Understanding responses to feedback: the potential and limitations of regulatory focus theory

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OBJECTIVES Regulatory focus theory posits the existence of two systems of self-regulation underlying human motivation: *promotion focus*, which is concerned with aspirations and accomplishments, and *prevention focus*, which is concerned with obligations and responsibilities. It has been proposed that regulatory focus theory may help to explain learners' variable responses to feedback, predicting that positive feedback is motivating under promotion focus, whereas negative feedback is motivating under prevention focus. We aimed to explore this link between regulatory focus theory and response to feedback using data collected in a naturalistic setting.

METHODS In a constructivist grounded theory study, we interviewed 22 early-career academic doctors about experiences they perceived as influential in their learning. Although feedback emerged as important, responses to feedback were highly variable. To better understand how feedback becomes (or fails to become) influential, we used the theoretical framework of regulatory focus to re-examine all descriptions of experiences of receiving and responding to feedback.

RESULTS Feedback could be influential or non-influential, regardless of its sign (positive or negative). In circumstances in which the individual's regulatory focus was readily determined, such as in choosing a career (promotion) or preparing for a high-stakes examination (prevention), the apparent influence of feedback was consistent with the prediction of regulatory focus theory. However, we encountered many challenges in applying regulatory focus theory to real feedback scenarios, including the frequent presence of a mixed regulatory focus, the potential for regulatory focus to change over time, and the competing influences of other factors, such as the perceived credibility of the source or content of the feedback.

CONCLUSIONS Regulatory focus theory offers a useful, if limited, construct for exploring learners' responses to feedback in the clinical setting. The insights and predictions it offers must be considered in light of the motivational complexity of clinical learning tasks and of other factors influencing the impact of feedback.

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INTRODUCTION

The notion that medical learners benefit from regular feedback in the clinical setting is widely accepted.[1] Feedback delivery has historically been the focus of much of the literature on this subject and efforts have been directed toward guiding supervisors in best practices related to approaching feedback with their learners.[2,3] Increasingly, however, attention has also been paid to the critical issue of learner receptivity to feedback.[4,5] Although medical learners have been shown to value the provision of well-timed feedback from credible sources, circumstances have been identified in which feedback may be rendered meaningless to learners.[6,7] When learners perceive that their evaluators are either not credible or not truly engaged in the creation and exchange of informed and accurate feedback, they may reject any feedback they receive.[7]

That feedback received during clinical training may fail to impact learners should not come as a surprise. In a meta-analysis of feedback interventions, Kluger and DeNisi[8] found that the effects of feedback interventions across a wide range of settings were generally modest, and that feedback actually hurt subsequent performance in over one-third of cases. In articulating their feedback intervention theory, which attempted to explain these findings, they noted that feedback that was threatening to self-esteem was especially apt to debilitate, rather than improve, performance. Their meta-analysis found no evidence, however, that the effects of feedback interventions were moderated by feedback sign: that is, positive feedback, which provides information about success, and negative feedback, which provides information about failure, did not differ in their effects on performance.[8] As negative feedback would seem, on the surface, to have greater potential to threaten self-esteem than positive feedback, this lack of influence of the sign of the feedback on its effectiveness seems paradoxical.

Recently, Kluger and van Dijk[9] invoked regulatory focus theory as a potential explanation for this apparent paradox. Regulatory focus theory extends the hedonic principle that humans approach pleasure and avoid pain by distinguishing two basic systems of self-regulation that underlie human motivation: promotion focus and prevention focus.[10] Promotion focus is concerned with aspirations and accomplishments; individuals experience goals as wishes or desires and are motivated by the achievement of rewards. Prevention focus is concerned with responsibilities and safety; individuals experience goals as obligations or necessities, and are motivated by the avoidance of pain or punishment. Essentially, promotion focus concerns those things we *want* to do, whereas prevention focus concerns those things we *have* to do.[10] Although regulatory focus may be a chronic trait of individuals and may influence their general approach to tasks, it may also be induced situationally by factors including the nature of the task and the scenario or context in which it occurs.[11]

Regulatory focus influences the types of incentives to which individuals will respond, and when there is compatibility between an individual's goals and the types of incentives provided, motivation and performance increase.[10] Applying this principle to the prediction of the effect of feedback interventions on performance, Kluger and van Dijk[9] proposed that positive feedback would increase motivation and performance under promotion focus, but debilitate motivation and performance under prevention focus. By contrast, they proposed that negative feedback would be motivating under prevention focus, but debilitating under promotion focus. Indeed, their predictions proved accurate when tested in a variety of experimental settings.[9,12]

Regulatory focus theory may therefore offer insight into the variability in responses to feedback, but how well do these experimental findings translate to real clinical situations in which the reality of responsiveness to feedback seems frustratingly complex? Recently, we reported on a study of doctors' reflections on experiences that were influential in their learning process. From this study emerged a model of clinical learning in which learners in the clinical environment encounter a variety of learning cues and make judgements about which of these cues deserve their attention, placing particular value on the cues they perceive to be most credible.[13] In our analysis, learners' responses to feedback emerged as particularly challenging to interpret as these responses were highly variable. In order to better elaborate a theory to account for this variability in learner response to feedback, the present study was undertaken. We aimed, in this study, to determine how readily clinical learning events could be classified as activating a promotion or a prevention focus, and to explore, through a careful analysis of doctors' descriptions of their feedback experiences, the predictive value of regulatory focus theory in the context of real clinical learning situations.

METHODS

This study involved a focused analysis of data collected as part of a larger study in which we examined the experiences that doctors considered to have been influential in their learning.[13] In this section, we will briefly describe our approach to data collection and analysis in that original study (Phase 1), and then detail our approach to the additional data analysis that constituted the present study (Phase 2). We approached both the present study and the original study using constructivist grounded theory, which attempts to provide a plausible interpretation of a studied phenomenon, while explicitly acknowledging that this interpretation is a construction influenced by the vantage points of researchers and participants alike.[14]

Phase 1

A purposive sample of early-career academic faculty staff was recruited from a single large Canadian medical school. All faculty members within the first 5 years of their initial academic appointment received an e-mail introducing the study and inviting their participation. We targeted this group because we sought individuals who were able to reflect meaningfully on their training with the benefit of time and distance from it, but who remained close enough to their training to recall important details. The study received approval from the university's ethics committee.

Data collection and analysis proceeded in an iterative fashion. Twenty-two (10 male, 12 female) faculty members representing a range of medical and surgical specialties (internal medicine [$n = 3$], psychiatry [$n = 4$], oncology [$n = 3$], surgery [$n = 4$], neurology [$n = 4$], paediatrics [$n = 3$], medical genetics [$n = 1$]) participated in individual, semi-structured interviews lasting up to 1 hour. The interview approach to data collection was chosen because we were interested in uncovering the internal, psychological dimensions of drawing meaning from learning experiences. Within these interviews, which centred on exploring experiences recalled as meaningful or influential, participants were specifically asked to describe experiences of receiving feedback during their clinical training and to comment on the impact of that feedback. Consistent with a constructivist grounded theory approach, our data collection was not guided by any particular theoretical orientation (including regulatory focus theory); rather, we simply asked participants to describe significant instances of receiving feedback without employing interview questions that explicitly probed existing theoretical concepts. Interviews were recorded and transcribed verbatim without identifying data. Interview data were analysed using the constant comparative approach customary in grounded theory.[15] Analysis occurred alongside and informed data collection, and the interview strategy evolved during the study to facilitate the exploration of emerging themes. The examination and re-examination of the transcripts facilitated the development of a robust coding scheme for organising and classifying data thematically. Consistent with a theoretical sampling approach, data collection continued until saturation of themes was achieved.[14]

Phase 2

From the first analytic phase there emerged a grounded theory in which clinical learning was conceptualised as a process by which learners, as they participate in clinical work, encounter a variety of learning cues, including feedback, that compete for their attention. In this grounded theory, which we have described in detail elsewhere,[13] the ultimate influence of these learning cues relates largely to learners' judgements of their credibility. The highly variable descriptions of responses to feedback contained within our data suggested that the process by which feedback becomes influential was deserving of greater scrutiny. We thus undertook a second analytic phase, drawing on the constructivist grounded theory tenet that *after* a grounded theory emerges, it is appropriate to consider how existing theoretical frameworks might complement or extend the data interpretation or offer alternative explanations for challenging data. This process of weaving existing sensitising concepts into a second level of analysis has the capacity to enhance the explanatory power of the emerging theory, as well as to allow the examination of how the emergent grounded theory 'extends, transcends, or challenges' significant ideas in the field.[14] With these principles in mind, we recognised that regulatory focus theory and, in particular, Kluger and van Dijk's[9] recent descriptions of its usefulness in explaining responses to feedback in experimental situations might illuminate our understanding of the challenging issues associated with response to feedback that emerged prominently from our data.

We thus re-examined all data relating to feedback through the theoretical lens of regulatory focus. Because our study was concerned with individual perspectives on learning experiences, we wanted to

ensure that we analysed all instances that participants perceived as feedback. We therefore defined feedback simply and broadly as any information about performance that participants recalled receiving during their clinical training; if a participant perceived an experience as 'feedback', it was considered in our analysis.

These data were not restricted to a single coding category, but, rather, were contained within a number of categories and thus the full original dataset was carefully mined for relevant examples. The dataset was then re-coded using the theoretical framework of regulatory focus: two investigators independently analysed each example to determine, when possible, the dominant regulatory focus based on the task described and on the individual's apparent approach to the task. They then met to compare their interpretations, resolving disagreements through discussion. Particular attention was paid to examples that were discordant or disconfirming to ensure that the analysis could account for their occurrence. To further enhance the rigour of the analysis, selected examples were reviewed by a third investigator and discussions among investigators were used to achieve interpretive consensus. Although all examples from the original dataset that involved feedback were examined for this study, some examples lacked sufficient information on either the task itself or the participant's mindset as he or she approached the task for an opinion to be formed regarding the likely regulatory focus that was active. Care was taken to avoid forcing such examples; we simply classed these instances as providing insufficient information to allow a meaningful interpretation of regulatory focus.

Reflexivity is an important consideration in the process of data collection and analysis in this type of research. The first author, who conducted the majority of the interviews, is a specialist doctor and thus has shared with the study participants the experience of receiving feedback during clinical training. Reflecting on these personal feedback experiences was a useful and, indeed, necessary element of the analytic process. The other authors are education researchers who are not doctors, and their perspectives were important in facilitating a balanced rendering of the data.

RESULTS

Commentary related to feedback appeared in every interview transcript; most participants were able to provide specific, elaborated examples of feedback they had received during their training. Much of the feedback described had been received from supervisors, although instances of feedback from other sources, including peers, other health professionals and patients, also appeared in a number of transcripts. The perceived impact of feedback varied considerably within and across individuals. Many participants recalled some examples in which feedback had been influential and others in which its effects had been neutral at best. The sign of the feedback – whether it was perceived as positive or negative – did not seem to be related to its ability to influence. Although some individuals seemed to demonstrate a preferential responsiveness to either positive or negative feedback, many recalled experiences that suggested that their responsiveness varied from one situation to the next. In order to examine the notion that regulatory focus theory might explain the variability we observed in responses to feedback, each instance was evaluated for evidence of fit of the theory. We found a number of circumstances in which our participants' responses to feedback were highly consistent with the predictions of regulatory focus theory. The evidence for this 'theoretical fit' will be described in the following sections, with illustrative examples.

Promotion focus

Promotion focus seemed particularly prominent at times of transition in training, perhaps because transitions inspire new goals and aspirations in learners. Regulatory focus theory would suggest that well-timed positive feedback received at these critical junctures would motivate learners to continue to approach the goals they set for themselves and, indeed, we found a number of instances supporting the link between promotion focus and influential positive feedback in this context. For example, one participant recalled an instance during a psychiatry rotation in medical school in which she had received feedback from a supervisor after an observed interview with a patient:

'He stopped me and said: ''Are you thinking about doing psychiatry as a career?'' And I said, ''Well, actually, you know it wasn't sort of originally in the plan but I really enjoy my rotation and now I'm thinking that.'' And he said, ''I think if you don't do it, it would be a waste.'' So, that totally influenced [my career plan].' (P8)

This individual went on to become a psychiatrist and, although there may have been a number of

contributors to her decision to do so, her vivid recall of this piece of positive feedback suggests that it was indeed influential.

In an additional example, another participant recalled being given valuable positive feedback toward the end of residency training as the transition to independent practice approached:

'When I worked with him in the fifth year, he said, ''You're almost done, you're going to be graduated in a few months, you are the consultant today,'' and he'd go up to his office and I'd basically run his clinics. Do everything myself. It was really scary at first but [I] realised after a few weeks that I can do this and I'm doing this all by myself with no-one to help me. If I made a decision on a treatment plan, even if it would not have been necessarily what he would have chosen, he'd say, ''Yep, that works – you know, there's nothing wrong with that plan, it isn't exactly what I would have done but it's totally acceptable,'' and I think that really helped to build my confidence.' (P7)

Although she identified the task as 'scary', which might initially suggest a prevention focus, this doctor reflected back on it as a powerful representation of her readiness to assume the identity of an independent clinician, thus placing the focus firmly on promotion. Accordingly, the positive feedback from a supervisor that the learner's approach required neither adjustment nor correction is recalled as motivating and confidence-enhancing. Educational experiences like these examples, in which the outcome involves building an identity as a doctor, speak to promotion focus, with its emphasis on approaching goals or rewards. In such circumstances, we found participants recalled positive feedback as motivating, providing, in the words of one participant, '…the beacon on the other side [that] allowed me to keep on the same track' (P16).

Prevention focus

Just as certain experiences, such as those involving career transitions, were readily identified as activating promotion focus, other experiences involved tasks that, by their nature, made the activation of prevention focus more likely. Perhaps the clearest example of a prevention-focused task is the preparation for high-stakes examinations, in which error avoidance is critical. As would be predicted by regulatory focus theory, participants tended to describe valuing negative over positive feedback in this situation. Illustrating this point, one participant described the approach taken to feedback during practice examinations with peers:

'So then we started practising with each other… and then we became a lot more critical… I think that we also sort of said, ''OK, now the time for being nice is over because this is going to help you pass or not. I'm not trying to be mean but you really need to do this or you're not going to get through.''' (P6)

In this and similar examples, there seems to have been an explicit agreement among the players that negative feedback was not only acceptable but desirable, and more highly valued than positive feedback.

Negative feedback was also influential in the realm of skills training, as the following description of the role of feedback in refining the skill of dictating clinical notes exemplifies:

'They would proofread every note I dictated and circle things and change words and cut out paragraphs that were too wordy... so this intense sort of feedback experience, I guess. And so anyway the way I dictate now is... I look at my notes from residency – every now and then I see a patient I saw in residency and I read this note and [think]: ''That's a terrible note, who did this note?'' Like, ''Oh, it was me.'' I'm better now.' (P12)

In this example, the participant describes a gradual process by which feedback, largely negative, shaped the form and content of notes he dictated and ultimately made them better. The responsiveness to negative feedback may be explained by the primarily prevention-focused nature of this particular task: it is a task one *must* do rather than a task one aspires to do.

Similar examples appeared in the realm of surgical skills training, with its prevention focus-activating emphasis on accuracy, safety and error prevention. One participant, recalling the challenging experience of working with a surgeon who routinely offered blunt criticism, admitted: 'Sometimes their feedback, even though it was really harsh and cruel, did improve my technical skills' (P19). The unmistakable influence of this largely negative feedback on technical skill development suggests that negative feedback in a prevention-focused setting can be practice-shaping, even if the experience of receiving the feedback is unpleasant.

Regulatory focus theory would further predict that positive feedback received in prevention focus would

result in diminished effort. We did not, in fact, encounter examples in which positive feedback disabled effort and motivation, but did encounter examples in which positive feedback related to prevention-focused tasks was seen to lack value. Consider the reaction of this surgeon to positive feedback received during an advanced stage of training:

'We were doing something really easy like closing skin... and he looks at me and says, ''Oh, really good.'' […] For him to tell me, ''Oh yeah, your closure is good'' is kind of making fun of me because, well, yeah, obviously at my stage I should be able to close skin, so don't tell me it's good.' (P9)

The act of closing skin is routine for a senior trainee and is likely to inspire a prevention focus, which may explain the meaninglessness of positive feedback. One might speculate that the same task, performed by a medical student or junior resident, might involve a promotion focus as it might represent the first important step in a surgical career, in which case positive feedback might have been highly valued. The potential variability in focus related to individual and situational factors is a key challenge in readily applying regulatory focus theory to the prediction of individual responses to feedback and will be discussed in more detail in the following section.

Challenges in applying regulatory focus theory

Although the examples provided in the preceding section suggest occasions in which regulatory focus theory can satisfactorily explain learner responses to feedback, we encountered many examples in which it proved challenging to readily apply regulatory focus theory to real feedback scenarios. A number of reasons for these challenges emerged, including the existence of a mixed regulatory focus, the potential for regulatory focus to change over time, and pressure from other influences, such as source credibility, on responsiveness to feedback. These challenges will be considered in this section.

Mixed regulatory focus

Unlike contexts such as career decision making or preparation for high-stakes examinations, which preferentially activate a particular regulatory focus, many tasks in the clinical learning environment are difficult to readily classify as intrinsically inspiring either a promotion or a prevention focus. Consider the following example in which the experience of putting in an intravenous line for the first time is described:

'My first i.v. line I remember there was a resident... who seemed to think I could do it when I'd never ever done that before in my whole life. But he said, ''Just put it in,'' and I remember blood was spurting out because I hadn't pressed the vein. But he said, ''No, that's fine. Just put the connection and you're done.'' […] Him thinking I was able to do it made me feel more able to try it out.' (P22)

In one sense, placing an intravenous line is a routine technical skill in which safety is paramount and errors are to be avoided, both of which are characteristics of a task that inspires prevention focus. However, for a medical student, the act of placing an intravenous line may symbolise a significant step toward assuming the professional identity of a doctor and in this light the task activates promotion focus. Although the comments of the supervising resident may seem merely instructional, the confidence he showed in the learner's ability to perform the task by providing encouragement rather than taking over the task was perceived as a powerful form of positive feedback. Regulatory focus theory can only explain the value this learner placed on positive feedback in this setting if we assume that the promotion-focused interpretation of this task is the dominant one.

In many instances, our efforts to interpret scenarios as either promotion- or prevention-focused proved fruitless; a more satisfactory interpretation was that promotion and prevention foci coexisted within the same experience. In the following example, a doctor describes undertaking a challenging, emotionally charged task:

'We had a newborn come in as SIDS [sudden infant death syndrome] and [I] had to break that news to the mum and that was the first time I'd done that in the emergency department and the staff person came with me and watched me and gave me feedback... It was generally positive feedback at the time you know. It was... she gave me feedback about sort of general approach, wording that I'd used. How much information... was a reasonable amount of information, or maybe leave out this word or that word, or you might want to say this. Pretty specific feedback – she's [a] very detailed doctor when it comes to that.' (P14)

Interviewer: 'Did that help you?'

Participant 14: 'Yeah, absolutely.'

The task is prevention-focused in the sense that breaking such dreadful news is a responsibility associated with the job; it is something the doctor *must* do. For an aspiring paediatrician, however, this most difficult of tasks is something one *wants* to be able to do well and thus it also carries an intrinsic promotion focus. The balance of the two foci may shift within individuals and contexts, but elements of both foci often appear to exist simultaneously. It is therefore perhaps not surprising that this individual recalled the feedback as helpful, although it contained both positive and corrective elements; the use of mixed-sign feedback may be especially meaningful in such circumstances.

A further interpretive challenge was that regulatory focus was not always a stable trait of tasks or individuals. One participant, for example, recalled two separate instances during training in which he had received feedback related to making a presentation at grand rounds. In the first example, he was harshly criticised for an error he made during his presentation and the experience of this negative feedback strongly motivated him to present again as soon as possible:

'I went back within three weeks, I was back up there. I wasn't supposed to be but I wanted to show that, ''OK, look, you know what, I had a bad case.'' I have to get back up in front of these people and show them you know, I can do this.' (P11)

In the second instance, he recalled how an esteemed senior doctor had said afterwards: 'That was a fantastic case, that was a very good job' (P11), and described how this feedback had had the effect of building his confidence and reassuring him that he would be able to succeed in his chosen field. Both the individual and the task were the same in these two examples, but it is likely that the dominant regulatory focus was prevention in the first instance and promotion in the second. Although the opportunity to present to peers and faculty members may be, for a resident, full of promotion focus possibilities, there may coexist the possibility that such presentations carry potential for prevention focus – error avoidance, damage control, prevention of embarrassment – that may emerge depending on how the event unfolds. Context and circumstances may conspire to influence focus in ways that are not always predictable.

Changes in focus over time

If individuals can operate in both promotion and prevention foci, and if tasks can contain elements of both, it seems likely that regulatory focus could also change over time. Indeed, we found examples in which this shift in regulatory focus was likely to have occurred within individuals. As a result of this reframing of regulatory focus over time, feedback that had been initially viewed with suspicion became influential. One participant recalled her reaction to feedback from a supervisor who had told her she lacked focus and often left projects unfinished:

'I would say probably at the time, I was hurt. You know when someone insults you, [you] kind of want to insult them back but I think somewhere inside I knew that their criticism was valid and that… *with time* that criticism by a very credible teacher is very motivating.' (P3)

The passage of time allowed feedback that was initially hurtful and discouraging to become motivating. What changed to allow the feedback to be reconsidered and found to be useful? Perhaps this participant had simply needed time to process the emotional aspect of the negative feedback, but it is also possible that, with time, she was able to reframe her academic work (completing projects) from a promotion-focused to a prevention-focused activity. If she came to view academic projects as obligations to be met rather than reflections of her career aspirations, the negative feedback perhaps began to resonate.

In another example, a surgical learner, having completed what he thought was a very smooth and successful procedure without requiring any assistance from his supervisor, was asked to review a video of the procedure while his supervisor pointed out flaws in his approach:

'I remember that being a very painful experience and not enjoyable to watch, and I remember at the end thinking that it was a waste of time, but in retrospect, I think it was quite useful in a sense. It did make me very conscious and aware the next time. So that would be a time where it wasn't pleasant but it probably was worthwhile.' (P19)

This surgeon's initial confidence following his independent completion of the task had been jarred by negative feedback, probably because his initial focus was on promotion. With time, he came to see the value of feedback that had aimed to eliminate even minor errors and to improve the economy of his surgical approach, which suggests a reframing of the task in prevention focus terms. His ability to value negative feedback may have hinged on this reframing, which required time and reflection:

'After a month or two, I saw the value in it. Sitting there for the 20 minutes, I didn't see the value in it.' (P19)

Other influences on responsiveness to feedback

Our data suggest that additional factors other than regulatory focus influence how learners interpret feedback, the most notable of which is the credibility of the feedback received. One participant noted:

'If the feedback is coming from somebody that is respected either by myself or by peers, then whatever feedback comes from that person… is what provides the motivation. I think that [includes] both positive and negative [feedback].' (P4)

Highly respected sources seem able to give feedback that demands learner attention, regardless of feedback sign or regulatory focus. The inherent credibility of these individuals allows them to provide meaningful negative feedback that might be dismissed if it were to come from others.

Feedback from patients seems to have particular credibility, as we noted in a previous study.[13] In that study, we used the following example, in which a participant recalls being 'fired' by a patient, to illustrate the power and credibility of feedback from patients:

'At first I was going to dismiss it and I thought, well, that isn't really fair to her. Why don't I think about what happened in that encounter and maybe it was something I said... I just thought I'd better not take this personally and try to figure out was there something that I said or did that I could do better? You want to be better at your job all the time.' (P7)

Viewed through a regulatory focus lens, the last sentence of the quotation, which refers to a constant striving for improvement, suggests a promotion focus, which makes it difficult to reconcile this individual's clear effort to make sense of and respond to the negative feedback provided by the patient. The question is thus raised of whether regulatory focus might be trumped, in certain circumstances, by more powerful forces, such as feedback from a source that demands attention.

DISCUSSION

Our results illustrate the complexity of learner responses to feedback. Consistent with Kluger and DeNisi's[8] finding that the effects of feedback interventions are not mediated by the sign of the feedback, the doctors in our sample vividly recalled examples of influential feedback that had been both positive and negative. This variability in responses to feedback among learners challenges and frustrates medical educators. Our goal in this study was to explore the capacity of regulatory focus theory to enrich our understanding of this variability. Since its conception by Higgins,[10] regulatory focus theory has been used to better understand human motivation and behaviour in a variety of settings, ranging from entrepreneurship to persuasive argument to sporting performance.[16–18] However, research examining the applicability of regulatory focus theory has occurred primarily in the carefully controlled world of the psychology laboratory. The need to move beyond 'scenario studies' and explore the effect of regulatory focus on attitudes and behaviours in real workplace settings has been recognised by key researchers in this field.[19]

Higgins[10] described promotion focus and prevention focus as serving fundamentally different needs, and acknowledged that although individuals and tasks vary in their intrinsic regulatory focus concerns, a particular focus can be induced, at least temporarily, by situations and contexts. Both promotion-focused tasks and prevention-focused tasks may play significant roles in the workplace.[12] An analysis of the behaviours necessary for entrepreneurial success, for example, found that some were better supported by a promotion focus and others by a prevention focus, suggesting that a combination of approaches was optimal.[16] A problem with much of the experimental work on regulatory focus and feedback is that it is based on the notion that task type is a key moderator of regulatory focus and thus of feedback effect; certain tasks activate a promotion focus, whereas others activate a prevention focus.[12] This assumption implies a certain stability of focus linked to particular tasks which may not be present in real circumstances.

Our key challenge, in fact, was that many of the tasks that face clinical learners defy tidy classification as either promotion- or prevention-focused tasks. Although Kluger and van Dijk[9] acknowledged that 'medical staff are faced with a mix of prevention and promotion foci', they went on to speculate that the medical community seemed to emphasise prevention (error avoidance, safety) over promotion (creativity, innovation). Our data do not suggest, however, that medical learners are inclined to emphasise one focus over the other. Indeed, both foci were often embedded within the same task and the balance between

the two foci varied within and across individuals and over time. Consider the example of a simple technical procedure such as drawing blood. Previous work on task type and its effect on regulatory focus would be likely to have characterised this task as inducing a prevention focus, given its emphasis on safety and error avoidance. However, a junior medical learner might view the performance of this task as an important step toward achieving the professional identity to which he or she aspires, thus inducing a promotion focus. Similarly, the task of submitting an abstract to a research meeting is readily classified as inducing a promotion focus, given its emphasis on creativity and achievement of reward, but for the resident struggling to complete a mandatory research requirement that obligates her to present her work at a national meeting, the task may instead inspire a prevention focus.

Our data suggest not only that medical learners must cope simultaneously with different foci activated by different tasks, but also with different foci activated by the same task, which makes the giving and receiving of feedback especially fraught. This delicate balance may be a particular feature of clinical tasks, which often involve following rules and procedures (prevention focus) in the service of altruistic goals (promotion focus). More broadly, this blending of foci around the same task may be a feature of educational settings in general, in which students may view the successful accomplishment of tasks as a means of accomplishing larger career goals, even as they strive to achieve the safe and responsible performance of these tasks.

Experimental work addressing the influence of regulatory focus on response to feedback has not only tended to reduce tasks to a simple categorisation of activating either promotion or prevention focus, but has also reduced feedback to the simple oppositional categories of positive and negative. Our work shows that both categorisations are problematic when applied to real clinical situations. Just as tasks can reflect a complex and shifting mix of regulatory foci, so too can feedback resist simple classification as positive or negative. For the purposes of our research, we defined the valence of feedback on the basis of its content; positive feedback was that which affirmed or reinforced behaviour, and negative feedback was that which criticised or corrected behaviour. Some of our examples, however, demonstrate that feedback that is corrective or critical may be viewed by the recipient as positive, particularly with the passage of time, if he or she is able to appreciate its beneficial effect.

Quite apart from these difficulties in categorisation, our data also suggest that the issue of predicting responsiveness to feedback is further confounded by other factors that influence receptivity to feedback, regardless of regulatory focus. Other authors have highlighted some of these influences, such as the important effect of emotion and its impact on the capacity of feedback to promote learning.[20,21] In our own earlier work, we identified credibility as a key factor in determining whether learning cues, including feedback, prove influential. Learners assess the credibility of the feedback they receive from their supervisors very critically, and only feedback that survives this credibility judgement is likely to be useful in shaping learning.[13] Matching feedback to regulatory focus is unlikely to be sufficient to guarantee its effectiveness if credibility is lacking. Similarly, highly credible feedback might trump an apparent mismatch between regulatory focus and feedback sign and still resonate with a learner. We contend that regulatory focus alone is insufficient to account for learners' responses to feedback; no model of receptivity to feedback can ignore the crucial element of credibility, which relates to the source of the feedback, the process by which it is generated and its content.

Our work highlights another important feature present in real clinical learning environments but absent from laboratory experiments, which Brockner and Higgins[19] have termed 'temporal dynamics'. We found that, for many individuals, responses to feedback changed with the passage of time, possibly suggesting shifts in regulatory focus. Experimental work on regulatory focus examines a point in time only, whereas real situations may allow for tasks to be reframed by learners in ways that alter their receptivity to feedback. Eva *et al.*[5] have highlighted, for example, that the confidence and experience which develop over time may influence perceptions of feedback, possibly facilitating the acceptance of more threatening feedback. Kluger and van Dijk[9] acknowledged, in fact, that their findings might be limited to initial reactions to feedback; these immediate responses may not always be the most salient reactions in terms of long-term influences on learning and behaviour.

Despite the limitations of applying regulatory focus theory to real clinical learning situations, the process of doing so reveals lessons for medical educators. The same task might activate a different regulatory focus in different learners, or even in the same learner depending on its timing and context. Although educators might simply respond to this

knowledge by blanketing the learner with mixed-sign feedback in the hope that some of this feedback will become influential, a more targeted approach may be possible. Armed with an awareness of the learner's regulatory focus, an educator may be more likely to provide feedback that aligns with that focus and is thus more likely to be influential. Using an awareness of regulatory focus to enhance the effectiveness of feedback in this way will require that feedback be treated as a conversation with the learner, in which the supervisor seeks to understand not only the learner's perception of his or her own performance, but also the meaning of the task to the learner and the motivation with which he or she has approached it.

Educators might also use the dynamic nature of regulatory focus in real settings to advantage. Applying regulatory focus to the science of persuasion, Cesario *et al.*[17] noted that both prevention and promotion foci can be primed in all people, making it possible to approach a persuasive argument by first priming one or other focus and then framing a message in a way that fits. Applying this same logic to feedback delivery, educators may frame tasks or experiences in ways that help necessary feedback to be received. An educator might, for example, highlight a surgeon's responsibility to minimise patient complications as a prelude to providing feedback on a surgical learner's technique, activating a prevention focus and increasing the likelihood that the learner will be receptive to criticism. Finally, encouraging learners to reflect on their regulatory focus as they receive feedback on clinical performance may be a productive step toward achieving the important but challenging goal of nurturing learners' receptivity to feedback.

There are important limitations to this study. The data were collected with a view to examining learning experiences recalled by doctors as meaningful or influential, including, but not limited to, feedback. Interviews were not conducted with the explicit goal of exploring participants' regulatory focus as they engaged in learning tasks or as they received feedback; the probable regulatory focus was inferred based upon the participant's description of the experience, its particular circumstances, and his or her own notions of why the experience did or did not resonate. These inferences were often challenging and open to debate, and in some instances the information given was insufficient to allow an inference about regulatory focus because our approach did not involve directly questioning participants about regulatory focus. This limitation was a necessary byproduct of our constructivist grounded theory approach, which depends on allowing concepts to emerge before examining these concepts through existing theoretical lenses. Therefore, this approach allows an exploration of the relationship between our emergent model of clinical learning[13] and regulatory focus theory, but it does not represent a test of regulatory focus theory in the clinical setting.

The interview technique we used for data collection was limited by issues of accuracy: individuals who were asked to reflect on experiences that had occurred earlier in their training are likely to have failed, at times, to remember these feedback experiences exactly as they occurred. However, we were able to assess not only our participants' perceptions of the feedback they had received, but also, in some cases, their evolving perspectives on the usefulness of that feedback with the benefits of time and reflection. In future, observational studies involving feedback interactions between learners and supervisors, supplemented by directed interviews, would be helpful in the further investigation of the usefulness of the regulatory focus concept in clinical learning. Finally, our general approach to understanding response to feedback was limited by its focus on the individual. External forces, including the effects of professional culture, are likely to influence how medical learners perceive and respond to feedback, and these important influences could not be assessed in this study. Indeed, this same critique could be levelled at regulatory focus theory itself, which focuses on individuals rather than on the environments in which they work or learn.

CONCLUSIONS

From this preliminary exploration of the application of regulatory focus theory to learner responses to feedback, we conclude that regulatory focus theory provides a useful perspective from which to explore the variable responses to feedback that occur in clinical learning settings. Additionally, regulatory focus theory has potential as a tool to assist educators in thoughtfully framing feedback to enhance its impact. What regulatory focus theory does not offer is a simple rubric for predicting how learners will react to feedback in real clinical settings. The reasons for this complexity include both the important influences of other factors, such as credibility, on receptivity to feedback, and the nature of the tasks that comprise the clinical learning environment, in which promotion and prevention foci are often inextricably intertwined and may compete for learner attention.

Although Kluger and van Dijk[9] have made the bold claim that regulatory focus theory solves the puzzle of the feedback sign, our work suggests that a more cautious approach that acknowledges both the potential and the limitations of regulatory focus theory in understanding learner responses to feedback is warranted.

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