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ORIGINAL PAPER

The effects of current unsatisfactory performance and evaluative approach on improvement expectancy and commitment to improvement

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Abstract
This study investigated the effects of current unsatisfactory performance (CUP) on improvement expectancy (IE) and commitment to improvement (CTI). 118 high school students were randomly assigned to consider either current satisfactory performance (CSP) or CUP. In addition, students within each group were randomly assigned to one of two evaluative approaches: (1) dichotomous present-focused evaluation ("Are you succeeding in this area? Or not?"), or (2) historical success scaling ("What is the highest level of success that you have reached in this area?"). It was hypothesised that (relative to CSP) CUP has a negative effect on improvement expectancy (IE). This hypothesis was supported. In addition, the data were consistent with an inconsistent mediation hypothesis according to which CUP has a positive direct effect on CTI but a negative indirect effect through reduced IE. The indirect effect of CUP on CTI was expected to be less negative amongst students engaging in historical success scaling than amongst students engaging in dichotomous present-focused evaluation. Although this was indeed the case, a test of moderated mediation indicated that the conditional indirect effects did not differ statistically. The study helps to illuminate the conflicting effects of CUP on CTI. Findings also have important implications for cognitive-behavioural and solution-focused approaches, both of which champion "scaling."

Keywords Unsatisfactory performance · Commitment · Expectancy · Performance heuristic · Inconsistent mediation

Amy is not pleased with her report card—two Cs and two Ds. Bella, on the other hand, is satisfied with hers- three As and one B. Which of the two girls will consider herself more likely to improve? And how *committed* to improvement will each of them be? In one sense, Amy has plenty of room to improve—her Ds could become Cs (or better) and her Cs could become Bs (or better). Bella, however, may be close to a ceiling—three As and one B leave little room for improvement. Surely, therefore, Bella's expectations for improvement will be lower than Amy's. And given that Amy is *dis*-satisfied with her performance (whereas Bella is satisfied), surely Amy will want to improve more than Bella. But perhaps it depends on perspective. For example, if Amy focuses narrowly on current unsatisfactory performance, perhaps she will lose heart and give up. On the other hand, if she takes a moment to recall her highest level of *success*, then perhaps she will have greater expectations of improvement.

Understanding scenarios like the above is essential in education and beyond. The following general questions may be asked:

1. What is the effect of current unsatisfactory performance (CUP) relative to current satisfactory performance (CSP) on commitment to improvement (CTI)?
2. What is the effect of current unsatisfactory performance (CUP) relative to current satisfactory performance (CSP) on improvement expectancy (IE)?
3. To what extent do the effects of CUP on CTI and IE depend on a person's evaluative approach?

The importance of commitment and CTI

Successful goal pursuit depends on commitment (e.g. Hu and Liden 2011; Klein et al. 2013; Locke 1968; Locke and Latham 1990). Within education, commitment is positively

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associated with motivation to learn (Colquitt and Simmering 1998), perseverance and effort (Tang et al. 2019), academic adjustment (Boudrenghien et al. 2013) and academic success (Hollenbeck et al. 1989; Kluger and Koslowsky 1988). Conversely, low levels of commitment have been linked to adolescent delinquency (e.g. Erickson et al. 2000).

An important type of commitment is commitment-to-*improvement* (CTI). Countless sources espouse the view that all students should be expected to improve (e.g. DiRanna et al. 2008; Koselak 2011; Wilson and Conyers 2013). Moreover, commentators argue that educators should cultivate students' CTI. For example, Nixon (2004, p. 115) suggests that an environment should be created "in which all students strive to improve over their previous performance." However, students may be more or less committed to improvement depending on their current performance.

Some studies suggest that successful goal pursuit might lead people to rest on their laurels (e.g. Amir and Ariely 2008). Complacency has been described as a "common correlate of satisfaction" (Audia et al. 2000, p. 840). If so, then perhaps current satisfactory performance (CSP) is inimical to CTI, whereas CUP serves to enhance it. However, others highlight the potentially demoralising effects of CUP (e.g. Haynes Stewart et al. 2011) and/or the inspiring effects of success (e.g. Bandura 1997). Understanding the effects of CUP turns out to be challenging.

The effect of CUP on CTI

It seems natural to suppose that if current performance is "unsatisfactory" then CTI will be high. If Amy is dissatisfied with her current grades then (by definition) she would like them to be better. That is, she attaches *value* to an improvement in her grades. Perceived value is a major determinant of commitment (e.g. Klein 1989; Shah et al. 2003). Amy should therefore be committed to improving her grades (assuming she considers this possible). Various theories support this supposition. For example, discrepancy-feedback or control theories of motivation suggest that individuals instinctively wish to close the gap between current and desired performance (e.g. Campion and Lord 1982; Carver and Scheier 1990). Compared to current *satisfactory* performance (CSP), CUP should therefore be associated with high CTI. Nevertheless, this proposition does not appear to have been tested.

However, research is suggestive. One cross-sectional study revealed that when students saw projects as relevant to their values, greater adversity in project pursuit predicted greater project commitment (Lydon and Zanna 1990). Moreover, several experiments suggest that indications, recollections or experiences of failure can enhance grit, motivation and performance (e.g. Baumeister and Tice 1985; Brunstein and Gollwitzer 1996; DiMenchi and Raymond 2015; Schultheis and Brunstein 2000; Wei and Haubl 2015; Xu et al. 2020). For example, Baumeister and Tice (1985) predicted that students with low self-esteem would be more motivated to improve on anagrams after failure than after success. These students did indeed spend more time on anagrams after failure, suggesting that (relative to CSP) CUP may have enhanced CTI.

Other research, however, suggests that CUP may have the opposite effect. For example, in the first experiment reported by Baumeister and Tice (1985), students with high self-esteem spent *less* time on anagrams after failure (than after success). Thus CUP apparently reduced CTI. Similarly, a recent study suggests that individuals may devalue goals that they are failing to attain (Sjåstad et al. 2020).

Yet other studies suggest that CUP may have varying, conflicting or no overall effects (e.g. Kim and Kim 2020; Swift and Peterson 2018; Venables and Fairclough 2009). For example, Venables and Fairclough (2009) repeatedly gave some students feedback that their performance was improving whilst others were repeatedly informed of a performance decline. The feedback appeared to have no overall effect on the quality of performance. On the one hand, students in the "failure" group initially made more effort to improve (whilst students in the "success" group did not). On the other hand, students in the "failure" group ultimately experienced a more pronounced decline in motivation and by the end of the experiment were on the verge of giving up.

It has been said that "[c]onflicting results characterize the extensive literature on the effects of success and failure on subsequent performance" (Brickman et al. 1976, p.149). Such conflicting results make it difficult to understand how CUP affects CTI. One key factor may be expectancy (e.g. Eberly et al. 2013). That is, "[p]eople's responses to negative-discrepancy feedback are also likely to vary depending on their perceived likelihood of eventually reaching the goal" (Williams et al. 2000, p.164). If Amy is dissatisfied with her grades *but expects to improve them,* then perhaps she will have high CTI. On the other hand, if her expectations of improvement are low, then CTI may suffer as well. However, intriguing research suggests that improvement expectancy is itself affected by current performance.

The effect of current performance on improvement expectancy (IE)

Failure tends to lower (and success tends to raise) goal attainment expectancy (e.g. Feather and Saville 1967; Healy et al. 2015; Zajonc and Brickman 1969). However, expectations for "doing well" must be distinguished from expectations for *improving*. If Bella is currently achieving good grades, she may expect similar grades in the future.

However, there is no obvious reason why she should expect to *improve*. Indeed, improving on grades that are already high might appear rather difficult. Amy, on the other hand, whose grades are currently low might see more potential for improvement. This sort of reasoning suggests that current unsatisfactory performance (CUP) is associated with higher IE than current satisfactory performance (CSP).

And yet research by Critcher and Rosenzweig (2014) suggests the opposite. In their experiments, the better students' most recent performance, the *higher* students' IE. Rather than reasoning that improving on high performance is relatively difficult, students appeared to be relying on a "Performance Heuristic": the better one's most recent performance, the more likely one is to improve. Of course, the study by Critcher and Rosenzweig (2014) has limitations. Experiments involved games of darts and anagrams—unusual activities for students. Moreover, single-session tasks are only one type of performance. "Performance" for a student is more likely to mean *ongoing* performance (e.g. over a school term). Finally, Critcher and Rosenzweig (2014) studied college students. Whether the "Performance Heuristic" is used by high school students is currently unknown. Nevertheless, Critcher and Rosenzweig's (2014) findings suggest that (compared to CSP) CUP may lower IE.

CUP, IE, CTI and inconsistent mediation

As observed, research on failure or CUP has produced mixed results. In some cases CUP appears to enhance CTI (e.g. Schultheis and Brunstein 2000). In other cases it appears to lower it (e.g. Leonard and Weitz 1971). And in yet other cases there appear to be effects in both directions, which may even cancel each other out (e.g. Venables and Fairclough 2009). One key to making sense of this may be *inconsistent mediation* (e.g. MacKinnon et al. 2000). Schultheis and Brunstein (2000) suggests that the experience of failure may have two conflicting effects. On the one hand, failure (or CUP) might lower expectations, which should lead to a reduction in commitment. On the other hand, CUP might motivate individuals to "fight back in the face of failure and try to remedy prior drawbacks" (Schultheis and Brunstein 2000, p.341). CUP might therefore have a negative indirect effect through reduced IE (via the "performance heuristic"), but a positive direct effect (independent of IE). This inconsistent mediation model is depicted in Fig. 1.

As can be seen from Fig. 1, the direct effect of CUP on CTI is hypothesised to be positive. This is the effect of CUP on CTI *controlling for IE*. In our running example, Amy is unsatisfied with her current performance, whereas Bella is satisfied. If they have equal expectations of improvement, then Amy should be more committed to improvement than Bella. This prediction is made by control theories of

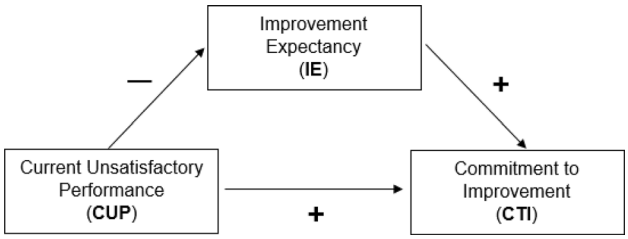

Fig. 1 An inconsistent mediation model presenting hypothesised direct and indirect effects of current unsatisfactory performance (CUP) on commitment to improvement (CTI)

motivation, which posit that individuals wish to eliminate discrepancies between current and desired states (e.g. Carver and Scheier 2011). On the other hand, current *satisfactory* performance (CSP) "provides a sense of partial goal attainment, signaling that less effort is needed to accomplish the goal" (Fishbach et al. 2010, p. 518). CSP might diminish, and CUP might enhance, CTI. Research does indeed suggest that dissatisfaction with current performance leads to greater motivation and effort, if people believe that they can reduce discrepancies (e.g. Bandura and Cervone 1986).

However, if students rely on the "performance heuristic," then (relative to CSP) CUP should lower improvement expectancy. Expectancy is positively associated with commitment (e.g. Bandura 2013; Carver et al. 1979; Colquitt and Simmering 1998). Lower IE should therefore lead to lower CTI. If the direct and indirect effects of X on Y have different signs (as in Fig. 1), they may in fact cancel each other out. As a result, current unsatisfactory performance (CUP) may have no overall effect on commitment-to-improvement (CTI).

Is the effect of CUP on IE/CTI moderated by evaluative approach?

Suppose now that Amy and Bella are both dissatisfied with current performance. Suppose that Amy's evaluative approach is dichotomous and present-focused: "Either I'm succeeding or I'm not. And I'm not." Bella, on the other hand, takes a more nuanced perspective, recalling higher levels of success: "I'm not doing too well right now. But last term I did better." It seems conceivable that Amy's and Bella's IE and CTI will be differentially affected by CUP. Specifically, any negative effects of CUP may be less negative for Bella than for Amy. The present study investigated the effect of encouraging two different evaluative approaches: (1) dichotomous present-focused evaluation, and (2) historical success scaling. These approaches were chosen (primarily) because the first has been considered

especially detrimental whereas the second has been widely championed.

Dichotomous present-focused evaluation

Focusing on the present when the present is unsatisfactory might lead to maladaptive rumination. Rumination on non-goal-attainment can have adverse effects on cognition and affect (e.g. McIntosh 1996). Present-focused thinking in a case of CUP might also blinker students' outlook, leading them to overlook past success. Research indicates that judgements are based not on the totality of one's experiences but on those that are specifically brought to mind (e.g. Schwarz and Clore 1983). Present-focused thinking might bring CUP to mind at the expense of prior success.

"Mental filtering" (i.e. selectively attending to negative experiences) and dichotomous thinking are described as "cognitive distortions" in cognitive-behavioural therapy (CBT) (e.g. Beck et al. 2015; Grant 2010). These distortions are thought to be common amongst adolescents (e.g. Joyce-Beaulieu and Sulkowski 2015; Stallard 2002; Verduyn et al. 2009). Countless commentators deprecate dichotomous thinking, urging individuals to evaluate experience on a continuum (e.g. Corey and Corey 1993; Leahy 2017; Neenan and Dryden 2004; Scioli and Biller 2010; Shafran et al. 2010). Dichotomous thinking is associated with several negative outcomes including maladaptive perfectionism (e.g. Egan et al. 2007), depression (Teasdale et al. 2001), entity (i.e. "fixed" rather than malleable) theories of human ability (Oshio 2012) and the abandonment of tasks in the face of difficulty (He 2016). Dichotomous present-focused evaluation might therefore exacerbate the negative effect of CUP on IE and, therefore, CTI.

Historical success scaling

"Scaling" is widely recommended in CBT and solution-focused approaches (e.g. Beck et al. 2015; Berg and Szabo 2005; Curwen et al. 2018; Jackson and KcKergow 2007). In the present study, historical success scaling was tested, i.e. "On a scale from 0 to 10, what is the highest level of success that you have ever reached in this area?" If individuals recall performance *at its best* (via success scaling), they may see a reason to be optimistic. Imagining oneself at one's best can engender positive expectancies (e.g. Peters et al. 2010). Moreover, recollections of past success can lead to a greater sense of hope, expectation and self-efficacy (e.g. Nelson and Knight 2010; Sharma and Moritz 2016; Snyder et al. 1996). Taking the time to recall previous success might also help students realise that current unsatisfactory performance (CUP) is not permanent. According to attribution theory (e.g. Weiner 1985), expectations for failure/success depend partly on the perceived stability of assumed causes. If students consider (the cause of) CUP to be an unchangeable constant, they are unlikely to expect much improvement. On the other hand, if they can be led to appreciate that CUP is "unstable," IE may be positively affected. Several studies have shown that manipulating attributions in favour of instability does enhance IE (e.g. Anderson 1983; Wilson and Linville 1982).

Dichotomous present-focused thinking might suggest that CUP is "stable" (e.g. Oshio 2012). On the other hand, historical success scaling may highlight instability by reminding people of past success (Lloyd and Dallos 2008). Freeman and Davis (1990, p. 345) suggest that scaling may help individuals "place their current concerns and feelings within a life-referenced context." Many solution-focused commentators therefore assert that (success) scaling has positive effects on hope and expectancy (e.g. Blundo and Simon 2016; O'Connell 2001). If so, then it might mitigate the negative effect of CUP on IE. However, no studies have tested this supposition. This is extremely surprising given the prominence of scaling in CBT and solution-focused

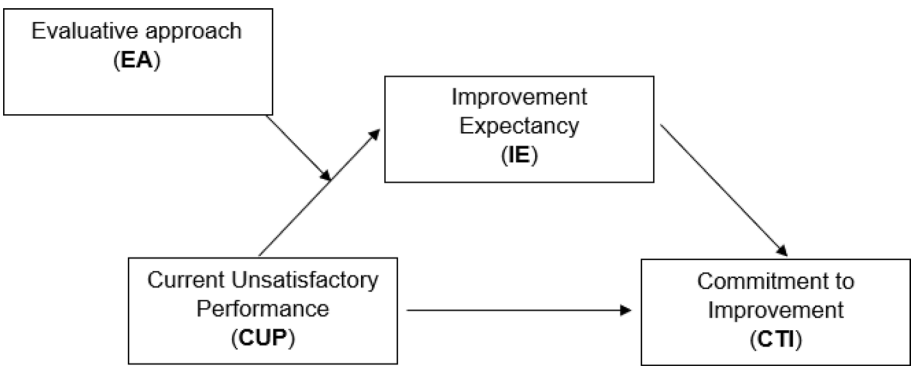

Fig. 2 A moderated mediation model in which Evaluative Approach moderates the effect of Current Unsatisfactory Performance on Improvement Expectancy and Commitment to Improvement

approaches. One hypothesis investigated in the present study was that evaluative approach (dichotomous present-focused evaluation vs. historical success scaling) moderates the effects of CUP on IE and CTI. Figure 2 presents a moderated mediation model that builds on Fig. 1.

The present study

Research suggests that current unsatisfactory performance (CUP) may have conflicting effects on commitment to improvement (CTI). However, previous studies have been limited. First, many experiments have involved experimentally-engineered failure on contrived activities. In one sense, these lack ecological validity. Darts, anagrams and other rigged tasks may tell us little about how individuals operate in the "real world". Moreover, "failure" and "success" are extremes. Amy may consider performance unsatisfactory without deeming it a "failure." It is important to understand how students think about less extreme forms of CUP. In addition, CTI must be measured (directly). Some previous studies have measured the effects of failure on task motivation (e.g. Brunstein and Gollwitzer 1996). However, task motivation is not identical to CTI. In other studies, CTI has been inferred from behaviour. For example, in the experiments reported by Baumeister and Tice (1985), additional time spent on anagrams was taken as evidence of (high) CTI. However, behaviour is best viewed as a *consequence* of commitment rather than as commitment itself (Klein et al. 2013). Direct measures of CTI are therefore necessary. Finally, previous research has focused on college students, largely ignoring high schools.

The present study sought to address the limitations above. CUP and CTI were examined in a more naturalistic context—students' everyday studies. CTI was measured directly and participants were high school students. The following hypotheses were advanced:

H1: (Relative to CSP) CUP has a negative effect on IE: students who consider performance unsatisfactory have lower improvement expectancy than students who consider performance satisfactory (i.e. students rely on the "performance heuristic").

H2: The effect of CUP on IE is moderated by evaluative approach (EA). Specifically, the effect of CUP on IE is *less negative* amongst students engaging in historical success scaling than amongst those engaging in dichotomous present-focused evaluation.

H3: Improvement expectancy (IE) is positively associated with commitment to improvement (CTI).

H4: The indirect effect of CUP on CTI (through IE) is moderated by evaluative approach. Specifically, the indirect effect of CUP on CTI is *less negative* amongst students engaging in scaling than amongst students engaging in dichotomous present-focused evaluation.

H4 effectively follows from H2. Evaluative approach is hypothesised to moderate the indirect effect of CUP on CTI by moderating its effect on IE.

H5: (Relative to CSP) CUP has a positive direct effect on CTI.

Method

Participants

118 female students aged 13–14 (M = 14.09, SD = 0.47) participated in the experiment. Students attended a private female-only high school in London, England. All students gave informed consent. The research was deemed by all relevant school leaders (including the Head teacher) to fall within the range of normal school activities and no significant ethical issues were identified. Parental consent was therefore not required (British Psychological Society 2014). The study was approved by the Ethics committee at Robert Gordon University.

Each participant was randomly assigned to one of four conditions: (1) CUP-with-Scaling ($n = 30$), (2) CUP with-dichotomous-present-focused-evaluation ($n = 30$), (3) CSP-with-Scaling ($n = 28$), or 4) CSP-with-dichotomous-present-focused-evaluation ($n = 30$).

Procedure

Each participant was sent an email with a link to a Google Form. Students completed their forms on school-issued iPads or laptops. Students read the "Participant Information" page and then provided informed consent. Those in the two CSP conditions were asked to identify an area of their studies that was "going fairly well." Students in the two CUP conditions were asked to identify an area that was "not going as well" as they would like. Thereafter the procedure was as follows.

Students in the CUP-with-scaling and CSP-with-scaling conditions read that "success comes in levels." They were asked to reflect on their performance history and indicate on a scale from 0 to 10 the "highest level of success" that they had ever reached in the area that they had identified. Following recommendations for adolescents made by experts in CBT (e.g. Wilkes et al. 1994), a visual representation of the scale was included by presenting the numbers horizontally from 0 (on the far left) to 10 (on the far right). In addition, following the practice of both cognitive-behavioural and solution-focused practitioners (e.g. Berg and Szabo 2005; Leahy 2017), the two ends of the scale were labelled in order

to clarify the continuum. "ZERO success" was written above "0" on the far left of the scale and "TOTAL success" above "10" on the far right.

Students in the groups involving dichotomous present-focused evaluation were asked to focus on their current performance. They were then asked to tick one of two boxes with that performance in mind: "I am succeeding in this area" or "I am NOT succeeding in this area."

After the condition-specific questions, all forms presented students with the questions for the dependent measures (IE and CTI).

Measures

Improvement expectancy (IE)

This was assessed with a three-item measure derived from Huang et al. (2017). The first item was: "How likely is it that you will improve in this area?" A 0–10 response scale was used with higher scores indicating higher improvement expectancy (IE). Internal consistency was good ($\alpha = 0.80$).

Commitment to improvement (CTI)

This was assessed by means of the four-item KUT commitment measure (see Klein et al. 2014). The first item was: "How committed are you to improving in this area?" For each item, a 1–7 response scale was used with higher scores indicating higher commitment to improvement (CTI). Internal consistency was good ($\alpha = 0.88$).

Analytical strategy

Multiple regression was used for all hypotheses and the RQ. Moderation, mediation and moderated mediation analyses were conducted using Hayes' PROCESS Macro for SPSS. The assumptions of independence, normality (assessed by Q-Q plots), linearity and homoscedasticity (assessed by means of a plot of standardised residuals against standardised predicted values) appeared to have been met in all cases. Alpha was set at 0.05 for each test. 95% confidence intervals are presented in square brackets.

Table 1 Improvement expectancy (IE) means and standard deviations

	CSP	CUP
Dichotomous present-focused	6.74 (SD = 1.09)	5.60 (SD = 1.29)
Historical Success Scaling	6.66 (SD = 1.20)	5.69 (SD = 1.15)

CSP Current satisfactory performance; *CUP* Current unsatisfactory performance

Table 2 Commitment to improvement (CTI) means and standard deviations

	CSP	CUP
Dichotomous present-focused	5.33 (SD = 1.10)	5.18 (SD = 1.28)
Historical Success Scaling	5.27 (SD = 1.05)	4.90 (SD = 0.89)

Results

Descriptive statistics

Means and standard deviations for improvement expectancy (Table 1) and commitment to improvement (Table 2) are presented in Tables 1 and 2.

In order to examine the effect of CUP on IE and the possibility of moderation, IE was regressed on current perceived performance (CUP vs CSP), evaluative approach (dichotomous present-focused vs historical success scaling) and their product. The main effect of current unsatisfactory performance CUP on IE was obtained by means of a main effects parameterisation (Hayes 2018). The two levels of current perceived performance—CSP and CUP—were coded as − 0.5 and 0.5 respectively, as were the two levels of evaluative approach—dichotomous present focused thinking and historical success scaling. The overall regression was statistically significant: $F(3,114) = 8.01$, $p < 0.001$, $R^2 = 0.17$.

The effect of CUP/CSP on IE

The coefficient for current perceived performance was statistically significant ($b = -1.07$ [− 1.50, − 0.33], $t = -4.88$, $p < 0.001$). As predicted, students who considered performance unsatisfactory had lower improvement expectancy than students who considered performance satisfactory. Moreover, the estimated effect size was large: $d = 0.90$ [0.52, 1.28]. H1 (which hypothesised a negative effect of CUP on IE) was therefore very much supported.

Evaluative approach as a moderator(?) of the effect of CUP/CSP on IE

The coefficient for the interaction was not statistically significant: $b = 0.16$ [− 0.71, 1.02], $t = 0.36$, $p = 0.72$. The difference between the simple (main) effects of CUP on IE was however in the direction predicted by H2. Amongst students engaging in dichotomous present-focused evaluation the effect of CUP on IE was − 1.14. Amongst students engaging in historical success scaling the effect of CUP on IE was − 0.97. Thus the estimated effect of CUP on IE was

indeed less negative amongst students engaging in scaling than amongst students engaging in dichotomous present-focused evaluation. Nevertheless, as reported, the difference between these simple effects was not statistically significant. Moreover, it was extremely small and (if real) unlikely to be of much practical importance. Thus evidence to support H2 (which hypothesised that the negative effect of CUP on IE is moderated by evaluative approach) was not strong.

For H3, H4 and RQ a moderated mediation model was estimated using Hayes' PROCESS macro (see Hayes 2018). The two levels of current perceived performance status—CSP and CUP—were dummy coded as 0 and 1 respectively. The two levels of evaluative approach—dichotomous present-focused and historical success scaling—were also dummy-coded as 0 and 1 respectively. Model 8 in PROCESS was used with current perceived performance as the focal variable (X), improvement expectancy as the mediator (M), evaluative approach as the moderator (W) and commitment to improvement as the dependent variable (Y). 95% bootstrap confidence intervals based on 5000 bootstrapped samples were used for inferential purposes.

The association between improvement expectancy (IE) and commitment to improvement (CTI)

Improvement expectancy emerged as a statistically significant predictor of commitment to improvement ($b = 0.44$ [0.29, 0.59], $t = 5.76$, $p < 0.001$). The standardised beta coefficient was 0.52, suggesting a fairly substantial effect. H3 (which hypothesised a positive association between IE and CTI) was therefore very much supported.

Evaluative approach as a moderator of the indirect effect of CUP on CTI (?)

The index of moderated mediation captures the difference between (i) the indirect effect of CUP on CTI amongst students engaging in dichotomous present-focused evaluation and (ii) the indirect effect of CUP on CTI amongst students engaging in scaling. The former conditional indirect effect was estimated to be − 0.50 [− 0.84, − 0.22] whereas the latter was estimated to be − 0.43 [− 0.80, − 0.15]. The indirect effect of CUP on CTI was therefore less negative amongst students engaging in scaling than amongst students engaging in dichotomous present-focused evaluation. The value for the index of moderated mediation was 0.07 [− 0.32, 0.45]. Since the 95% bootstrap confidence interval straddled zero, it could not be concluded that the two indirect effects were statistically different from each other (Hayes 2018). Moreover, the difference between them was extremely small (0.07). Thus there was no strong evidence to support H4, viz. that the indirect effect of CUP on CTI is moderated by evaluative approach.

In the model of CTI that included IE, the coefficient for the interaction between current perceived performance and evaluative approach was not statistically significant ($b = -0.29$ [− 0.99, 0.42], $t = 0.81$, $p = 0.42$). There was therefore no good evidence to suggest that the direct effect of CUP on CTI is moderated by evaluative approach.

A simple mediation model

Given the lack of evidence for moderated mediation, evaluative approach was dropped and a simple mediation model was estimated. The focal variable was CUP (vs. CSP); the mediator was improvement expectancy (IE); and the outcome was commitment to improvement (CTI). The results of the analysis are depicted in Fig. 3.

The indirect effect of CUP on CTI was estimated to be − 0.47 [− 0.75, − 0.24]. Since the 95% bootstrap confidence interval did not include zero, it was concluded that the indirect effect of CUP on CTI is indeed negative. That is, current unsatisfactory performance has a negative indirect effect on commitment to improvement by reducing improvement expectancy. The direct effect was estimated to be 0.21 [− 0.18, 0.59], suggesting a *positive* effect of CUP on CTI when improvement expectancy is held constant. This is in line with H5. However, the coefficient for the direct effect was not statistically significant ($t = 1.06$, $p = 0.29$). The total effect of CUP on CTI was estimated to be − 0.26 but this was also not statistically significant ($t = -1.30$, $p = 0.20$). The indirect effect was negative and

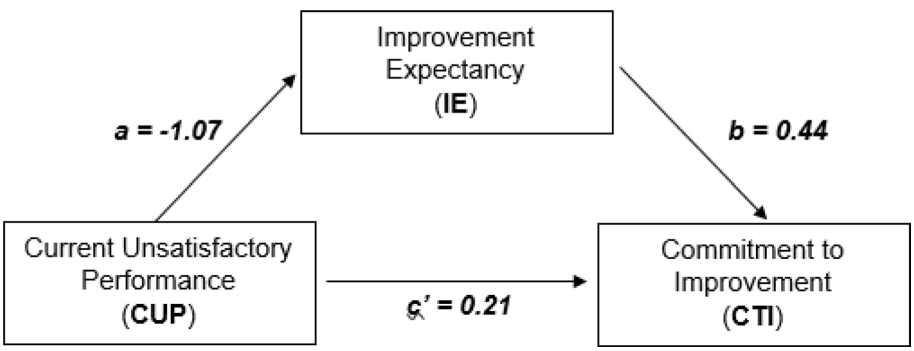

Fig. 3 Simple mediation model estimating the effect of current unsatisfactory performance (CUP) on commitment to improvement (CTI) through and independently of improvement expectancy (IE)

the direct effect positive, implying "inconsistent mediation" (e.g. MacKinnon et al. 2000).

Finally, in order to explore what happened during scaling, "highest level of success" scores were examined in the conditions that included scaling. On average, "highest level of success" was marginally higher in the CSP-with-scaling group (M = 8.18; SD = 0.86) than in the CUP-with-scaling group (M = 7.37; SD = 1.69). An independent samples *t*-test indicated that this difference was statistically significant ($t(56) = 2.28$, $p = 0.03$). However, the difference between the two means (0.81) was considered small for practical purposes. Both groups were apparently able to recall a fairly high (subjective) level of success. Indeed, 23 of the 28 students in the CUP-with-scaling group recorded a "highest level of success" score of 7 or higher.

Discussion

The aim of the present study was to investigate how current unsatisfactory performance (CUP) affects commitment to improvement (CTI) both through and independently of improvement expectancy (IE). Whether evaluative approach moderates the effects of CUP on IE and CTI was also examined.

First, as predicted by H1, CUP had a negative main effect on IE. Students who considered current performance unsatisfactory reported considerably lower improvement expectancy than students who considered it satisfactory. The former students evidently did *not* see more potential for improvement. Rather, participants appeared to be using the "Performance Heuristic": the lower/higher their current perceived performance, the lower/higher their IE. The results of the present study therefore build on those of Critcher and Rosenzweig (2014). It appears that the "Performance Heuristic" is used not only by college students during unusual tasks (e.g. darts) but also by high school students reflecting on everyday studies.

H2 hypothesised that the negative effect of CUP on IE is moderated by evaluative approach. Specifically, it was hypothesised that the negative effect of CUP (relative to CSP) is less pronounced among students engaging in historical success scaling than among students engaging in dichotomous present-focused evaluation. On the one hand, the negative effect of CUP on IE was indeed estimated to be less negative among students engaging in scaling. On the other hand, the difference was extremely small and not statistically significant. Support for H2 was therefore very limited. CBT and solution-focused theorists widely recommend the acknowledgement of success and the practice of scaling (e.g. Beck et al. 2015; Berg and Szabo 2005; Curwen et al. 2018; Jackson and McKergow 2007). The present study suggests, however, that faith in success scaling (as a standalone tool) may be misplaced.

23 of the 28 students in the CUP-with-scaling condition reported a score of at least 7 out of 10 on the scale for "highest level of (previous) success." This suggests that most were able to recall (subjectively) high performance. And yet this did little to minimise the negative effect of CUP on IE. This fact becomes clearer when the IE means of the CUP-with-scaling and CUP-with-dichotomous-present-focused- evaluation groups are compared (5.69 and 5.60, respectively). The IE "advantage" for the scaling group is a negligible 0.09 of a point. If students in the former group reminded themselves of success whilst students in the latter focused squarely on CUP, it may be wondered why the former did not have (much) higher IE.

A possible explanation can be formulated on the basis of Rosenzweig and Critcher's (2014) "Salience-Assessment-Weighting" (SAW) model of forecasting. According to SAW, there are three steps in likelihood estimations. First, a dimension possibly relevant to the outcome becomes *salient.* Second, individuals *assess* their standing on that dimension. Third, individuals give the dimension a certain *weight* when estimating the likelihood of the outcome. Consider the dimension of previous success. Historical success scaling was designed to make this salient. That is, students in the CUP-with-scaling group were explicitly invited to consider previous success. Moreover, it appears that students in this group also assessed themselves favourably on this dimension, as evidenced by the fact that over 80% reported a "highest level of success" score of 7 or above. However, it appears that they did not give much *weight* to previous success when evaluating the likelihood of improving on CUP. Thus in terms of the SAW model, previous success may have failed at the third hurdle (weighting). Although the underweighting of previous success may seem surprising, there are several reasons why it may have occurred.

It has been pointed out that "[p]eople may sometimes attend to their past experiences but nevertheless fail to incorporate this information into their predictions" (Buehler et al. 1994, p.367). The perceived relevance of past experiences depends partly on people's causal attributions (Weiner 1985). For example, research indicates that attributions to luck are negatively associated with future success expectancy (McMahan 1973). Similarly, attributing prior success to unusually high effort results in lower expectations than attributing it to personal ability (Weiner et al. 1976). Historical success scaling may indeed help Bella recall success, but if she attributes that success to luck or extreme effort, her expectations for improvement may be unaffected. Indeed, it may be unrealistic to expect a minimal intervention such as historical success scaling to override entrenched attributional tendencies. Within CBT, for example, it is acknowledged that certain assumptions and beliefs can be resistant

to change (e.g. Tolin 2016). Historical success scaling may therefore need to be supplemented by some form of (re) attributional support (Wilson et al. 2002).

H3 hypothesised that improvement expectancy (IE) is positively associated with commitment to improvement (CTI). This hypothesis received strong support. As IE increased by one standard deviation CTI was predicted to increase by over half a standard deviation. Many studies report a positive relationship between goal attainment expectancy and goal commitment (Klein et al. 2013). The present study provides support for that relationship when the goal is improving on current performance. This is an important point to bear in mind. Many interventions are designed to improve student performance, e.g. "personal best goal-setting" (e.g. Martin and Elliot 2016). Such interventions will almost always depend on student CTI. As the present study indicates, CTI depends on IE. Schools may therefore wish to measure IE periodically in order to maintain CTI.

H4 hypothesised that the negative indirect effect of CUP on CTI is moderated by evaluative approach. As already indicated, there was little support for H2, which hypothesised that evaluative approach moderates the effect of CUP on IE. Thus a lack of support for H4 might be expected given that H4 was advanced on the basis of H2. Results indicated that CUP had a negative indirect effect on CTI by reducing improvement expectancy. Although this effect was indeed estimated to be less negative amongst students engaging in scaling, the difference between the conditional indirect effects was exceptionally small (0.07) and the bootstrap confidence interval included zero. Thus it would appear that historical success scaling (as a one-time intervention) is not an effective means of preserving commitment in the face of unsatisfactory performance. It is possible that training in the method might lead to stronger results. Alternatively, students like Amy and Bella could list reasons *why* their unsatisfactory performance might improve—a process that has been shown to improve students' mood (Wilson and Linville 1982). Research also suggests that self-compassion regarding CUP may enhance CTI (Breines and Chen 2012).

There was no evidence that evaluative approach (EA) moderates the direct effect of CUP on CTI. EA was therefore dropped. Estimation of a simple mediation model then suggested that CUP had not only the predicted negative indirect effect on CTI through IE but also the *positive* direct effect hypothesised by H5. Admittedly, this effect was not statistically significant and some readers may want to treat it with caution. However, the bulk of the confidence interval was positive and the effect was large enough (0.21) to be considered meaningful. Moreover, a positive (direct) effect is predicted by control theory and other discrepancy-feedback models of motivation (e.g. Carver and Scheier 1982). If improvement expectancy is held constant, then current *unsatisfactory* performance is apparently associated with higher CTI than current satisfactory performance. The present study therefore finds support for the inconsistent mediation model depicted in Fig. 1. This may help to explain the findings in previous research. Some studies have found that "failure" or CUP has a motivating effect (e.g. Brunstein and Gollwitzer 1996). Others appear to have found a demoralising effect (e.g. Leonard and Weitz 1971). And others have found conflicting (e.g. Williams et al. 2000) or no overall (e.g. Venables and Fairclough 2009) effects. If CUP does indeed have a positive direct effect on CTI but a negative indirect effect through reduced expectancy, it may be wondered which effect is likely to prevail. The study by Venables and Fairclough suggests that it may depend on the duration of CUP. In that study, students in the negative feedback group initially increased their efforts in response to CUP but appeared to become less motivated over time. In the short term, CUP may therefore enhance CTI. However, prolonged CUP may begin to erode IE, which in turn reduces CTI.

Limitations of the present study should be acknowledged. The experiment involved a convenience sample. Participants were female students in a private school. Researchers may therefore wish to replicate the study with male (or mixed) participants in a state school before making generalisations. In addition, given that "evaluative approach" (as conceived in the present study) did not appear to moderate effects, other moderators (e.g. causal attributions) should be explored. More prolonged efforts to alter students' thinking may also have greater success.

In conclusion, the present study makes several important contributions. First, it indicates that the "Performance Heuristic" applies to high school (as well as college) students. Importantly, participants were asked to consider not anagrams or darts but *real* areas of academic study. As was the case in the study by Critcher and Rosenzweig (2014), the better/worse current (perceived) performance, the higher/lower students' IE. This suggests that the "Performance Heuristic" may be a general phenomenon, at least among students. The present study also illuminates previous research on "failure" (or CUP). Some studies have reported motivating effects, whereas others suggest a demoralising influence. The inconsistent mediational model for which the present study finds support can be used to explain both effects. Moreover, it also explains why CUP sometimes appears to have no overall effect: direct and indirect effects may be cancelling each other out. Finally, the present study suggests that common perspectives on "scaling" may need to be revised. Widely prescribed as an antidote to dichotomous thinking, scaling is thought to minimise the impact of adverse events whilst maintaining or raising hope and motivation (e.g. Freeman and Davis 1990; O'Connell et al. 2012; Blundo and Simon 2016). However, such views appear to have been formed in the absence of evidence. The present study suggests that (compared to dichotomous

present-focused evaluation) historical success scaling has at best an extremely small positive effect and quite possibly no effect at all. Helping students maintain IE and CTI appears to require more than scaling. A prolonged intervention including (re)attribution prompts might be more effective (Wilson et al. 2002). Understanding how to mitigate the negative effects of CUP whilst harnessing its motivational power is an important goal for future research.

Data availability Data are available from the first author on request.

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