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**The Impact of Fear Appeals on Subjective-task Value and Academic Self-efficacy: The
Role of Appraisal**

Abstract

Previous studies have shown that when appraised as threatening, fear appeals (messages that highlight the negative consequences of failure) are related to more negative emotions, maladaptive motivations, and lower grades. This study asks the question whether subjective-task values, academic self-efficacy are differentially related to challenge as well as threat appraisals of fear appeals. Data were collected from 923 students preparing for a high-stakes secondary school leaving examination and analyzed using structural equation modeling. Fear appeals were positively related to subjective-task values and academic self-efficacy when appraised as challenging and negatively related when appraised as threatening. The effectiveness of fear appeals as a motivational strategy depends on how they are interpreted and understood by the student. Teachers require training to be able to judge which messages are likely to be effective for which students.

Keywords: Fear appeals, subjective-task value, academic self-efficacy, threat, challenge

The Impact of Fear Appeals on Subjective-task Value and Academic Self-efficacy: The Role of Appraisal

1.0 Introduction

A number of reviews have documented how teacher behavior and instructional style can have a profound influence on student learning as well as achievement-related values, beliefs, and goals (e.g., Pianta, Hamre, & Allen, 2012; Reeve, 2009; Urdan & Schoenfelder, 2006; Wubbels & Brekelmans, 2005). In this study we examine teacher messages used prior to high-stakes examinations that communicate to students the importance and value of these examinations by highlighting the consequences of failure (Putwain & Roberts, 2009; Putwain & Symes, 2014). These communications are referred to as fear appeals. Previous research has shown that, when appraised as threatening, fear appeals are related to a number of educational outcomes including a higher performance-avoidance goal (to avoid performing worse than one's classmates), higher test anxiety, and lower test scores (e.g., Putwain & Symes, 2011a; Putwain & Best, 2011). In the present study this line of research is extended in two ways. First, we examined how fear appeals relate to students' academic self-efficacy (ASE) and their subjective task values (STV). Second, we examined challenge as well as threat appraisals. It was anticipated that fear appeals would show positive relationships with ASE and STV when appraised as a challenge and negative relationships when appraised as a threat.

1.1 Messages Used Prior to High-stakes Examinations

Prior to high-stakes examinations, teachers, and other school staff, communicate various messages to students. Some of these, such as official school communications, contain largely administrative information, such as the time, date, and venue of the examination. However, teachers may also communicate other messages about the value, importance, and worth of examinations through their instructional dialogue (Banks & Smyth, 2015; Hall,

Collins, Benjamin, Nind, & Sheehy, 2004; Gulek, 2003; Putwain, Connors, Woods, Nicholson, 2012). These messages are used to highlight how failure can lead to subsequent negative life opportunities (e.g., difficulty in finding a job or continuing in education or training) as a motivational tactic to encourage students to engage with their studies (Putwain & Roberts, 2009). Fear appeals have been more widely studied in the health communications literature to investigate, among others, smoking cessation, safe sex practices, and use of skin protection in the sun (Maloney, Lapinski, & Witte, 2011; Peters, Ruiters, & Kok, 2013). Fear appeals are designed to show how one course of action can lead to negative consequences and how these can be avoided with an alternate course of action (Ruiters, Kessels, Peters, & Kok, 2014; Witte, & Allen, 2000). It would appear that fear appeals are also used relatively frequently prior to high-stakes examinations. In one study, between 32% and 81%, of secondary school teachers agreed or strongly agreed with the use of fear appeals, depending on the strength of the appeal, (Putwain & Roberts, 2012).

1.2 How are Fear Appeals Appraised?

Putwain and Symes (2014) propose a model of fear appeals appraisal that focuses on two judgments: The personal meaning or importance of the fear appeal and on one's resources or options for responding effectively to the demand made in the fear appeal. Judgments over the personal meaning of the message are likely to be on the basis of STV. Three STVs are outlined in Eccles and colleagues expectancy value theory (e.g., Eccles, 2005, 2007; Eccles, O'Neill, & Wigfield, 2005; Wigfield, Tonks, & Klauza, 2009). These are intrinsic value (a task is interesting and enjoyable), attainment value (success is an important element of self-identity), and utility value (the task contributes to short or long-term goals or aspirations). If a student has high attainment or utility value they are likely to perceive the fear appeal as a personally meaningful message. Low attainment or utility value would likely result in the fear appeal being disregarded or ignored. Intrinsic value is unlikely to influence

whether a fear appeal is deemed to be meaningful; the likelihood of success or failure does not necessarily pose a risk to task interest or enjoyment.

If the message was deemed personally meaningful, judgments over one's capacity to respond effectively would determine whether a challenge or threat appraisal was most likely. These judgments would be primarily based on action-control expectancies, or ASE: the belief that one can successfully perform a task (Bandura, 1997; Schunk & Pajares, 2002). A challenge appraisal would follow from high ASE and a threat appraisal from low ASE. A challenge appraisal is a mastery-focused mindset that is accompanied by positive emotions (such as hope), and results in approach-orientated cognitions and behaviors (such as engagement). Threat appraisal is focused on self-worth protection, accompanied by negative emotions (such as anxiety), and results in avoidance-orientated cognitions and behaviors (such as strategic withdrawal of effort, or de-valuing achievement). Studies have supported the theorized roles of STV and ASE in the appraisal of fear appeals using experimental (Putwain & Symes, 2016), cross-sectional (Putwain, Remedios & Symes, 2014; Symes & Putwain, 2016; Symes, Putwain, & Remedios, 2015), and longitudinal designs (Putwain & Remedios, 2014a).

The distinction between approach-avoidance motivation (e.g., Elliot, 2008) has been incorporated into some of the major theoretical frameworks that seek to account and explain academic motivation including achievement goals (e.g., Elliot, 2005, 2008; Elliot & Church, 1997) and regulatory focus (e.g., Molden, Lee, & Higgins, 2008; Molden & Rosenzweig, 2016). The appraisal of a fear appeal would most likely act as a proximal antecedent of approach- or avoidance-orientated emotions, cognitions, and behaviors (Putwain & Woods, 2016). All things being equal, a challenge appraisal would elicit an approach motivation such as a mastery-approach goal (to develop one's task or self-referenced competence) and a promotion-approach regulatory focus (the opportunity to attain a positive outcome); a threat

appraisal would elicit a performance-avoidance goal (see Putwain & Symes, 2011b) and a prevention-avoidance regulatory focus (to secure avoiding a negative outcome).

1.4 STV and ASE as Outcomes of Appraisals

Putwain, Remedios, and Symes (2015) extended the appraisal model to include a feedback loop from STV and ASE to challenge and threat appraisals. That is, STV and ASE are outcomes as well as antecedents of appraisals (i.e., a bidirectional relationship between appraisals and STV/ ASE). The results of a longitudinal study over three waves of data collection showed that challenge appraisal predicted higher subsequent attainment value and ASE, and threat appraisal predicted lower subsequent attainment value and ASE, while controlling for prior variance in attainment value and ASE. While this study provided evidence of a feedback loop from appraisals to attainment value and ASE, it did not examine the possibility of relations between appraisals and utility value. Like attainment value, it would be expected that a challenge appraisal reinforces one's belief to respond effectively to the demand made in the fear appeal whereas a threat appraisal reinforces the belief that one cannot respond effectively. The likely outcome is for a challenge appraisal to be related to higher utility value and for a threat appraisal to be related to lower utility value as a form of self-worth protection (see Loose, Régner, Morin, & Dumas, 2012; Réneger & Loose, 2006).

Furthermore, although intrinsic value is not posited as an antecedent of fear appeal appraisals, it is likely to be an outcome. Previous studies have shown that intrinsic value and interest correlate positively with a mastery goal orientation (Harackiewicz, Durik, Barron, Linnenbrink-Garcia, & Tauer, 2008; Hulleman, Durik, Schweigert, & Harackiewicz, 2008), and with achievement emotions such as enjoyment, and negatively with anxiety (Ainley & Ainley, 2011; Stöeber, Feast, & Hayward, 2009). Accordingly, the mastery orientation and positive emotions that characterize a challenge appraisal are likely to relate positively to

intrinsic value. Conversely, the self-protection focus and negative outcomes that characterize a threat appraisal would likely relate negatively to intrinsic value.

A particular limitation of Putwain et al.'s (2015) study was that frequency of fear appeals used by the teacher was not included. Therefore, it was not possible to examine the indirect relationship of fear appeals to STV and ASE, mediated by challenge and threat appraisals, and address whether fear appeals are leading to adaptive educational outcomes. Consistent with evidence from the social psychology literature that repetitive persuasive messages are more impactful (e.g., Cacioppo & Petty, 1989; Garcia-Marques & Mackie, 2001; Moons, Mackie, & Garcia-Marques, 2009), increased frequency of fear appeals, used by a classroom teacher, is associated with a greater challenge and threat appraisal (Putwain et al., 2014). The repetition of the judgments, self-reflective processes and emotions that accompany the appraisal of fear appeals (e.g., see Oades, Robinson, Green, & Spence, 2011; Sin & Lyubomirsky, 2009; Waters, 2011) would result in differential outcomes depending on whether a challenge or threat appraisal was made. More frequent fear appeals would link positively to STV and ASE when mediated by a challenge appraisal and would link negatively to STV and ASE when mediated by a threat appraisal.

1.5 Aim of the Present Study

The aim of the present study was to examine how the relationships between fear appeals, used by a classroom teacher prior to a high-stakes examination, and STV and ASE differ depending on whether the fear appeal is appraised as a challenge or a threat. Relations were examined using structural equation modeling (SEM) and diagrammed in Figure 1. In addition to the paths from challenge and threat appraisal to STV and ASE, paths were also included from fear appeals to STV and ASE to examine the possibility that there are direct paths in addition to, or instead of, indirect paths mediated by appraisals. Importantly, we

control for the autoregressive, and cross-lagged, relations that might arise from prior STV and ASE.

Although not the main focus of this study, this also allows for paths from STV and ASE, as antecedents, to appraisals. Theoretically speaking STV and ASE would be expected to interact in predicting challenge and threat appraisals. Interactions, however, were not investigated in the present study. This was partly to avoid introducing additional complexity into the analytic model and partly as the main aim of this was to examine relations from fear appeals, and their appraisal, to STV and ASE. Gender and year group were included as covariates. These were not included in Figure 1 for simplicity.

[Figure 1 here]

Fear appeals were examined in the context of the examinations taken at the end of secondary schooling in England, Wales, and Northern Ireland: the General Certificate of Secondary Education (GCSE). Students typically follow an eighteen-month program of study over Years 10 and 11 in between eight and ten subjects (English and mathematics are compulsory). These are *prima facie* high-stakes examinations for students (Denscombe, 2000). Minimum pass grades are typically required for any form of post-compulsory education (academic, technical, or vocational) and for entry to the labor market (Onion, 2004; Roberts, 2004). To facilitate generalizability, the study did not focus on a single academic subject and included a variety of different subjects studied for GCSE: English, mathematics, science, modern foreign languages, and humanities. To ensure a high-degree of domain specificity, participants completed measures about a single GCSE subject only, and all measures were made specific to this subject. The following hypotheses were tested:

H₁: A challenge appraisal will positively relate to STV and ASE; a threat appraisal will negative relate to STV and ASE.

H₂: More frequent fear appeals will relate positively to challenge and threat appraisals.

H₃: More frequent fear appeals will relate to STV and ASE positively, when mediated by challenge appraisals, and negatively when mediated by threat appraisals.

2.0 Method

2.1 Participants

At the first wave of data collection the participants were $n = 923$ students in their final year of secondary schooling (Year 11), with a mean age of 15.2 years ($SD = .68$), and following the program of study leading to the school exit examinations (GCSE). There was a relatively even gender split (male $n = 443$, female $n = 480$). The ethnic heritage of participants was white Caucasian ($n = 806$), Asian ($n = 47$), Black ($n = 26$), other backgrounds ($n = 18$), and dual heritage backgrounds ($n = 26$). Two participants did not disclose their ethnic background. Students were clustered into 42 classes for their instruction, with a mean of 21.9 students per class. From the first to second wave of data collection attrition was 10.5%. Missing data were subsequently handled using Full Information Maximum Likelihood in the *Mplus* software.

2.2 Measures

STV was measured using the version of the *Michigan Study of Adolescent Life Transitions* scales (Eccles et al., 2005) adapted by Putwain and Remedios (2014a). All items were made specific to GCSE and the subject that students completed measures in relation to. Three items were used to measure intrinsic value (IV: e.g., 'In general, I find GCSE English lessons...very boring/ very interesting'), three items used to measure attainment value (AV: e.g., 'How important is it to you to get good grades in GCSE English?') and three items were used to measure utility value (UV: e.g., 'How useful is learning GCSE English for getting a job or going to college?'). Participants responded on a five-point scale of 1 – 5 (1 = very boring/ not important, 3 = neither, 5 = very interesting/ very important). On this metric a higher score represents higher IV, AV, or UV.

Three items were selected from the *Motivated Strategies for Learning Questionnaire* (Pintrich & DeGroot, 1990) to measure academic self-efficacy. Items were selected on the basis of their face validity; that they referred to action-control beliefs about the likelihood of achieving success in their GCSE. All items were made specific to the GCSE subject that students complete measures in relation to (e.g., ‘I think I will receive a good grade in my English GCSE’). Participants responded on a five-point scale of 1 – 5 (1 = strongly disagree, 3 = neither, 5 = strongly agree). On this metric a higher score represents higher ASE.

The frequency of fear appeals used by teachers, and their appraisal, was measured using the *Revised Teachers Use of Fear Appeals Questionnaire* (Putwain & Symes, 2014) in which all items were made subject-specific to the class that they were completed in relation to. The frequency that teachers were perceived to use fear appeals (e.g., ‘How often does your teacher tell you that you will find it difficult to get a good job if you fail GCSE English?’), challenge appraisal (e.g., ‘Do you want to make an effort to pass GCSE English when your teacher tells you that you need to attain at least a grade C to get into college or 6th form?’) or threat appraisal (e.g., ‘Do you feel worried when your teacher tells you that English GCSE is important in order to get a good job?’) were measured with three items each. Participants responded on a five-point scale of 1 – 5 (1 = strongly disagree, 3 = neither, 5 = strongly agree). On this metric a higher score represents a perception that teachers used more frequent fear appeals and that fear appeals were appraised as more challenging and threatening.

2.3 Procedure and Data Collection

Teachers, rather than whole schools, were initially invited to participate in the study through professional networks. Teachers then selected one of their Year 10 or 11 classes and students in that class were invited to complete the student version of the questionnaires. We did not invite teachers of particular subjects to participate, resulting in a wide range of subject

domains. The subject that questionnaires were completed in relation to was determined by the subject taught by participating teachers. The first point of data collection (T_1) was early on during the Autumn term and the second point of data collection (T_2) was shortly after students return from school after the winter break (the school year in England runs from September to July). Student questionnaires were administered by their teacher who followed a script that explained the purpose of the study, covered ethical considerations (such as anonymity and the right to withdraw), that the study was not a 'test', and that it was appropriate to ask for help with reading if required.

3.0 Results

3.1 Preliminary Analyses

3.1.1 Descriptive statistics.

The descriptive characteristics of study variables are reported in Table 1. Internal reliability coefficients were all acceptable (Cronbach's $\alpha \geq .70$) and, with the exception of attainment value, all data were normally distributed (skewness and kurtosis < 1). Attainment value at both T_1 and T_2 was high resulting in a positively skewed, leptokurtic, distribution. Intraclass correlation coefficients (or ICC_1 – see Lüdtke, Robitzsch, Trautwein & Kunter, 2009) represent the proportion of variance that is attributable to the class level. These indices show that 10 – 33% of the variance in ASE and STV at T_1 , 11 – 27% of the variance in ASE and STV at T_2 , and 19 – 36% of the variance in fear appeals frequency and appraisal was attributable to the classroom level. Factor loadings, from the measurement model described below, all showed satisfactory standardized loadings ($\lambda > .4$) on their target factors. An approach to modelling data is required that is robust to violations of normality and capable of accounting for the clustered nature of the data structure.

[Table 1 here]

The reliability of shared perceptions can be established using the interclass correlation statistics, referred to as ICC₂, where estimates $>.7$ are considered as acceptable (Lüdtke et al., 2009). The ICC₂ estimate for consequence reminders was .97 showing that the shared perceptions of fear appeals within a classroom were highly reliable. In subsequent analyses, fear appeals were aggregated by class.

3.1.2 Measurement model.

A measurement model was built and examined in *Mplus* 7.3 (Muthén & Muthén, 2012) using the MLR estimator to account for the non-normal distribution of attainment value and the complex/ cluster commands to adjust standard errors for the clustering of data at the class level. Residuals variance was allowed to correlate between corresponding pairs of ASE and STV items at T₁ and T₂ and also between pairs of T₂ challenge and threat items referring to the same domain (failure in general, continuing education and finding a job). *Mplus* output reports the following model fit indices: χ^2 statistic, Root Mean Square Error of Approximation (RMSEA), the Standardized Root Mean Square Residual (SRMR), Comparative Fit Index (CFI), and the Tucker Lewis Index (TLI). Good fitting models can be expected show a RMSEA of $\leq .05$, a SRMR of $\leq .08$, and CFI and TLI $\geq .95$ (Marsh, Hau, & Grayson, 2005; Marsh, Hau, & Wen, 2004). By these criteria, the measurement model showed a good fit to the data: $\chi^2(422) = 1227.02$, $p < .001$, RMSEA = .037, SRMR = .046, CFI = .950, TLI = .937. Standardized factor loadings, reported in Table 1, were estimated using the STDYX command in *Mplus*. Latent bivariate correlations from the measurement model (also estimated using the STDYX command) are reported in Table 2.

[Table 2 here]

Positive intercorrelations were shown between fear appeals, challenge appraisal and threat appraisal, and between ASE and STV (at both T₁ and T₂). Challenge appraisal was positively correlated with ASE and STV at both T₁ and T₂. Threat appraisal was negatively

correlated with ASE and IV and positively correlated with AV and UV at both T₁ and T₂ (although the relation with T₂ IV was $p > .05$). The frequency of fear appeals was unrelated to ASE and STV with the exception of negative correlations with IV at both T₁ and T₂.

3.2 Structural Equation Modeling

A SEM was built and examined in *Mplus* 7.3 using the MLR estimator and the cluster/ complex commands. Gender (0 = male, 1 = female) was included as a covariate and the same correlations between pairs of residual variance as specified in the measurement model. The SEM showed a reasonable to good fit to the data: $\chi^2(470) = 1332.31, p < .001$, RMSEA = .037, SRMR = .045, CFI = .942, TLI = .926. Standardized coefficients were estimated using the STDYX command in *Mplus*. It is notable that STVs and appraisals showed strong covariance which could possibly result in multicollinearity biasing model parameters. Simulations suggest multicollinearity is negligible when a large sample size is high, a relatively high proportion of variance are explained by latent constructs ($R^2 = .59 - .70$ for the present study), and internal reliability is adequate (Grewal, Cote, & Baumgartner, 2004). Since large the magnitude to beta coefficients in the SEM did not deviate substantially from latent bivariate correlations we would cautiously conclude that multicollinearity did not greatly influence SEM parameters.

3.2.1 Paths from T₂ fear appeals to T₂ appraisals and T₂ ASE and STV.

An increased frequency of T₂ fear appeals was associated with greater T₂ challenge appraisal ($\beta = .34, p < .001$) and greater T₂ threat appraisal ($\beta = .41, p < .001$). Direct paths from the frequency of T₂ fear appeals to T₂ ASE and STV were not statistically significant (ASE: $\beta = .01, p = .70$, IV: $\beta = -.03, p = .40$, AV: $\beta = -.01, p = .79$, UV: $\beta = -.04, p = .38$).

3.2.2 Paths from T₂ appraisals to T₂ ASE and STV.

Stronger T₂ challenge appraisal was associated with greater T₂ ASE ($\beta = .24, p < .001$), T₂ IV ($\beta = .30, p < .001$), T₂ AV ($\beta = .24, p < .001$) and T₂ UV ($\beta = .33, p < .001$). Stronger T₂ threat

appraisal was associated with lower T₂ ASE ($\beta = -.21, p <.001$), T₂ IV ($\beta = -.16, p =.02$), T₂ AV ($\beta = -.14, p =.02$) and T₂ UV ($\beta = -.21, p <.001$).

3.2.3 Indirect paths from T₂ fear appeals to T₂ ASE and STV via T₂ appraisals.

An increased frequency of T₂ fear appeals was associated with greater T₂ ASE when mediated by a challenge appraisal ($\beta = .08, p <.001$) and lower T₂ ASE when mediated by a threat appraisal ($\beta = -.08, p <.001$). The total indirect path from T₂ fear appeals to T₂ ASE was not statistically significant ($\beta = .01, p =.68$). An increased frequency of T₂ fear appeals was associated with greater T₂ IV when mediated by a challenge appraisal ($\beta = .10, p <.001$) and lower T₂ IV when mediated by a threat appraisal ($\beta = -.07, p =.002$). The total indirect effect was not statistically significant ($\beta = .01, p =.68$). The total indirect path from T₂ fear appeals to T₂ IV was not statistically significant ($\beta = -.02, p =.62$). An increased frequency of T₂ fear appeals was associated with greater T₂ AV when mediated by a challenge appraisal ($\beta = .08, p =.001$) and lower T₂ AV when mediated by a threat appraisal ($\beta = -.06, p =.02$). The total indirect path from T₂ fear appeals to T₂ AV was not statistically significant ($\beta = .01, p =.77$). An increased frequency of T₂ fear appeals was associated with greater T₂ UV when mediated by a challenge appraisal ($\beta = .11, p =.002$) and lower T₂ UV when mediated by a threat appraisal ($\beta = -.09, p =.001$). The total indirect path from of T₂ fear appeals to T₂ UV was not statistically significant ($\beta = .01, p =.88$).

3.2.4 Paths from T₁ ASE and STV to T₂ appraisals.

A stronger challenge appraisal was predicted by higher ASE ($\beta = .24, p <.001$) and higher AV ($\beta = .51, p <.001$), but not IV ($\beta = -.02, p =.77$) or UV ($\beta = .04, p =.69$). A stronger threat appraisal was predicted by lower ASE ($\beta = -.28, p <.001$) and higher UV ($\beta = .20, p =.02$), but not IV ($\beta = -.11, p =.21$) or AV ($\beta = .18, p =.06$).

3.2.5 Stability and cross-lagged paths and covariates.

Stability paths from T₁ ASE and STV to T₂ ASE and STV were all statistically significant (ASE: $\beta = .69, p < .001$, IV: $\beta = .76, p < .001$, AV: $\beta = .67, p < .001$, UV: $\beta = .65, p < .001$). None of the cross-lagged paths were statistically significant ($ps > .05$) with the exception of T₁ IV predicting T₂ ASE ($\beta = .11, p = .005$). Gender was related to T₁ ASE ($\beta = -.14, p = .001$), T₂ challenge appraisal ($\beta = .12, p = .007$), and threat appraisal ($\beta = .14, p < .001$). All other relations with gender were not statistically significant ($ps < .05$).

4.0 Discussion

The aim of the study was twofold. First, to expand on previous research examining links between fear appeal appraisal and subjective task-values (STV), to include intrinsic value (IV), attainment value (AV), utility value (UV), as well as academic self-efficacy (ASE). Second, to test a model whereby fear appeals could relate positively or negatively to STV and ASE, mediated by challenge or threat appraisals, over and above the variance contributed by prior STV and ASE. Results showed that a challenge appraisal was positively related to STV and ASE, whereas a threat appraisal was negatively related to STV and ASE, supporting H₁. A higher frequency of fear appeals was related to a higher challenge and threat appraisal, supporting H₂. Finally, fear appeals positively related to STV and ASE when mediated by a challenge appraisal and negatively related to STV and ASE when mediated by a threat appraisal, supporting H₃. In response to the question of whether fear appeals relate to positive or negative educational outcomes, the findings of this study show it depends on how they are appraised by students.

These findings extend the body of work linking fear appeals, as a motivational strategy used by teachers prior to high-stakes examinations, to educational outcomes, such as motivation, goals, emotions and grades (e.g., Putwain & Symes, 2011a, Putwain & Best, 2011, 2012; Putwain & Remedios, 2014b). In particular, results build on the study by Putwain, Remedios, and Symes (2015) by showing how fear appeals appraisals are not only

related to attainment value, but also to intrinsic and utility value. Furthermore, it was demonstrated that fear appeals were not directly related to STV and ASE but mediated by their appraisal. Fear appeals themselves would therefore appear to be neither a positive nor negative strategy. Their success, or failure, depends on the student who is the recipient of the fear appeal and how their personal values and beliefs about competence and achievement shape their interpretation of that message.

Interventions reported in the positive psychology and positive education literatures have shown that reflecting on one's strengths can help to strengthen confidence and efficacious beliefs (e.g., Oades et al., 2011; Sin & Lyubomirsky, 2009; Waters, 2011). We propose that fear appeals appraisals work in a similar way by prompting self-reflection over one's achievement-related values and beliefs. If a student values mathematics GCSE because, for instance, they aspire to continue their education, and believe that they can succeed, reflecting on these values and beliefs has a re-affirming and reinforcing effect; STV and ASE further increase. However, if a student values mathematics GCSE but does not believe that they can succeed, reflecting on these values and beliefs only serves to reinforce their already low ASE further, and undermines STV as form of self-worth protection (see Anderman, Eccles, Yoon, Roeser, Wigfield & Blumenfeld, 2001; Loose et al., 2012; Réneger & Loose, 2006).

4.1 Study Limitations

The study collected STV and ASE data over two waves. A more robust and sophisticated design would use three, or more, waves to allow for a temporal separation between fear appeals/ appraisals and subsequent STV/ ASE. Nonetheless, our findings represent a useful stepping-stone in showing relations between the appraisal of fear appeals and STV/ ASE over and above autoregressive relations with prior STV/ ASE. Appraisals were defined in this study as having a mastery or self-protective focus, for challenge and

threat respectively, accompanied by emotions (such as hope or anxiety). In this respect, the operationalization of appraisals could be improved. In the version of the questionnaire adapted to measure fear appeals in this study (Putwain & Symes, 2014), challenge items emphasize mastery over positive emotions whereas threat items emphasize negative emotions over self-protection. Future research should explore a more balanced approach and allow for a combination of focus (mastery vs. self-protection) and emotion (positive vs. negative) items. Finally, while a range of different subject domains were included in this study it is not clear the extent to which relations between fear appeal appraisals and STV/ ASE might differ across subject groupings (e.g., science and mathematics subjects vs. arts and humanities subjects). Future research should theorize and test the likely influences of subject domains.

4.2 Implications for Practice

Fear appeals relate to the values and beliefs of students preparing for high-stakes examinations. Relations can be positive or negative depending on how they are appraised. A somewhat utopian vision would be for teachers and instructor to adapt the types of messages they use to the individual characteristics of students, or groups of students. The practicality of this arrangement may not be possible in a typical secondary school classroom and as research has shown teachers may not be an effective judge of students private beliefs, motivations, and emotions (Karing, Dörfler, & Artelt, 2013; Urhahne, Chao, Florineth, Luttenberger, & Paechter, 2011). In order for teachers to be able to provide the most effective message for a particular student, or group of students, they need to be skilled in adopting a student-centered perspective, and understanding how student's beliefs and values can influence their motivation, engagement, and learning. We would therefore advise that greater attention to teacher-student relational support and communication, and the psychology of student motivation, emotion, and engagement is provided during initial teacher education and for the continuing professional development of qualified teachers. Sadly, these 'soft skills' are not

currently reflected in the standards required for qualified teacher status in England (Malmberg, Hagger, Burn, Mutton, & Colls, 2010).

4.3 Conclusion

Fear appeals are neither a positive nor negative motivational strategy for teachers. Relations with educational outcomes depend on how they are interpreted and understood by students. When appraised as a challenge they are positively related to STV and ASE, over and above the prior variance accounted for by prior STV and ASE. When appraised as a threat they are negatively related to STV and ASE, over and above the prior variance accounted for by STV and ASE. The implication is that the effectiveness of the message depends on the beliefs and values of the message recipient. Teachers and instructors need to be supported in developing the skills to be able to understand student's motivation beliefs and values, and to be able to apply this knowledge effectively.

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Table 1*Descriptive statistics for academic self-efficacy, subjective task value, and the appraisal of fear appeals as challenging or threatening*

	Mean	SD	Cronbach's α	ρ_1	Skewness	Kurtosis	Factor Loadings
T ₁ Academic self-efficacy	3.61	.61	.83	.16	-.48	.99	.70 – .82
T ₁ Intrinsic Value	3.05	1.01	.83	.33	-.20	-.63	.73 – .88
T ₁ Attainment Value	4.11	.72	.73	.10	-1.35	2.72	.62 – .69
T ₁ Utility Value	3.55	.93	.76	.14	-.60	-.11	.63 – .84
T ₂ Fear Appeals	2.57	1.13	.78	.36	.30	-.90	.82 – .99
T ₂ Challenge Appraisal	3.31	1.12	.78	.26	-.39	-.65	.71 – .76
T ₂ Threat Appraisal	2.64	1.16	.84	.19	.25	-.91	.77 – .81
T ₂ Academic self-efficacy	3.67	.62	.83	.11	-.34	.89	.72 – .90
T ₂ Intrinsic Value	3.14	.99	.83	.27	-.36	-.53	.76 – .88
T ₂ Attainment Value	4.08	.76	.73	.12	-1.11	1.40	.70 – .76
T ₂ Utility Value	3.57	.95	.76	.15	-.54	-.30	.64 – .86

Table 2*Latent bivariate correlations for ASE and STV (at T₁ and T₂), and the frequency, and appraisal of fear appeals.*

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1. T ₁ Academic self-efficacy	—	.53***	.53***	.45***	-.01	.22***	-.25***	.78***	.46***	.38***	.32***
2. T ₁ Intrinsic Value		—	.65***	.82***	-.27***	.14*	-.13*	.50***	.82***	.52***	.45***
3. T ₁ Attainment Value			—	.57***	-.09	.40***	.11*	.39***	.55***	.79***	.63***
4. T ₁ Utility Value				—	-.01	.35***	.17***	.78***	.51***	.67***	.73***
5. T ₂ Fear Appeals					—	.36***	.51***	-.17**	-.04	-.03	-.04
6. T ₂ Challenge Appraisal						—	.68***	.11*	.26***	.43***	.41***
7. T ₂ Threat Appraisal							—	-.21***	-.09	.11*	.12*
8. T ₂ Academic self-efficacy								—	.57***	.51***	.44***
9. T ₂ Intrinsic Value									—	.68***	.63***
10. T ₂ Attainment Value										—	.80***
11. T ₂ Utility Value											—

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

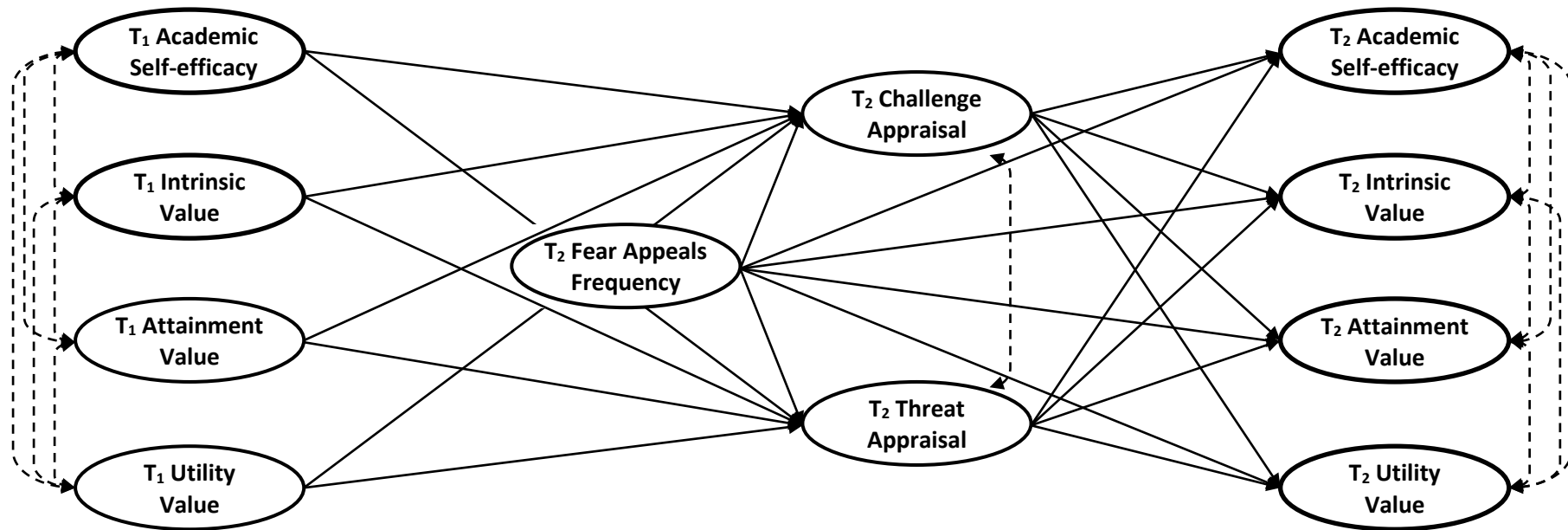


Figure 1. The SEM showing direct paths from T₂ fear appeals to T₂ ASE and AVT, and indirect paths via T₂ challenge and threat appraisal, controlling for T₁ ASE and AVT (for simplicity, paths from T₁ to T₂ ASE and STV are omitted).

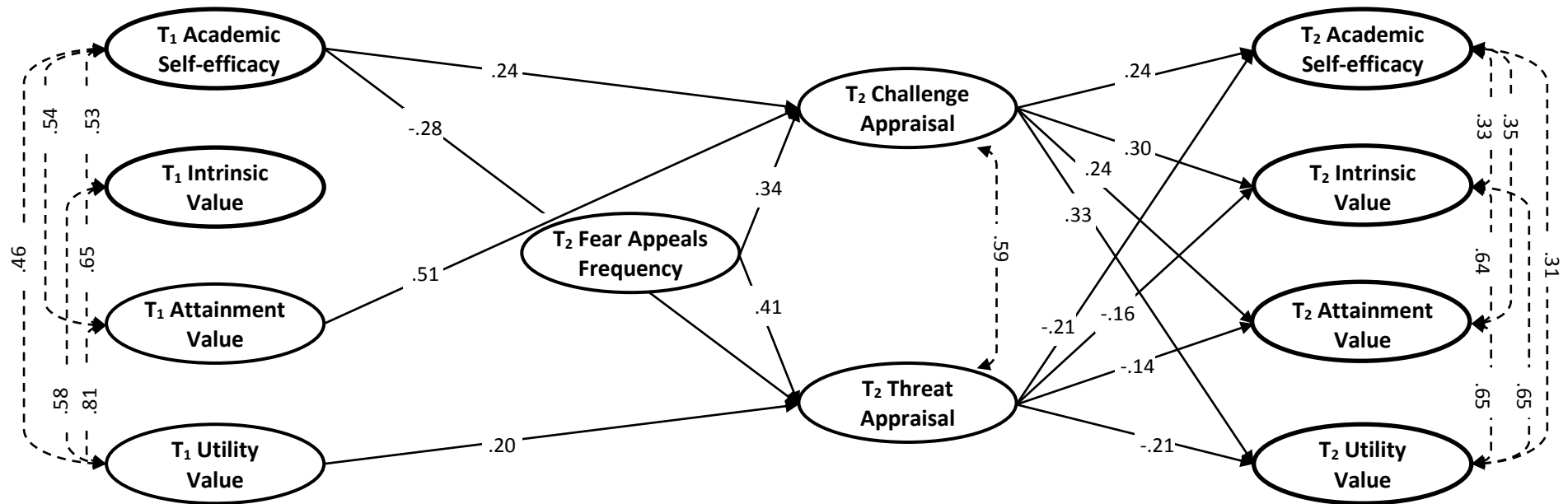


Figure 2. Statistically significant paths from: (a) T₁ ASE and STV and T₂ fear appeals to T₂ challenge and threat appraisal, and (b) T₂ challenge and threat appraisal to T₂ ASE and STV (for simplicity, paths from T₁ to T₂ ASE and STV, and for covariates are omitted).