



# Teaching empathy in an interprofessional setting with a focus on decategorization: Introducing I-Team

Barret Michalec<sup>a</sup>, Julie M. Schneider<sup>b</sup>, Michael Mackenzie<sup>c,\*</sup>

<sup>a</sup> Center for Advancing Interprofessional Practice, Education and Research (CAIPER) and Associate Professor, Edson College of Nursing & Health Innovation, Arizona State University, USA

<sup>b</sup> Assistant Professor of Communication Science and Disorders, Louisiana State, USA

<sup>c</sup> Associate Professor of Health Behavior Science, University of Delaware, USA

## ABSTRACT

**Background:** The Interprofessional Training in Empathy, Affect, & Mindfulness (I-TEAM) was designed to promote and cultivate collectivity and a sense of shared identity and values among health profession students.

**Purpose:** This study showcases the theoretical foundation, evaluation-based protocol, and findings of the pilot I-TEAM program.

**Method:** To evaluate the impact of the pilot offering of I-TEAM, we employed a rigorous multimethod protocol consisting of surveys (pre and post), observations, and interviews.

**Discussion:** Students significantly improved in empathy, and positively shifted their perceptions of other health professions. Moreover, student-oriented goals for the program and fundamental aspects of the IPEC competencies were shown to be addressed through the I-TEAM program.

**Conclusion:** Centralizing an interprofessional program on the principles of decategorization and shared experiences, may have a positive impact on students' perceptions of other health professions as well as ability and willingness to connect with others on an emotional and cognitive level (i.e. empathy).

## 1. Introduction

Interprofessional Education (IPE) is when two or more health and social care professions learn with, from, and about each other to enable collaboration and improve health outcomes.<sup>1</sup> Given these broad conceptual boundaries, IPE has taken numerous shapes and sizes – from shared didactics and integrated curriculum, to full-day intensive symposia, to even shared clinical rotations/placements and online virtual simulations.<sup>2–7</sup> Despite the variety, there has been remarkably consistent focus among IPE programs on/in emphasizing what each health profession brings to the table, highlighting *differentiation* between health profession categories, and in turn, how these pieces can fit within the larger picture of team-based healthcare delivery.<sup>8</sup> What is somewhat absent from the IPE portfolio are programs that focus on *decategorization* and enhancing commonalities among health profession students, that promote students' overarching connectedness and shared values and identity. Although focusing on intergroup differences may yield knowledge of what each health profession does, it may also exacerbate pre-existing stereotypes and preconceived notions of health professions,<sup>9</sup> and could detract from fostering an *interprofessional* identity and cultivating respect, understanding among health profession students. With this in mind, we developed the Interprofessional Training in

Empathy, Affect, & Mindfulness (I-TEAM).

We begin by presenting the theoretical driving force(s) of the I-TEAM program by providing a brief overview of cognitive representation and re-categorization models commonly utilized within IPE program development and research. We then offer the background on the I-TEAM program itself, discussing key structural components, the conceptual cornerstones of empathy and mindfulness, as well as the overarching thematic foundations.

## 2. Background

### 2.1. Theoretical foundation of I-TEAM: the Contact Hypothesis and models of cognitive representation

Within the Contact Hypothesis,<sup>10</sup> outlines four key positive conditions for intergroup (i.e. in- and out-group) contact, that when met can help reduce prejudice and bias held by and between groups. Allport's positive conditions set the stage for *if* and *when* intergroup contact can potentially impact stereotypes and biases, there are three principle models that explore *how* intergroup contact can impact cognitive representations of group membership (i.e. perceptions of in- and out-group) and, in turn, dilute stereotypes: Mutual Intergroup Differentiation,

\* Corresponding author.

E-mail addresses: [Barret.Michalec@asu.edu](mailto:Barret.Michalec@asu.edu) (B. Michalec), [juschnei@lsu.edu](mailto:juschnei@lsu.edu) (J.M. Schneider), [mmackenz@udel.edu](mailto:mmackenz@udel.edu) (M. Mackenzie).

Personalization, and Common In-group Identity, As the name suggests, the Mutual Intergroup Differentiation encourages *differentiation* between and among group members in that those of the in- and out-groups understand and acknowledge what they do and do not bring to the table of the contact situation.<sup>11,12</sup> As such, according to the model, group members see how they are similar and where they are different, and in turn, each group is seen as it wishes to be seen, role security is strengthened, and intergroup harmony is cultivated.

However, Brewer and Miller<sup>13–15</sup> stress that group-based situations where the shared goals are highly salient, highlighting distinctions can evoke competition and out-group rejection. Therefore, in these situations there is a need for reduced differentiation to decrease the apparent notion of “different-ness” of the social categories (i.e. decategorization). According to Brewer and Miller, this decategorization should lend to interactions between the in- and out-group members that promote differentiation of individual members *within* a specific category and Personalization - seeing and responding to others as people not just their group affiliations. In turn, this shift to focus on more “personal”, non-category-based information becomes the basis for future interactions with members of the out-group.

Similar, yet distinct from the Personalization approach, the Common In-group Identity model argues specifically for the need to transform group members’ cognitive representations of their memberships “... from separate groups, to one, more inclusive group”.<sup>16</sup> In short, the model proposes the need to shift group identities from an *us* and *them* to a *we* perspective, thereby promoting a Common In-group Identity. This Common In-Group Identity is evoked by conjuring the prominence of factors that are shared by all members of each group.<sup>16</sup>

Although there has been persistent attention within the IPE literature to spotlighting differentiation, in order to promote and cultivate collectivity, solidarity, connectiveness, as well as a general sense of we-ness and person-hood among health profession students, the I-TEAM program was developed utilizing the conditions of positive contact (outlined by Allport) and following the tenets of Personalization and Common In-Group Identity – cognitive representation and recategorization models that emphasize the potential impact of decategorization processes.

#### 2.1.1. Conceptual foundation of I-TEAM: empathy as the primordial soup of interprofessionalism

Although there is ambiguity regarding the conceptualization of empathy, especially within health professions education setting,<sup>17</sup> we conceptualize empathy as the emotional and cognitive experience of another’s emotional state, and following the tenets of the Russian Doll Model,<sup>18–20</sup> we approach the teaching of empathy within I-TEAM as a building and honing of the various innate and learned skills and abilities associated with this encompassing conceptualization.

Although there is no shortage of empathy-oriented programs aimed at training particular health professions,<sup>21</sup> I-TEAM features unique approaches to teaching empathy specifically within an *interprofessional* setting. We centered the design of I-TEAM around the empathy experience not only because of the extensive research touting the value of empathy in healthcare delivery,<sup>22–25</sup> but also because the tenets of empathy (e.g., perspective taking, emotional state recognition and attunement, self and other awareness, etc.) are key clinical and team-based care skills. Empathy fosters shared understanding, collaboration, trust, and teamwork, and allows practitioners to think beyond their own discipline-specific roles – it is therefore a key ingredient to IPE. Furthermore, no one profession can lay claim to dominance in empathy. It can be challenging to teach students certain clinical skills in an interprofessional setting given their developing professional identities within siloed learning structures and an overarching culture that sustains the status hierarchy of healthcare occupations.<sup>8,26</sup> However, everyone can improve in the various aspects of empathy. In this sense, a program focused on the empathic experience could serve as the primordial soup where interprofessional identities, values, and practices

could develop and flourish.

Moreover, the socio-emotional nature of the material and the program-based reflections and exercises are intended to foster openness, sensitivity, and vulnerability among health profession students. Returning to the Contact Hypothesis and models of cognitive representation, by focusing on clinical skills that everyone can improve on, cultivating common goals through shared assignments and course-based outcomes, and stripping away informal and formal competition, I-TEAM sets the stage to positively impact perceptions of in- and out-groups (i.e., those within and outside of one’s own health profession). Rather than spotlighting different-ness between (pre)professional categories, I-TEAM provides opportunities to emphasize students’ person-ness, humanity, and commonalities through cultivating psychological safety and providing consistent shared experiences (i.e. intergroup contact situations) that encourage vulnerability as well as self- and other-awareness.

### 3. Background on I-TEAM

#### 3.1. The structure of I-TEAM

I-TEAM is a semester-long immersive professional development program featuring a hybrid structure where online lectures are presented every two weeks and students meet for in-person Training Sessions every two-to-three weeks. The online lectures (30–45 min each) focus on the conceptual and theoretical foundations of empathy, mindfulness, emotions, and affect – spotlighting approaches and perspectives (from a socio-historical lens), debates in the field(s), and key empirical findings from relevant scholarly research. During the in-person Training Sessions (60–90 min), students meet in their respective 8-person interprofessional groups to review lecture material, engage in workouts, small group discussions, and reflection exercises. These training sessions were held in the evenings and specific dates were chosen for the sessions to avoid conflict with the schedules of participating health profession departments. Practices of mindfulness are embedded throughout the entire program, practiced as a group at the beginning of each group meeting, and presented consistently throughout the program as a valuable practice to promote well-being, prevent burnout, and preserve empathic resilience.

#### 3.2. Workouts for empathy muscles

The premise behind the workouts approach to teaching empathy is quite simple: you would not run a marathon without training, or squat 300lbs without building up to it - without effective and holistic training you would risk serious injury. So why do we expect health profession students to be empathic providers without providing them ample and consistent opportunities to train their empathy muscles (i.e., the various mechanisms associated with the empathic experience)? If someone tossed you a 30lb medicine ball and you had very little capability, capacity, or willingness to catch it, you would either let it fall to the ground, or it would hit you in the chest or arms and, in turn, it may actually cause significant pain or damage.

Health profession students’ ability to empathize can deteriorate during their education and training due to noxious elements associated with institutional and interpersonal stressors, factors that foster physical, emotional, and social distance between those in healthcare and those that are not, and challenges associated with patient contact and suffering.<sup>27,28</sup> In turn, the shedding of empathy and the cultivation of detachment are mechanisms utilized by students and professionals to protect themselves, minimize vulnerability, and prevent becoming overwhelmed by others and their emotional states.<sup>29–31</sup> However, previous literature suggests that empathy is associated with satisfaction with work and meaning in one’s professional activity, and therefore may be a protective factor against burnout.<sup>29,32</sup> By providing workouts in a step-wise fashion, we believe that health profession students have the potential to develop (what we term) “empathic resilience” – an attuned

authentic ability and willingness to identify and engage and resonate with others' emotions, while maintaining self-awareness and not succumbing to the potential aversive effects of others' negative affect. In this sense, through the development of empathic resilience students may become less susceptible to the negative side-effects of feeling with patients while still maintaining authentic empathic connections. The workouts within I-TEAM are structured to provide a slow and intentional build up to allow students to stretch out and train various muscles essential to empathy before fully engaging with and applying the empathic experience.

Examples of developmentally progressive workouts featured within I-TEAM include: journaling (individual and interactional), body and emotion scans, breathing-focused meditation, observation exercises, mindful listening, facial affect recognition training (PaulEkmanGroup®, 2019), and simulations (among others). Students also engage in reflections following certain workouts, and regarding specific readings and videos/films to help reinforce learning objectives. Although a majority of the workouts are conducted during the in-person training sessions, certain workouts (e.g. purposeful observation of others' emotions in public setting) and particular reflections are conducted outside of the training sessions. Students are also encouraged to continue their mindfulness practice(s) on their own.

### 3.3. The value of integrated mindfulness practice

Within this study, and embedded throughout the design and implementation of the I-TEAM program, we follow the Kabat-Zinn<sup>33</sup> conceptualization of mindfulness as being nonjudgmentally aware of the present moment. Integration of various forms of mindfulness meditation throughout the I-TEAM program was done to promote well-being, prevent burnout, and preserve empathic resilience. "Mindfulness meditation is designed to foster awareness of present-moment experiences by redirecting people's attention to an object, such as breathing, while taking a nonjudgmental stance toward distractions".<sup>34</sup> Extensive research has shown that mindfulness-based practices cultivate focused attention, enhance (self and other) awareness and self-regulation, reduce perceived stress, as well as cultivate empathy, and improve active listening and working memory<sup>35-39</sup>. This heightened level of attention and awareness can then lead to improved skills related to personal health and prosocial behaviors, interpersonal communication and relationship building, even work-related performance (including academic success). Notably, these skills and resources are essential to various clinical competencies and patient-centered care delivery.

Recent work by Ridderinkhof and colleagues<sup>34</sup> highlight comprehensive research that provides "... empirical evidence for the link between mindfulness and empathy" through self-report, intervention-based, and neurological data. The authors argue that there are multiple mechanisms through which mindfulness can enhance empathy. For example, through the general, consistent practice of increasing nonjudgmental awareness of the present moment, individuals can shift perceptions of their own thoughts and feelings, no longer viewing them as "fixed parts of the self" but rather begin to view "... them from a distance as floating states of the mind." In turn, it is easier to not crowd or be overly focused on their own thoughts and feelings, allowing them to be more aware of the present moment, those around them, and even more open to others' thoughts and feelings. As noted, mindfulness practice has been shown to improve self and other awareness – better understanding and appreciation of one's own emotions (as well as others') can lead to better understanding of emotional states and processes in general. This particular type of awareness coupled with more nonjudgmental engagement with the present moment may improve individuals' abilities to identify and understand non-verbal displays of emotional states (i.e. through the face and body), which is paramount to the empathy experience. These authors also present a novel approach to examining the connection between mindfulness and empathy – through stress-reduction. If noxious and stressful elements

are present in the environment/situation they will take up a majority of our cognitive and emotional space and effort to manage and respond. Therefore, if through mindfulness practice we are able to reduce our entanglements with stressors, we leave space and effort to be aware of others' emotional states and emotions in general.

Within the health and social care fields specifically, mindfulness programs aimed at healthcare professionals as well as graduate-level health profession students, have been shown to not only reduce experienced anxiety and perceived stress, but also enhance peer cohesion and group support, communication and observation skills, self-care, work-life balance, and empathy, as well as boost overall resilience and prevent burnout<sup>40-45</sup>; McAleer, & Hahne, 2017<sup>46</sup>; Verweij et al., 2018<sup>47</sup>). Given the explicit connection of mindfulness to the tenets of the experience of empathy, as well as the extolled benefits of mindfulness practice for health profession students, various mindfulness practices were formally and explicitly integrated into the I-TEAM program. Furthermore, given the sensitive and vulnerable nature of the empathy experience, we felt that consistent mindfulness practices would serve somewhat as a cryogenic chamber – allowing students the space and time to recover, heal, and recharge together as a group.

Having provided the theoretical, conceptual, and thematic foundations of I-TEAM, we now present the evaluation and assessment protocol associated with the program utilized to explore students' experiences with and perceptions of I-TEAM and to examine if and how I-TEAM may have had impact on the health profession students.

## 4. Methods

The I-TEAM program was piloted at the University of Delaware (UD) in the fall semester of 2019 with over 150 students enrolled from Nursing, Physical Therapy, Epidemiology, Clinical Exercise Physiology, Dietetics, Speech Language Pathology, and Clinical Psychology. Although there is continued debate regarding when it is most effective to offer IPE programs,<sup>48</sup> for the pilot I-TEAM was offered to all first-year health profession graduate students when they first began their own respective discipline-specific programs. However, given their fairly extensive clinical experiences thus far, third and fourth year undergraduate nursing students were also invited to participate. The evaluation and assessment protocol for this pilot of I-TEAM consists of a longitudinal mixed-methods design. Human subjects research was approached by the lead authors' institutional review board (IRB).

### 4.1. Surveys

Participants were administered a survey via Qualtrics prior to the start of the program (T1: August 2019) and again at the end of the program (T2: December 2019). This survey included three well-established measures, used to assess students' levels of empathy (Interpersonal Reactivity Scale<sup>49</sup>), subjective well-being (Mental Health Continuum, short form<sup>50</sup>), and perceptions of their own and other health professions (Student Stereotype Rating Questionnaire<sup>51</sup>). The Interpersonal Reactivity Index (IRI) is a 28-item multidimensional measure of individual-level empathy. The IRI has 4 subscales: Perspective Taking, the tendency to spontaneously adopt the psychological point of view of others (alpha = .75-.78); Fantasy, which taps respondents' tendencies to transpose themselves imaginatively into the feelings and actions of fictitious characters in books, movies, and plays (alpha = .75-.78); Empathic Concern, assesses "other-oriented" feelings of sympathy and concern for unfortunate others (alpha = .70-.72); Personal Distress, measures "self-oriented" feelings of personal anxiety and unease in tense interpersonal settings (alpha = .78). On a 5-point Likert scale, participants responses may range from "Does not describe me well" to "Describes me very well". The Mental Health Continuum, short form (MHC-SF) is a valid and reliable tool to measure dimensions of, and overall, well-being.<sup>50</sup> The MHC-SF consists of 14 items and requires participants to identify on a 6-point Likert scale the frequency with

which they have experienced or felt the particular characteristics during the past month (from never to every day). The Student Stereotype Rating Questionnaire (SSRQ) is a highly reliable and valid tool that explores the perceptions and views that health profession students hold of their own and other health professions.<sup>51</sup> Individuals are asked to rate their own and other professional groups on nine characteristics from very low (1) to very high (5): academic ability, interpersonal skills, professional competencies, leadership, being a team player, being an independent worker, confidence, decision making and practical skills.

In addition to the three scales included in the survey, participants were also asked particular demographic characteristics, such as their gender, age, race, and “health/social care profession pursuing”. For race, participants were allowed to provide any response (i.e. self-identify). Similarly, for “health/social care profession pursuing”, students were allowed to provide any response. We had assumed that this would be fairly straightforward, given they were pursuing professional degrees in particular health disciplines (e.g. Physical Therapy, Speech, Nutrition, Nursing, etc.), yet the wide range of responses limited our ability to clearly categorize some students. Therefore, certain students were allocated to an ‘Other’ category for this specific question - which encompasses responses such as ‘Engineering’, ‘Medical Facility’, ‘Other’, ‘Prefer not to say’, or ‘Undeclared’.

The T1 survey also featured questions assessing the students’ own goals of the I-TEAM program (i.e. what they wanted to get out of their participation in the program). In turn, in the T2 survey the students had the opportunity to rate (1 (not at all) to 5 (completely)) to what extent the program had attended to the tallied top five student-oriented goals. Students also completed a course evaluation at the end of the program to gather their perceptions of the instructors’ approaches to the material, the depth and relevance of the material, and the degree of their engagement with various elements of the program. All students enrolled in the I-TEAM program were given the opportunity to take the T1 and T2 surveys and the course evaluation. However, students who wanted to complete a T2 survey, but had not completed a T1 survey, were told that they had to have attended 5 out of the 6 in-person sessions in order to do so.

Prior to the start of I-TEAM, all enrolled students were sent an email notifying them of the research project, what participation in the study would entail, and that participation in the study was completely voluntary - and not required to participate in the I-TEAM program. Soon thereafter students received a link to the T1 survey, which included a unique study-ID code so that data from T1 and T2 could be linked. Two follow-up emails were sent to the students to attempt to gather as many participants as possible. Similarly, for the T2 survey, students were reminded of the upcoming survey, then shortly thereafter sent a link to the survey, followed by two follow-up/reminder emails.

#### 4.2. Interviews

After the I-TEAM program had concluded, a subsample of 18 students (at least 2 from each program) were interviewed to gain a more detailed understanding of students’ perspectives of I-TEAM, including the relevance and value of the workouts and lectures. In the T1 survey, we asked students to mark if they were willing to partake in a 30–45 min interview at the end of the program. Students from the list of those that were willing to participate in the interview were then randomly selected from within their own discipline group to ensure representation from each of the programs. Semi-structured interviews were conducted with this sub-sample of students to ensure that participants addressed specific questions that were aligned with the aims of the study, but also provided the opportunity for participants to provide information regarding topics and issues beyond what had been explicitly asked during the interviews. Examples of specific questions that were asked of each participant included: *Overall, how was your experience with the I-TEAM program? What do you feel you learned during the I-TEAM program? Do you feel you had the opportunity to learn about other health professions (Why/why not)?*

During these interviews, students were also asked about their inter-professional small groups, the structure and format of I-TEAM, and ways in which they felt the program could be improved. All interviews were recorded (with the students’ permission) and the audio recordings were then transcribed by an unaffiliated professional transcription company.

#### 4.3. Observations

Throughout the I-TEAM program, the author team took time during each of the training session to observe the interprofessional small groups during specific workouts, small group and individual activities, and even during certain mindfulness practices. The goal of this specific methodological approach was to assess (even if only on a surface-level) the degree of interaction, engagement, and participation of the students and student-groups. After each in-person session, observation notes were shared among the team to provide a comprehensive review for each session. These notes were then used as supplemental data to compare to and with the data gleaned from the other methods utilized in the program evaluation and assessment of participants.

The goal of this longitudinal, mixed-method design was to not only evaluate I-TEAM overall in regards to curricular, clinical, and IPEC-related goals/aims, but also to explore the overarching notions of the value of teaching empathy through workouts, and the promotion of personalization and/or common in-group identity through the cultivation of psychological safety and encouraging vulnerability among peers.

#### 4.4. Participants

I-TEAM was offered to all first-year health profession graduate-level students within the University of Delaware, as well as all 3rd and 4th year nursing students (given their clinical experience by that time in their education). At T1, each first-year cohort was well represented (90% or higher participation rate among first year students from each participating program), but undergraduate nursing students were far less represented. At T1, a total of 109 students completed the survey from 8 different health profession programs: 17 from Speech-Language Pathology, 6 from Exercise Physiology, 39 from Physical Therapy, 7 from Clinical Psychology, 13 from Nursing, 1 from Epidemiology, 7 from Dietetics, and 19 “Other”. There was an evident decrease in participation in the T2 survey, including the absence of Clinical Psychology and Epidemiology, and other programs dropping to 50% or less cohort representation. At T2 a total of 92 students completed the survey from 7 different health profession programs: 21 from Speech-Language Pathology, 3 from Exercise Physiology, 48 from Physical Therapy, 6 from Nursing, 3 from Dietetics, and 11 “other” (see [Table 1](#) for demographic information). Due to their lack of representation in the T2 data, Clinical Psychology and Epidemiology were not included in subsequent analyses. However, perceptions of Clinical Psychology and Epidemiology were included in SSRQ analyses.

As noted earlier, in the T1 survey, participants were not provided specific racial categories to select, but rather were requested to write the race they most identified with. The “racial categories” featured in [Table 1](#) reflect the most common response for each group, and whereas it is understood that Latinx (which is used here rather than Latino/a to be more gender-inclusive) reflects ethnicity rather than race, and “Asian”, as well as other categories presented, represent a broad array of races (and cultures) – we felt it necessary to present the students’ responses.

#### 4.5. Quantitative analysis

Specific items of the IRI were reverse coded and a sum across all items was computed for overall individual IRI scores. Sub-categories for Fantasy, Perspective Taking, Empathic Concern, and Personal Distress were calculated by summing items within each sub-category. All items on the MHC were summed to compute an overall individual score of “well-being”. Sub-scales for social, emotional, and physical well-being



**Table 1**  
Sample at T1 & T2 surveys.

T1	Speech-Language Pathology	Exercise Physiology	Physical Therapy	Clinical Psychology	Nursing	Epidemiology	Dietetics	Other
Sample Size	17	6	39	7	13	1	7	19
Age (Mean/SD)	22.46/1.66	22.6/.89	22.94/2.11	24.71/1.60	21.38/6.64	24	22.5/1.73	29.6/9.63
Self-Identified Gender Ratio (F/M)	16/1	5/1	27/12	5/2	10/3	1/0	7/0	5/4
Self-identified Race								
White	15	5	28	5	13	1	7	7
Latinx		1	3					1
Asian	2		3	2				1
Indian American			1					
Black or African American			3					
Multiracial			1					
T2								
Sample Size	21	3	48		6		3	11
Age (Mean/SD)	23.19/1.63	24.33/2.52	22.88/1.90		24.00/9.42		30.0/13.86	24.71/2.50
Self-Identified Gender Ratio (F/M)	17/1	1/1	29/15		3/3		1/1	4/2
Self-identified Race								
White	18	3	37		5		2	5
Latinx			5					
Asian	2		2		1		1	1
Indian American			1					
Black or African American			2					
Multiracial								

were calculated by summing items within each sub-category. Self-identified race was coded (1- white, 2- Latinx, 3- Asian, 4- Indian American, 5- Black or African American, 6- Multiracial) and Gender was dummy-coded. For the SSRQ students' ratings of attribute for each profession were tallied.

The current analysis sought to evaluate whether students in the I-TEAM program shifted (from T1 to T2) in empathy, well-being, or regarding their attitudes towards other health care professions. We also sought to identify the goals of students in attending the I-TEAM program and evaluate whether this program was effective. To address these questions, statistical analyses were conducted within SPSS comparing group-level differences between majors<sup>52</sup>. No new students enrolled/attended the I-TEAM program once it began (attendance was taken for each in-person session), yet given the differences in sub-samples for each department at T1 and T2 analyses conducted to compare health profession students, changes among students, and change by health profession were conducted at the cohort-level, not the individual-level.

#### 4.6. Qualitative analysis

Once transcribed, interview data were analyzed using a multi-step coding process<sup>53,54</sup> to identify patterns in students' experiences with and perceptions of the I-TEAM program, to examine if the tenets of the IPEC Core Competencies were indeed present/satisfied in I-TEAM, and to possibly identify elements of processes of decategorization related to personalization and common in-group identity. First, each transcribed interview was read through to identify recurring concepts, terms, and phrases. Inductive codes identified in this read-through stage were then combined with deductive codes identified within empathy, affect, and mindfulness literature and the cognitive representation models (e.g., empathy, otherness, emotions, presence, person, in-common, among other deductive codes), as well as key concepts nested within the IPEC Competencies (e.g. values, team, communication, respect, among others) to develop the initial codebook. These codes were used in the second more detailed coding process.

In order to conceptualize the experience and perceptions among the health profession students, comparisons were made between the interviews from specific disciplines (e.g. comparing the interview data

from physical therapy students to the interview data from the speech-language pathology students to see if/how they were unique and/or similar). These particular analyses showed that there was little to no difference between the disciplines, therefore analyses then focused on issues and factors that were consistent among all the disciplines to identify persistent aspects of students' experience and perceptions related to I-TEAM. In the final stage of analysis, categories of perceptions and experiences were then used as codes themselves to fully explore their nuances and intricacies within the data.

A similar analysis process was utilized for the course evaluation data (i.e. compare categories/themes between disciplines, and among whole sample), and these specific data were then compared to the interview data to further explore commonalities in experiences and perceptions. Regarding observation data, notes were taken by the team during each session and then met at the end of each training session to compare notes on student participation and engagement, the overall flow of the session, and what did/did not work well. Through discussion among the team, comprehensive notes were compiled for each training sessions and were then typed into a Word document immediately following each session. The team discussion and the entering of data into a Word document served as the first rounds of observation data analysis. Once all sessions had been observed, noted, discussed, and re-noted, all observation data were then analyzed in their entirety to identify any reoccurring factors and issues related to participation and engagement in general throughout the I-TEAM program.

In the following Results section, we present relevant quantitative data first to provide an outline of key findings related to I-TEAM. We then present the qualitative data to provide a deeper insight into the possible impact of the program.

## 5. Results

### 5.1. Empathy

Although we found no significant differences in the students' empathy scores *between* discipline groups at T1 or T2 respectively, independent samples t-tests revealed that student group in the I-TEAM program significantly improved in empathy scores from T1 to T2,

specifically in *Empathic Concern* ( $t(177) = -2.32, p < .05$ ) and *Perspective Taking* ( $t(175) = -7.40, p < .001$ ). Students did not significantly increase (or decrease) in the dimensions of *Fantasy* or *Personal Distress*. Furthermore, a linear regression identified that students who had higher ratings of Empathic Concern at T2 were more likely to report continuing the I-TEAM-related mindful practices on their own ( $\beta = 0.03, t = 2.19, p < .05$ ). This was true even when controlling for other sub-scales of the IRI, and regardless of students' discipline. In short, higher empathic concern predicts likelihood of continued engagement with mindfulness practice.

### 5.2. Well-being

We did not find any significant differences between discipline specific groups from T1 to T2 (i.e. change) on any dimensions of well-being, nor was any dimension of well-being associated with the significant changes in empathy scores.

### 5.3. Students' perceptions of other health professions

A one-way ANOVA revealed that overall SSRQ scores for each discipline did not significantly differ from one another at T1 – meaning that ratings students from each discipline assigned to their own profession and other professions, on each attribute, were not significantly different. Table 2 presents the shifts in students' perceptions of health professions from T1 to T2. The top of Table 2 shows each professions' highest and lowest rated attribute at T1 and T2. The bottom portion of Table 2 shows the specific profession receiving the highest and lowest rating for each attribute at T1 and T2. This Table provides a glimpse into the perceptions (i.e. stereotypes) that health profession students bring to their programs of study before the program even begins, and shows how engagement in an interprofessional program like I-TEAM may have an impact on their perceptions of what certain professions are and can do.

We next used a 6 (Major: Speech-Language Pathology, Physical Therapy, Clinical Psychology, Dietetics, Exercise Physiology, Nursing) x 2 (Time: T1,T2) RMANOVA model to evaluate whether differences existed in the perception of majors across time points for any sub-scale of the SSRQ (Leadership, Academic Ability, Professional Competence, Interpersonal skills, Ability to work Independently, Ability to be a Team Player, Ability to make Decisions, Practical Skills, Confidence). This analysis yielded that perceptions of all professions significantly improved from T1 to T2 in regards to the attributes of *Independence* ( $F(1,444) = 9.75, p < .01$ ), *Leadership* ( $F(1,444) = 7.10, p < .01$ ), and ability to be *Team Player* (except Nursing, which was rated lower in Team Player at T2;  $F(5,444) = 3.00, p = .01$ ). This suggests that over the course of the I-TEAM program, students gained keen insights into, knowledge of, and perhaps even respect for, other health professions in

regards to their *Leadership*, *Independence*, and *Team-ness*. Taken together, the SSRQ data shows that students' perceptions of various health professions do shift within the earliest stages of their professionalization and socialization and may be (positively) impacted by early offerings of interprofessional programming (like I-TEAM).

### 5.4. Students' goals for I-TEAM

As noted above, in the T1 survey, students were asked to list 3–5 goals/aims for I-TEAM (i.e. what they wanted to get out of the program). These goals were then read through, sorted into thematic categories, and then a frequency analysis was conducted to examine which goals were the most common among the students. The top 5 student goals were (in order of most common): 1.) *Meet/make friends/learn about people from other departments/professions*, 2.) *Better understand empathy and mindfulness*, 3.) *Learn practices of self-care, self-awareness, and burnout prevention*, 4.) *Eat good food*, and 5.) *Improve communication skills*.

In the T2 survey, we asked the students to rate, "... the extent you agree that the program has addressed these goals for you." Table 3 presents each goal, the mean, median, and mode regarding the responses, and the total percentage that "Agreed" the goal had been addressed by I-TEAM.

### 5.5. Student evaluations of I-TEAM program

During the final Training Session of I-TEAM, students were asked to evaluate particular aspects of the program through a series of close- and open-ended questions (i.e. course evaluation). Students were asked to respond either "Yes" or "No" to if they felt they had learned anything new about empathy, mindfulness, and other health profession groups during the I-TEAM program. An open-ended follow-up question requested that the students further explain what it was they had learned.

**Table 3**  
Percentage Agree that Goals were Met by I-TEAM.

Goal	Mean	Median	Mode	% Agree <sup>a</sup>
Meet/make new friends in & learn about other professions	3.81	4.00	4.00	72.7
Better understand empathy & mindfulness	4.09	4.00	4.00	81.8
Learn practices for self-care, self-awareness & burnout prevention	4.20	4.00	4.00	89.8
Eat good food	4.31	5.00	5.00	83.0
Improve communication skills	3.69	4.00	4.00	61.3

<sup>a</sup> Percentage of students that responded "Agree" or "Strongly Agree" among sample.

**Table 2**  
SSRQ-related ratings of each profession at T1 & T2.

Profession	Highest Attribute	Lowest Attribute	Highest Attribute	Lowest Attribute
Physical Therapy	Academic Ability	Interpersonal Skills	Ability to Work Independently/Decision Making	Interpersonal Skills
Speech Language Pathology	Professional Competence	Leadership	Ability to Work Independently	Confidence
Nursing	Practical Skills	Leadership	Ability to be a Team Player	Leadership/Confidence
Dietetics	Ability to Work Independently	Leadership	Ability to Work Independently	Leadership
Clinical Exercise Physiology	Practical Skills	Leadership	Ability to Work Independently	Leadership
Clinical Psychology	Ability to Work Independently	Ability to be a Team Player	Academic Ability	Leadership
Attribute	Highest Rated Profession	Lowest Rated Profession	Highest Rated Profession	Lowest Rated Profession
Academic Ability	Physical Therapy	Dietetics	Speech Language Pathology	Clinical Exercise Physiology
Ability to be a Team Player	Nursing	Clinical Psychology	Speech Language Pathology	Clinical Exercise Physiology
Ability to Make Decisions	Physical Therapy	Dietetics	Speech Language Pathology/Nursing	Physical Therapy
Confidence	Physical Therapy	Dietetics	Speech Language Pathology	Nursing
Interpersonal Skills	Physical Therapy	Speech Language Pathology	Nursing	Physical Therapy
Leadership Ability	Physical Therapy	Speech Language Pathology	Physical Therapy	Nursing
Practical Skills	Nursing	Dietetics	Speech Language Pathology	Clinical Psychology
Professional Competence	Speech Language Pathology	Dietetics	Physical Therapy	Speech Language Pathology

There were no instances where students who had responded “No” offered any further explanation, therefore further data was only collected for affirmative responses. Other open-ended questions requested students offer what they enjoyed about the I-TEAM program and how they felt the I-TEAM program could be improved.

Responses to the follow-up questions and other open-ended questions were read through, respectively, to identify thematic categories to group common responses. Once these categories had been developed, the responses to the question were read through again to fully conceptualize the categories as well as to conduct a rudimentary frequency analysis to see which response categories were the most common. This was conducted for responses to each question for each specific discipline as common thematic categories were then compared between discipline groups to identify any differences in perspectives between disciplines. No differences were found between groups – the common thematic categories were similar (if not identical) across the disciplines. Therefore, what we present below are the most common thematic response-categories for each question for the entire sample, with exemplary data to reflect those categories. To present these particular data, we offer the specific questions (written in *italics*), followed by the percentage of “Yes” responses out of all the responses offered (for the yes/no questions), followed by the common thematic response categories, and exemplary data.

*Do you feel you learned anything new about empathy?* (“Yes”: 93%) The most frequent response-categories were: a) students learned more about empathy as an experience and, b) students felt they can enhance their empathic ability with practice.

“Empathy is not kindness, it is a natural experience in and of itself.”

“[Empathy] is not something you can force, but you can grow your ability over time and practice.”

“The experience of empathy does not require action, empathy can be experienced without action or even expression.”

*Do you feel you learned anything new about mindfulness?* (“Yes”: 96%) Students commonly reported: a.) learning about the breadth of mindfulness practices and b.) the science/empirical evidence associated with research on mindfulness.

“I liked the short exercises we did, like the ‘Minute to Arrive’, and plan to incorporate some of them into my everyday routine.”

“I learned about a lot about the research supporting mindfulness practices.”

“The various type of exercises and daily practices – and that I need to be more present in moments.”

*Do you feel you learned anything new about other health professions?* (“Yes”: 84%) The most common categories of responses to this question were related but somewhat distinct. They include: a) learning the roles of other health professions, and how they are related to their own, b) learning about the structure of other health professions education (and the associated challenges), and c) that they were all going through rigorous and challenging programs.

“I have learned how Speech and PT work with their clients, and I didn’t really know what exercise physiology was all about before. I feel like I learned a lot about their roles.”

“I had no idea the schooling and stress these other programs go through. I thought ours was rough, but damn.”

“We all have similar issues regarding our programs and our training. We’re all kind of going through the same thing. Our education overlaps more than I realized. We’re more similar than different I think.”

“I realized how important each health profession is in their own way, but also how we all have similar goals.”

*What are some (specific) areas you think the I-TEAM program could be improved?* There were two very prominent response-categories to this question: a) more clinical relevance/experience, and b) less lecture-review at the beginning of each training session.

“Not repeating what was stated in the online lectures in-person.”

“More patient-based application, more clinical setting stuff.”

“More clinical activities, like hands-on patient activities, like in the real world.”

*What are some (specific) aspects of the I-TEAM Program that you have enjoyed?* Students consistently noted how: a) the food, b) working/meeting with students from other health professions, and c) the mindfulness exercises, were what they enjoyed most about the program.

“Food and meeting new people.”

“Getting to work with other professions and seeing how things are the same and different between professions.”

“The food!! And meeting new people from other professions and learning about something that can help my career.”

“I enjoyed getting to know new people and getting to talk and learn about the things they’re going through. I also enjoyed learning about mindfulness because it has helped with my stress management.”

## 5.6. Observations of training sessions

Overall, the analysis of the observation notes taken during Training Sessions suggest that particular workouts (including specific Mindfulness Practices) resonated more strongly with the students than others – these included: I-TEAM Bingo, the Gift of Listening, Mindful Eating, Emotion Scans, the Elephant List, and Lego & Communication. Although level of participation or engagement can be difficult to observe, it was evident through students’ body language and discussions post-workout that certain workouts generated vulnerability and sensitivity, and provided opportunities for students to see each other as people going through similar stressors and challenges.

For example, in the I-TEAM Bingo workout students had to find someone from a different health profession that was “*Nervous about seeing patients*” or was “*Feeling somewhat overwhelmed*”, or “*Crushed it on a recent exam*” or other topics/events/experiences that would be common among all students. The goal of the workout was to check off as many boxes as possible. We observed that although the goal was to check off as many of the 25 boxes as possible (and there was a “prize” for the top 3 scorers) once the students found someone who fit the description in the box, they often introduced themselves, stood or sat down and had a conversation. After this exercise, when we opened the floor for discussion, the students noted that this exercise helped to minimize the differences nested within their professional roles and enhanced their understanding of their similarities as health profession students.

In the Gift of Listening workout students paired up with another student who was not in their discipline and following the directions outlined in Search Inside Yourself<sup>55</sup> for a similar exercise, the Speaker was provided three uninterrupted minutes to speak, and the Listener had to work to give the Speaker the “gift” of their attention by not asking questions, minimizing acknowledgements (head nods, I see’s, etc.) and trying to keep their attention on the Speaker and what the Speaker was saying. After the 3 min the student-pairs then switched roles. We observed the students struggling with eye contact, presenting attentiveness, and even body control. After the workout, students reflected that it was remarkably challenging to not interrupt, to not add something to the Speaker’s monologue, and the awkwardness and even

vulnerability they felt during the process – that there was a level of intimacy that was uncomfortable. In short, the students noted how hard listening can actually be. Students also discussed enjoying learning about each other and that as most Speakers took the opportunity to talk about themselves outside-of-school, and who they are as people (background, interests, etc.)

Although certain workouts and mindfulness practices appeared to provide opportunities for students to be vulnerable and open with each other, observation-based data also revealed that although all students were attentive and participated in each workout, many students did not engage with the brief lecture review held at the beginning of each Training Session – with many focusing on their food or their phones. This was also confirmed through the course evaluations, as noted above.

The students were made aware that food would be provided free-of-charge at each I-TEAM Training Session, and as noted above, one of the top five goals for the students for I-TEAM was to “Eat Good Food”, and indeed, food was a very important part of program. Students would line up in the buffet line and talk to each other. Many students would arrive within their own discipline-specific cohort, but inevitably during each Session students would converse with their colleagues from other disciplines about the food offering that day, their own program-related responsibilities, current events, etc. Then, once they got their food, they would go to their assigned interprofessional group tables, and have similar conversations with those at their table. Students were given plenty of time to eat and chat. The food was an important draw of the program – purposely. Built within the structure of I-TEAM is the idea of sharing meals and sharing experiences over food and to simply provide a free meal to the students. It was consistently noted that for each Training Session, the food/meal was a centering mechanism, bringing students together, providing them time to decompress from the day, and connect with students from other programs.

### 5.7. Interviews

Much like the survey-based data and data gleaned from the course evaluations, there were no differences found between discipline-specific groups regarding the interview data. Interview data paralleled course evaluation data; whereas students enjoyed a majority of the workouts and mindfulness practices, some workouts and practices were found to be more valuable (to their personal and professional lives) and engaging than others. All interviewees expressed the value in meeting with and learning about students from other health professions, and the opportunity to learn and experience well-being-related practices. Moreover, a number of interviewees expressed that, post-I-TEAM they were now saying hello, stopping to talk, and/or “hanging out” with students from other professions. In this sense, participation in I-TEAM broke down certain familiarity/social-barriers as well. However, during the interviews, students provided much more detailed information as to how they felt the program could be improved from their perspectives. Interviewees consistently noted the potential value in: a) changing up the interprofessional table groups each (or every other) Training Session, b) integrating clinically-oriented case-studies/vignettes in to the Training Sessions, and c) minimizing/eliminating the lecture review at the beginning of each Training Session.

“I liked my group, but I would have liked to have been able to meet more people. It would have been cool if we had switched up the tables every once in a while.”

“I know empathy is important to interacting with my patients, but overall the program really didn’t talk a lot about patient-interaction specifically. I wish there had been more clinically relevant workouts. I think we could have done some case-studies where we all use our professional perspectives and offer our thoughts and ideas.”

“I thought [I-TEAM] would have been more clinically-based. I think the faculty in my department thought that it would be that way too,

at least that is what they told us. It was nice to get the more general approach to teamwork and empathy and all that, but I would have liked some direction or exercise to try to practice it with a patient or something.”

“There was really no need for the lecture in the beginning of each session. I was sitting in class all day, I didn’t need to sit more.”

Similarly, the students consistently expressed wanting more *explicit* reasoning and information as to why they were engaging in certain workouts when they occurred, and why the program (and aspects therein) was structured the way it was.

“I guess, I wondered why we were doing emotional scans with each other right there in front of each other, when I could just do them at home by myself. I wish we had been told why were doing certain things. Like, they’re great, and I enjoyed them, but why then – what was it for exactly?”

“I liked the laid-back atmosphere and the instructors’ enthusiasm but I wish we had been given specific directions or information on why our groups were the way we were, or why we had to eat with those groups. And what was the meaning behind certain workouts and exercises? It felt organized but all like this weird mystery.”

“I thought we were going to get information ... like, we’d go into that Lego exercise and we were given the rules, but no one said ‘This will help you with x, y, or z.’ So we just did it and moved on to the next thing. I mean sometimes we’d do a reflection for some exercises, but they never gave us a reason as to why we did it.”

## 6. Discussion

We found that students in the I-TEAM program significantly improved in empathy scores, specifically *Perspective Taking* and *Empathic Concern*. Although we cannot argue that I-TEAM exclusively caused the positive change in empathy scores, we did find, through the analysis of the qualitative data, that students also reported learning about the experience of empathy (and mindfulness), other health professions, and their fellow students/peers, and demonstrated shifts in perspectives regarding other health professions. Taken together, the evidence suggests that the I-TEAM program had (positive) impact on health professions students’ empathy levels. Furthermore, given that students did not significantly increase in *Fantasy* or *Personal Distress*, it is possible that the I-TEAM program targeted the specific components it was designed to address – and that this approach may indeed be triggering (to some extent) our concept of *empathic resilience*.

Quantitative and qualitative data show that students’ perceptions of their own and others’ professions shifted significantly in regards to notions of *Leadership*, *Independence*, and *Team-ness* over the course of the program. Although it is likely that discipline-specific socialization and professionalization processes had some impact on these perceptions and attitudes, we argue that because I-TEAM was one of the few, if not the only opportunity to connect with students from other health disciplines, I-TEAM therefore served as the primary space and place for these students to learn with, from, and about each other. Through the evaluations and interviews, students consistently reported not only learning about other health profession programs’ structure, requirements, and their respective roles, but also learning about what they shared and what was in-common in regards to values, experiences, and understandings – key tenets of the IPEC Competencies.

Whereas other empathy-oriented programs have enhanced students’ empathy,<sup>21</sup> I-TEAM is the first program to engage students in explicit workouts for their empathy muscles, focus on developing empathic resilience, and nest the program within an interprofessional education framework. In this sense, it is important to note, the results indicate that the I-TEAM program not only addressed student-based goals, but also



the tenets of the IPEC Core Competencies<sup>56</sup>: *Values/Ethics for Interprofessional Practice, Roles/Responsibilities, Interprofessional Communication, Teams & Teamwork*. Therefore, this novel and innovative approach to teaching empathy in an interprofessional setting has shown to possibly have significant impact, even in its pilot design and delivery.

Clearly, a primary driving force of this program was to accentuate the same-ness between students, to showcase their similarities by consistently emphasizing qualities and attributes that related to their humanity, including vulnerability, openness, and inter-connectedness. Previous work by Michalec et al.<sup>8</sup> argued that IPE programs should direct more efforts towards enhancing/increasing the opportunities for students to *informally* connect and learn with, from, and about each other. Students in that particular study noted that they felt they learned more about each other in the time/space before the formal IPE program began. *Informal* space for students to learn about and from each other was cultivated in and around I-TEAM in very conscientious and purposeful ways. One specific mechanism was through sharing meals. Almost like a Trojan Horse, we utilized food and eating meals together as an opportunity for students to talk with each other about what they do, aspects of their program, challenges, achievements, etc. Another approach to enhancing the informal space was through specific workouts and exercises meant to accentuate the same-ness between students, to showcase their similarities and consistently pushing the value in vulnerability, openness, and inter-connectedness. For example, there was a certain level of awkwardness that was present when the students were led through the mindful eating practice for the first time – but that awkwardness was universal, they were all going through this practice together. In-line with decategorization processes, students were somewhat stripped of their specific professional/clinical knowledge and titles and engaged in a human experience as a unit. This was similar for the Emotion Scans, the Listening exercise, and other workouts throughout I-TEAM.

Although we did not find any significant positive shifts in any of the dimensions of well-being or overall subjective well-being among the students, the qualitative data does suggest that the students actively participated with mindfulness practices embedded in the program, and found them useful in confronting noxious and stressful elements of their lives (including their discipline-specific training and education). In future evaluative efforts of I-TEAM, we will include a mindfulness/presence scale (e.g. FFMQ, see Ref. <sup>57</sup>) to examine if an increase in empathy is associated with enhanced presence. Furthermore, because we found that an increase in empathy scores was related to more frequent mindfulness practice, and previous literature highlights a connection between empathy and mindfulness, our future research must dissect the concept of empathic resilience in relation to the dimensions of empathy (i.e. perspective taking, empathic concern, and personal distress) and the dimensions of mindfulness.

It is not surprising that students expressed the desire for more explicit reasoning/directions for why I-TEAM included certain workouts, or why the program was structured the way it was. Students were not informed that we were trying to emphasize vulnerability, same-ness, commonalities, humanity, and sensitivity. Although debriefing sessions were provided after each workout for students to openly express thoughts, feelings, and ideas from and about the workout, these debriefing sessions were not used to explicitly offer an explanation to students as to why they were led through the workout. Given the overwhelming data in support of empathy and mindfulness education and training for health profession students (cited above), a primary premise of the I-TEAM program was for students to simply experience (and reflect on) various elements of the program with each other without specific directions on what, how, or why to experience those elements of the program. Furthermore, such workouts and practices are indeed non-normative for health profession students. Although some education and training may include seminars on communication, interpersonal skills, and even empathy or mindfulness, to have an entire course dedicated to these clinical skills and principles may have felt unnerving.

Administrative and department-level support/buy-in was earned by stressing the value of clinical skills, professional development, and well-being among students, while emphasizing the utility of the program in relation to IPE-specific learning objectives and accreditation standards. Providing lecture content online, and purposefully scheduling the in-person sessions to avoid conflicts and requirements of the participating health profession programs also fostered support for I-TEAM among department leadership. Moreover, although empathy and mindfulness are “not on the exam”, the program has significant support from the students as well. During the development of I-TEAM, and throughout the program, students welcomed not only the opportunity to practice these clinical skills with their health profession colleagues, but also stated how useful the mindfulness practice was in coping with and navigating the arduous and stressful nature of their discipline specific program. However, it should be noted that despite best scheduling efforts and buy-in from department leadership, as end-of-semester exams, academic- and clinical-responsibilities mounted, and the general stress associated with health professions education intensified towards the end of the semester, it was clear that many students elected to not attend the final I-TEAM session (which also had an impact on the T2 response rate). Therefore, it is strongly suggested that interprofessional programs such as I-TEAM be explicitly required course-work within participating departments, or simply mandated as required for all health profession students by College-level administration. In this sense, although the workouts approach of I-TEAM does address individual-level (empathic) resilience, the explicit integration (i.e. formal requirement) of the semester-long program into each of the graduate-level curricula would reflect authentic institutional culture change and spotlight the importance the institution places on these skills, practices, and values.

Although the data suggests that the I-TEAM program had a positive impact on students' empathy levels, addressed their goals as well as the tenets of the IPEC Core Competencies, there are particular limitations to the study. While all students who completed the survey at T2 participated in at least 5 out of the 6 training sessions, samples at T1 and T2 varied slightly. Therefore, it is possible that significant changes in empathy are attributed to cohort differences; however, we find this unlikely as the majority of students remained stable across time-points. Moreover, because there is no control group, we cannot say with any certainty that the significant increase in empathy that was found does not happen to all health profession students in their first year. Research has shown that empathy levels can actually *decrease* in specific health profession groups during their first year,<sup>27</sup> however, future research on I-TEAM, and on programs similar to I-TEAM, should utilize a control group for a more robust approach to the evaluation and assessment of their program. Similarly, future experimental-design research could compare the impact of the I-TEAM program as a whole to the impact of only particular elements of the program (e.g. specific workouts) on students' attributes.

Regarding sample-based limitations, I-TEAM was conducted in one College at one University that houses a particular set of health professions. Expanding the sample size of institutions and other health profession groups will be necessary to better test the impact of I-TEAM. Because participation in all aspects of this study were completely voluntary there may be some degree of self-selection bias associated with the survey and interview findings. Also, a limited sub-sample of participants from each discipline were interviewed, and therefore comparisons of data between discipline-groups would require more robust sampling. Finally, this study was conducted through the pilot offering of I-TEAM. Finding consistent results through future offerings of I-TEAM will further solidify the actual impact and overarching value of the program. Despite these limitations, however, this evaluation and assessment-based study shows that teaching empathy in an interprofessional setting is not only possible but is also an effective mechanism to promote and cultivate interprofessional values, principles, and competencies among health profession students.

I-TEAM was designed with Allport's conditions of positive

intergroup interaction in mind: a) by focusing on clinical skills that no one profession could lay claim to and hosting the program on mutual turf we cultivated *equal status between groups* (to the best of our ability), b) by engaging the interprofessional groups in (non-competitive) team-based activities and exercises, and conducting even the individual-level workouts together as one unit, students shared common goals and engaged in intergroup cooperation, and c) we had explicit buy-in/Support from Leadership/Authority at the department and college-levels. Yet, rather than attempting to shift students' cognitive representations by focusing on the profession-based differences between and among the students (i.e. the mutual intergroup differential model), I-TEAM focused on decategorization processes by trying to have students realize, understand, and respect the similarities among themselves as health profession students and future healthcare professionals, as well as at the most basic personhood and human-level. Whereas it is true that I-TEAM was designed to teach health profession students key *clinical* skills, the workouts to stretch and strengthen empathy muscles, including the mindfulness practices, had very real *personal* value as well. Utilizing workouts to strengthen empathy muscles and engaging students in these workouts together, can promote seeing each other as persons (not just as their professional category) and provide opportunities for students to see what connects them, as well as their shared values, understandings, and practices. In this sense, the processes and mechanisms nested within I-TEAM did align more with enhancing the common in-group identity (i.e. health professions students and/or future healthcare professionals), and personalization (i.e. that their fellow students were people-first, not just a nursing student or PT student).

Although a majority of IPE programs have been developed and analyzed employing differentiation models to highlight what each profession does and does not do so as to perhaps accentuate role clarity and responsibilities, we show that IPE programs can (and should) be built upon pillars of decategorization, helping health profession students see what brings them together, what they share, rather than what makes them different from each other. The structure, design, implementation, and overarching thematic focus on decategorization were shown to have a significant impact on students' empathy levels, shift their perceptions of other health professions, and spotlight similarities and commonalities between and among students. We argue that whereas it is essential to provide fundamental background information on various health professions to students, consistently spotlighting the variations in what professions can and cannot do in regards to healthcare delivery may further solidify and rigidify the health professions-related status hierarchy nested and, in turn, further stifle the internalization of values and principles of interprofessionalism, collaboration, and team-based care delivery. Rather than continue to re-draw the boundaries of each profession's territory, we need to start presenting health profession students with interprofessional education opportunities that promote inclusivity, collectivity, and solidarity.

## 7. Conclusion

This specific study shows centralizing an interprofessional program on the principles of decategorization through opportunities for health profession students to see themselves and others as part of a larger in-group, emphasizing similarities, connectedness, and shared experiences, may have a positive impact on students' perceptions of other health professions as well as ability and willingness to connect with others on an emotional and cognitive level (i.e. empathy). This study also showcases the potential value of focusing IPE programs on common goals, attributes, and values – to level the playing field and address fundamental clinical skills that apply to *all* health and social care professions. The I-TEAM program is a novel and innovative approach to interprofessional education and the building of empathy muscles.

## CRedit authorship contribution statement

**Barret Michalec:** Visualization, Conceptualization, Methodology, Data curation, Formal analysis, Writing - original draft, Project administration, Funding acquisition. **Julie M. Schneider:** Methodology, Data curation, Formal analysis, Writing - original draft. **Michael Mackenzie:** Visualization, Conceptualization, Writing - review & editing.

## Acknowledgements

The I-TEAM program, and related study featured here, were funded in-part by, The Josiah Macy Jr. Foundation, The University of Delaware Grand Challenges Grant, and the Arnold P. Gold Foundation.

## References

- Centre for the Advancement of Interprofessional Education (CAIPE). *About Us*; 2020. <https://www.caipe.org/about-us>. Accessed May 20, 2020.
- Oandasan Ivy, Reeves Scott. Key elements for interprofessional education. Part 1. The learner, the educator and the learning context. *J Interprof Care*. 2009;19(S1): 21–38.
- Reeves Scott, Tassone Maria, Parker Katherine, Wagner Susan J, Simmons Brian. Interprofessional education: an overview of key developments in the past three years. *Work*. 2012;41:233–245.
- Reeves S, Perrier L, Goldman J, Freeth D, Zwarenstein M. Interprofessional education: effects on professional practice and health care outcomes (update). *Cochrane Database Syst Rev*. 2013;3. <https://doi.org/10.1002/14651858.CD002213.pub3>.
- Courtenay Molly, Bair Aaron, Bakerjian Debra, et al. Interprofessional education: an overview of six initiatives across the schools of health at a single university. *J Interprof Care*. 2014;28(2):155–156.
- Shrader S, Hodgkins R, Laverentz D, et al. Interprofessional Education and Practice Guide No. 7: development, implementation, and evaluation of a large-scale required interprofessional education foundational programme. *J Interprof Care*. 2016;30(5): 615–619.
- Reeves Scott, Palaganas Janice, Zierler Brenda. An updated synthesis of review evidence of interprofessional education. *J Allied Health*. 2017;46(1):56–61.
- Michalec B, Giordano C, Dallas S, Arenson C. A longitudinal mixed-methods study of IPE students' perceptions of health profession groups: revisiting the contact hypothesis. *Journal of Interprofessional Education & Practice*. 2017;6:71–79.
- Michalec Barret, Giordano Carolyn, Pugh Brandie, Arenson Christine, Speakman Elizabeth. Health professions students' perceptions of their IPE program: potential barriers to student engagement with IPE goals. *J Allied Health*. 2017;46(5): 10–20.
- Allport Gordon. *The Nature of Prejudice*. Reading, MA: Addison-Wesley; 1954.
- Hewstone Miles, Brown Rupert. Contact is not enough: an intergroup perspective on the 'contact hypothesis'. In: Hewstone M, Brown R, eds. *Contact and Conflict in Intergroup Encounters*. New York, NY: Basil Blackwell; 1986:1–44.
- Carpenter John, Claire Dickinson. Understanding interprofessional education as an intergroup encounter: the use of contact theory in programme planning. *J Interprof Care*. 2016;30:103–108.
- Brewer Marilyn B. When contract is not enough: social identity and intergroup contact. *Int J Intericult Relat*. 1996;20:291–303.
- Brewer Marilyn B. The social psychology of intergroup relations: can research inform practice? *J Soc Issues*. 1997;53:197–211.
- Brewer Marilyn B, Norman Miller. Beyond the contact hypothesis: theoretical perspectives. In: Miller N, Brewer M, eds. *Groups in Contact: The Psychology of Desegregation*. New York, NY: Academic Press, Inc; 1984:281–302.
- Gaertner Samuel L, Rust Mary C, Dovidio John F, Bachman Betty A, Anastasio Phyllis A. The contact hypothesis: the role of a common ingroup identity on reducing intergroup bias. *Small Group Res*. 1994;25:224–249.
- Sulzer Sandra H, Weeth Feinstein Noah, Wendland Claire. Assessing empathy development in medical education: a systematic review. *Med Educ*. 2016;50(3): 300–310.
- de Waal, Frans BM. Putting the altruism back into altruism: the evolution of empathy. *Annu Rev Psychol*. 2008;59:279–300.
- de Waal, Frans BM. The antiquity of empathy. *Science*. 2012;336:874–876.
- de Waal, Frans BM, Preston Stephanie D. *Mammalian Empathy: Behavioral Manifestations and Neural Basis*. vol. 18. 2017:498–509.
- Everson N, Levett-Jones T, Pitt V. The impact of educational interventions on the empathic concern of health professional students: a literature review. *Nurse Educ Pract*. 2018;31:104–111.
- Derksen F, Bensing J, Largo-Janssen A. Effectiveness of empathy in general practice: a systematic review. *Br J Gen Pract*. 2013;63(606):76–84.
- Decety Jean, Fotopoulou Aikaterini. Why empathy has a beneficial impact on others in medicine: unifying theories. *Front Behav Neurosci*. 2015;8:1–11.
- Sternke Elizabeth A, Abrahamson Kathleen, Bair Matthew J. Comorbid chronic pain and depression: patient perspectives on empathy. *Pain Manag Nurs*. 2016;17(6): 363–371.

25. Sinclair Shane, Beamer Kate, Hack Thomas F, et al. Sympathy, empathy, and compassion: a grounded theory study of palliative care patients' understandings, experiences, and preferences. *Palliat Med.* 2017;31(5):437–447.
26. Braithwaite, Jeffrey, Clay-Williams, Robyn, Vecellio, Elia, et al. The basis of clinical tribalism, hierarchy and stereotyping: a laboratory-controlled teamwork experiment. *BMJ Open.* 6(7): 1–10.
27. Michalec Barret. "An assessment of medical school stressors on preclinical students' levels of clinical empathy." *Curr Psychol.* 2010;29(3):210–221.
28. Michalec Barret. The pursuit of medical knowledge and the potential consequences of the hidden curriculum. *Health.* 2012;16(3):264–278.
29. Halpern J. What is clinical empathy? *Journal of General Internal Practice.* 2003;18(8): 670–674.
30. Michalec Barret. Learning to cure, but learning to care? *Adv Health Sci Educ.* 2011; 16:109–130.
31. Underman Kelly, Hirschfield Laura E. Detached Concern?: emotional Socialization in twenty-first century medical education. *Soc Sci Med.* 2016;160:94–101.
32. Zenasni Franck, Boujut Emilie, Woerner Aude, Sultan Serge. Burnout and empathy in primary care: three hypotheses. *Br J Gen Pract.* 2012;62(600):346–347.
33. Kabat-Zinn J. *Where Ever You Go, There You Are: Mindfulness Meditation in Everyday Life.* 1994 (New).
34. Ridderinkhof Anna, Bruin De, Esther I, Brummelman Eddie, Bögels Susan M. Does mindfulness meditation increase empathy? An experiment. *Self Ident.* 2017;16(3): 251–269.
35. Chiesa A, Calati R, Serretti A. Does mindfulness training improve cognitive abilities? A systematic review of neuropsychological findings. *Clin Psychol Rev.* 2011;31: 449–464.
36. Tang Y-Y, Hölzel BK, Posner MI. The neuroscience of mindfulness meditation. *Nat Rev Neurosci.* 2015;16:213–225.
37. Jones Susanne M, Bodie Graham D, Hughes Sam D. The impact of mindfulness on empathy, active listening, and perceived provisions of emotional support. *Commun Res.* 2019;46(6):838–865.
38. Voss Andreas, Bogdanski Martin, Langhor Bernd, Albrecht Reyk, Sandbothe Mike. Mindfulness-based student training leads to reduction in physiological evaluated stress. *Front Psychol.* 2020;11:1–12. <https://doi.org/10.3389/fpsyg.2020.00645>.
39. Hölzel BK, Lazar SW, Gard T, Schuman-Olivier Z, Vago DR, Ott U. How does mindfulness meditation work? Proposing mechanisms of action from a conceptual and neural perspective. *Perspect Psychol Sci.* 2011;6:537–559.
40. Krasner Michael S, Epstein Ronald M, Beckman Howard, et al. Association of an educational program in mindful communication with burnout, empathy, and attitudes among primary care physicians. *J Am Med Assoc.* 2009;302(12): 1284–1293.
41. Van der Riet Pamela, Levett-Jones Tracy, Aquino-Russell Catherine. The effectiveness of mindfulness meditation for nurses and nursing students: an integrated literature review. *Nurse Educ Today.* 2018;65:201–211.
42. de Vibe Michael, Solhaug Ida, Tyssen Reidar, et al. Waal, Frans. 2009. The Age of Empathy. *Mindfulness Training for Stress Management: A Randomised Controlled Study of Medical and Psychology Students.* BMC Medical Education. vol. 13. New York, NY: Harmony Books; 2013:107–de.
43. Barbosa P, Raymond G, Zlotnick C, Wilk J, Toomey III R, Mitchell III J. Mindfulness-based stress reduction training is associated with greater empathy and reduced anxiety for graduate healthcare students. *Educ Health.* 2013;26:9–14.
44. Burton Amy, Burgess Catherine, Dean Sarah, Koutsopoulou Gina, Hugh-Jones, Siobhan. How effective are mindfulness-based interventions for reducing stress among healthcare professionals? A systematic review and meta-analysis. *Stress Health.* 2016;(33). <https://doi.org/10.1002/smi.2673>.
45. Walker Moira, Mann Robert A. Exploration of mindfulness in relation to compassion, empathy and reflection within nursing education. *Nurse Educ Today.* 2016;40: 188–190.
46. Malpass Alice, Binnie Kate, Robson Lauren. Medical students' experience of mindfulness training in the UK: well-being, coping reserve, and professional development. *Educ Res Int.* 2019. <https://doi.org/10.1155/2019/4021729>.
47. Crowther Lara Louise, Robertson Noelle, Anderson Elizabeth Susan. Mindfulness for undergraduate health and social care professional students: findings from a qualitative scoping review using the 3P model. *Med Educ.* 2020. <https://doi.org/10.1111/medu.14150>.
48. Michalec Barret, Giordano Carolyn, Arenson Christine, Antony Reena, Rose Molly. Dissecting first-year students' perceptions of health profession groups: potential barriers to interprofessional education. *J Allied Health.* 2013;42(2):202–213.
49. Davis MH. A multidimensional approach to individual differences in empathy. *JSAS Catalog Selected Doc Psychol.* 1980;10:85.
50. Keyes CLM. The mental health continuum: from languishing to flourishing in life. *J Health Soc Behav.* 2002;43:207–222.
51. Hean Sarah, Clark Macleod, Jill Adams Kim, Humphris Debra. Will opposites attract? Similarities and differences in students' perceptions of the stereotype profiles of other health and social care professional groups. *J Interprof Care.* 2006;20(2):162–181.
52. IBM Corp. *IBM SPSS Statistics for Windows, Version 25.0.* Armonk, NY: IBM Corp; 2017. Released.
53. Miles Matthew B, Huberman AM, Saldaña Johnny. *Qualitative Data Analysis: A Methods Sourcebook.* fourth ed. Thousand Oaks, CA: SAGE; 2020.
54. Brinkmann Svend, Kvale Steinar. *Learning the Craft of Qualitative Research Interviewing.* third ed. Thousand Oaks, CA: SAGE; 2015.
55. Tan Chade-Meng. *Search inside Yourself.* New York, NY: Harper One; 2012.
56. Interprofessional Education Collaborative (IPEC). *Core Competencies for Interprofessional Collaborative Practice: 2016 Update.* Washington, D.C.: Interprofessional Education Collaborative; 2016.
57. Baer RA, Smith GT, Hopkins J, Krietemeyer J, Toney L. Using self-report assessment methods to explore facets of mindfulness. *Assessment.* 2006;13:27–45.