

COMMENTARY

Enhancing remediation by focusing on affective experience

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Mills and colleagues' recent review¹ highlights how little attention emotions receive in remediation programmes, 'which may be indicative of the persistence of a prior model that views emotion and cognition as discrete domains, with learning falling under the realm of cognition'. In doing so, it helps us determine important goals for medical education—one of which should be boosting research on emotions by applying knowledge from different fields. The authors also point out 'potential areas for intervention, including emphasis on supportive remediation coaching relationships and greater attention to possible positive emotions'. Thus, their work helps identify several key issues that deserve to be the focus of future research studies on emotions in remediation and, more broadly, in medical education. This essay takes a brief look at some basic interrelated issues worth considering when designing those future studies: understanding emotions and learning within emotion theory perspectives, measuring emotions in remediation and using research findings in education.

With respect to the first issue, understanding emotions and learning, I would argue that it is important to broaden the current research scope in medical education to consider the more recent neuroevolutionary affective neuroscience perspective. This perspective offers an integrative framework for emotion theories and accepts the coexistence of various levels of emotion analysis that may be useful for researching emotions in remediation.^{2,3} While Panksepp's affective neuroscience perspective has robustly informed recent clinical and basic sciences, it has received less attention in medical education. His model presents the interplay between emotion and cognition as being based on an evolutionary stratification of mental functions in which primary instinctual, action-based, emotional processes are foundational for secondary learning processes and tertiary, cognitively mediated, thought. In humans, all the processes work in a hierarchical circular and causative fashion. A deeper understanding of learning processes and cognitively enriched emotions may, thus, be envisioned

as being rooted in evolutionarily grounded basic emotional systems; these networks of interacting circuits are, in turn, refined by emotionally significant experiences and social context.

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While a full description of the model is beyond the scope of this commentary (see Panksepp and Biven² for such), neuroevolutionary affective neuroscience studies may well open a window to the emotional processes and behaviours underlying both the self-conscious emotions that occur during remediation and the efficacy of remediation programmes. For example, self-conscious cognitively enriched emotions such as shame and fear of stigma may see the involvement of the PANIC/separation distress emotional system; different degrees of activation of this system may lead to social support and reassurance seeking or to 'surrender', 'give up' feelings and reduced trust. Similarly, the two-way route between emotions and learning is likely related to the involvement of the dopamine energised exploratory/SEEKING emotional system that fuels motivation and sustains all the other emotional systems.^{3,4} Given that insight and motivation play a key role in the efficacy of remediation programmes,⁵ and the SEEKING system impacts learning by modulating attentive processes,^{2,3} effective remediation programmes may be those that harness the power of exploratory/SEEKING, CARE and social PLAY emotional processes by both increasing feelings of social comfort and self-confidence and nurturing insights and motivation. Whether these speculative hypotheses prove correct is immaterial for the moment as

the general point is simply that the affective neuroscience perspective can help in structuring research studies that explore the emotional dynamics that may facilitate the development of supportive remediation relationships.

To move in that direction, careful attention must be paid to a second issue, the measurement of emotions. When choosing a measurement strategy, it is important to remember that emotions in remediation are experienced at different levels, not only through the cognitively mediated reasoning about one's own emotions that are most likely to be detected with self-reports. Rather, there is value in adopting the straightforward strategy of designing research protocols that encompass a multimethod approach, including measures of cognitively mediated propositional descriptions of one's own emotions and action-based expressions of emotions in daily context, such as those gathered by observing learners' moment-to-moment interactions with peers and supervisors and by measuring physiological activations. Analysis of non-verbal behaviour and prosodic aspects of communication may be integrated with observations that tackle emotion-based learned habits, attitudes and implicit bias, all of which are easily measurable in experimental tasks. By extending previous research into the effects care schema activation have on social cognition and attention to learning material,^{6,7} researchers could investigate the impact of experimental manipulations on learners' emotional experiences toward remediation.

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Importantly, emotions in remediation would be better explored during early assessment experiences and using longitudinal studies, that is, well before remediation. Though remediation is an emblematic experience during medical education, it is likely preceded by experiences of frustration from unexpected feedback, fear of failure, anticipated or experienced shame and enthusiastic expectations regarding 'second-chance' opportunities for learning or for improving social interactions with peers or supervisors. To this end, longitudinal research studies could focus on the expression of various emotions during regular coursework, assessments and on relational and contextual factors that may influence one's feelings toward remediation. Such longitudinal studies could aid in identifying and predicting the emotions related to remediation and the degree of individual variability in how remediation is expected, experienced and elaborated throughout the curriculum. They could also aid in identifying trajectories of emotional experience in remediation and who may need support to experience remediation as a positive turning point in their educational path.

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Finally, a key issue in enhancing the link between research and learning is how best to harness research studies in educational contexts. As already stated elsewhere,⁸ and resonating with Balmer and colleagues' view,⁹ potentiating emotion research and promoting learners' psychological reasoning in medical education may be envisioned as a two-way process that begins early in the medical education curriculum and involves both research on medical students' emotional processes and discussing those findings with the students. Their reflections and feedback in turn serve as a compass for new research questions and experiments.

Emotion research and promoting learners' psychological reasoning in medical education may be envisioned as a two-way process.

Self-emotional insights on one's own and others' emotionally driven behaviours and beliefs more likely occur when the reflection is anchored to concrete, emotionally self-relevant, action-triggering experiences. Thus, like the several emotionally salient challenges occurring early on during the curriculum, remediation represents a key opportunity for studying learners' emotions in context and for prompting learners to observe, with curiosity, their own and their peers' psychological processes, from emotions in actions to cognitively mediated beliefs to personal roles in affecting interpersonal interactions. Thus, we believe a research programme combined with educational attention to emotions in remediation holds great potential to yield insights that can be translated into testable interventions that support learners beyond the remediation experience itself, during the challenging times of continuing education and daily clinical work.

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Mitigating bias in medical school admissions and the MCAT to optimize equity

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Efforts to increase equity, diversity and inclusion in medicine have received greater attention due to recent nationwide calls for racial justice and the ongoing COVID-19 pandemic. Despite efforts at the federal and institutional levels, underrepresented minorities comprise a smaller percentage of U.S. medical students today than 20 years ago.¹ As the gatekeeper to the field, the medical admissions process significantly affects the proportion of underrepresented minorities in medicine. Addressing forms of conscious and unconscious bias in the admissions process will play a critical role as we seek to reform the current system.

As the gatekeeper to the field, the medical admissions process significantly affects the proportion of underrepresented minorities in medicine.

In this issue, Robinett et al. present a study of multiple interventions to mitigate bias in the admissions process at the University of Maryland School of Medicine. Starting in 2019, interviewer implicit bias training, changes to recruitment, screening, interview, acceptance and matriculation were implemented to reduce bias and promote inclusivity. As a result of these efforts, the admitted and matriculating class profiles changed significantly. In 2019, the class included 54% students of colour, and for the first time, no single racial group comprised the majority. In 2020, the proportion of Black and Latinx

students reached 24% of the incoming class, up from 10–13% in preceding years.¹ The study demonstrates that an institution can effectively utilise a multifaceted, antiracist approach to increase representation in their student body.

Although not the main focus of their study, the authors point out that the Medical College Admissions Test (MCAT) disadvantages underrepresented and under-resourced students. The authors found students' MCAT scores did not significantly correlate with STEP I performance and medical school advancement at their institution.¹ These findings led them to approach applicants' MCAT scores in a pass/fail manner and blind interviewers to scores. The authors state that while the nature of the MCAT perpetuates systemic inequities, the test itself has not been shown to have inherent racial bias.¹ However, this may not be the case. Analysis of preparatory materials provided by the Association of American Medical Colleges (AAMC) reflects a potentially problematic design.

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One fourth of the MCAT consists of the Critical Analysis and Reasoning Skills (CARS) section. Unlike other sections, which are content-based, CARS is reasoning-based. Students are provided with a passage