



University of Dundee

Mindset in the secondary school classroom

Donohoe, C.; Topping, K. J.; Hannah, E.

Published in:
Educational Psychology in Practice

DOI:
[10.1080/02667363.2021.1905613](https://doi.org/10.1080/02667363.2021.1905613)

Publication date:
2021

Licence:
CC BY-NC-ND

Document Version
Publisher's PDF, also known as Version of record

[Link to publication in Discovery Research Portal](#)

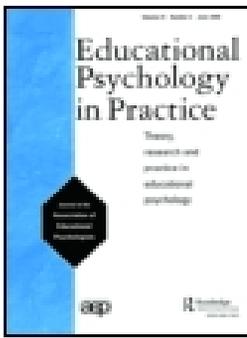
Citation for published version (APA):
Donohoe, C., Topping, K. J., & Hannah, E. (2021). Mindset in the secondary school classroom: interaction with social value of effort and contingencies of self-worth. *Educational Psychology in Practice*, 37(3), 235-250. <https://doi.org/10.1080/02667363.2021.1905613>

General rights

Copyright and moral rights for the publications made accessible in Discovery Research Portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

Take down policy

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.



Educational Psychology in Practice

theory, research and practice in educational psychology

ISSN: (Print) (Online) Journal homepage: <https://www.tandfonline.com/loi/cepp20>

Mindset in the secondary school classroom: interaction with social value of effort and contingencies of self-worth

C. Donohoe, K.J. Topping & E. Hannah

To cite this article: C. Donohoe, K.J. Topping & E. Hannah (2021): Mindset in the secondary school classroom: interaction with social value of effort and contingencies of self-worth, Educational Psychology in Practice, DOI: [10.1080/02667363.2021.1905613](https://doi.org/10.1080/02667363.2021.1905613)

To link to this article: <https://doi.org/10.1080/02667363.2021.1905613>



© 2021 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group.



Published online: 02 Apr 2021.



Submit your article to this journal [↗](#)



Article views: 78



View related articles [↗](#)



View Crossmark data [↗](#)

Mindset in the secondary school classroom: interaction with social value of effort and contingencies of self-worth

C. Donohoe , K.J. Topping  and E. Hannah

School of Education and Social Work, University of Dundee, Dundee, UK

ABSTRACT

This quantitative study examined year group, ability level and gender differences in mindset, social value of effort and contingencies of self-worth of 174 participants aged 13–18 years in a Scottish secondary school. The measures were Dweck's (2000) Theories of Intelligence Scale, Juvonen and Murdoch's (1995) Social Value of Effort Scale and Crocker's (2003) Contingencies of Self-Worth Scale. Analysis of Variance indicated no significant differences for mindset or age. However, significant gender differences were found for social value of effort and contingencies of self-worth. The research and practitioner implications of these findings are discussed. The limitations are that this study focussed on specific age and ability groups which could limit its generalisability. Future research should investigate these variables in wider contexts. Implications for educational psychologists' practice include taking account of psychological and social factors in the adoption and implementation of interventions designed to improve pupils' academic progress.

KEYWORDS

Age; adolescents; ability; gender; secondary school; mindset; contingencies of self-worth; social value of effort

Introduction

Recently, there has been a surge of interest in concepts such as growth mindset, which are claimed to promote the psychological and academic benefits of effort and persistence (Hochanadel & Finamore, 2015). A pupil with a growth mindset will have a view of intelligence as malleable, believing it can be developed as a result of "learning strategies, effort and persistence" (Dweck, 2006, p. 40). On the other hand, a pupil with a fixed mindset will consider intelligence to be fixed and immutable. Growth mindsets are inextricably linked with effort, and C. Dweck (2015) acknowledged that "effort is key for students' achievement" (p. 1); but she also stressed that growth mindset is not just about effort but also about seeking new strategies and learning from others. So, how might growth mindsets be developed? Interventions, such as the software program Brainology, aim to shape the individual's approach to learning by nurturing a growth mindset (Donohoe et al., 2012).

Mindset

Some studies have suggested that, although a growth mindset can be encouraged in a student, it may not be maintained longer term. Thus, Donohoe et al. (2012) found that participation in the online Brainology program resulted in a significant shift towards a growth mindset in mid-ability Scottish secondary school pupils aged 13–14 years old. However, at follow up stage, this shift had not been sustained. Orosz et al. (2017) also found that older (10th grade) high ability Hungarian students had returned to their pre-intervention state after an initial positive response to a growth mindset intervention.

Why has mindset not always been sustained in the long term? Educators support effort, but how is effort viewed by an adolescent operating within the social context of the classroom, and to what extent is their view deep and responsive to that of the teacher? For example, Dweck (2015) discusses a false growth mindset where superficial praise is given to effort rather than a deeper focus on unlocking learning and thriving on challenges. Additionally, what is important to pupils in terms of their own psychological well-being and self-worth in school (Yeager et al., 2013)? Is there a disconnect between socio-psychological interventions and the social and personal goals of students? Or are there specific groups of pupils who are more likely to hold a fixed mindset and for whom exposure to the idea of a growth mindset may make a difference and be more meaningful and longer-term?

Recent meta-analyses (Sisk et al., 2018) indicated only a weak relationship between mindset and academic achievement overall, although the authors did cautiously suggest that mindset interventions may be beneficial to pupils who are “at risk” academically. Aronson et al. (2002) and Good et al. (2003) found that college students and adolescents at risk from gender, race or poverty stereotype threat were more engaged and performed better academically after a mindset intervention. Burnette et al. (2018) and Paunesku et al. (2015) also found that pupils who were at risk academically benefited from a mindset intervention. Li and Bates (2020), however, found no association between mindset and grades during a challenging transition or indeed at any point in their longitudinal study.

Other studies suggest that there are gender differences and that high performing girls are more likely to have a fixed mindset (Ahmavaara & Houston, 2007; Dweck, 1986; Halvorson, 2011). Some research suggests that mindset awareness may be most impactful at specific ages (Ablard & Mills, 1996; Schmidt et al., 2017) or challenging transitional stages such as adolescence (Blackwell et al., 2007). Gonida et al. (2006) focussed on children in early adolescence and found that their ideas about intelligence were mainly linked to their school achievement, while high achievers were more likely to adopt incremental beliefs. Thus, the picture is mixed and it is therefore timely to address these somewhat contradictory findings regarding mindset.

At a wider level, it is also important to better understand the many psycho-social processes operating in educational contexts, especially in peer groups, in order to be better able to effectively implement interventions. Effort may be promoted by educators as a means of achieving academically, but does it hold the same value socially for pupils?

Social value of effort

In schools, effort may be viewed (especially by teachers) as a means of achieving academic success and working towards a positive future. On the other hand, it also carries risks. If a pupil tries hard but fails to achieve, then others may view him/her as lacking in intelligence. Secondly, time spent revising might mean sacrificing opportunities to socialise (Jackson & Nyström, 2015), leading to castigation as an isolated pupil who is focussed on academic rather than social pursuits. So how do pupils navigate this conflict between academic and social goals?

Juvonen and Murdock's (1995) study of the social value of effort suggested that students circumvent this conflict by giving different reasons for success or failure to teachers and peers. They found that by eighth grade students were well aware of how they could manipulate their attributions for success and failure according to audience. By this age, they were more willing to attribute success to trying hard to an audience of teachers than to an audience of peers. Conversely, they were less likely to tell an audience of teachers that failure was due to a lack of effort. This demonstrated that they were aware that teachers might respond to lack of effort with disapproval. Students also tended to attribute success to ability to gain approval from teachers, while attributing failure to low ability was a means of reducing responsibility for poor outcomes and eliciting sympathy from teachers. Peers however might interpret this differently. Students of this age were reluctant to attribute failure or success to the presence or lack of effort with an audience of peers (Juvonen & Murdock, 1995).

Heyder and Kessels (2017) found that students who were able to achieve without apparent effort had a higher social status than those who worked hard. Juvonen and Murdock (1995) concluded that it is important that affiliation and achievement are considered as interacting, rather than as two distinct concepts. They stressed the importance of considering the social context along with an understanding of the cognitive domain. Similarly, LaFontana and Cillessen (2010) found that early adolescents' overriding priority was popularity among peers, particularly evident among males and majority students.

In fact, a recent study indicated that effort was considered to be a "feminine" trait by both teachers and students (Heyder & Kessels, 2017). In an earlier study, the same authors suggested that students view school as being more feminine than masculine. This perception was related to boys' academic performance in some subjects (Heyder & Kessels, 2013). Rusillo and Arias (2004) indicated that there were gender differences in attributions: effort attributions were more common for females, whereas males attributed more to ability. Burgner and Hewstone (1993) also found significant sex differences in attributional styles. Males were more likely to employ a self-enhancing pattern, whereas girls' attributions were shown to be more self-derogating. Smith et al. (2002) indicated that male attributions for success tended to be for factors such as ability, but failure was attributed to effort. This was interpreted as a means of preserving their own self-image. Warrington et al. (2000) discovered that male pupils were subject to higher levels of pressure to conform to the group norm of being "cool" and masculine and there was a greater tendency to mock boys for exerting effort in class. Girls, in contrast, could be seen to be working hard and still be popular amongst their peers.

Thus, there is a conflict between the perceptions of teachers and those of the peer group. Matteucci et al. (2008) found that when teachers believed that a child's failure was a result of poor effort, their subsequent educational intervention was more severe and "with retributive purpose" (p. 29). When teachers ascribed failure to a lack of effort, they had an emotional "angry" response, but when they perceived that the pupil was not responsible for the failure their emotional response was sympathetic. By contrast, there is evidence that pupils do perceive effort as having social value. They are aware of perceived positive views of effort by teachers and negative views of effort by peers and are able to manipulate their responses accordingly.

So, what is important to pupils in the classroom, and what do pupils consider to be important to their self-worth?

Contingencies of self-worth

Covington's (1984) self-worth theory emphasised the importance of protecting a sense of self-worth in relation to pupil achievement. Covington (1998) pointed out the inherent complexities around pupil attitudes to effort. The consequences of trying hard and failing carry risk, and avoiding this risk may be a goal in itself. Young people may aim to maintain a sense of self-worth by avoiding mastery opportunities which could expose weaknesses in ability. Effort could also be seen as a compensatory measure; trying hard can be equated with low ability. Therefore, low achievers may avoid any test of ability, thereby maintaining their sense of worth.

Crocker and Knight (2005) explored the interaction of self-esteem and contingent self-worth. They suggest that people are more invested in certain domains and it is failure and success only in these areas that impact upon their self-esteem. Therefore, it is the domains in which self-worth is contingent which influence behaviour and long- and short-term goals. For example, a pupil whose self-worth is contingent on academics will be most concerned with achieving good grades. Success in this domain will increase their self-esteem; while academic failure will lower their self-esteem.

More recent investigation into contingencies of self-worth (Hoy et al., 2011) indicated that contingencies of self-worth may reveal areas that are integral to participants' perceived social standing. In order to protect their self-worth, some students withdraw effort and reject due credit for their successes (Thompson, 1993). Gender differences have also been identified in contingencies of self-worth. Male self-worth has been found to be contingent on being more successful than others, whereas female self-worth is more likely to be based on the approval of others (Josephs et al., 1992).

Covington (1984) discusses competition in terms of contingencies of self-worth in school-age children. Younger students tend to restrict their judgements to their own previous performances (Ruble et al., 1976). However, as children become more mature there is a shift to comparisons with others and peer "norms". As a result of this, self-worth becomes dependent on doing better than comparative others. Covington (1984) claimed that this sense of competitiveness is exacerbated by the competitive context of high school.

Crocker and Park (2004) indicated that contingent self-worth can lead to more effort, so in that sense it could be seen as motivating. However, this does not necessarily result in the desired success. For example, students whose self-esteem is contingent on academic performance might not actually attain higher grades, despite applying effort in terms of

study (Crocker & Luhtanen, 2003). The consequence of a failure in an area of contingent self-worth for a pupil could lead to self-handicapping or procrastinating. This may in turn threaten self-esteem. Thus, the domain in which a pupil's self-worth is contingent could play a critical role in their academic and social goals, approach to learning and also their behaviour in the classroom.

The research literature thus suggests that secondary students actually maintain a double strategy, emphasising the role of effort in relation to their teachers while demeaning it in relation to their peers, and this dual strategy is intimately but in a somewhat complex way related to mindset and self-worth. Additionally, there are likely to be differences between genders.

Aims of the study

This study aimed to investigate if pupils considered effort as having a social value and what pupils believed was important to their own psychological well-being and self-worth. The latter two are important, as interventions may be more likely to be adopted if they align with pupils' own beliefs and values.

This study specifically explored the following research questions:

- (1) Do mindsets vary according to academic ability?
- (2) Do boys and girls differ in terms of mindset?
- (3) Are there key ages or challenging stages where mindset matters most?
- (4) Do pupils wish to be viewed as exerting effort in the classroom?
- (5) What is important to pupils' self-worth during adolescence?
- (6) Is there any interaction between the variables above?

In order to achieve this, the current study investigated the dependent variables of mindset, contingencies of self-worth and social value of effort. A fixed mindset is the view that intelligence is stable; a growth mindset is the view that intelligence is malleable. The social value of effort investigated whether pupils attributed success and failure to effort or ability and if this varied depending on the audience (teachers or peers). Contingencies of self-worth were explored to ascertain what was important to a pupil's sense of self-worth. Specifically, the subsets of academic self-worth, competition and approval of others were employed.

It was expected that these three measures would give an insight into how pupils viewed intelligence, if they attributed success to effort in their relations with their peers and teachers, and finally what was important to them in terms of their self-worth. This was important because pupils are not merely the passive recipients of interventions, but independent actors who will try to assimilate new ways of thinking into their broader ecological context (Bronfenbrenner, 1979).

Method

Participants

In total, 174 secondary school pupils from the same high school in a large Scottish city took part in the study. There were 1351 pupils in the school and the free school meals entitlement was in line with the national average. During secondary education, pupils are adapting to new social environments and peers, developing their own identities, facing examinations and other academic pressures and going through puberty. In Scotland, pupils enter high school at age 12. They continue by year and in the fourth year they undertake formal examinations. The next two years involve further, more advanced, formal examinations. Some pupils opt to leave school after the fourth year at 16 years of age. This study looked at pupils in the second, fourth and fifth years to examine whether there were any differences in responses at different ages/stages, possibly as a result of maturation.

Another independent variable investigated was academic performance. The school banded pupils in each year group into ability groups for English. Therefore, these groups were used as they were already in existence and any alternative would have been very disruptive. Three ability groupings were studied: top, middle and lower, for each of the three school stages (second, fourth and fifth years). The final independent variable considered was gender.

The nature of the sampling was partly convenience (accessible to the researcher who was a teacher in the school), but also partly systematic, in that there was an attempt to sample across the year groups and ability groups in a way that was not determined by convenience. The sample was stratified into year groups, then each stratum was further divided into three ability groups (upper, middle and lower). Once the make-up of these groups was considered, it became obvious that the lower sets were composed of more boys than girls (33 boys; 18 girls).

In summary, the inclusion criteria were: secondary school pupils in School X; in 2nd, 4th or 5th year of school, in the lower, middle or upper ability group. The exclusion criteria were: in 1st, 3rd or 6th year of school, not in the lower, middle or upper ability group. This meant that the other groups which straddled more than one group (for example, lower/middle stratum) were excluded.

Measures

Implicit theories of intelligence

Participants' implicit theories of intelligence were investigated using C.S. Dweck's (2000) Theories of Intelligence Scale for children. There are six items on this scale (three fixed; three growth) using a Likert scale (1 = strongly agree; 6 = strongly disagree). A mindset mean was calculated by reverse scoring the growth mindset items. A higher score indicated a growth mindset. Internal reliability of 0.94–0.98 for this scale was found by Hong et al., (1999), while Da Fonseca et al. (2007) found a Cronbach's alpha of 0.81 for the incremental items and 0.78 for the entity items.

Social value of effort

Attitudes towards effort were measured using Juvonen and Murdock (1995) Social Value of Effort scale. This scale investigated pupils' attitude towards effort in terms of two different audiences: peers and teachers. This scale had eight items, for example: Imagine that you did really well on an important exam. The teacher is wondering why you did so well. You want your teacher to like you. What are you going to tell him/her when they ask you why you did so well? I am just really good at this stuff. A Likert scale was used (1 = very likely and 6 = very unlikely) and answers were reversed scored. No validity or reliability data were available for this measure.

Contingencies of self-worth

Crocker et al.'s (2003) Contingencies of Self-Worth scale was modified to focus only on academic self-worth, competition and approval of others, rather than the original seven variables. The adapted scale contained 15 items, for example: I feel better about myself when I know I'm doing well academically. This measure employed a Likert scale (1 = strongly agree; 6 = strongly disagree) and answers were reversed scored. Reliability for this measure was reported as 0.82–0.96 and evidence has been provided of convergent and predictive validity (Crocker et al., 2003).

Analysis

Data were analysed in SPSS using multivariate analysis of variance (MANOVA) as there were three dependent variables (mindset, contingencies of self-worth and social value of effort) and three independent variables (year group, gender and ability level). Using the G*Power software, the minimum sample size for between factors MANOVA was 54 (well within the sample size here) and the power was 0.950 (Faul et al., 2007). Then individual interactions were explored with two-way and one-way ANOVAs. Again, using G*Power, the minimum sample size for between factors ANOVA was 132 (well within the sample size here) and the power was 0.950. Clearly, there is an issue with using parametric methods with a non-random sample yielding data on Likert Scales, but it was felt that parametric methods offered multiple assessment of variables in a way that non-parametric methods could not. The data were also analysed using Effect Sizes (Cohen's *d*).

Procedure

Ethical approval was sought and granted from the university Ethics Board, the Local Authority and the Headteacher. Operational discussions were then held with the Head of English and relevant class teachers. The researchers then spoke to the selected classes, informing them about the study, and consent forms for parents/guardians and pupils and participant information sheets were issued. Pupils were informed of their rights to refuse to take part, to withdraw from the study and that all information given would be confidential and not discussed with other members of staff. Two pupils withdrew from the study at this point.

Once consent forms were returned, the study began. Pupils were issued with a booklet of questionnaires. The first author explained the Likert Scale with an example on the

whiteboard. Again, the pupils' rights regarding participation in the study were explained and it was reiterated that their responses were anonymous. Pupils were assured that this was not a test and their responses would not be the subject of discussion with their teacher or any other member of staff. The class teacher then left the room leaving the researcher to complete the test. Pupils completed the questionnaires, taking about 15 minutes.

Results

The MANOVA showed an overall significant interaction between year group and gender ($F(2,172) = 1.65, p = 0.031$), but no others. These results are further investigated below, displayed for clarity under the headings of year group, ability level and gender.

Year group

There were no significant differences between year groups for the variables of Mindset or Contingencies of Self-Worth. One-way ANOVA on SuccessPeerAbility (attributing success to ability to an audience of peers), a subset of social value of effort, almost reached significance ($F(2, 170) = 3.02, p = 0.051$), with the second year group being most likely to attribute success to ability to peers, the fourth year group less likely and the fifth year group least likely (although given the multiple testing undertaken, finding one significant result should not be over-emphasised) (Table 1). Two-way ANOVA indicated that the interaction between year group and gender was only significant for attributing success to effort to peers ($F(2,168) = 5.59, p = 0.004$). Means for the interaction show that boys were more likely to attribute success to effort to peers in the second year, but less likely in the fourth year.

Ability

There were no significant findings on ability for either mindset or social value of effort. In terms of contingencies of self-worth, one-way ANOVA showed one significant result (Table 2). Competition, in terms of contingencies of self-worth, was significant ($F(2, 171) = 5.16, p = 0.004$), with the lowest ability group being most competitive and the top group the least.

Gender

One-way ANOVA indicated that there were no significant results for mindset. However, significant findings were shown for social value of effort (Table 3). Girls were shown to be significantly more likely to attribute failure to ability to teachers (FailureAbilityTeacher) ($F(1,171) = 7.95, p = 0.005$). In contrast, FailureEffortTeacher ($F(1, 171) = 9.49, p = 0.002$) showed that when interacting with teachers, boys were significantly more likely to attribute failure to effort and success to ability (SuccessAbilityTeacher) ($F(1, 171) = 8.82, p = 0.003$). Boys were also significantly, when with peers, more likely to attribute success to ability (SuccessAbilityPeer) ($F(1, 171) = 5.13, p = 0.025$). Contingencies of self-worth in terms of competition

Table 1. Descriptive statistics for year group and the variables of mindset, contingencies of self-worth and social value of effort.

	Year Group	N	Mean	Std. Deviation
Mindset	2	49	4.090	.909
	4	64	3.838	.874
	5	61	3.838	1.142
Total		174	3.909	.986
Contingencies of self-worth: Competition	2	49	17.857	4.168
	4	64	17.968	4.097
	5	61	17.754	3.960
Total		174	17.862	4.047
Contingencies of self-worth: Academic	2	49	17.816	3.431
	4	64	17.062	3.646
	5	61	17.114	3.656
Total		174	17.293	3.585
Contingencies of self-worth: Approval	2	49	9.551	4.752
	4	64	9.546	4.859
	5	61	10.393	5.257
Total		174	9.844	4.961
Social value of effort: FailureAbility Teacher	2	49	3.632	1.590
	4	64	4.000	1.458
	5	60	4.233	1.394
Total		173	3.976	1.486
Social value of effort: FailureEffort Teacher	2	49	3.183	1.740
	4	64	3.828	1.579
	5	61	3.754	1.738
Total		174	3.620	1.694
Social value of effort: FailureAbilityPeer	2	49	3.877	1.576
	4	64	3.968	1.500
	5	59	3.813	1.383
Total		172	3.889	1.476
Social value of effort: FailureEffortPeer	2	49	3.693	1.816
	4	64	3.890	1.624
	5	61	4.262	1.711
Total		174	3.965	1.716
Social value of effort: SuccessAbility Teacher	2	49	4.224	1.558
	4	64	3.937	1.478
	5	60	3.683	1.651
Total		173	3.930	1.568
Social value of effort: SuccessEffort Teacher	2	49	5.000	1.500
	4	64	5.015	1.266
	5	61	5.065	1.236
Total		174	5.028	1.318
Social value of effort: SuccessAbilityPeer	2	49	4.816	1.285
	4	64	4.203	1.654
	5	60	4.166	1.553
Total		173	4.364	1.540
Social value of effort: SuccessEffortPeer	2	49	3.979	1.713
	4	64	4.421	1.621
	5	61	4.557	1.396
Total		174	4.344	1.582

For example, "FailureAbilityTeacher" means attributing failure to ability to an audience of teachers.

showed that boys had significantly higher results than girls ($F(1,172) = 16.84, p = 0.001$), indicating that boys' self-worth was more likely to be contingent on competitiveness.

Turning to analysis by Effect Size (ES), of the main variables Mindset, Competition, Academic Level and Approval, only two yielded an ES above 0.20 – Competition at 0.44 with Males higher than Females and Mindset for Year 2 vs. Year 4 at 0.29. Of the subsidiary variables, females were higher than males on FailureAbilityTeacher (attributing failure to ability to an audience of teachers) (ES = 0.35), while males were higher than females on

Table 2. Descriptive statistics for ability level.

		N	Mean	Std. Deviation
Mindset	Top	71	3.924	1.017
	Middle	52	3.925	.879
	Lower	51	3.871	1.063
	Total	174	3.909	.987
Contingencies of self-worth: Competition	Top	71	17.042	3.490
	Middle	52	17.480	4.394
	Lower	51	19.392	4.055
	Total	174	17.862	4.047
Contingencies of self-worth: Academic	Top	71	17.647	2.908
	Middle	52	16.576	4.603
	Lower	51	17.529	3.202
	Total	174	17.293	3.585
Contingencies of self-worth: Approval	Top	71	10.323	5.217
	Middle	52	10.173	4.492
	Lower	51	8.843	5.001
	Total	174	9.844	4.961
Social Value of effort: FailureAbilityTeacher	Top	70	4.014	1.279
	Middle	52	3.769	1.591
	Lower	51	4.137	1.637
	Total	173	3.976	1.486
Social Value of effort: FailureEffortTeacher	Top	71	3.464	1.619
	Middle	52	3.634	1.703
	Lower	51	3.823	1.796
	Total	174	3.620	1.694
Social Value of Effort: FailureAbilityPeer	Top	70	3.871	1.317
	Middle	52	3.615	1.646
	Lower	50	4.200	1.470
	Total	172	3.889	1.476
Social Value of Effort: FailureEffortPeer	Top	71	4.211	1.584
	Middle	52	3.750	1.824
	Lower	51	3.843	1.770
	Total	174	3.965	1.716
Social Value of Effort: SuccessAbilityTeacher	Top	70	3.657	1.502
	Middle	52	4.096	1.562
	Lower	51	4.137	1.637
	Total	173	3.930	1.568
Social Value of Effort: SuccessEffortTeacher	Top	71	5.098	1.185
	Middle	52	5.057	1.334
	Lower	51	4.902	1.486
	Total	174	5.028	1.318
Social Value of Effort: SuccessAbilityPeer	Top	70	4.114	1.489
	Middle	52	4.596	1.403
	Lower	51	4.470	1.712
	Total	173	4.364	1.540
Social Value of Effort: SuccessEffortPeer	Top	71	4.352	1.353
	Middle	52	4.403	1.694
	Lower	51	4.274	1.778
	Total	174	4.344	1.582

FailureEffortTeacher (attributing failure to effort to an audience of teachers) (ES = 0.33), SuccessAbilityTeacher (attributing success to ability to an audience of teachers) (ES = 0.32) and SuccessAbilityPeer (attributing success to ability to an audience of peers) (ES = 0.24). Other ESs were less than 0.20. The ES analysis thus largely corroborated the parametric analysis.

Table 3. Descriptive statistics for gender.

		<i>N</i>	Mean	Std. Deviation
Mindset	Male	86	3.976	.935
	Female	88	3.843	1.035
	Total	174	3.909	.987
Contingencies of Self-worth: Competition	Male	86	19.081	4.221
	Female	88	16.670	3.502
	Total	174	17.862	4.047
Contingencies of Self-worth: Academic	Male	86	17.418	4.151
	Female	88	17.170	2.948
	Total	174	17.293	3.585
Contingencies of Self-worth: Approval	Male	86	9.558	4.258
	Female	88	10.125	5.574
	Total	174	9.844	4.961
Social Value of Effort: FailureAbilityTeacher	Male	86	3.662	1.492
	Female	87	4.287	1.421
	Total	173	3.976	1.486
Social Value of Effort: FailureEffortTeacher	Male	86	4.011	1.648
	Female	88	3.238	1.660
	Total	174	3.620	1.694
Social Value of Effort: FailureAbilityPeer	Male	86	3.872	1.509
	Female	86	3.907	1.452
	Total	172	3.889	1.476
Social Value of Effort: FailureEffortPeer	Male	86	3.988	1.648
	Female	88	3.943	1.789
	Total	174	3.965	1.716
Social Value of Effort: SuccessAbilityTeacher	Male	86	4.279	1.460
	Female	87	3.586	1.603
	Total	173	3.930	1.568
Social Value of Effort: SuccessEffortTeacher	Male	86	4.953	1.371
	Female	88	5.102	1.268
	Total	174	5.028	1.318
Social Value of Effort: SuccessAbilityPeer	Male	86	4.627	1.463
	Female	87	4.103	1.577
	Total	173	4.364	1.540
Social Value of Effort: SuccessEffortPeer	Male	86	4.255	1.535
	Female	88	4.431	1.631
	Total	174	4.344	1.582

Discussion

This study examined mindset in the secondary school. Mindset was not found to vary in terms of age or stage; there were no significant differences in mindset found in terms of academic ability and there were no significant gender differences. Mindset results were consistent across year groups, ability levels and gender. The youngest year group (S2) did lean more towards a growth mindset; however, this did not reach significance (but this was unsurprising given the relatively small sample size).

Other recent studies also found little or no relationship between mindset and academic achievement (Li & Bates, 2020; Sisk et al., 2018). These findings are in contrast with previous literature which found age and stage differences (Ablard & Mills, 1996; Blackwell et al., 2007; Schmidt et al., 2017), ability differences (Gonida et al., 2006; Paunesku et al., 2015;) and gender differences (Ahmavaara & Houston, 2007; Dweck, 1986; Halvorson, 2011). The majority of the above studies took place in the U.S. and this study was carried out in Scotland, so perhaps differing cultural contexts played a role. Differing age ranges were also at play; the present study looked at pupils aged 11–17 years.

The researchers were also interested to explore if pupils' attitude to effort could play a role in any reluctance to adopt a growth mindset longer-term. Effort is a key factor in the growth mindset, but how does effort fit into the pupil's school context? This leads to the question: Do pupils wish to be viewed as exerting effort in the classroom? Significant gender differences were discovered here. Boys were significantly more likely than girls to attribute success to ability to both peers and teachers. They were also significantly more likely to tell teachers that failure was due to lack of effort. There were no significant results for girls in terms of peers, but they differed from boys in that they were more likely to explain to teachers that failure was a consequence of lack of ability. This could suggest that pupils are aware of the social value of effort and are conscious of manipulating attributions depending on their audience.

Smith et al.'s(2002) study agreed that boys tended to attribute success to ability but failure to lack of effort. The authors' explanation was that this preserved boys' self-image. Burgner and Hewstone(1993) suggested that boys were more likely to attribute in order to be self-enhancing, whereas girls' attributions were more self-derogating. Girls were found more likely to attribute failure to ability, which could be a means of avoiding teacher disapproval. Attributing failure to lack of ability may serve as a means of eliciting teachers' sympathy and attention (Juvonen & Murdock, 1995). Perhaps, as Heyder and Kessels (2017) suggested, effort is perceived as a feminine trait by both teachers and pupils.

Next, this research investigated: What is important to pupils' self-worth during adolescence? This study suggested that for boys and those of lower ability, self-worth was more likely to be based on competition. It is important to their self-worth to be doing better than others. They were motivated by a competitive ethos in the classroom (Josephs et al., 1992), although if they felt that this might endanger perceptions of their ability, they might opt out of the activity. This might explain why they were likely to attribute success to ability and failure to effort. If they explained that they did not succeed because they did not try, then this protected their own and others' perceptions of their ability.

Significant differences were found between the lowest ability group and middle/higher ability groups in terms of competitiveness as a subset of contingencies of self-worth. The lowest groups were significantly more likely than the higher groups to see their self-worth as contingent on competition. The lower sets were composed of more boys than girls (33 boys; 18 girls). This may explain why this ability group presented the highest scores in terms of competitiveness.

Warrington et al.'s(2000) finding that boys felt compelled to conform to group norms of being cool and masculine is relevant to the present study. There is a question whether competitiveness is a gender "trait" for boys or if it is fostered by the social world of the classroom. Girls are not shown to be subject to the same peer pressures. The current study did however suggest that girls are more sensitive to approval from teachers.

The final question was: Is there any interaction between these variables? There was one significant interaction. This was between year group and gender. The interaction between year group and gender was only significant for attributing success to effort to peers. Boys were more likely to attribute success to effort to peers in the second year, but less likely to do so in the fourth year. This could suggest that effort carries a higher social value for boys at the age of 16 than it does at the age of 12.

Limitations

This study is limited in several ways. Firstly, the research was carried out in only one school and a variety of year groups and ability groups were selected, but others were not included. These factors limit its generalisability. Secondly, the first author was a practitioner in the school and the sample selected included pupils whom the first author taught at the time or had taught in the past. This could have been a confounding factor. The emphasis on the first author's role as researcher rather than practitioner and stress on the pupil's right to withdraw along with reassurance of confidentiality were measures used to counteract this limitation. A further limitation was that there was no validity or reliability reported for the social value of effort measure.

Future research

Although this study did not find variation in mindset results for age, academic achievement or gender interaction, it would be interesting to investigate mindset in terms of minority or excluded groups which were not explicitly examined here (although low ability groups were). Future research could also examine if there are cultural differences in mindset. It would be interesting to also further investigate the relationship of pupils' attitude to effort and their longer-term adoption of mindset interventions, to further explore if there is indeed a conflict between learning and social goals.

Researchers could also further explore the impact of the gender differences indicated. This study indicates that boys are more likely to have self-worth which is contingent on competition and be more likely to attribute failure to effort and success to ability at secondary school. It would be interesting to investigate if this was also found at primary school level. A further, perhaps qualitative, study exploring why girls may tend to attribute failure to ability would be interesting also.

Implications for practice

Educational psychologists should be cognisant of the key findings from this study. Firstly, this investigation has confirmed previous research that has found no relationship between mindset and academic ability. Thus, it is recommended that educational professionals take a cautious approach to adopting and implementing mindset interventions. Secondly, educational professionals should note the gender differences found in this study in relation to the social value of effort. These gender differences could impact on the efficacy of interventions which incorporate an effort element. Thirdly, practitioners working in educational contexts should be cognisant of the finding that there were gender and ability differences in relation to self-worth. In particular, the finding that the self-worth of boys and those of lower ability is more likely to be based on competition.

This study highlights the complexity of implementing interventions in educational contexts designed to improve pupils' academic progress, in particular, the importance of taking account of social and psychological factors. Educational psychologists are well placed to understand such complexities and, working alongside others, to adapt and evaluate interventions.

Conclusion

This study set out to examine mindset in the secondary school classroom. It specifically looked to answer the following questions: Do mindsets vary according to academic ability? Do boys and girls differ in terms of mindset? Are there key ages or challenging stages during adolescence where mindset matters most? Do pupils wish to be viewed as exerting effort in the classroom? What is important to pupils' self-worth during adolescence? and Is there any interaction between the variables above?

In contrast to previous studies, mindsets were found to be consistent across age, ability and gender groups. The study then investigated if pupils assigned a social value to effort. It confirmed previous findings that boys are more likely to attribute failure to effort and success to ability. It also investigated pupils' self-worth. Boys were found to be more likely to base their self-worth on competition.

In conclusion, the classroom is clearly a complex social world. Psycho-social interventions are not introduced onto blank slates, but onto situations where students are already dealing with complex and conflicting social pressures. It is important to view pupils as active participants who try to assimilate new approaches and methods into their existing individual and social contexts in their own way.

Disclosure statement

No potential conflict of interest was reported by the author(s).

ORCID

C. Donohoe  <http://orcid.org/0000-0003-0005-9056>

K.J. Topping  <http://orcid.org/0000-0002-0589-6796>

References

- Ablard, K. E., & Mills, C. J. (1996). Implicit theories of intelligence and self-perceptions of academically talented adolescents and children. *Journal of Youth and Adolescence*, 25(2), 137–148. <https://doi.org/10.1007/BF01537340>
- Ahmavaara, A., & Houston, D. M. (2007). The effects of selective schooling and self-concept on adolescents' academic aspiration: An examination of Dweck's self-theory. *British Journal of Educational Psychology*, 77(3), 613–632. <https://doi.org/10.1348/000709906X120132>
- Aronson, J., Fried, C. B., & Good, C. (2002). Reducing the effects of stereotype threat on African American college students by shaping implicit theories of intelligence. *Journal of Experimental Social Psychology*, 38(2), 1–13. <https://doi.org/10.1006/jesp.2001.1491>
- Blackwell, L. S., Trzesniewski, K. H., & Dweck, C. S. (2007). Implicit theories of intelligence predict achievement across an adolescent transition: A longitudinal study and an intervention. *Child Development*, 78(1), 246–263. <https://doi.org/10.1111/j.1467-8624.2007.00995.x>
- Bronfenbrenner, U. (1979). *The ecology of human development*. Harvard University Press.
- Burgner, D., & Hewstone, M. (1993). Young children's causal attributions for success and failure: 'Self-enhancing' boys and 'self-derogating' girls. *British Journal of Developmental Psychology*, 11(2), 125–129. <https://doi.org/10.1111/j.2044-835X.1993.tb00592.x>
- Burnette, J. L., Russell, M. V., Hoyt, C. L., Orvidas, K., & Widman, L. (2018). An online growth mindset intervention in a sample of rural adolescent girls. *British Journal of Educational Psychology*, 88(3), 428–445. <https://doi.org/10.1111/bjep.12192>

- Covington, M. V. (1984). The self-worth theory of achievement motivation: Findings and implications. *The Elementary School Journal*, 85(1), 5–20. <https://doi.org/10.1086/461388>
- Covington, M. V. (1998). *The will to learn: A guide for motivating young people*. Cambridge University Press.
- Crocker, J., Karpinski, A., Quinn, D. M., & Chase, S. K. (2003). When grades determine self-worth: Consequences of contingent self-worth for male and female engineering and psychology majors. *Journal of Personality and Social Psychology*, 85(3), 507–516. <https://doi.org/10.1037/0022-3514.85.3.507>
- Crocker, J., & Knight, K. M. (2005). Contingencies of self-worth. *Current Directions in Psychological Science*, 14(4), 200–203. <https://doi.org/10.1111/j.0963-7214.2005.00364.x>
- Crocker, J., & Luhtanen, R. K. (2003). Level of self-esteem and contingencies of self-worth: Unique effects on academic, social, and financial problems in college students. *Personality & Social Psychology Bulletin*, 29(6), 701–712. <https://doi.org/10.1177/0146167203029006003>
- Crocker, J., & Park, L. E. (2004). The costly pursuit of self-esteem. *Psychological Bulletin*, 130(3), 392. <https://doi.org/10.1037/0033-2909.130.3.392>
- Da Fonseca, D., Schiano-Lomoriello, S., Cury, F., Poinso, F., Rufo, M., & Therme, P. (2007). Validité factorielle d'un questionnaire mesurant les théories implicites de l'intelligence (TIDI). *L'Encéphale*, 33(4), 579–584. [https://doi.org/10.1016/S0013-7006\(07\)92056-4](https://doi.org/10.1016/S0013-7006(07)92056-4)
- Donohoe, C., Topping, K., & Hannah, E. (2012). The impact of an online intervention (Brainology) on the mindset and resiliency of secondary school pupils: A preliminary mixed methods study. *Educational Psychology*, 32(5), 641–655. <https://doi.org/10.1080/01443410.2012.675646>
- Dweck, C. (2015). Carol Dweck revisits the growth mindset. *Education Week*, 35(5), 20–24.
- Dweck, C. S. (1986). Motivational processes affecting learning. *American Psychologist*, 41(10), 1040. <https://doi.org/10.1037/0003-066X.41.10.1040>
- Dweck, C. S. (2000). *Self-theories: Their role in motivation, personality and development*. Psychology Press.
- Dweck, C. S. (2006). *Mindset: The new psychology of success*. Random House.
- Faul, F., Erdfelder, E., Lang, A.-G., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods*, 39(2), 175–191. <https://doi.org/10.3758/BF03193146>
- Gonida, E., Kiosseoglou, G., & Leondari, A. (2006). Implicit theories of intelligence, perceived academic competence, and school achievement: Testing alternative models. *The American Journal of Psychology*, 119(2), 223–238. <https://doi.org/10.2307/20445336>
- Good, C., Aronson, J., & Inzlicht, M. (2003). Improving adolescents' standardized test performance: An intervention to reduce the effects of stereotype threat. *Journal of Applied Developmental Psychology*, 24(6), 645–662. <https://doi.org/10.1016/j.appdev.2003.09.002>
- Halvorson, H. G. (2011, Jan 27). *The trouble with bright girls*. The Science of Success. <https://www.psychologytoday.com/gb/blog/the-science-success/201101/the-trouble-bright-girls>.
- Heyder, A., & Kessels, U. (2013). Is school feminine? Implicit gender stereotyping of school as a predictor of academic achievement. *Sex Roles*, 69(11–12), 605–617. <https://doi.org/10.1007/s11199-013-0309-9>
- Heyder, A., & Kessels, U. (2017). Boys don't work? On the psychological benefits of showing low effort in high school. *Sex Roles*, 77(1–2), 72–85. <https://doi.org/10.1007/s11199-016-0683-1>
- Hochanadel, A., & Finamore, D. (2015). Fixed and growth mindset in education and how grit helps students persist in the face of adversity. *Journal of International Education Research*, 11(1), 47–50. <https://doi.org/10.19030/jier.v11i1.9099>
- Hong, Y., Chiu, C., Dweck, C., Lin, D. & Wan, W. (1999). Implicit theories, attributions and coping: a meaning system approach. *Journal of Personality and Social Psychology*, 77(3), 588–599. <https://doi.org/10.1037/0022-3514.77.3.588>
- Hoy, M. B., Fernandez, K., & Hoyle, R. H. (2011). Academic-contingent self-worth and the social monitoring system. *Personality and Individual Differences*, 50(1), 59–63. <https://doi.org/10.1016/j.paid.2010.08.022>

- Jackson, C., & Nyström, A. S. (2015). 'Smart students get perfect scores in tests without studying much': Why is an effortless achiever identity attractive, and for whom is it possible? *Research Papers in Education*, 30(4), 393–410. <https://doi.org/10.1080/02671522.2014.970226>
- Josephs, R. A., Markus, H. R., & Tafarodi, R. W. (1992). Gender and self-esteem. *Journal of Personality and Social Psychology*, 63(3), 391–402. <https://doi.org/10.1037/0022-3514.63.3.391>
- Juvonen, J., & Murdock, T. B. (1995). Grade-level differences in the social value of effort: Implication for self-presentation tactics of early adolescents. *Child Development*, 66(6), 1694–1705. <https://doi.org/10.2307/1131904>
- LaFontana, K. M., & Cillessen, A. H. (2010). Developmental changes in the priority of perceived status in childhood and adolescence. *Social Development*, 19(1), 130–147. <https://doi.org/10.1111/j.1467-9507.2008.00522.x>
- Li, Y., & Bates, T. C. (2020). Testing the association of growth mindset and grades across a challenging transition: Is growth mindset associated with grades? *Intelligence*, 81, 101471. <https://doi.org/10.1016/j.intell.2020.101471>
- Matteucci, M. C., Tomasetto, C., Selleri, P., & Carugati, F. (2008). Teacher judgments and pupils' causal explanations: Social valorization of effort-based explanations in school context. *European Journal of Psychology of Education*, 23(4), 421–432. <https://doi.org/10.1007/BF03172750>
- Orosz, G., Péter-Szarka, S., Bóthe, B., Tóth-Király, I., & Berger, R. (2017). How not to do a mindset intervention: Learning from a mindset intervention among students with good grades. *Frontiers in Psychology*, 8, 311. <https://doi.org/10.3389/fpsyg.2017.00311>
- Paunesku, D., Walton, G. M., Romero, C., Smith, E. N., Yeager, D. S., & Dweck, C. S. (2015). Mind-set interventions are a scalable treatment for academic underachievement. *Psychological Science*, 26(6), 784–793. <https://doi.org/10.1177/0956797615571017>
- Ruble, D. N., Parsons, J. E., & Ross, J. (1976). Self-evaluative responses of children in an achievement setting. *Child Development*, 47(4), 990–997. <https://doi.org/10.2307/1128435>
- Rusillo, M., & Arias, P. (2004). Gender differences in academic motivation of secondary school students. *Electronic Journal of Research in Educational Psychology*, 2(1), 97–112. <https://doi.org/10.17220/ijpes.2020.02.019>
- Schmidt, J. A., Shumow, L., & Kackar-Cam, H. Z. (2017). Does mindset intervention predict students' daily experience in classrooms? A comparison of seventh and ninth graders' trajectories. *Journal of Youth and Adolescence*, 46(3), 582–602. <https://doi.org/10.1007/s10964-016-0489-z>
- Sisk, V. F., Burgoyne, A. P., Sun, J., Butler, J. L., & Macnamara, B. N. (2018). To what extent and under which circumstances are growth mind-sets important to academic achievement? Two meta-analyses. *Psychological Science*, 29(4), 549–571. <https://doi.org/10.1177/0956797617739704>
- Smith, L., Sinclair, K., & Chapman, E. (2002). Students' goals, self-efficacy, self-handicapping and negative affective responses: An Australian senior school student study. *Contemporary Educational Psychology*, 27(3), 471–485. <https://doi.org/10.1006/ceps.2001.1105>
- Thompson, T. (1993). Characteristics of self-worth protection in achievement behaviour. *British Journal of Educational Psychology*, 63(3), 469–488. <https://doi.org/10.1111/j.2044-8279.1993.tb01072.x>
- Warrington, M., Younger, M., & Williams, J. (2000). Student attitudes, image and the gender gap. *British Educational Research Journal*, 26(3), 393–407. <https://doi.org/10.1080/01411920050030914>
- Yeager, D., Walton, G., & Cohen, G. L. (2013). Addressing achievement gaps with psychological interventions. *Phi Delta Kappan*, 94(5), 62–65. <https://doi.org/10.1177/003172171309400514>