Teachers Use of Fear Appeals Prior to a High-stakes Examination: Is Frequency

Linked to Perceived Student Engagement and How Do Students Respond?

Abstract

Prior to high-stakes examinations teachers use messages that focus on the importance of avoiding failure (fear appeals). This study examined whether teacher use of fear appeals was related to their perceptions of student engagement, followed by students' interpretation of fear appeals, and how they related to student-reported engagement. Teachers used more frequent fear appeals when they perceived student engagement to be low. More frequent fear appeals resulted in stronger challenge and threat appraisals. A challenge appraisal was associated with greater, and a threat appraisal with lower, behavioural and emotional engagement. Student appraisal seems to determine the effectiveness of these messages.

Keywords: Fear appeals, challenge, threat, engagement, behavioural engagement, emotional engagement.

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1. Introduction

High-stakes school leaving examinations are a feature of many educational systems (Nichols & Berliner, 2007; Office of Qualifications and Examinations Regulation, 2012). The outcomes of these examinations can have profound bearing on the subsequent life trajectory of students and, increasingly, are being used as indicators of teacher effectiveness (Allensworth, 2005; Carnoy, 2005; Jacob, 2005; von der Embse, Schoemann, Kilgus, Wicoff, & Bowler, 2016). It is, therefore, not surprising that teachers, and other school personnel, communicate to students the value and importance of these examinations and the implications of success and failure; these messages convey a potentially potent motivational quality. Extant research has focused on messages used prior to high-stakes examinations that focus on the importance of avoiding failure, those factors that determine how students interpret these messages, and what effects they might have on students. Understanding of the factors that might impact on why teachers use these messages is presently limited. The present study addressed this limitation by examining how teachers' perceptions of student engagement related to the use of teacher messages, subsequent student appraisal of those messages, and student-reported engagement.

1.1 What Are Fear Appeals?

Fear appeals are persuasive messages that highlight the negative consequences of a particular course of action, and how those consequences can be avoided with an alternative course of action (Maloney, Lapinksi, & Witte, 2011; Witte, & Allen, 2000). They have been most commonly used, and researched, in promoting health-conscious behaviours such as smoking cessation, safe sex practices, and UV protection in sunlight (Peters, Ruiter, & Kok, 2012; Ruiter, Kessels, Peters, Kok, 2014). The goal of the fear appeal is to create an adaptive

fear of the negative outcome in order to motivate an alternative course of action (Popova, 2012). The past decade has also seen fear appeals researched in an educational context used prior to high-stakes examinations. In this context, teachers and school managers, communicate to students in lessons and assemblies the negative consequences of failure on high stakes examinations for one's future life trajectory (e.g., continued study and training, employment opportunities), and one's sense of self-worth, as a means to motivate students to engage in those behaviours (e.g., effort, persistence, and participation) likely to enhance chances of success (e.g., Author & Author, 2009; Author & Author, 2016).

1.2 How Frequently are Fear Appeals Used?

Author and Author (2012) surveyed 230 secondary school teachers about the types of messages they used prior to the high-stakes school leaving examination used in English schools (the General Certificate of Secondary Education: GCSE). Results showed 51.7% of respondents agreed, and 29.9% of respondents strongly agreed, that students should be reminded that they would fail if they did not complete coursework and revision; 56% of respondents agreed, and 11.5% of respondents strongly agreed, that students should be reminded that they would not get college or university places if they failed. Furthermore, when asked to report their typical use of fear appeals, both teacher- and student-reports suggest that in Years 10 and 11, during the GCSE programme of study, on average, teachers use fear appeals fairly regularly (Author, Author, & Author, 2014). The use of fear appeals would therefore seem to be relatively widespread prior to high-stakes examinations and worthy of investigation.

1.3 What is Student Engagement?

Student engagement is a metaconstruct that is used to describe and capture the range of behaviours, cognitions, and emotions, that contribute to successful completion of, and performance on, educational programmes of study (Fredericks, Blumenfeld, & Paris, 2004;

Jimerson, Campos, & Gried, 2003; Reschly & Christenson, 2012). In this study we draw on the classic two-component model of student engagement comprising behavioural and emotional engagement (Finn, 1989; Finn & Zimmer, 2012). Emotional engagement is a sense of belonging, and valuing of one's lessons and other school activities; indicators include interest and enjoyment (e.g., Appleton, Christenson, Kim, & Reschly, 2006; Fredricks, McColskey, Meli, Mordica, Montrosse, & Mooney, 2011; Fredricks & McColskey, 2012). Behavioural engagement refers to active participation and involvement in one's lessons and other school activities; indicators include on-task behaviours and persistence on challenging tasks (e.g., Appleton et al., 2006; Fredricks et al., 2011; Fredricks & McColskey, 2012).

1.4 Why Might Teachers Use Fear Appeals More or Less Frequently?

The classroom and instructional behaviours of teachers are subject to a wide range of influences, including experience, pedagogical and subject knowledge, self-efficacy, and expectations of their students (e.g., Coe, Aloisi, Higgins, & Elliot, 2014; Good & Brophy, 2000; Kyriakides, Creemers, & Antoniou, 2009; Morris-Rothschild & Brassard, 2006; Struyven, Dochy, & Janssens, 2010; Wolters, & Daugherty, 2007). Specifically, when teachers perceive their students to be less engaged, they use instructional behaviours that are more controlling, coercive, and directive. For instance, external observers rated physical education teachers as using a more controlling instructional style with students they perceive to be less motivated (Sarrazin, Tessier, Pelletier, Trouilloud, & Chanal, 2006). Similarly, elementary school teachers report using more coercive behaviours, and less autonomy support, when they perceive their students to be less behaviourally engaged (Skinner & Belmont, 1993).

If teachers do not perceive their students to be engaged in tasks particularly when those might adversely impact on students' chances of success, (as is typically the case with a programme of study leading to a high-stakes examination), it is plausible to suggest that

teachers might warn students of the consequences of their actions (i.e. use fear appeals).Indicators of behavioural enjoyment are overt and tangible, whereas indicators of emotional engagement are private experiences that are necessarily harder for observers to judge accurately (see Appleton et al., 2006; Urhahne, Chao, Florineth, Luttenberger, & Paechter, 2011). Therefore, a more pronounced relationship might be expected between teacher perceptions of low behavioural engagement and the more frequent use of fear appeals, than for teacher perceptions of low emotional engagement.

1.5 What Impact Do Fear Appeals Have on Students?

Author and Symes (2014, 2016) propose that the impact of fear appeals on educational outcomes depends on how they are interpreted. Fear appeals can be interpreted as a challenge or as a threat, depending on the importance afforded to success or failure by the student, and the belief that they are capable (or not) of performing those behaviours required to avoid failure (or attain success). A challenge appraisal arises when the student values success and believes that, with effort, failure can be avoided and success attained (Symes & Author, 2016; Author, Author, & Author, 2015). Challenge is growth and mastery-focused and accompanied by positive emotions, such as optimism, and positive behavioural intentions (e.g., Hijzen, Boekaerts, & Vedder, 2007; McCarthy, 2011; Shiota, Neufeld, Yeung, Moser, & Perea, 2011). Accordingly, a challenge appraisal leads to gains in values, competence beliefs, and student engagement (Author, Author, & Author, 2015; Author, Author, Author, Author, Author, & Author, 2016).

A threat appraisal arises when the student values success but does not believe failure can be avoided (Author & Author, 2014a). Valued aspirations and/ or self-worth are threatened, accompanied by negative emotions, such as anxiety, and avoidance-orientated behaviours (e.g., Covington, 2000, 2009; Meijen, Jones, McCarthy, Sheffield & Allen, 2013; Roseman, 2013). Accordingly, a threat appraisal leads to greater test anxiety, a performance-

avoidance goal to avoid performing worse than one's classmates, and lower intrinsic motivation, engagement, and examination scores (Author et al., 2016; Author & Author, 2014b; Author & Author, 2011a, 2011b).

1.6 More Frequent Fear Appeals Lead to Greater Challenge and Threat Appraisals

Studies have reported that more frequent fear appeals, made by teachers, are associated with stronger challenge *and* threat appraisals (e.g., Author et al., 2014; 2016). Although the mechanism is not wholly clear, it seems likely that fear appeals prompt a student to reflect on the judgements that underpin challenge and threat appraisals; their perceived value or importance and whether the student believes they are capable of performing those behaviours required to attain success (or avoid failure). Judgements become more salient when prompted more frequently. Indeed, evidence from the positive education literature suggests that prompting students to identify and reflect on their strengths serves to reinforce and enhance student's self-esteem and self-worth (e.g., Oades, Robinson, Green, & Spence, 2011; Sin & Lyubomirsky, 2009; Waters, 2011). Sadly, the opposite may also be true. Prompting students to reflect on a belief that they are not capable of success could serve to reinforce and entrench that belief too.

1.7 Aims of the Present Study

Although the relationship between student appraisal of fear appeals and student engagement has been established in previous work (Author et al., 2016), studies have yet to establish if teachers use fear appeals more frequently when they perceive their students to be lacking engagement. This link is examined in the present study at the first wave of data collection (T_1) where we use teacher-reported student engagement and frequency that fear appeals were used. The second wave of data collection (T_2) focuses on student-reported appraisal of fear appeals and engagement. In bringing the two waves of data collection together in a single analytic model, we examine the indirect relationship from teacher

perceptions of student engagement to subsequent student engagement, via teacher use of fear appeals and their appraisal as challenging or threatening (see Figure 1).

[Figure 1 here]

Students were following the eighteen-month GCSE programme of study, taken over the final two years of compulsory secondary schooling in England. GCSE grades can, and do, influence access to job opportunities and access to further educational opportunities. Without minimum GCSE pass grades in mathematics and English, educational and job opportunities for young people are extremely limited (Perryman, Ball, Maguire, & Braun, 2011). We focus on a single subject, mathematics. This is partly due to it being a compulsory subject, hence increasing the potential sample size, and partly due to the high-stakes nature of mathematics. Accordingly, to ensure appropriate level of domain-specificity, all measures used in the study were mathematics-specific. Since gender differences have been reported in mathematics (e.g., Barkatsas, Kasimatis, & Gialamas, 2009; Watt, 2006), and the frequency and appraisal of fear appeals may differ across the final two years of compulsory schooling, gender and Year Group were included as covariates.

The following hypotheses were tested:

H_1: Teachers who perceive students to be less engaged will use more frequent fear appeals. This relationship will be stronger for behavioural engagement.

H_2: More frequent use of fear appeals will be associated with stronger challenge and threat appraisals.

H_3: Stronger challenge appraisal will be associated with greater student-reported engagement and stronger threat appraisal will be associated with lower student-reported engagement.

2. Method

2.1 Participants

The participants in this study were 2061 students in their final two years of compulsory secondary education and 49 teachers who were responsible for their mathematics education. In the student sample, there was a roughly even balance of gender ($n = 1043$ male students, $n = 984$ female students, $n = 34$ not reported) and Year Group ($n = 1108$ Year 10 students, $n = 952$ Year 11 students, $n = 1$ not reported) with a mean age of 14.6 years ($SD = .62$). The majority of students were from a Caucasian background ($n = 1667$) and smaller numbers from Black ($n = 39$), Asian ($n = 221$), other ($n = 56$), and mixed heritage backgrounds ($n = 66$), with $n = 12$ not reported. Approximately 10.9% of the sample ($n = 223$) were eligible for free school meals, a proxy for low income ($n = 22$ not reported).

Students were clustered into 109 classes ($M = 18.9$ students per class) for their mathematics instruction from six English secondary schools. In the teacher sample ($n = 49$) there was a roughly even split of gender ($n = 23$ male, $n = 26$ female) with a mean age of 39.9 years ($SD = 11.2$). The ethnic heritage of teachers was predominantly Caucasian ($n = 44$) with smaller numbers from Black ($n = 1$) and Asian ($n = 4$) backgrounds. Teachers may have been responsible for instruction in more than one class. This was most commonly one Year 10 and one Year 11 class, however, a small number of teachers were responsible for teaching two Year 10 or Year 11 classes.

2.2 Measures

    2.2.1 Behavioural and emotional engagement. T_1 teacher-reported, and T_2 student-reported, behavioural and emotional engagement were measured using twelve items from the *Engagement vs. Dissatisfaction with Learning Questionnaire* (Skinner, Kindermann, & Furrer, 2009). For T_1 teacher-reported engagement, three items each were taken from the teacher-report version of the behavioural (e.g., 'In my class, the students work as hard as they can') and emotional (e.g., 'In my class, the students seem to enjoy their work) engagement subscales. Items were adapted to refer to a whole class rather than a specific student (as per

the original scales). For T_2 student-reported engagement, three items each were taken from

the student-report version of the behavioural (e.g., 'I participate in the activities and tasks in

my GCSE maths class') and emotional (e.g., 'I enjoy learning things in GCSE maths')

engagement subscales. All items were adapted to specifically refer to GCSE mathematics[1].

Participants responded to items on a five-point scale (1 = strongly disagree, 3 = neither agree

nor disagree, 5 = strongly agree) such that a higher score represented stronger teacher-

reported or student-reported engagement. The internal reliability and validity (construct and

predictive) of data using the full and shortened versions of these scales have been reported in

the literature (Skinner & Chi, 2012; Skinner, Furrer, Marchand, & Kinderman, 2008; Skinner

et al., 2009). In the present study, acceptable internal reliability (Cronbach's $\alpha >.7$) was

shown for both teacher- and student-reported subscales (see Table 1).

      2.2.2 Fear appeals frequency and appraisal. T_1 teacher-reported frequency of fear

appeals and T_2 student-reported challenge and threat appraisal were measured using nine

items from the *Teacher's Use of Fear Appeals Questionnaire* (Author & Author, 2014) in

which all items were adapted to be specific to GCSE mathematics. Three items were used to

measure the frequency with which the teacher used fear appeals (e.g., 'How often do you tell

your class that unless they work hard they will fail Maths GCSE?'), three items were used to

measure student-reported challenge appraisal (e.g., 'Does it make you want to pass GCSE

maths when your teacher tells you that unless you work hard you will fail?'), and three items

were used to measure student-reported threat appraisal (e.g., 'Do you feel worried when your

teacher tells you that unless you work hard you will fail your maths GCSE?'). Participants

responded to items on a five point scale (1 = never, 3 = sometimes, 5 = most of the time),

such that a higher score represents more frequently used fear appeals by the teacher, or a

stronger challenge/ threat appraisal by the student. In previous research, the internal

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[1] In the UK mathematics is colloquially referred to as maths.

reliability and validity (construct and predictive) of data collected using these scales have

been demonstrated (e.g., Author & Author, 2014; Author, Author, & Author, 2014).

Acceptable internal reliability (Cronbach's $\alpha > .7$) was shown in the present study for teacher-

reported frequency and student-reported appraisal (see Table 1).

2.3 Procedure

Data for T_1 teacher-reported engagement and frequency of fear appeals were collected

early on in the first term of the school year (October). Teachers completed a separate set of

questionnaires for each Year 10 and Year 11 mathematics class they taught during a subject

team meeting. Data for T_2 students-reported engagement and appraisal of fear appeals were

collected four months later (January), in the second term of the school year. Students

completed questionnaires in the period of the school day used for pastoral and administrative

purposes so as not to interfere with usual instruction. Student questionnaires were

administered by the regular form tutor and thus were not completed in the presence of their

regular mathematics teacher. The form tutors read out standardized instructions that included

the purpose of the study, ethical details (participation was voluntary, how to withdraw data,

and so on), and which emphasised that the questionnaires were not a 'test'. An abbreviated

form of these instructions was provided on the front cover of the questionnaires. Written

ethical consent was provided by the Head Teachers (or Principals) of the participant schools

and participants (teachers and students). For students, passive parental consent was also

sought.

3. Results

3.1 Descriptive Data and Statistics

Descriptive data and statistics are reported in Table 1. Data were, in the main,

normally distributed. T_1 teacher-reported fear appeals frequency showed a slight positive

skew and T_2 student-reported behavioural engagement showed slight leptokurtosis. Factor

loadings, generated from the measurement model described below were acceptable ($\lambda \geq .52$).

Intraclass reliability coefficients (σ_I), were generated from empty multilevel models (i.e.,

with no predictors) to partition the variance into between- and within-mathematics class

components. The proportion of between-class variance was large for T_2 student-reported

behavioural and emotional engagement ($\sigma_I = .09 - .10$) and substantial for T_2 student-reported

challenge and threat appraisals ($\sigma_I = .19 - .21$).

3.2 Measurement Model and Bivariate Correlations

A measurement model was built using teacher-reported behavioural engagement,

emotional engagement, and frequency of fear appeals (three items per construct) at T_1 and

student-reported behavioural engagement, emotional engagement, and the appraisal of fear

appeals as challenging or threatening (also three items per construct) at T_2. Residual variance

for challenge and threat items with the same referent specified in the wording (failure in

general, continuing college education, and entering the labour market) were allowed to

correlate. A confirmatory factor analysis was used to assess the properties of this

measurement model. In M*plus,* version 7.3 (Muthén & Muthén, 2012), the maximum-

likelihood estimator (MLR) with robust standard errors was used to account for the slight

non-normal distributions of T_1 teacher-reported fear appeals frequency and T_2 student-

reported behavioural engagement. The complex/ cluster commands were used to adjust

standard errors for the between-class variance in T_2 student-reported engagement and student-

reported appraisals.

A number of model fit indices, provided in the M*plus* output, can be used in

conjunction with inspection of residuals, factor loadings, and other descriptive information, to

guide model fit and/ or misspecification. Model fit indices include the root mean square error

of approximation (RMSEA), standardized root means square residual (SRMR), comparative

fit index (CFI), and the Tucker-Lewis index (TLI). Although criteria for the interpretation of

these indices as providing a 'good' fit to the data (e.g., RMSEA/ SRMR ≤ .05 and CFI/ TLI ≥ .95) are widely used, these values should be interpreted as guidance rather than rigid 'rules' (Heene, Hilbert, Draxler, Ziegler, & Bühner, 2011; Marsh, Hau, & Grayson, 2005; Marsh, Hau, & Wen, 2004). The measurement model appeared to show a good fit the data, $\chi^2(165) = 256.49$, $p < .001$; RMSEA = .018, SRMR = .046; CFI = .964, and TLI = .954, and a check of factor loadings (see Table 1), residuals, and modification indices showed no obvious evidence of model misspecification.

[Table 1 here]

A model with gender (0 = male, 1 = female) and Year Group (0 = Year 10, 1 = Year 11) were added as covariates, to generate latent bivariate correlations, was on the cusp of a good fit: $\chi^2(193) = 336.80$, $p < .001$; RMSEA = .021, SRMR = .047; CFI = .944, and TLI = .927. Latent bivariate correlations, estimated using the STDYX command in M*plus* are reported in Table 2. T_1 teacher-reported behavioural engagement was negatively correlated with T_1 teacher-reported fear appeals frequency. T_1 teacher-reported fear appeals frequency was positively correlated with T_2 student-reported challenge and threat appraisals. T_2 student-reported challenge appraisal was positively correlated with T_2 student-reported behavioural and emotional engagement. T_2 student-reported threat appraisal was negatively correlated with T_2 student-reported emotional engagement. T_1 teacher-reported behavioural and emotional engagement, T_2 student-reported behavioural and emotional engagement , and T_2 student-reported challenge and threat appraisals, were all positively intercorrelated.

3.3 Structural Equation Modelling

A structural equation model (SEM) was used to test the linkages presented in Figure 1. These included paths from T_1 teacher-reported behavioural and emotional engagement to T_1 teacher-reported fear appeals frequency, T_1 teacher-reported fear appeals frequency to T_2 student-reported challenge and threat appraisals, and finally from T_2 student-reported

challenge and threat appraisals to T_2 student-reported behavioural and emotional engagement. Gender (0 = male, 1 = female) and Year Group (0 = Year 10, 1 = Year 11) were included as covariates. Analyses were conducted in M*plus* version 7.3 using the MLR estimator, the complex/ cluster commands to control for clustering effects, and the SDTYX command to generate standardised coefficients. The SEM showed a reasonable fit to the data, $\chi^2(203) =$ 361.74, $p <$.001; RMSEA = .021, SRMR = .066; CFI = .939, and TLI = .924, with no obvious sources of misspecification.

3.3.1 T_1 Teacher-reported behavioural and emotional engagement to T_1 teacher-reported fear appeals frequency.

T_1 teacher-reported fear appeals frequency was predicted by T_1 teacher-reported behavioural engagement (β = -.72, $p <$.001), but not T_1 teacher-reported emotional engagement (β = .44, p = .22).

3.3.2 T_1 teacher-reported fear appeals frequency to T_2 student-reported challenge and threat appraisals.

T_1 teacher-reported fear appeals frequency predicted T_2 student-reported challenge (β = .31, $p <$.001) and threat (β = .38, $p <$.001) appraisals.

3.3.3 T_2 student-reported challenge and threat appraisals to T_2 student-reported behavioural and emotional engagement.

T_2 student-reported challenge appraisal predicted greater T_2 student-reported behavioural (β = .53, $p <$.001) and emotional (β = .40, $p <$.001) engagement. T_2 student-reported threat appraisal predicted lower T_2 student-reported behavioural (β = -.35, $p <$.001) and emotional (β = -.39, $p <$.001) engagement.

3.3.4 Covariates: Gender and year group.

Female students reported higher T_2 threat appraisal (β = .16, p <.001) and T_2 behavioural engagement (β = .09, p =.009), and lower T_2 emotional engagement (β = -.06, p =.03). Year 11 students reported higher T_2 behavioural engagement (β = .12, p =.008). Coefficients for all other covariates were not statistically significant (ps >.05).

3.3.5 Indirect relations from T_1 teacher-reported engagement and emotion to T_2 student-reported engagement. Indirect relationships were assessed by creating 95% confidence intervals (CIs) around the standardised coefficient in M*plus*. CIs that do not cross zero are statistically significant ($p < .05$). The indirect paths from T_1 teacher-reported behavioural engagement to T_2 student-reported behavioural engagement , via T_1 teacher-reported fear appeals frequency and T_2 student-reported appraisals, were negative for a challenge appraisal, $\beta = -.119$, SE $= .049$, 95% CIs [-.038, -.200] and positive for a threat appraisal, $\beta = .095$, SE $= .045$, 95% CIs [.021, .017]. The indirect paths from T_1 teacher-reported behavioural engagement to T_2 student-reported emotional engagement , via T_1 teacher-reported fear appeals frequency and T_2 student-reported appraisals, were negative for a challenge appraisal, $\beta = -.090$, SE $= .038$, 95% CIs [-.028, -.153], and positive for a threat appraisal, $\beta = .105$, SE $= .049$, 95% CIs [.024, .186]. The indirect paths from T_1 teacher-reported emotional engagement to T_2 student-reported behavioural and emotional engagement were not statistically significant the 95% CIs crossed zero.

4. Discussion

The aim of this study was to examine if fear appeals used by secondary school teachers, prior to a high-stakes school leaving mathematics examination, were related to perceptions of low student engagement, and how the subsequent appraisal of messages by students linked to student-reported engagement. Data were collected over two waves. Teacher-reported student engagement and frequency of fear appeals were collected in the first wave and student-reported appraisal and engagement in the second wave. Results showed that teachers reported using more frequent fear appeals in classes they perceived to be low in behavioural engagement. The likelihood of a fear appeal being appraised as both a challenge and as a threat by the student was increased when fear appeals were used more frequently by the teacher. A challenge appraisal was linked to higher behavioural and emotional

engagement whereas a threat appraisal was linked to lower behavioural and emotional engagement. An indirect relationship was established from teachers' perception of behavioural engagement to subsequent student-reported behavioural and emotional engagement; positive through a threat appraisal and negative through a challenge appraisal.

The hypothesis that teachers would use fear appeals more frequently when they perceived low student engagement (H_1) was partially supported. A link was established from low behavioural engagement to more frequent use of fear appeals, but not from low emotional engagement to more frequent use of fear appeals. Rather than the relationship between teacher perceived emotional engagement and frequency of fear appeals use being weaker than for teacher perceived behavioural engagement, as we anticipated, the relationship was negligible. This would seem to tally with the proposition that teachers' judge student engagement primarily on overt and tangible indicators, such as on-task behaviour, rather than private experiences such as interest and enjoyment. Indeed, research has shown that teachers find it difficult to accurately judge the emotional and motivational states of their students (Auger, 2004; Givvin, Stipek, Salmon, & MacGyvers, 2001; Urhahne et al., 2011). This may be partly as students may choose not to publically disclose their motivations and emotions in classroom environments (Jackson, 2006, 2013) and partly as secondary school teachers may not have sufficient time to develop trusting relationships in which students could disclose personal feelings (Gregory & Ripski, 2008).

The hypothesis that more frequent fear appeals would be associated with greater challenge and threat appraisals (H_2) was supported. Although this tallies with previous findings (e.g., Author et al., 2014, 2016), at first sight this finding might appear contradictory; challenge and threat appraisals have differing foci and outcomes. The threat of failure, however, is not uniformly detrimental, and for some individuals can be a powerful motivating force (see Pekrun, 2006; Pekrun & Perry, 2006). Fear appeals are proposed, then,

to be a prompt for reflecting on the values highlighted in the fear appeal (e.g., academic success in its own right, getting a college place, and so on) and beliefs about one's capacity to attain success (e.g., academic self-efficacy, expectancy of success, buoyancy and so on). If one values academic success and holds strong competence beliefs, repeatedly reflecting on these, as prompted by the fear appeal, serves to enhance the growth and mastery-focused mindset characterised by a challenge appraisal. However, if one values academic success but does not hold strong competence beliefs, repeatedly reflecting on these, serves to enhance the self-protective and avoidance-focused mindset characterised by a threat appraisal.

The hypothesis that challenge would lead to greater, and threat to lower, behavioural and emotional engagement (H_3) was supported. This tallies with previous findings linking the appraisal of fear appeals to engagement (Author et al., 2016), motivation (Author & Author, 2014b), and values and beliefs (Author et al., 2015). It is also consistent more generally with findings from the adjacent educational psychology literature showing that mastery foci, and positive emotions facilitate engagement whereas avoidance-focused intentions and negative emotions undermine engagement (e.g., Gonida, Voulala, & Kiosseoglou, 2009; Lau, Liem, & Nie, 2008; Liew, Lench, Kao, Yeh, Kwock, 2014; McGregor & Elliot, 2002; Reschly, Huebner, Appleton, & Antaramian, 2008). Individual differences in challenge and threat appraisal, therefore, determine whether a fear appeal, made prior to a high-stakes examination, is associated with educational gains or losses.

Indirect relationships were also shown from the teacher perception of student behavioural engagement to subsequent student-reported behavioural and emotional engagement. The relationship was negative when the fear appeals were appraised as a challenge; teachers perceived low behavioural engagement, used more fear appeals, students appraised them as a challenge, and students subsequently reported greater behavioural and emotional engagement. The relationship was positive when the fear appeals were appraised

as a threat; teachers perceived low behavioural engagement, used more fear appeals, students appraised them as a threat, and students subsequently reported lower behavioural and emotional engagement. This represents an important link by showing how teachers' behaviour in response to low student engagement (their increased use of fear appeals) has differential relations with student-reported engagement depending on how students appraise those fear appeals. It would therefore appear to be a risky strategy; working well for those making challenge appraisals, but not for those making threat appraisals.

4.1 Study Limitations

Although we tested a process model that linked teacher perceptions and behaviours to subsequent student appraisals and student perceptions, we were not able to control for autoregressive relationships. For instance, would teachers' perception of low engagement predict increased use of fear appeals over and above the variance accounted for by their prior use of fear appeals? A related point is that teacher perceptions and behaviour were both measured at the same time point, and student appraisals and perceptions were also measured at the same, albeit later, time point. It is necessary to measure teacher use of fear appeals in close proximity to their perceptions of student engagement, as their behaviours are likely to change in response to levels of student engagement. Similarly, it is necessary to measure student appraisals and engagement in relatively close proximity as any change in appraisals would likely impact on engagement very quickly. Nonetheless, it would assist a more formal test of mediation if short temporal spaces were inserted between teacher perceptions and behaviours, and between student appraisals and perceptions. Despite these limitations, this study represents an important step in linking teacher use of fear appeals to their perception of class characteristics, and then how those relate to subsequent student appraisals and engagement.

4.2 Educational Implications

Results are of relevance to both trainee and in-service teachers, to those responsible for educating teachers and providing professional development for in-service teachers, as well as other school professionals (counsellors and psychologists). The principal question is whether teachers should be using fear appeals or not. The answer is not straightforward. Our results suggest that they can be effective, but only if students appraise them as a challenge. If appraised as a threat, they will not only be ineffective, they will also be damaging. As we note earlier, this would make them a high-risk strategy to use. This is especially the case if used with a whole class which will inevitably contain a range of stronger and weaker competence beliefs. It is also not the case that fear appeals would be more effective in high ability classes as students' beliefs about competence are, in part, judged against their peers (e.g., Bong & Skaalvik, 2003; Wigfield & Eccles, 2002). It is possible that fear appeals could be adaptive if used with individual students who were likely to make a challenge appraisal (i.e. those with high value and competence beliefs). However, as we have already commented on in this article, teachers may not be able, for good reasons, to accurately judge the internal motivational states of students. There is no guarantee that targeting individuals, rather than groups, would result in beneficial outcomes.

4.3 Conclusion

In this study we show that teachers are more likely to use fear appeals when they perceive students are less behaviourally engaged. This, in turn, links to higher student engagement when students appraise fear appeals as a challenge, and lower student engagement when appraised as a threat. Thus, an indirect link can be established from teachers' perceptions to subsequent student engagement through fear appeals frequency and appraisal. Fear appeals can result in educational gains (i.e., higher engagement), if appraised as a challenge, however we would argue that this is a high-risk strategy.

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Table 1

Descriptive data for T_1 teacher-reported engagement and frequency of fear appeals use, and T_2 student-reported engagement and the appraisal of fear appeals as challenging or threatening.

	Mean	SD	α	σ_I	Skewness	Kurtosis	Factor Loadings
T_1 Teacher-reported Behavioural Engagement	2.54	.98	.79	—	.36	-.60	.52 –.83
T_1 Teacher-reported Emotional Engagement	2.47	.94	.84	—	.77	.20	.70 –.97
T_1 Teacher-reported Fear Appeals Frequency	2.10	1.01	.79	—	1.06	.71	.71 –.75
T_2 Student-reported Challenge Appraisal	3.44	1.10	.77	.19	-.48	-.55	.70 –.75
T_2 Student-reported Threat Appraisal	2.73	1.16	.84	.21	.17	-.93	.76 –.83
T_2 Student-reported Behavioural Engagement	4.01	.67	.74	.09	-.68	1.08	.66 –.73
T_2 Student-reported Emotional Engagement	3.01	.99	.85	.10	-.12	-.52	.79 –.88

Table 2

Latent bivariate correlations between T_1 teacher-reported engagement and frequency of fear appeals use, T_2 student-reported engagement, the appraisal of fear appeals as challenging or threatening, gender and year group.

	1.	2.	3.	4.	5.	6.	7.	8.	9.
1. T_1 Teacher-reported Behavioural Engagement	—	.83***	-.35*	-.13	-.22*	.19**	.18***	.02	.09
2. T_1 Teacher-reported Emotional Engagement		—	-.08	-.12	-.18	.15*	.12*	.01	.11
3. T_1 Teacher-reported Fear Appeals Frequency			—	.34***	.36***	-.09	-.05	.01	-.01
4. T_2 Student-reported Challenge Appraisal				—	.65***	.32***	.16***	.07	-.03
5. T_2 Student-reported Threat Appraisal					—	.01	-.12**	.16***	-.07
6. T_2 Student-reported Behavioural Engagement						—	.53***	.06	.14**
7. T_2 Student-reported Emotional Engagement							—	-.10***	.09
8. Gender								—	—
9. Year Group									—

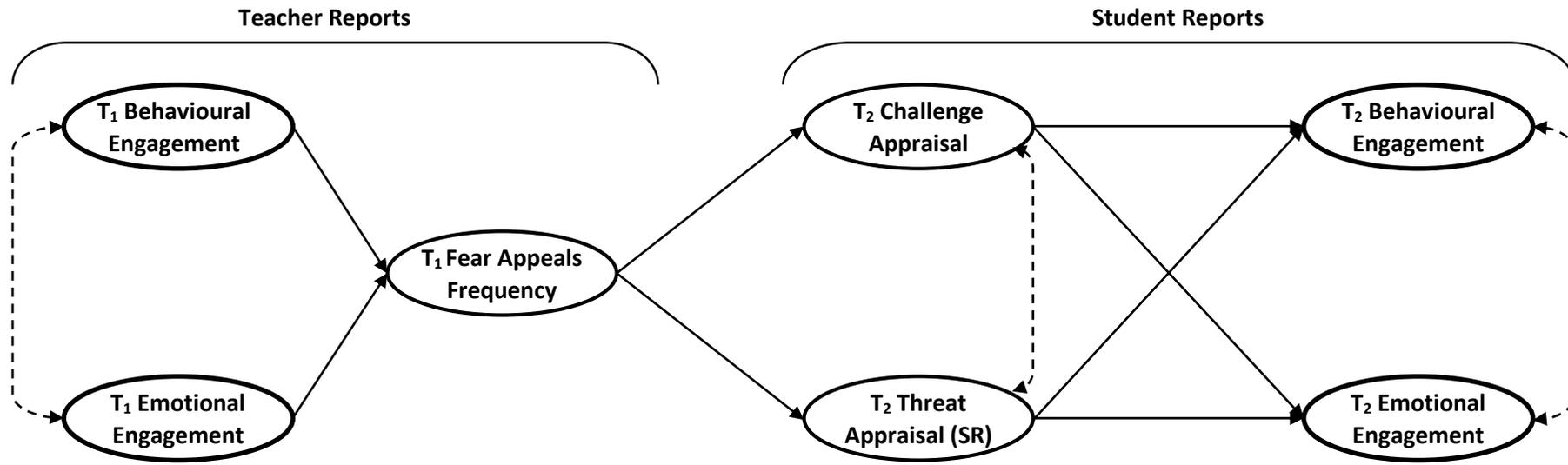*$p \leq .05$, **$p \leq .01$, ***$p \leq .001$

Figure 1. The hypothesised model showing linkages from teacher perceptions of student engagement (behavioural and emotional) to the frequency of fear appeals, from the frequency of fear appeals to student's appraisal of fear appeals, and from the appraisal of fear appeals to student-reported engagement.
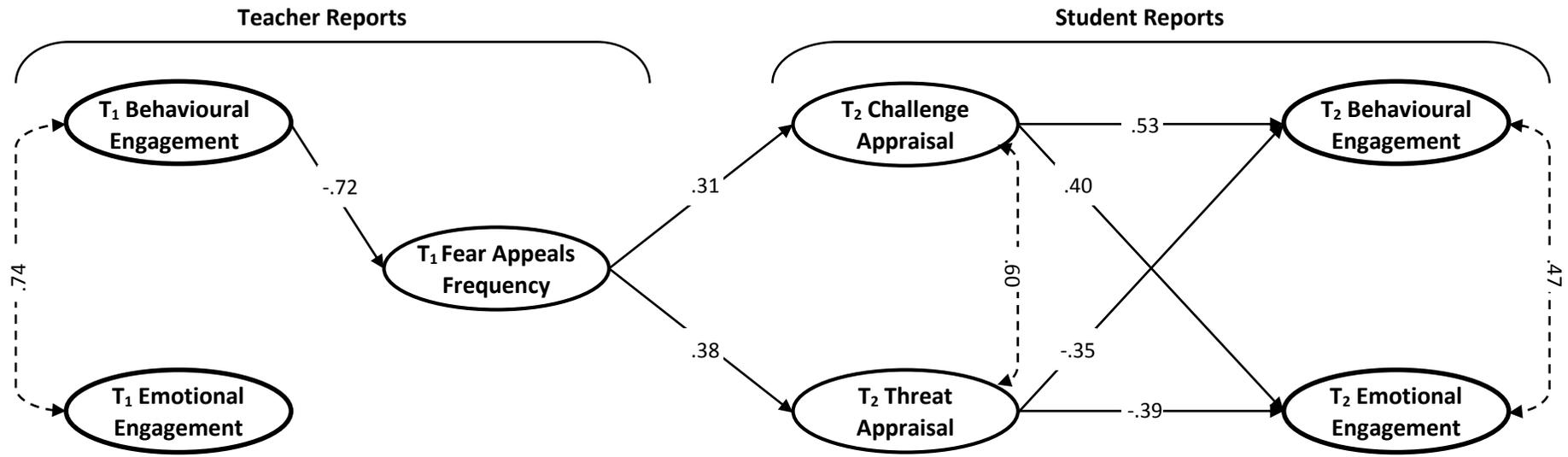
Figure 2. The SEM showing statistically significant linkages from teacher perceptions of behavioural engagement to the frequency of fear appeals, from the frequency of fear appeals to student's appraisal of fear appeals, and from the appraisal of fear appeals to student-reported engagement (behavioural and emotional).