Learning to self-regulate multi-dimensional felt experiences: The cases of four female medical students

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Abstract

Self-regulation skills in the context of medicine are important and can foster learning. While regulating felt experiences has been shown to enhance performance and well-being in sport, this process has not been examined in medicine. The purpose of this multiple case study was to explore the process in which four female medical students learned to regulate how they felt by participating in a feel-based, person-centered intervention. Results, synthesized through an analysis of narratives, indicated that for each student, feel was a holistic, dynamic, self-defined multidimensional experience that varied over time. Through the intervention, each student was able to identify how they wanted to feel based on different dimensions, observe how these mediated each other, and learn how to regulate their felt experiences to optimize performance and well-being. Findings are linked to the growing literature on self-regulation and give insight into healthy, lifelong, self-regulated learning in the medical field.

Key words: Self-regulation, medical students, learning, feel, multi-dimensional experiences, analysis of narrative

Introduction

It is almost unfeasible to think that an individual can live life without being affected by the field of medicine. We all face medical challenges, whether it is related to our own health, or that of a friend, family member, or colleague. When we encounter medical professionals, we tend to expect and assume they will perform at their best in order to meet our health challenges. However, seldom do we reflect on who these professionals really are as people; susceptible to the same pressures, downfalls, and affective experiences in their daily lives as everyone else.

Despite an increased awareness of the importance of overall physician health, studies show that during medical training, many students learn to routinely ignore their personal needs and how they generally feel in order to “get the job done” (Puddester, 2001). As such, it would seem important to initiate this process early on and to help medical students build the self-awareness and reflective skills needed to succeed in this highly demanding profession (Willson, 2006). Aside from potential health challenges, medical care evokes a diverse range of feelings in physicians that affect how they perform (Novack et al., 1997). However, medical schools often do not include opportunities or activities in their curriculum to address feelings in relation to performance (Novack, Volk, Drossman, & Lipkin, 1993). Overall, after a thorough review of the literature pertaining to medical education, it has become clear that there is no substantive empirical research conducted in the area of feel and performance. Therefore, a pertinent step in reducing this gap is to explore how the performance of medical students is affected by how they feel in order to understand better how students can actively take a role in the regulation of their felt experiences in their quest for optimal performance.
Some researchers have shown that individuals can learn to regulate how they feel by participating in a feel-based, person-centered intervention (Arcand, Durand-Bush & Miall, 2007; Callary & Durand-Bush, 2008; Doell, Durand-Bush & Newburg, 2006; Lussier-Ley & Durand-Bush, 2009). In these studies, feel was defined as a holistic, subjective, multi-dimensional experience mediated by one’s ability to perceive, to be aware of, or to be conscious of one’s inner self and environment. As such, the concept of feel, studied from a slightly different yet innovative vantage point, may be differentiated from traditional definitions of feelings and emotions (Denzin, 1984; Hansen, 2005; Vallerand & Blanchard, 2000) because in addition to emotions (e.g., I feel happy), it encompasses other dimensions such as physical (e.g. I feel strong), cognitive (e.g. I feel confident), social (e.g. I feel connected to others), and spiritual (e.g. I feel at peace) (Burke, Durand-Bush & Doell, 2008; Callary & Durand-Bush, 2008).

Resonance, as depicted in the Resonance Performance Model (RPM; Callary & Durand-Bush, 2008), adapted from Newburg, Kimiciek, Durand-Bush, & Doell, (2002), represents a dynamic and interactive process through which individuals regulate their felt experiences to optimize performance and well-being. As a self-regulation process, it underlines individuals’ efforts to alter their inner states or responses to bring themselves into line with preferred standards (Vohs & Baumeister, 2004). In Carver and Scheier’s (1981) words, it leads individuals to become consciously aware of the discrepancies between their current and desired self-states, and to then consciously choose to engage in actions to reduce these discrepancies. Congruent with Vohs and Baumeister’s (2004) observations, individuals experiencing resonance possess the skills to maintain harmony between their inner self and their social and physical environment. The RPM comprises the four following components: The way you want to feel, preparation, obstacles, and revisit the way you want to feel. Table I briefly describes the components of the RPM. For a more detailed description, please see Callary and Durand-Bush (2008).

As demonstrated by Callary and Durand-Bush (2008), Arcand et al. (2007), Doell et al. (2006), and Lussier-Ley & Durand-Bush (2009), the RPM was used as an intervention tool to help student-athletes identify how they wanted to feel across life and performance situations (e.g., preferred standards, Zimmerman, 2000), and to develop personal strategies to regulate their desired feel, particularly in the face of obstacles such as competitive pressure and stress from balancing academia and sport. The intervention process promoted self-observation, self-monitoring, and self-reflection through journaling and multiple individual and/or group sessions with a trained researcher/consultant, which led to heightened self-awareness and self-regulatory abilities. This in turn enhanced these individuals’ perceptions of performance and well-being. A university volleyball coach who participated in a 14-week intervention with his 16 women student-athletes stated:

“...We stayed with [resonance] long enough this year, and trusted it and we’ve seen some results. I think that’s what’s got me hooked on it and it will stay more in the front of my mind.”

From the student-athletes’ perspective, it was reported: “That’s when we realized that we don’t need [the coach] to control our feelings, we can do it ourselves” (Callary & Durand-Bush, 2008). The intervention helped the student-athletes to manage not only how they feel but also be more self-directed in their learning and performance.

Since the aim of the resonance process is to nurture awareness, reflection, and the self-regulation of desired felt experiences (i.e., align current and desired inner states or responses, Vohs & Baumeister, 2004), especially in the face of obstacles such as stress or adversity, and since it was perceived to be beneficial by student-athletes in several studies (Arcand et al., 2007; Callary & Durand-Bush, 2008; Doell et al., 2006; Lussier-Ley & Durand-Bush, 2009), it would seem noteworthy and innovative to apply it with medical students. Of importance, Schunk and Ertmer (2000) reported that little research has linked the process of self-regulation with specific interventions, thus more research is necessary to explore how self-regulated learning and performance may be facilitated.

Social relationships must be considered in this facilitation process as they can trigger self-regulatory responses (Fitzsimons & Bargh, 2004) and vice-versa (Vohs & Baumeister, 2004). A key feature of (Zim, 2000) social-cognitive model of self-regulation is the interdependent roles of social, environmental, and self-influences. Typically, individuals who neglect environmental and social influences, or view them as an obstacle to personal development, are often less effective in regulating themselves (Zim, 2000). It thus appears to be important to consider these influences when examining self-regulation if learning and instructional conditions (Schutz & Davis, 2000; Zimmerman, 1990) are to be maximized to allow students to evaluate, adjust, and monitor their progress toward achieving learning goals (Schunk & Ertmer, 2000). Exploring this in the context of medical education to determine if medical students can enhance their self-regulatory abilities to manage actively their personal needs and social and physical
of how the participants in this study constructed their experiences and interpretations of feel and self-regulation. The aim was not to generalize their constructed realities but to explore and provide a thorough and rich account of the participants’ individual experiences (Creswell, 2007; Guba & Lincoln, 2005).

Multiple case study

Integral to the constructivist paradigm, a multiple case study approach was used to explore how the phenomena/concepts (e.g. feel) appeared in different contexts (Stake, 2006). In this study, the word context did not necessarily pertain to different circumstances or contexts per se, but was rather interpreted as the inherent diversity contained within each participant’s perceptions and assigned meanings. For instance, participants may have encountered similar experiences within the same context, however, the interpretation and meaning they assigned to these experiences differed. Thus, in line with constructivism (Creswell, 2007; Guba & Lincoln, 1994, 2005), it was critical to focus on the individual experiences of each medical student over the course of the intervention so as to preserve each of their unique realities.

According to Stake (1995), case study researchers acknowledge that their contributions to readers’ experiences will depend on how the latter interpret knowledge and reality. In the present study, the in-depth multiple case study approach allowed the emergence of rich and meaningful data that reflected the participants’ exploration and construction of feel. However, the researcher/facilitator had the task of both clarifying descriptions and sophisticating interpretations (Stake, 2006). Thus, in terms of generalization, researchers embracing a constructivist view of knowledge tend to focus on the diversity of experience and encourage readers to deduce their own interpretations by providing them with rich material (Stake, 2006). Since four different and extensive

| Component                          | Description                                                                                                                                                                                                 |
|------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| The way you want to feel           | Refers to the way individuals want to feel in important areas of life from different relevant perspectives (e.g. physically, emotionally, cognitively, and socially, and spiritually). |
| Preparation                        | It can include, but is not limited to, cognitive, physical, technical, tactical, emotional, social, or organizational means, strategies, or activities.                                                    |
| Obstacles                          | Obstacles are both internal (e.g. negative thought) and external (e.g. parental pressure) barriers that prevent individuals from feeling the way they want.                                                        |
| Revisit the way you want to feel   | Refers to what allows individuals to reconnect with the way they want to feel after facing an obstacle. It can include, but is not limited to, cognitive, physical, technical, tactical, emotional, social or organizational means, strategies, or activities. |
individual interventions were conducted in the present study, one way to synthesize and convey the rich experiential data to readers was through an analysis of narratives (Polkinghorne, 1988). Congruent with the constructivist paradigm (Guba & Lincoln, 2005), this was deemed an effective method to analyze and present the subjective stories of each participant (Callary & Durand-Bush, 2008; Lussier-Ley & Durand-Bush, 2009).

Participants

Four female medical students were recruited through a research notice posted in the School of Medicine at a Canadian University. This number of participants was deemed appropriate due to the considerable length and in-depth nature of the individual interventions conducted (Doell et al., 2006; Arcand et al., 2007) and the overall research paradigm and methods used (Stake, 1995). Participants were required to be either third or fourth year medical students undertaking their clerkship years, or medical residents currently in their residency in order to ensure they all shared a similar medical performance environment; that is, clerkship students and residents both participate on block rotations focusing on a specific medical specialty, typically lasting three to four weeks. Stake (2006) postulated three general criteria for selecting multiple cases, which guided the purposeful sampling of the four participants in this study (Patton, 2002): (a) the cases must be relevant to the topic under study; (b) the cases must provide diversity across the context under investigation; and (c) the cases must provide good opportunities to learn about complexity and contexts.

Specifically, six interested candidates attended an individual orientation session in which the commitment and requirements to participate were discussed (Doell et al., 2006). Due to the length of the intervention and overall study, choosing volunteers who would be able to commit to the 17-week process was critical and four of the six candidates chose to participate. After obtaining informed consent, the participants understood that their continued involvement was voluntary and they were informed that they could withdraw from the study at any time without repercussion. The results section includes a demographic profile of each participant. Note that the sample included four women participants because only women volunteered to participate.

Data collection phases

The present study took place across three phases spanning 17 weeks. In the pre-intervention phase (weeks 1–2), an individual interview was conducted with each participant to build rapport, explore their motives for attending medical school and pursuing a career in medicine, introduce them to key concepts (e.g. RPM, feel), establish their initial understanding and experiences of these concepts, and clarify intervention procedures including the journaling process and other logistical information. In the intervention phase (weeks 3–13), the participants engaged in an individual, feel-based, person-centered intervention comprising a total of six one-hour sessions conducted every two weeks by the researcher/facilitator. These intervention sessions focused on the participants’ felt experiences and their lessons learned while attempting to explore what dimensions of feel were relevant to them, the connections they perceived between these dimensions, and their attempts to regulate their felt experiences across time and situations using the RPM (Callary & Durand-Bush, 2008). Finally, after a four-week post-intervention phase (weeks 14–17) in which no sessions were conducted, each medical student participated in a final interview to discuss overall experiences during the study including any changes in perceptions and ability to self-regulate, and how the intervention process could guide them in their future career as medical professionals.

Journaling. As part of the intervention, each participant was provided with a journal and asked to write down how they felt each day as they reflected on their thoughts, behaviours, and feelings related to their performance environment and general daily life. Journaling has been successfully used in past research with medical students (Pitkala & Mantyranta, 2004) and nursing students (Simpson & Courtney, 2007) to facilitate reflection. It was considered a critical element in the study because it gave the participants the opportunity to self-observe, self-monitor, and self-reflect on their process over time based on their interests, commitment, time constraints, and preferences (Callary & Durand-Bush, 2008; Doell et al., 2006). The journals were used as a self-regulation tool and as such, their content was not systematically analysed.

Data analysis

According to Polkinghorne (1995), a narrative approach to data analysis involves constructing the data in a chronological or systematic order to give events, circumstances, or experiences cohesive meaning. Polkinghorne contrasts two approaches, stipulating that a narrative analysis is a method to organize and construct narrative/storied data to give chronological or processional context. An analysis of narratives,
conversely, is a more typical method for exploring the meaning of narrative/storied data. Specifically, it is a paradigmatic approach where specific experiences or responses, organized in a narrative/storied form, are further organized into more generalized themes and categories of meaning that can be predetermined based on a theoretical approach, or can emerge in the analysis. Since the aim of this study was not to relay the stories of each medical student unfolding through their intervention process, but on exploring the core themes shaping the meaning of each student’s narrative/storied data, an analysis of narratives was performed (Polkinghorne, 1995).

Specifically, each interview/intervention session was digitally recorded, transcribed verbatim, filtered for grammatical errors, and then chronologically assembled case by case to form four independent but complete transcripts. These were subsequently reduced to include relevant information that best illustrated the participants’ experiences and contributed to answering the research questions. An analysis of narratives (Polkinghorne, 1995) was performed in which the RPM and the multiple dimensions of feel (e.g. social, physical, emotional, and cognitive) were used to deductively organize the data, and an inductive approach was used to allow for the emergence of additional themes such as: (a) personal definitions of feel; (b) relevance of each dimension in overall felt experiences; (c) inter-relatedness of dimensions; and (d) role of dimensions in self-regulation of feel. These themes were presented and discussed in conjunction with direct citations to provide the participants’ perspectives in their own words (Bruner, 2002; Lieblich, Tuval-Mashiach & Zilbar, 1998).

Trustworthiness

Qualitative research is generally assessed in terms of trustworthiness (Creswell, 2007; Guba & Lincoln, 1990) and several steps were taken to maximize trustworthiness in this study. Pilot interviews were conducted with three medical students to identify and address any potential problem with the interview guide and other methodological procedures. In addition to regular debriefing sessions with the co-investigator to maximize the authenticity of the emerging data collection and analysis process, (Stake, 1995), respective transcripts were sent to each participant for content authentication (Guba & Lincoln, 1994).

The researcher/facilitator was properly trained to implement the feel-based intervention and conducted each interview and intervention session with all four participants. As such, a trustworthy relationship was maintained, which is crucial in any person-centered intervention in which participants are to feel comfortable and safe to share their life experiences (Ivey & Ivey, 2003). Furthermore, to preserve the integrity and authenticity of the contextually bound data, they were analysed and interpreted by the researcher/facilitator who conducted the interventions and experienced the process first-hand with the participants (Rubin & Rubin, 2005).

Ethics. The procedures and practices used within the present study were in accordance with the ethical standards for minimal risk human subject research under the University of Ottawa Research Ethics Board. Ethical approval for this research is categorized as a branch of a larger project, previously approved by the University of Ottawa Research Ethics Board (obtained 28 May 2003, file number H 05–03–05). Signed, informed consent was received from each participant. All documents included in, and related to, this manuscript (including interview transcripts and narratives) were validated by each participant. All procedures and methods used in the present research also adhere to the Helsinki Declaration (1975, revised 1983), in accordance with the basic principles for all medical research. Note that the present research was conducted without internal or external financial contribution. As such, no significant conflict of interest can be identified.

Results

Results pertaining to the four independent cases are presented and to preserve the participants’ anonymity, pseudonyms were used. Tables II–V summarizing the participants’ subjective definition, experience, and regulation of multi-dimensions of feel are included (see Tables II, III, IV, and V). Readers are strongly encouraged to familiarize themselves with the content of these tables before immersing themselves in the subsequent sections that present a more detailed account of the participants’ experiences during the intervention process.

Ruby

Ruby is a 32-year-old female medical resident in her second year of residency in obstetrics gynaecology.

Ruby discovered through the intervention that it is important for her to recognize when she is feeling cognitively overwhelmed. Such thoughts bring about physical sensations of which she often becomes conscious even before she can identify that something is wrong. Her physical dimension of feel became a key indicator: “I’ve become more physically in tune with what I’m feeling and it motivates me to get back to a point to what’s happening and what I can do to change the situation.”
Table II. Summary of Ruby’s definition, experience, and regulation of interrelated dimensions of feel.

| Definition of feeling | Desired felt experiences “Feeling the way she wants” | Overall |
|-----------------------|------------------------------------------------------|---------|
| Definition of feeling | Internal position of gut-feeling that reflects either when there is something wrong about a situation, or when she is feeling the way she wants. | Feeling the way she wants is like a high; she is energized by a lasting surge of energy that allows her to feel like she can juggle multiple tasks at once; there is also a feeling of excitement. In her daily life, she wants to feel relaxed, with no internal conflicts or insecurities. It’s a calming sensation she experiences when something feels ‘right’ (sense of clarity). |
| Desired felt experiences | Overall “Feeling the way she wants” | |
| Dimension | Social | Feel/experience a sense of social connectedness with her patients, colleagues and preceptors. |
| | Physical | Feel in-tune with her body. She feels in control, and can breathe effectively and calmly. Neck muscles feel warm and relaxed, and body feels gelatinous. |
| | Emotional | Feel a sense of excitement. Experience a greater sense of empathy with patients, and generally feel happy as a person. |
| | Cognitive | Feel motivated and “on top of things.” Feel intuitive with a sense of clarity. |
| Interrelation and regulation of dimensions | Social | When she feels connected, reciprocally feels motivated (cognitive) to perform and keep moving forward and feels happier (emotional) with what she is doing. |
| | Physical | When in-tune with her physical bodily sensations, she notes changes in how she feels emotionally, cognitively, and socially. Give her insight into how to use this physical data to guide her overall self-regulation. |
| | Emotional | When experiencing facilitative emotions (e.g. happiness or excitement), she feels more confident (cognitive), which is also felt physically, and she is often more motivated (cognitive) to go the extra distance for her patients. |
| | Cognitive | When she feels intuitive and has clear, flowing thoughts, she feels physically aware of how her environment, social or otherwise, is affecting her. When she is able to be logical, rational, and intuitive, she feels confident (cognitive) in her tasks. |

Undesired felt experiences “Not feeling the way she wants”

At school she feels disconnected with her tasks and has difficulty accomplishing anything. In her daily life and at school, she feels physically tense and cannot relax or experience a sense of calm. She feels preoccupied by negative thoughts, and the ensuing negative emotions tend to cause her to “over-catastrophize” situations, and “wallow” rather than proactively take control and formulate steps to effectively self-regulate. Since facilitative feedback from social interactions play an important role in her self awareness, a lack thereof typically interferes with her ability to gather feel and performance related data on which she relies to prepare for and regulate future performance. She finds herself in a state of amotivation, and feels physically tight in her neck muscles, and heavy in her chest.
Running and cycling were physical strategies that Ruby used to feel the way she wanted and regulate her daily experiences. These also helped her to clear her mind and feel more focused, relaxed, and in control of her internal self:

As I'm running, I'll look at the water, it's calming, and allows me to sense that mental dialogue with myself. Saying, ‘Why are you saying those negative thoughts?’ and ‘Ok, you need to work on this element, or that, etc.’ So in the future, when you run into the situation again, you won’t make the same mistake….There is a certain element of fatigue, but it almost brings a sense of peace, so the muscles hurt but they are not tight. There is warmth there, so the muscles are warm and tired, but the mind is calm. Even though my heart is racing, it is associated with better thoughts. It seems like everything is working together, and there is no disconnect anywhere in my life.

Logic was an important part of Ruby’s cognitive processing; she had the ability to take the stance of a third person by metaphorically removing herself from a situation in order to evaluate all available data, and prevent any interpretations from being influenced by negative emotions. An important conflict that could arise, however, was between logic and intuition. How could Ruby rely on logic to make decisions and still rely on her intuitive sense as well? It is a fair assumption to make that often we are faced with a choice that feels right but it may not appear to be the most logical, “I have to put the two together, I can ask the logical questions to myself but then I have to see if these answers fit with my intuitive sense.”

Being able to use both logical and intuitive processes allowed Ruby to establish a positive perspective and a clearer state of mind. More importantly, however, by paying attention to and reflecting on these processes over the course of the intervention, Ruby learned that she needs to take a step back to evaluate her experiences and recognize that she can regulate her cognitive processes and reconnect with the way she wants to feel across dimensions.

Overall, Ruby learned to regulate how she feels socially, cognitively, emotionally, and physically, and concurrently enhanced her ability to regulate her thoughts and actions as well, which are an integral part of the resonance process due to the strong reflective component and the implementation of behaviours and thought processes leading to desired felt experiences. Feel played a central role for Ruby both in her medical performance environment and everyday life. By becoming aware of physical sensations, she was able to develop an awareness of specific obstacles that led her to feel frustrated, and formulate ways to avoid or respond to situations before negative thoughts and emotions emerged. Socially, she discovered how important it was for her to establish positive connections with her colleagues, preceptors, and patients in order to perform at an optimal level.

Emelia

Emelia is a 29-year-old female medical resident in her second year of residency in paediatrics.

While it is difficult to pinpoint which dimension of feel was the most critical for Emelia, she felt as though her thoughts played a central role in the overall regulation of her felt experiences. Her thoughts acted like a central base where information was interpreted and responses were formulated based on the data she received from her emotions, physical sensations, and social experiences:

Once I change my thoughts, everything else changes…. [when feeling overwhelmed by debilitative emotions and thoughts] I just have to be calm….take deep breaths, and then I can get a grasp on my emotions and thoughts [by taking that step back to evaluate and reflect] …try to be aware of, and then [take] control.

Over the course of the intervention, Emelia met her goal of exploring her thoughts and emotions, and determined how she could use that information to exert more control over the way she felt to help guide and facilitate positive connections with her patients:

When I [am able to] feel more in control of things, it improves relationships with my patients….I think it’s going to help me in developing the link between the thoughts and emotions…. if I can control my emotions, I can control my thoughts.

Since feeling in control was important for Emelia, she also worked on her appraisal of situations she could not control, such as the amount of hours she worked on a rotation. Instead of feeling helpless, she chose to consciously reflect and focus on what she could control; that said, this often proved to and continues to be a challenge for her. If she experienced intense debilitative emotions while cognitively evaluating the “controllability” of an experience, they could have a reciprocal debilitative effect on her subsequent thoughts, creating a negative vicious cycle. However, when she was able to efficiently control these negative thoughts and focus on positive
| Definition of feeling | Sees feel primarily as how she experiences her emotions and thoughts and how they are physically manifested within her body. |
|-----------------------|-----------------------------------------------------------------------------------------------------------------|
| Desired felt experiences “Feeling the way she wants” | Wants to feel confident in her knowledge and execution of tasks, and be able to identify and evaluate what prevents her from feeling the way she wants to regulate herself and her performance. Establishing control is a critical element because when in control, she feels relaxed and at ease and is unaware of physical bodily sensations; flowing from her as if she is on autopilot. It is a holistic experience that she describes as her ‘balance’. |
| Interrelation and regulation of dimensions Social | Social Dimension | Wants to feel connected with her patients and feed off that positive energy. |
| Physical | Physical Dimension | Wants to feel connected to her body; feel relaxed in her muscles like she is limber, dexterous, and coordinated; feel light as if her body does not have any weight, especially in her legs and arms. |
| Emotional | Emotional Dimension | Wants to feel, above all else, a love for what she is doing; she also wants to feel happy and content while on her rotations, which she experiences as a light and floating sensation. |
| Cognitive | Cognitive Dimension | Wants to feel in control of her thoughts, which in turn makes her feel confident that she can actively regulate the other dimensions of feel. She also feels motivated to do more, and seek out new learning experiences. |
| Undesired felt experiences “Not feeling the way she wants” | If she is not feeling the way she wants, she becomes more conscious of physical sensations such as muscle tension and a heavy feeling, like she is not in control of her body or mind. Her stomach feels uneasy and her body feels clumsy. Cognitively, she feels foggy, like she cannot see. Emotionally, she experiences frustration, anger, and even fear. Negative emotions bring on more of a heavy feeling and a diminished sense of control. When her social connections with her patients are weak, she loses motivation to be there and devote time to them and their families. Not feeling the way she wants interferes with her ability to effectively regulate her performance, particularly by inhibiting her holistic sense of “balance”. |
| Overall | | Positive social interactions give a feeling of accomplishment, satisfaction, and motivation (cognitive) to make that extra effort. It is also an important variable in connecting to, and regulating over time, her ‘balance’. Taking control of her physical sensations (e.g. through exercise) becomes a regulatory mechanism. It helps her to reflect on, organize, and act on her thoughts to feel more positive (cognitive); In turn leading to facilitative emotions (e.g. feels happier). Attuning to the physical dimension often acts as a strength indicator, allowing her to be aware of where she is in reference to her “balance”. |
| | | In a cyclical relationship, how she feels emotionally influences how she feels cognitively. When she experiences this light and floating sensation, she does not feel any tension in her body (physical), nor does she feel overwhelmed by negative thoughts (cognitive). She feels love (emotional) when she experiences a strong social connection with her patients (social). Thoughts and the way she feels cognitively play a central role in her performance and the regulation of her emotional, physical, and social dimensions. When her thoughts and ensuing feelings change, her emotions (emotional) and physical bodily sensations (physical) seem to follow and influence her perception of social and other environmental stimuli (social). Thus, her ability to take charge of her thoughts and how she feels cognitively (e.g. confident, motivated) is a critical factor in her ability to self-regulate. |
elements of her experiences, it became an effective way for her to feel the way she wanted from a cognitive (i.e. felt confident), social (i.e. felt motivated to spend more time with patients), and physical (i.e. felt a sense of calm and positive energy) perspective. Thus, it was important that she identify and evaluate the element of personal control she had within a given moment over either herself or her environment, and take progressive steps to establish facilitative regulatory processes to experience her desired feel. Emelia remarked, “if I can control how I feel, I can control how I approach the situation, and change things into positives… I can’t always control the external factors, but I can control my thoughts, my outlook.” While Emelia admitted that she was still not completely able to manage certain feelings like feeling overwhelmed due to the high demands of her medical training context, she loved what she was doing with her career, which to her was what ultimately counted.

Over the course of the intervention, Emelia found that once she became aware of a physical impediment, she automatically began to initiate actions or responses to reverse that experience instead of allowing it to pass. She stated in one session: “Even though I feel physically drained and I’m reacting negatively because of it, instead of letting that drain me, I’m actively trying to be positive… that way it does not snowball.” As such, she was better able to regulate how she felt and performed in both her school and everyday life by adopting this active rather than passive approach to her experiences:

I am better able to recognize when I need to be more prepared, or when I need to be more positive, so I’m better able to recognize when I’m feeling overwhelmed and stressed and initiate my regulatory mechanisms… for instance with my thoughts, I take a step back and reflect on exactly what I’m stressed about, and actually I’ve started to map it out. I’ll write all the things I’m stressed about, and make a pie chart, or write questions to myself to elicit what I’m being bothered by, and how, and that helps me… before [the intervention process] I’ve never felt I was ever physically in control of my thoughts. Now I can go to the gym and it feels great in my body… I can prepare myself better for what lies ahead.

Emelia’s experience reveals that each of the dimensions of feel she deemed relevant (i.e. emotional, cognitive, social, and physical) were inter-related, and she provided tangible examples illustrating how each worked to holistically mediate her overall felt experiences, for better or for worse. Overall, the intervention process helped Emelia better control how she feels and performs on a daily basis. None-theless, she stated that she would need to engage in this continuous, lifelong learning process to be able to regulate all of the experiences she will face in her life and career.

Marissa

Marissa is a 24-year-old female student completing her clerkship in third year of medical school. She is planning on specializing in anaesthesiology, plastic surgery, family, or emergency medicine.

Through the intervention, Marissa came to understand how physical, emotional, cognitive, and social dimensions of feel influenced each other and collectively as a whole, and determined that when she feels the way she wants, she experiences her aura:

If I have a migraine and I am in a bad mood, and someone makes a negative comment about it, I would not take it in the same way as I would if I had my aura… It determines how well I respond and how much a certain situation affects me.

When Marissa experienced her aura, her physical sensations were heightened and she was more aware of everything around her. She felt centered and positive, “Everything I see and experience, I turn it into a positive feeling and it keeps feeding that aura.” Emotionally, she felt like she had a “force field” around her that kept the positive thoughts and emotions flowing. It was an invincibility that allowed her to frame every experience as a positive one and feel more prepared for whatever came her way.

Marissa could better regulate her thoughts and actions with this aura,

“… I have more control over how I handle situations… something bad happens and I can easily control how I’m going to approach or handle the situation… I can think more clearly.”

With her aura firmly in place, she had a holistic awareness of social, emotional, physical, and cognitive dimensions; she felt untouchable and ready to take on any challenge. Marissa shared an “aura” experience during a rotation in the operating room:

I intubated a patient on my own, I had the scope in my hand and I got to do it all alone, so… a first for me, and I got it on the first shot… I felt it in my chest, in my heart… I was excited, more alert… there was that lightness, lighter on my feet, positive thinking… any situation, no matter what, I was just thinking positively about it… I can figure out what I want more easily if I am
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Table IV. Summary of Marissa’s definition, experience, and regulation of interrelated dimensions of feel.

| Definition of feeling | Desired felt experiences |
|-----------------------|--------------------------|
| Feel is both multi-dimensional and situational, connected primarily to her state of mind in the moment. There are social, cognitive, emotional, and physical dimensions to it, and every aspect of her life plays a role in the way she experiences feel. She strives to achieve an ultimate feeling as often as possible, which extends from her performance as a medical student, to everyday life. | Overall “Feeling the way she wants” |
| Calls her ultimate feeling her “aura”; a feeling of confidence, preparedness, and happiness where she feels almost invincible, and feels motivated to take on new tasks. Her aura encompasses physical, emotional, cognitive, and social dimensions. Experiencing her “aura” is critical in her life because the quality of all her social interactions (e.g. preceptors, friends, patients) depends on it. | |

| Dimension | Interrelation and regulation of dimensions |
|-----------|-------------------------------------------|
| Social    | Believing social energy is contagious, as a regulatory mechanism she often draws on this energy from others (e.g. friends) when she wants to connect with her “aura”; feeding her “aura” and giving her a light (physical), uplifted feeling, and sense of enjoyment (emotional). |
| Physical  | Physically feeling the way she wants often has a social source. Positive feedback from her preceptors (social) facilitates these surges of energy, which in turn make her feel more confident and motivated (cognitive). Taking a more active role in her physical regulation, she discovered that exercise allows her to feel physically healthy and able to “wind down” at the end of her shifts; a time to clear her head, reflect on her day (cognitive). |
| Emotional | When feeling the way she wants emotionally, her thoughts seem to be positive and clear and she feels cognitively focused (cognitive). Feeling in control of her emotions gives her the confidence and motivation to take charge by focusing on the task at hand and maintaining positive thoughts (cognitive), and by physically engaging herself and using the resulting surge of energy (physical). |
| Cognitive | Her cognitive processes act as the center where she perceives, interprets, and reacts to her experiences including social, physical, and emotional data. It allows her to self-regulate effectively by reflecting on past performances and making appropriate adjustments that incorporate each dimension. |

| Undesired felt experiences “Not feeling the way she wants” | |
| When she is unable to feel the way she wants, she cannot experience her “aura”. She has negative emotions and experiences a high level of anxiety that are often rooted in a lack of perceived control over a situation. Cognitively, she begins to take words out of context and perceives more situations as negative or as bigger than what they actually are. Physically, she experiences a lack of energy, which is detrimental to her performance and overall well being. |
feeling the way I want … more than if I were just sitting there dwelling on the negatives.

As an intensely social person, relationships affected how she responded to any given experience within her performance environment and could generate a trickle-down effect on cognitive, physical, and emotional dimensions that became more difficult to control:

If something is wrong with a relationship and I did something wrong, then I’ll feel it internally. I’ll feel uncomfortable, kind of sad and confused. I’ll feel that I don’t know how I should feel, or that I can’t figure it out. I can’t get out of that feeling and I can’t get back to that confident, happy aura.

Marissa identified several self-regulation strategies from which she was able to draw when she did not feel the way the wanted. While some were less accessible when performing “in the moment,” positive self-talk appeared to be a key one to maintain a positive frame of mind when faced with conundrums:

Long term wise, I can use the social connections I have with others, but more in the moment, I can’t just stop what I’m doing and go talk to a friend, go for a run, or blast some music when I’m with a patient. So I try to think positive thoughts … organize them as much as I can in the moment … if I can’t use my normal regulatory strategies then I’ll do what I can without them and consciously work to maintain a positive attitude.

Through the intervention, it became important for Marissa to recognize different regulatory strategies that worked for her, allowing her to connect and reconnect to her aura:

It is using those to my advantage, like a toolbox in that if one does not fit, work to connect with my feel, than I have other tools in there I can try … they [regulation strategies] help with my thought content, I kind of shift my thoughts to the music, and I like the feel it gives me, it’s a very upbeat, good feeling … if I’m just dwelling on how I’m going to do poorly on an exam, that affects my feel physically, my thoughts, etc. but if I redirect, calm, or block those negative thoughts then I won’t fall into that negative cycle where I can feel physically tense … the music takes away the tension, it brings me closer to my aura.

Marissa built upon an already strong awareness and understanding of how each of her relevant dimensions contributes to her performance and well-being:

I’m a lot more aware of how I feel … what makes me feel how I want to feel. I workout four or five times a week now … I feel physically better, have more energy, and just feel healthier and more confident … psychologically I feel a lot better. I’m clear-minded and it’s a time that I can just spend with me.

Sophie

Sophie is a 24-year-old female student completing her clerkship in third year of medical school. She is planning on specializing in family or emergency medicine.

For Sophie, becoming aware of which dimensions of feel were most relevant to her was a process that spanned the course of the intervention. While it proved to be quite challenging to explore her thoughts and emotions in relation to her performance, she felt a strong connection to her physical self. This physical attunement allowed her to describe accurately physical states as they precipitated from her experiences. For instance, when her anxiety was high, she had trouble breathing, her heart rate increased, her hands got sweaty, she felt dizzy, she had trouble seeing, and in extreme cases, she felt like she could lose consciousness. The advantage of this awareness was that she could prepare herself by using these bodily reactions as indicators of oncoming debilitative states. That said, controlling these reactions and states proved to be troublesome. Becoming aware was only the first step:

Being prepared, and being in control of my anxiety, allows me to feel the way I want. I know it’s normal to feel anxious at times, but the thing is, when it gets to the point that I start to feel it physically, that’s all I can focus on and it builds up until I want to pass out, and I just wish I could stop that all when the anxiety is still at a low level, and I can’t. It was as if once she began to notice those physical sensations, it was already too late to act as the anxiety became too elevated to manage it.

Sophie’s anxiety became a central issue during the intervention process and learning to control it was one of the reasons she wished to participate in this study. In fact, when asked to describe the way she wanted to feel while performing as a medical student, her immediate response was “not feeling anxiety.” For Sophie, this absence of high anxiety was represented by a feeling of being on autopilot with few conscious thoughts:
| Definition of feeling | Throughout the intervention process and especially in the beginning, she found it difficult to articulate what feeling was to her, and how she experienced it. Despite being able, in hind and foresight, to identify how she wanted to feel socially, cognitively and emotionally, she was not particularly aware of how she felt in the moment beyond physical sensations, and found it difficult to identify links between the different dimensions of feel. For her, feel was primarily sensed in physical ways, in a reciprocal relationship with her social and environmental experiences; she was thus very in tune with her body in any given moment. |
| --- | --- |
| Desired felt experiences | "Feeling the way she wants" | Overall |
| **Wants to feel confident, smart, physically relaxed, and devoid of negative anxiety; which is reflected in normal breathing, a regular heartbeat, and an absence of negative thoughts. Her confidence is deeply rooted in her social experiences with others, and her school performance efficacy. When feeling more physical energy, she feels engaged and motivated, which in turn makes her want to work harder. When she is experiencing high confidence and a sense of flow, she works on autopilot and has few conscious thoughts.** |
| **Interrelation and regulation of dimensions** | Represents a central dimension of her felt experiences. All others permeate from her social experiences. When she feels valued by her preceptor (social), she feels happy (emotional), confident and motivated to do more (cognitive), and feels more relaxed in her body (physical) in that any anxiety she may have does not reach a conscious level, which is when it gets too debilitating to overcome. |
| Social | **Wants to feel connected with her social environment at school, especially with her preceptors and colleagues.** |
| **Wants to feel connected with her social environment at school, especially with her preceptors and colleagues.** | Became instrumental in the development of her ability to regulate herself. She was naturally attuned to physical manifestations within her body, and thus able to use these as a precursor to, or indicator of, her thoughts and the way she cognitively (e.g. focused, confident) and emotionally felt. |
| Physical | **Wants to feel relaxed, with a regular heart and breathing rate; ultimately does not want to consciously be aware of her body in the moment as this means she is experiencing a sense of flow.** |
| **Wants to feel relaxed, with a regular heart and breathing rate; ultimately does not want to consciously be aware of her body in the moment as this means she is experiencing a sense of flow.** | Recognized over time that her emotions played a role in her chronic experience of negative anxiety. Initially a physical phenomenon for her, her experience of somatic anxiety (physical) was rooted in feelings of frustration and anger (emotional) that often emerged in response to negative feedback from her preceptor (social). Since she found it difficult to manage her anxiety once it reached an intolerable physical level, she began to consciously attune to negative thoughts preventing her from feeling confident (cognitive) and a sense of enjoyment (emotional) so she could interject and attempt to regulate them before they physically manifested themselves. |
| Emotional | **Wants to smile and experience a sense of enjoyment in her work. Overall, she wants to feel devoid of negative emotions.** |
| **Wants to smile and experience a sense of enjoyment in her work. Overall, she wants to feel devoid of negative emotions.** | To feel confident, focused, and flowing, she became more aware of the influence that her thoughts had in her every day experiences, allowing her to make links to her physical sensations (physical), realizing that her inability to feel relaxed was due to her anxiety. Feeling confident and calm was coupled with low anxiety and tension (physical). Actively engaging herself in an inclusive and supportive social environment at school greatly increased her opportunities to feel confident and focused (cognitive), happy (emotional), and socially connected (social). |
| Cognitive | **Wants to feel confident and a sense of flow whereby she is only focused on her current tasks.** |
| **Wants to feel confident and a sense of flow whereby she is only focused on her current tasks.** | When she is unable to feel confident, she typically loses physical and mental energy, and the motivation to work harder and take "that extra step". She often experiences negative anxiety which results from an inability to feel confident, calm, and socially connected to those in her performance environment. Unable to achieve that feeling of flow, she "gets down on herself" and finds it difficult to feel engaged in her tasks. When she has high anxiety, she has trouble breathing, her heart rate increases, her hands become sweaty, and she feels dizzy. |
| Undesired felt experiences | "Not feeling the way she wants" | Overall |
| **When she is unable to feel confident, she typically loses physical and mental energy, and the motivation to work harder and take "that extra step". She often experiences negative anxiety which results from an inability to feel confident, calm, and socially connected to those in her performance environment. Unable to achieve that feeling of flow, she "gets down on herself" and finds it difficult to feel engaged in her tasks. When she has high anxiety, she has trouble breathing, her heart rate increases, her hands become sweaty, and she feels dizzy.** |
When I’m relaxed like that and able to have that regular heartbeat and breathing rate, I don’t notice it consciously. I only notice when I have that high anxiety… it’s automatic, I’m not thinking about anything negative, or focused on how my body feels.

Toward the end of the intervention, Sophie had aligned herself with four relevant dimensions of feel and linked them with her experience of anxiety, which she saw as a process. First, social stimuli, such as feedback from her preceptor, fed the process. These stimuli could lead her to generate negative thoughts, which were accompanied or followed by physical sensations. It was not until much later in the intervention that Sophie became aware of additional manifestations of her felt experiences. For instance, she realized that she felt frustrated when unable to regain focus after becoming distracted, and this often left her feeling very agitated and anxious. This was a critical step because Sophie, at least in the preliminary stages of the intervention process, somewhat denounced emotions and even thoughts as role players both in her chronic anxiety and everyday experiences. She had focused more on the physical components of anxiety with little consideration of the emotional inputs and outputs associated with her feelings of anxiety. However, she later understood that this was more due to a lack of awareness, understanding, and confidence in her ability to explore her emotions and thoughts as opposed to a belief that they did not play a role in her life.

Also toward the end of the intervention process, Sophie realized and accepted that anxiety is a part of her life and is something of which she will never totally rid herself. The question became, “Now that I’m aware of it, what can I do to manage it in the most efficient and effective manner? Can I reduce it? Can I predict it?” It was still an obstacle for her, but she no longer felt that it was as daunting as it once was:

Anxiety has been a distraction, but less so than before. I have really been able to work around it more. It’s not as paralyzing as it used to be, but it is still very hard to overcome at times. I do try some things like taking deep breaths, but it is still hard. Staff members and the overall clinical environment in which Sophie worked during her final cardiology rotation provided positive social stimuli, which affected other dimensions of feel and resulted in positive thoughts and self-appraisals. As such, Sophie finally began to experience the ultimate way she wanted:

“I’ve realized that the environment is a key dimension… it has to be positive, energetic, in order for me to feel the way I want… I will need to look at that when I decide where I want to do my residency and where I want to work later on in my career. I need to be in an environment that I really enjoy.”

Overall, the intervention process proved to be quite a challenge for Sophie. While she did not reach a position where she could consistently control her anxiety, she gave herself a monumental head start by becoming aware of how her social, cognitive, emotional, and physical felt experiences are holistic and interconnected, and affects both her performance and overall well-being.

**Summary of results**

In sum, Ruby, Emelia, Marissa, and Sophie demonstrated through their descriptions how feel evolved for them into a holistic, dynamic, subjective, multidimensional, and contextual experience that they could actively regulate through increased self-observation, self-monitoring, and self-reflection. The person-centered, feel-based self-regulation intervention allowed them to identify how they wanted to feel from different vantage points, and characterize their desired feel with such terms as their “aura,” “balance,” and “high”. They also learned to prepare to feel this way by developing and applying regulatory strategies such as exercising and using positive self-talk. It also led them to identify and anticipate obstacles that distanced them from their desired feel, the most common of which were; social (e.g. negative feedback from preceptors or colleagues), physical (e.g. an inability to exercise due to demanding schedules), and emotional (e.g. distress and negative anxiety) in nature. Finally, they identified and applied regulatory strategies to respond appropriately to these obstacles by reconnecting with their desired feel. Examples of these include; using physical sensations as indicator mechanisms, taking time to reflect on thoughts and emotions and how these affected their actions, and seeking out positive social connections. As evidenced by the extensive and profound reports of each student, the relevance of each dimension of their felt experiences varied, as did they way these dimensions influenced each other and the strategies they used to regulate them. Of importance, their perceptions were such that the process through which they evolved positively influenced their performance and well-being.

**Discussion**

The purpose of this study was to explore the self-regulation of multidimensional felt experiences of four female medical students. Overall, as suggested in past research (e.g., Arcand et al., 2007; Burke & Durand-Bush, 2008; Callary & Durand-Bush,
Learning to self-regulate multi-dimensional felt experiences

2008; Doell & Durand-Bush, 2006; Lussier-Ley & Durand-Bush, 2009), by the end of the self-regulation intervention, Ruby, Emelia, Marissa, and Sophie viewed feel as a subjective, multidimensional, dynamic, and holistic experience that varied over time based on their inner self and external environment. While each student identified with the same multiple dimensions (i.e. social, emotional, physical, and cognitive), there was diversity in the extent to which each dimension played a role within their daily experiences, how they were inter-related, and how they were able to regulate them. For example, the data suggest that the physical dimension was the most important for Ruby and Sophie as they paid attention to physical sensations first to regulate themselves. Alternatively, the social dimension seemed to be central for Emelia and Marissa, as much of their overall felt experiences depended on how connected they were with their social environment. These results are innovative in that this study is the first to explicitly highlight the inter-relatedness of dimensions and illustrate how regulating one influences the regulation of others as well as the overall felt experiences of the participants.

In line with Zimmerman’s (2000) social-cognitive model of self-regulation, it appears to be important to examine participants’ thoughts and behaviours in tandem with how they feel multi-dimensionally. Several observations that emotions were associated with cognitions and physiological responses were made by the participants, which support the research of Artz (1994), Damasio (1994), and Pekrun, Goetz, Titz and Perry (2002). For example, much like the physical dimension of feel was identified by Ruby, Emelia and Sophie as an important “indicator mechanism,” emotions seemed to have a similar function as they triggered reflective thinking about their experiences, contributing to overall efforts to self-regulate (Vohs & Baumeister, 2004). Specifically, Ruby’s recognition of the debilitating and facilitative nature of her emotions in her decision making processes appeared to help her change the way she thought in order to change the way she felt, a link also discussed by Ochsner and Gross (2004).

Results of this study show that the four medical students were able to identify and apply strategies to exert more control over themselves as they sought to achieve their academic and personal goals (Vohs & Baumeister, 2004). However, one important difference to highlight in comparison to Zimmerman’s (2000) self-regulation research is that central to these participants’ self-regulation attempts was their desired feel (see RPM in Table 1). In his research, Zimmerman discusses how self-generated thoughts, feelings, and actions are planned and cyclically adapted to the attainment of personal goals during self-regulation. However, it is not clear how these thoughts, feelings, and actions may be planned and adapted in real life situations. The present study demonstrated this process and also differentiated multi-dimensional felt experiences from feelings traditionally defined in the literature (Hansen, 2005; Vallerand & Blanchard, 2000). By clearly identifying and articulating their desired feel based on several meaningful dimensions, the medical students rendered their felt experiences more tangible, controllable, and adaptable to bring themselves in line with their preferred standards (Vohs & Baumeister, 2004). Furthermore, they were concurrently able to observe and identify current and desired thoughts and behaviours, which is an integral part of the self-regulation process (Zimmerman, 1990).

Future exploration of self-regulation, incorporating diverse, meaningful elements of felt experiences could help us better understand how individuals can engage in holistic self-regulated lifelong learning (Schutz & Davis, 2000). Indeed, the ability to effectively self-regulate is a critical step in any learning process (Schutz & Davis, 2000) as it allows individuals to evaluate and monitor their progress toward learning goals, alter their approach as needed, and adjust social and environmental factors to provide a setting highly conducive to learning (Schunk & Ertmer, 2000). The experiences of these four students suggest that their ability to self-regulate led them to enhance their performance and well-being, which could have important implications throughout their medical training. If future research supports these findings, given the ever-changing nature of the medical field (Arnetz, 2001; Puddester, 2001; Shanafelt, Sloan & Habermann, 2003), the facilitation of such adaptive skills could, inferably, become a key outcome of medical training. In fact, life-long, self-regulated learning has already been identified as a key strategy for gaining expertise in many areas of medicine (Dunn, Iglewicz & Moutier, 2008). However, what are missing from the research are processes through which self-regulation skills can be developed and sustained over time.

The social dimension of feel emerged as a noteworthy theme in the current study. Research has shown that self-initiated self-regulation processes can alter an individual’s social and physical environment, and are reciprocally affected by those changes (Vohs & Baumeister, 2004; Zimmerman, 2000). As was apparent within each case, interpersonal relationships such as interactions with colleagues, patients, preceptors, friends, and family affected and were affected by each student’s ability to self-regulate desired feel. Similar results also emerged in previous studies in which a feel-based intervention was carried
out with student-athletes (Arcand et al., 2007; Callary & Durand-Bush, 2008; Lussier-Ley & Durand-Bush, 2009), highlighting the interdependent roles that social and self-influences appear to play in the optimal regulation of the self. This supports the notion of resonance process in which congruence with one’s social environment is central (Doell et al., 2006; Newburg et al., 2002) and corroborates the social-cognitive nature of Zimmerman’s (2000) self-regulation model.

An important aspect of the feel-based intervention conducted in the present study that may influence lifelong self-regulated learning is the identification of and preparation to generate desired felt experiences in the process of achieving goals, as this appeared to increase the participants’ motivation and engagement. Each student reflected that when they were able to feel the way they wanted in their performance environment, they felt reciprocally motivated to “do more.” For instance, when they felt confident in what they were doing, they felt empowered and motivated to ‘take that extra step’ in their duties instead of only striving to achieve what was asked of them. As such, motivation can be linked to the concept of self-regulation (Zimmerman, 2000) and the concept of feel (Callary & Durand-Bush, 2008). While self-regulation may be the “exercise of control over oneself” (Vohs & Baumeister, 2004), p. 2, such abilities are of little consequence if people cannot motivate themselves to use them. Akin to the resonance process, for the regulation of felt experiences to take place, individuals need to be intrinsically motivated (Deci & Ryan, 1985) and efficacious (confident) in their ability to feel the way they want. Interestingly, as reported by the participants in this study and in past research on resonance (Burke & Durand-Bush, 2009; Lussier-Ley & Durand-Bush, 2009), focusing on their desired feel, designing their life to experience this feel, and actually being able to feel the way they wanted in different situations was in and of itself intrinsically motivating. In other words, it requires motivation to self-regulate and, conversely, being able to self-regulate enhances motivation. Furthermore, these increases in self-regulation and motivation appeared to facilitate their optimal performance and well-being. In the case of the four medical students, it augmented their efforts to enhance the service they provided to their patients. In light of the interpersonal nature of the medical field, any efforts, such as those made by the participants in the present study, to maximize the positive reciprocity between themselves and their social environment could inferably have a positive impact on the quality of service delivery. More research should be conducted to examine the links between feel, self-regulation, motivation and the delivery of patient care.

Since the development of self-regulation skills was an ongoing process in this study, it is also important to highlight how these skills were developed. Despite being limited to four participants, what can be gained by exploring their individual cases are depth, detail, and insight into methods and processes used. First, particularly during the initial phases of the intervention process, each began to develop self-regulation skills by engaging in ongoing self-observation, self-monitoring, and self-reflection (Zimmerman, 2000). For example, Ruby noticed, by keeping a journal and actively engaging in the intervention sessions, that when she felt cognitively overwhelmed by any number of tasks, she also began to feel it physically in her body. Becoming aware of how each dimension was related was the first step from which they learned to formulate regulation strategies, based on the premise that exercising control over one dimension (e.g. feeling relaxed by decreasing heart rate) could influence another (e.g. feeling positive by controlling thoughts).

As a key outcome of self-observation, self-monitoring, and self-reflection (Zimmerman, 2000), self-awareness became a central component of the intervention process for these medical students by fostering a climate for reflective thinking in which they learned to pay attention to themselves, their social and physical environment, and the role each played in their daily felt experiences. For example, Sophie identified primarily with the physical dimension of feel at the outset of the intervention process, but her awareness of the roles that other dimensions played gradually surfaced over time. As demonstrated by Carver and Scheier (1981) who acknowledged the important function of self-awareness in self-regulation processes, these four medical students learned to recognize and monitor their inner states in relation to “preferred standards” (e.g. how they wanted to feel, what they wanted to think, and how they wanted to behave to perform at their best). Furthermore, each demonstrated an increased ability to not only note discrepancies between their current and desired experiences but also apply personal strategies to reduce these discrepancies to feel the way they wanted and bring themselves into line with preferred standards (Vohs & Baumeister, 2004). From this they identified additional congruent standards such as preferred thoughts, preferred behaviours, and preferred performance environments.

As put forth in the RPM, in Zimmerman’s (2000) social-cognitive model of self-regulation, and in the constructivist paradigm (Guba & Lincoln, 2005), no self-regulatory strategy will work equally well for all
persons, and few strategies will work optimally for a person across all situations and tasks. This highlights the importance of personalizing self-regulation interventions and processes and to monitor these over time. Zimmerman asserts that self-regulation skills are context specific. However, it was not clear by reviewing Zimmerman’s work how these skills should be developed, that is, whether or not individuals’ best learn to self-regulate through personal discovery or with the guidance of other individuals or resources. In this study, the four medical students highlighted that it was beneficial to work with the researcher/facilitator throughout the intervention to develop self-regulation skills. It remains unclear, nonetheless, whether the skills each participant identified and refined will be maintained and/or adapted over time without the presence of the researcher/facilitator. Naturally, future research should longitudinally examine the retention of self-regulation skills of individuals who undergo interventions of this nature, as well as explore lifelong learning methods that could sustain the development of adaptive self-regulatory skills over time.

As previously mentioned, this study was the first to document through four independent cases the interrelated nature of the multiple dimensions of felt-experiences, and to implement an intervention of this nature in the context of medicine. Given the limited number of cases presented here, future research should expand on these findings with a wider range of students. The findings, in the very least, begin to address Schmidt and Riker’s (2007) assertion that medical students need to devote more time to reflecting on their performance environment and experiences in order to deepen their understanding and performance. It also introduces a potential intervention specific to self-regulation that could contribute to not only enhanced performance but also learning and well-being (Schunk & Ertmer, 2000). From an applied perspective, a potential long-term contribution could be medical training curricula that include interventions designed to optimize students’ self-regulatory abilities by incorporating self-awareness and reflective skills that take into account the holistic and ongoing nature of student experiences. In doing so, it could promote conditions for optimal health (Puddester, 2001) and life-long, self-regulated learning (Harvey, Rothman & Frecker, 2003).

From a theoretical and methodological viewpoint, the concept of feel, as described by Newburg et al. (2002), Arcand et al. (2007), and Callary & Durand-Bush (2008) had never been formally studied in tandem with existing self-regulation literature. Based on the similarities between Zimmerman’s social-cognitive model of self-regulation (Zimmerman, 2000), and the RPM (Newburg et al., 2002), Callary & Durand-Bush), future efforts should be made to continue exploring the complimentarily properties of these two models. Overall, more research should be conducted in this very important domain of medicine to help medical students and practitioners best regulate themselves to manage stress and adversity. In sum, by encouraging and empowering students to give their performance and how they feel priority from the onset of their medical training, it may help them build a solid foundation for becoming attuned physicians, better able to serve patients by first taking care of themselves (Ball & Bax, 2002).

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References

Arcand I., Durand-Bush, N., & Miall, J. (2007). “You have to let go to hold on”: A rock climber’s reflective process through resonance. Reflective Practice, 8(1), 17–29.
Arnitz, B. B. (2001). Psychosocial challenges facing physicians of today. Social Science & Medicine, 52, 203–213.
Arnold, A., & Feighn, K. M. (1995). Students’ general approaches and performances in medical school: A longitudinal study. Academic Medicine, 70(8), 715–722.
Artz, S. (1994). Feeling as a way of knowing: A practical guide for working with emotional experience. Toronto, ON: Trifolium Books.
Ball, S., & Bax, A. (2002). Self-care in medical education: Effectiveness of health-habits interventions for first-year medical students. Academic Medicine, 77(9), 911–917.
Bruner, J. (2002). Making stories: Law, literature, life. New York: Farrar, Strauss, and Giroux.
Burke, S. M., Durand-Bush, N., & Doell, K. (2008). An ethnographic study of motivation and feel with novice and elite Mount Everest climbers. Manuscript submitted for publication. International Journal of Sport & Exercise Psychology.
Callary, B. & Durand-Bush, N. (2008). A group resonance intervention with a volleyball team: An exploration of the process between a consultant, coach, and athletes. Athletic Insight, 10(3). Retrieved October 1, 2008, from http://www.athleticscience.com/Vol10Iss3/Process.htm
Carver, C. S., & Scheier, M. F. (1981). Attention and self-regulation: A control-theory approach to human behavior. New York, NY: Springer-Verlag.
Creswell, J. W. (2007). Qualitative inquiry and research design: Choosing among five approaches (2nd ed.). Thousand Oaks, CA: Sage.

Damasio, A. R. (1994). The feeling of what happens: Body and emotion in the making of consciousness. New York: Harcourt Brace & Company.

Deci, E. L., & Ryan, R. M. (1985). Intrinsic motivation and self-determination in human behaviour. New York, NY: Plenum.

Denzin, N. K. (1984). On understanding emotion. Washington, DC: Jossey-Boss.

Doell, K., Durand-Bush, N., & Newburg, D. (2006). The process of performance of four track athletes: A resonance-based intervention. *Athletic Insight, 8*(2). Retrieved July 1, 2006, from http://www.athleticinsight.com/Vol8Iss2/Process.htm.

Dunn, L. B., Iglewicz, A., & Moutier, C. (2008). A conceptual model. In J. W. Creswell (Ed.), *Choosing among five qualitative research approaches* (pp. 244). Thousand Oaks, CA: Sage.

Fitzsimons, G. M., & Bargh, J. A. (2004). Automatic self-regulation. In R. F. Baumeister, & K. D. Vohs (Eds.), *Handbook of self-regulation: Research, theory, and applications* (pp. 151–170). New York: The Guilford Press.

Guba, E. G., & Lincoln, Y. S. (2005). Paradigmatic controversies, and emerging conservatism. In N. K. Denzin, & Y. S. Lincoln (Eds.), *The Sage handbook of qualitative research: Third Edition* (pp. 191–217). Thousand Oaks, CA: Sage.

Harvey, B. J., Rothman, A. I., & Frecker R. C. (2003). Effect of an undergraduate medical curriculum on students’ self-directed learning. *Academic Medicine, 78*(12), 1259–1265.

Ivey, A. E., & Ivey, M. B. (2003). *Intentional interviewing and counseling: Facilitating client development in a multicultural society* (5th ed.). Pacific Grove, CA: Thomson/ Brooks/Cole.

Keltner, D., Locke, K. D., & Audrain, P. C. (1993). The influence of attributions on the relevance of negative feelings to personal satisfaction. *Personality and Social Psychology Bulletin, 19*(1), 21–29.

Lieblich, A., Tuval-Mashiach, R., & Zilber, T. (1998). *Narrative research: Reading, analysis, and interpretation*. Thousand Oaks, CA: Sage.

Lussier-Ley, C., & Durand-Bush, N. (2009). Exploring the role of feel in the creative process of modern dancers: A realist tale. Manuscript submitted for publication. *Research in Dance Education*.

Newburg, D., Kimiecik, J., Durand-Bush, N., & Doell, K. (2002). The role of resilience in performance excellence and life engagement. *Journal of Applied Sport Psychology, 14*, 249–267.

Novack, D. H., Suchman, A. L., Clark, W., Epstein, R. M., Najberg, E., & Kaplan, C. (1997). Calibrating the physician: Personal awareness and effective patient care. *Journal of the American Medical Association, 278*(6), 502–509.

Novack, D. H., Volk, G., Drossman, D. A., & Lipkin, M., Jr. (1993). Medical interviewing and interpersonal skills teaching in US medical schools: Progress, problems, and promise. *Journal of the American Medical Association, 269*(16), 2101–2105.

Ochsner, K. N., & Gross, J. J. (2004). Thinking makes it so: A social cognitive neuroscience approach to emotion regulation. In R. F. Baumeister, & K. D. Vohs (Eds.), *Handbook of self-regulation: Research, theory and applications* (pp. 229–255). New York, NY: The Guilford Press.

Patton, M. Q. (2002). *Qualitative evaluation and research methods* (3rd ed.). Thousand Oaks, CA: Sage.

Pekrun, R., Goetz, T., Titz, W., & Perry R. P. (2004). Academic emotions in students’ self-regulated learning and achievement: A program of qualitative and quantitative research. *Educational Psychologist, 37*(2), 91–105.

Pitkala, K. H., & Mantyra, T. (2004). Feelings related to first patient experiences in medical school: A qualitative study on students’ personal portfolios. *Patient Education and Counseling, 54*, 171–177.

Polkinghorne, D. E. (1988). *Narrative knowing and the human sciences*. State University of New York Press.

Polkinghorne, D. E. (1995). Narrative configuration in qualitative analysis. In J. Amos, & R. Wimsieki (Eds.), *Life history and narrative* (pp. 5–23). Bristol, PA: The Falmer Press.

Puddester, D. (2002). The Canadian Medical Association’s policy on physician health and well-being. *Western Journal of Medicine, 174*, 5–7.

Raskin, J. D. (2002). Constructivism in psychology: Personal construct psychology, radical constructivism, and social constructionism. In J. D. Raskin, & S. K. Bridges (Eds.), *Studies in meaning: Exploring constructivist psychology* (pp. 1–21). New York, NY: Pace University Press.

Schmidt, H. G., & Rikers, R. M. J. P. (2007). How expertise develops in medicine: Knowledge encapsulation and illness script formation. *Medical Education, 41*, 1133–1139.

Schunk, D. H., & Ertmer, P. A. (2000). Self-regulation and academic learning: Self-efficacy enhancing interventions. In M. Boekaerts, P. R. Pintrich, & M. Zeidner (Eds.), *Handbook of self-regulation* (pp. 631–651). San-Diego, CA: Academic Press.

Schutz, P. A., & Davis, H. A. (2000). Emotions and self-regulation during test taking. *Educational Psychologist, 35*(4), 243–256.

Skanafelt, T. D., Sloan, J. A., & Habermann, T. M. (2003). The well-being of physicians: Association of professors of medicine. *The American Journal of Medicine, 114*, 513–519.

Simpson, E. C., & Courtney, M. (2007). A framework guiding critical thinking through reflective journal documentation: A Middle Eastern experience. *International Journal of Nursing Practice, 13*, 203–208.

Sotile, W. M., & Sotile, M. O. (2002). The resilient physician: Effective emotional management for doctors and their medical organizations. AMA Press.

Stake, R. E. (1995). *The art of case study research*. Thousand Oaks, CA: Sage.

Stake, R. E. (2006). *Multiple case study analysis*. New York: The Guildford Press.

Vallerand, R. J., & Blanchard, C. M. (2000). The study of emotions in sport and exercise: Historical, definitional, and conceptual perspectives. In Y. Hanin (Ed.), *Emotions in sport* (pp. 3–37). Champaign, IL: Human Kinetics.

Vohs, K. D., & Baumeister, R. F. (2004). Understanding self-regulation: An introduction. In R. F. Baumeister, & K. D. Vohs (Eds.), *Handbook of self-regulation: Research, theory, and applications* (pp. 1–12). New York: The Guilford Press.

Westberg, J., & Jason, H. (2001). *Fostering reflection and providing feedback: Helping others learn from experience*. New York: Springer Publishing Company.

Willson S. (2006). Essay: What can the arts bring to medical training? *Medicine and Creativity, 36*, 815–16.

Zimmerman B. J. (1990). Self-regulating academic learning and achievement: The emergence of a social cognitive perspective. *Educational Psychology Review, 2*(2):173–201.

Zimmerman B. J. (2000). Attaining self-regulation: A social-cognitive perspective. In M. Boekaerts, P. R. Pintrich & M. Zeidner (Eds.), *Handbook of self-regulation* (pp. 13–42). San Diego, CA: Academic Press.