dimensions; locus of causality, stability and controllability. The assumption was that people interpret their environment in a way that maintains a positive self-image (Weiner, 1992). In motivational terms an individual's perceptions for success or failure determined the amount of effort applied to an activity in the future. Success was attributed to internal factors such as ability and effort whilst failure was attributed to external factors such as task difficulty or luck. This theory was an important one as it contributed to some of the theoretical assumptions underlying Eccles' expectancy-value model (Eccles, 2007; Eccles et al., 1983) and thus the theoretical assumptions underlying this research. The expectancy-value model of motivation was adopted in this research because it offers a multidimensional approach to understanding student motivation within educational contexts (Hulleman, Barron, Kosovich, & Lazowski, 2016) but has not been tested within the context of high stakes school examinations in the UK It benefits from being grounded in the theoretical and empirical work associated with many of the theories in the field including theories of achievement motivation (Ames & Archer, 1988; Dweck, 1986; Elliot, 1999; Elliot & Harackiewicz, 1996; Elliot & McGregor, 2001), attribution theory (Weiner, 1985) and self-determination theory (Deci & Ryan, 1985, 2008).

The aim of this research was to determine students' perceptions of the relationship between task difficulty, effort, expectations and values for A-levels. Understanding these relationships in high stakes, A-level contexts in England is particularly important given that the grades achieved at A-level determine an individuals' higher education choices and their future life options. The research question was 'What are students' perceptions regarding the relationship between their perceived task demands and expectations and values for A-levels?'

Theoretical Framework

According to the expectancy-value model (Eccles, 2007; Eccles et al.,1983) a student's beliefs about their abilities and expectations for success are a strong predictor of grades (in maths) and differences in task value underlie differences in motivation and achievement. In line with the theoretical model expectations, in this study, are defined as a student's belief about their ability and how well they will do on their A-levels (Eccles & Wigfield, 1995; Wigfield & Eccles, 2000). Subjective task value (STV) is the function of the intrinsic value, attainment value, utility value and perceived cost although empirically the focus has been on the first three concepts (Eccles, 2007; Eccles et al., 1983; Eccles, Adler, & Meece, 1984; Eccles & Wigfield, 1995). So, in this research, students were therefore asked about their anticipated enjoyment/ interest in A-levels (intrinsic value), the personal importance attached to doing well in them (attainment value) and how useful A-levels are perceived to be (utility value).

According to this model a number of factors will potentially influence A-level students' expectations and values including perceived task demands (task difficulty and effort) and these are, in turn, influenced by a student's demographics, their gender and ethnicity, as shown in Figure 1 (Eccles et al., 1983; Eccles & Wigfield, 1995, Wigfield & Eccles, 2000).

This is however an under-researched area. This study makes a contribution by examining these relationships in a sample of A-level students where they have not been previously tested. It has been found that adolescents valued activities they thought they were good at and they were less likely to believe they were good at something, and therefore devalued it, if they thought it was difficult. A positive relationship was formerly established between perceptions of task difficulty and required effort. A strong negative relationship was established between task difficulty and expectations and also between difficulty and STV (Eccles, O'Neill, & Wigfield, 2005; Eccles & Wigfield, 1995).

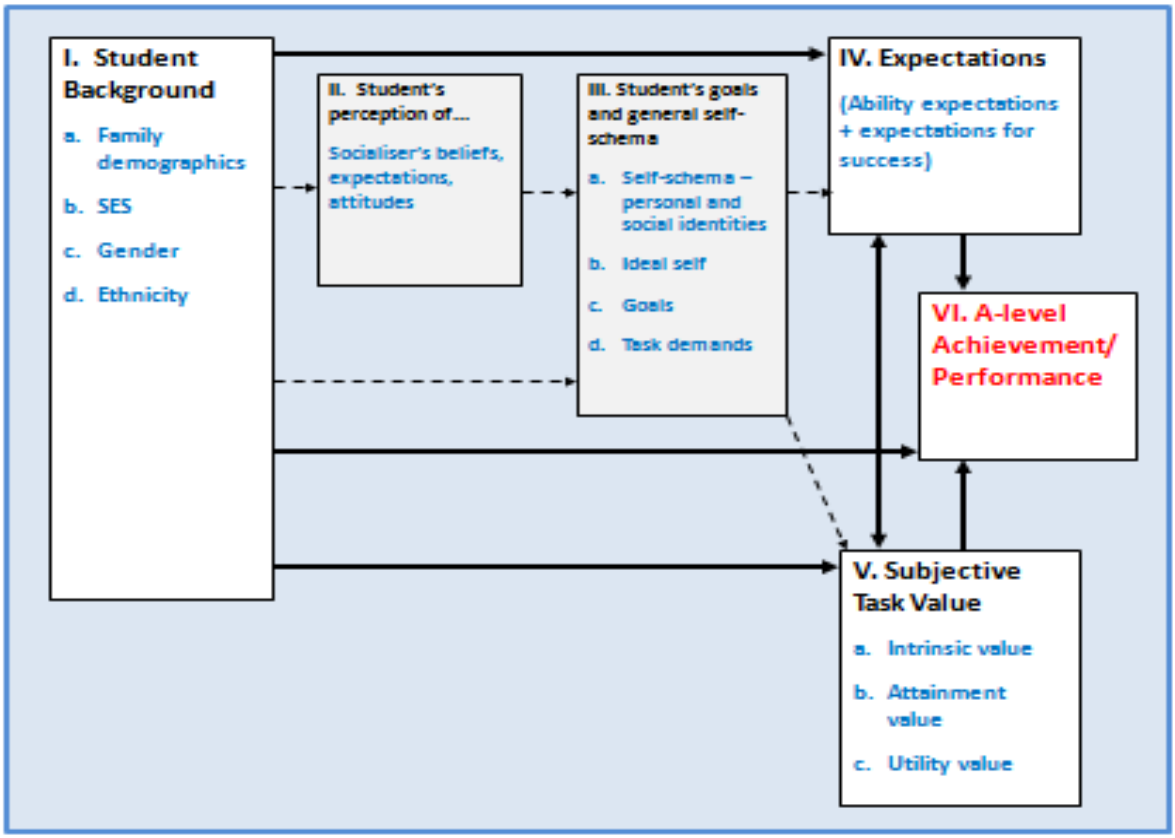

Figure 1 An *Expectancy-Value Model of A-level Achievement (adapted from Eccles, 2007)*

Methodology

Participants

The convenience sample employed in this research included 930 sixth form students from 12 schools in Oxfordshire where 733 pupils were from state schools (78.8%) and 197 (21.2%) from independent schools. Eight state co-educational, and four independent schools (two mixed day schools, one boys' boarding school and one girls' day school) participated. The sample was broadly in line with national figures, where 81.8% of school pupils achieving one or more A-levels came from the state sector and 18.2% of pupils achieving one or more A-levels came from independent schools (Department for Education, 2015a). In this sample there were 445 boys (47.85%) and 482 girls (51.8%). AS level qualifications were being studied by 534 pupils (57.4%) in year 12 and A-levels qualifications were being studied by 396 pupils (41.9%) in year 13.

Instrument and Procedure

The questionnaire employed in this research comprised of three parts, although the items included in part three are not the focus of the analyses or discussions in this current paper. Part one collected data on students' background including the subjects they were studying, demographic information and data on their gender, ethnicity and socio-economic status. Items were derived from the student and parent questionnaires employed in the Programme for International Student Assessment (PISA) in 2009 and 2012 (see OECD, 2012; 2014).

Based on the Self and Task Perception Questionnaire (Eccles and Wigfield, 1995) part two of the questionnaire examined students' expectations and values about A-levels including their task perceptions concerning the difficulty of A-levels and the required effort for these qualifications. Table 1 outlines the item pool for items measuring these perceived task

demands for A-levels, expectations and values. Two items relating to task difficulty and effort were excluded from the original self and task perception questionnaire as they assessed specific skills related to maths which could not be converted to items relevant to more general A-level studies.

Part three asked students about their general life expectations, values and goals and the influences upon their choices based on items used in wave 6 of the Michigan Study of Adolescent and Adult Life Transitions (1990), however the results are not reported in this current paper as the focus is on task perceptions.

Table 1 *Item Pool: Perceived Task Demands, Expectations, Values and A-levels*

Compared to other students, how well do you expect to do in your A-levels this year? (Much worse than other students-much better than other students)	Ability/expectancy
How well do you think you will do in your A-levels this year? (Very poorly-very well)	Ability/expectancy
How good are you at A-levels? (Not at all good-very good)	Ability/expectancy
If you were to order all students in your year group from best to worse academically, where would you put yourself? (The worst-the best)	Ability/expectancy
How have you been doing in your A-levels this year? (Very poorly-very well)	Ability/expectancy
In general I find working on A-level assignments (Very boring-very interesting)	Intrinsic value
I like doing A-levels (Strongly disagree-strongly agree)	Intrinsic value
For me, being good at my A-levels is? (Not at all important-very important)	Attainment value
Is the amount of effort it will take to do well in A-levels worthwhile to you? (Not very worthwhile-very worthwhile)	Attainment value
How important is it to you to get grades in your A-levels? (Not at all important-very important)	Attainment value
In general, how useful is what you learn at A-level for your daily life outside school? (Not at all useful-very useful)	Utility value
How useful are A-levels for what you want to do after you finish school and go to University/ work? (Not at all useful-very useful)	Utility value

In general, how hard are A-levels for you? (Very easy-very hard)	Task Difficulty
Compared to other students in your class how hard are A-levels for you? (Much easier-much harder)	Task Difficulty
How hard do you have to try to do well in your A-level courses? (Not very hard-very hard)	Required Effort
How hard do you have to try to get good grades in your A-levels? (A little-a lot)	Required Effort
How hard do you have to study for your A-level exams to get a good grade? (A little-a lot)	Required Effort

In the majority of the schools (n=10) the paper and pencil questionnaires were administered to students prior to the summer examination series in May 2014 (n=798). However due to logistic constraints students within two schools participated following the exam session (n=132). This study complied with the British Psychological Society's Code of Human Research Ethics (British Psychological Society, 2014).

Achievement data consisted of a student's A-level or AS grades, provided by each school, and was measured by calculating the total point score per student achieved in that academic year based on the points allocated in the calculations used by the DfE (Department for Education, 2014a). The number of subjects studied, number of entries and average point scores achieved are shown in Table 2. The national average for year 13 students is reported as 775 points (Department for Education, 2014b) which is higher than the 760 points achieved in this study but this may be explained by the fact that the national average also includes any AS grades achieved by students in year 12 but not continued into full A-level qualifications in year 13. In contrast, the average total point score reported for the students in this study comprises only of the grades achieved in the full A-level qualifications at the end of year 13 (so excludes prior AS grades) as this was the only data made available by schools.

Table 2 *Descriptive Statistics for Achievement Data*

Year Group	Subject level	No. in Sample	Total no. of Subjects Studied	Total No. of Entries	Average Total Point Score
13	A-level	396	50	1, 033	760
12	AS level	534	53	1, 867	374

Results

Low reliability for items related to task difficulty were reported in this study (see Table 3). It is worth noting that this construct did however only contain two items. It is possible that these findings reflect the differences of testing the self-and-task perception questionnaire in a UK rather the US context. Furthermore, Eccles' scales are domain specific whereas students in the current study are asked about the perceived difficulty of their A-levels as a whole which may also account for these findings. Interestingly the reliability for required effort was low in the Year 12 sample only, perhaps because they have not yet received any grades and have completed less of their course than the year 13 students.

Table 3 *Cronbach Alphas of Perceived Task Demand Items in the Questionnaire*

	Eccles, O'Neill & Wigfield (2005)	Year 13 Sample	Year 12 Sample	No. of items in scale
Self and Task Perception Questionnaire				
Task difficulty	.80	.68	.67	2
Required effort	.78	.88	.43	3

Descriptive Statistics on the Relationships between Task Demands, Expectations and Values for A-levels

The findings indicate that students perceive these high stakes examinations to be hard and believe they have to apply themselves in order to achieve. As shown in Table 4 the students

in both samples rated A-levels a little above the midpoint in terms of difficulty with a mean score of 9.08 (on a scale 2-14) for those studying A-levels and 9.34 for those studying AS levels**.** Students also perceived that a lot of required effort was required (on average 16.95 for A-level students and 17.00 for AS students on a scale ranging from 3-21)**.**

Table 4: see appendix

The Relationships between Task Difficulty, Effort, Expectations and Values for A-levels

In this study task difficulty was negatively associated with achievement (n=329, *r*=-.37 p<0.001 for the year 13 sample, n=497, *r*=-.33 p<0.001 for year 12) and negatively correlated with expectations (n=379, *r*=-.55, p<0.001 in the year 13 sample, n=515, *r*=-.58, p<0.001 for year 12). Surprisingly task difficulty did not correlate with STV, using an aggregated score, in the students studying A-levels in year 13 (n=385, *r*=-.04, p=.477) but correlated in the year 12 sample (n=514, *r*=-.12 p=0.008). The established correlations between these variables are however weak (see Table 5). In both samples there was a significant negative correlation between difficulty and intrinsic value (year 13 n=388, *r*=-.11, p=.028, year 12 n=526, *r*=-.23, p<0.001 for year 12) and with utility value in the year 12 sample (n=521, *r*=-.09, p=.047). Perceptions of difficulty did not relate to attainment value in either sample (year 13 n=389, *r*=.01, p=.863, year 12 n=518, *r*=-.01, p=763).

Effort was negatively correlated with achievement in both samples (n=329, r=-.24, p<0.001 for the year 13 sample and n=488, r=-.21, p<0.001 for the year 12 sample), presumably because high ability students perceive themselves needing to apply less effort in their A-levels than low ability students, who find them more difficult. This is further supported by the

finding that expectations were negatively correlated with effort in this study (n=381, r=-.31, p<0.001 year 13 students, n=509, r=-.29, p<0.001 for year 12 students). As shown in Table 5 effort was weakly, positively related to an aggregated STV score in both samples (year 13 n=387, r=.21, p<0.001, year 12 n=510, r=.13 p=0.004). Again in both samples effort was positively related to both attainment value (year 13 n=387, r=.25, p<0.001, year 12 n=514, r=.19 p<0.001) and utility value (year 13 n=389, r=.15, p=0.003, year 12 n=515, r=.09 p=0.049) but not intrinsic value (year 13 n=389, r=.08, p=0.128, year 12 n=517, r=.02, p=0.717). As might be expected, a positive correlation between task difficulty and effort was also established (r=.64 year 13, r=.58 year 12).

Table 5 *Correlations between Task Difficulty, Effort. Expectations and Values for A-levels*

	Expectations	STV	Intrinsic Value	Attainment Value	Utility Value	Achievement
Year 13						
Task difficulty	-.55***	-.04	-.11*	.01	-.13	-.37***
Effort	-.31***	.21***	.08	.25***	.15**	-.24***
Year 12						
Task difficulty	-.58***	-.12**	-.23***	-.01	-.09*	-.33***
Effort	-.29***	.13**	.02	.19***	.09*	-.21***

*p<0.05 **p<0.01 ***p<0.001

Gender Differences in Perceived Task Demands

Interestingly there were gender differences in the perceived task demands of students. On average girls thought A-levels were more difficult (9.63) than boys (8.56) and similar findings were reported in the AS sample where girls similarly found them more difficult (with an average score of 9.82 compared to 8.74 for boys). The scale ranged from a minimum of two to a maximum of 14. There were significant gender differences in the perceived difficulty of both A-levels ($t(388)=4.96$, $p<0.001$) and AS levels ($t(522)=6.16$, $p<0.001$). Girls also perceived A-levels (average score of 17.89 for girls compared to 16.06 for boys) and AS levels (17.61 versus 16.22) to require more effort (on a scale ranging from 3-21). There were significant gender differences in perceptions of required effort in the year 13 ($t(389)=5.47$, $p<0.001$) and the year 12 sample ($t(513)=5.15$, $p<0.001$).

Conclusion

Overall students perceived A-levels to be hard and thought they would have to apply much effort, providing insight into students' perceptions of these qualifications which may be of benefit to both policy makers and practitioners. There were gender differences in the perceived task demands which warrant further exploration as girls perceived A-levels to be harder and perceived them to require greater effort. The results may be useful for those interested in understanding the motivational patterns and achievement of A-level students including the gender differences, and beyond the UK for those interested in achievement motivation for high stakes examinations.

It was not surprising to find that task difficulty was negatively associated with expectations and achievement. It was, however, unexpected that difficulty was not related to STV in the year 13 sample, but only in the year 12 sample, given that students were predicted to attach

less value to tasks they find difficult (Eccles et al., 1983; Eccles & Wigfield, 1995) and are known to attribute failure to external factors such as task difficulty (Weiner, 1992). This may suggest that the expectancy-value model does not adequately explain the relationships between these variables when tested in the context of high-stakes examinations in the UK and this research therefore makes a potential theoretical contribution to the field. It is tentatively suggested that the findings could perhaps be alternatively explained by goal theories which propose that if students' adopt mastery patterns it has a positive effect on learning, increases competence and results in adaptive outcomes which increase motivation (Ames & Archer, 1987, 1988; Elliot, 2007; Elliot & Harackiewicz, 1996; Senko, Hulleman, & Harackiewicz, 2011). Thus, if A-level students see these qualifications as an opportunity to learn (learning goals) and not just an opportunity to perform (performance goals) a negative relationship between task difficulty and A-levels may not occur.

The theoretical assumption concerning the perceived relationships between effort, expectations and values were largely supported in this study. Effort was negatively correlated with expectations and achievement presumably as more able students perceive themselves as needing to apply less effort, an assumption supported by the fact that expectations and effort were themselves correlated. Since effort was known to relate to attainment, intrinsic and utility value (Eccles et al., 1983) it was not surprising that a positive relationship was found between attainment value and effort in both samples in this study and also with utility value. Thus, overall it appears that expectations and values are influenced by perceived characteristics of the task demands of A-levels; by both the perceived task difficulty and required effort. These insights add to this under-researched aspect of the expectancy-value model.

These findings have implications for further researching the role of cost in the expectancy-value model (of which effort is a key component). Despite a few emerging studies (Barron &

Hulleman, 2015; Perez, Cromley, & Kaplan, 2014) this is still a largely untested area empirically (Flake, Barron, Hulleman, & McCoach, 2015) and the findings of this study suggest it is a very important one. It has recently been found that cost contained multiple dimensions including task effort cost, outside effort cost, loss of valued alternatives, emotional cost and was related to student outcomes (Flake et al., 2015).

There are also implications for the use of interventions. Hulleman et al. (2016), for example, suggest that when interventions provide students with specific training in ascribing academic success to things that are within their control (e.g., effort) and the notion that academic difficulties can be overcome (and thus increase perceived academic control) then such changes mediate effects on academic motivation and achievement outcomes (e.g., Haynes, Ruthig, Perry, Stupnisky, & Hall, 2006; Perry, Stupnisky, Hall, Chipperfield, & Weiner, 2010). Since effort was linked to the expectations and values of A-level students in this research there are potential for practice. Therefore, further research on the perceived role of task demands in A-level students is warranted.

Appendix.

Table 4 *Descriptive Statistics: Perceived Task Demands of A-level Students*

			A Level				AS Level			
	Minimum	**Maximum**	**N**	**Mean**	**SD**	**Skew**	**N**	**Mean**	**SD**	**Skew**
Task difficulty	**2**	**14**	**390**	**9.08**	**2.21**	**-0.42**	**527**	**9.34**	**2.08**	**-0.37**
In general, how hard are A-levels for you?	1 (very easy)	7 (very hard)	391	4.89	1.33	-0.58	530	5.02	1.25	-0.61
Compared to other students in your class how hard are A-levels for you?	1 (much easier)	7 (much harder)	393	4.19	1.21	-0.07	529	4.32	1.14	-0.01
Required Effort	**3**	**21**	**391**	**16.95**	**3.42**	**-1.18**	**518**	**17**	**3.12**	**-1.2**
How hard do you have to try to do well in your A-level courses?	1 (not very hard)	7 (very hard)	393	5.47	1.36	-0.1	528	5.49	1.25	-1.01
How hard do you have to try to get good grades in your A-levels?	1 (a little)	7 (a lot)	392	5.62	1.24	-1.06	528	5.64	1.15	-0.96
How hard do you have to study for your A-level exams to get a good grade?	1 (a little)	7 (a lot)	393	5.83	1.25	-1.33	524	5.87	1.14	-1.26

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