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ORIGINAL RESEARCH

Promoting Speaking Up Through Interprofessional Identity Triggers in a Mixed-Profession Simulation Scenario: Two Group Double-Blinded Pre-Test-Only Design

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Background: Speaking up can manifest in various forms, such as raising concerns or sharing ideas. While conceptual overlap exists within its behavioural dimensions, distinctions remain, including context-dependent social risks. Regarding the assurance of quality and safety in patient care, speaking up is paramount, particularly in mixed-profession groups. Speaking up requires specific competencies and depends on individuals' motivation to do so. Interprofessional identity (IPI) is a specific source of intrinsic motivation for interprofessional collaboration (IPC). Little is known about its relationship with speaking up. This study aims to investigate whether conversational topics act as triggers of IPI affecting speaking-up behaviour, and whether the strength of their influence varies across different conversational topics.

Methods: Participants of this study were 41 dental bachelor and 43 dental hygiene students. IPI was measured using the Extended Professional Identity Scale (EPIS) eight weeks prior to a simulation session (not a training). Students were assigned into weak or strong identity conditions based on EPIS scores. Small mixed-profession groups with four to five members were formed based on their identity condition and in alphabetic order. Every mixed-profession group discussed eight conversational topics. Groups listed up to ten ideas per topic. The number of ideas generated per topic in each group was used to measure speaking up. A higher idea percentage in the strong IPI group indicated activated IPI, reflecting identity-congruent behaviour.

Results: Mixed-profession groups with relatively strong IPI showed more speaking up than groups with weak identifiers. Conversational topics can trigger IPI to varying degrees, reflected in differing levels of speaking up.

Conclusion: Some topics raise awareness of IPI, boosting speaking up in groups with relatively strong IPI. Using Extended Professional Identity Theory (EPIT) and effective IPI triggers in simulations helps trigger this behaviour. Moreover, reflective debriefing is likely to further support IPI and encourage speaking up.

Keywords: interprofessional identity, interprofessional education, speaking up, simulation, healthcare

Introduction

In healthcare settings, when individuals refrain from speaking up, critical concerns can go unaddressed, errors may remain uncorrected, and valuable insights are lost. The World Health Organization (WHO) emphasises the importance of speaking up in reducing the occurrence of avoidable harm.[1] Therefore, speaking up is paramount, particularly in mixed-profession groups where decision-making is complex and must incorporate diverse perspectives. While having the competencies to communicate concerns and ideas effectively is essential, the motivation to actually do so is equally critical. One promising motivational source is interprofessional identity (IPI).[2] Current evidence offers compelling

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support for one particular theoretical approach in IPI: Extended Professional Identity Theory (EPIT).[3] However, the relationship between EPIT-based IPI, its activation through conversational topics as identity triggers, and speaking up as identity-congruent behaviour has yet to be empirically examined.

In healthcare, speaking up is often related to the concept of "safety voice".[4] This refers to raising concerns about risky or deficient actions within healthcare settings.[5] Speaking up also refers to the communication of ideas or opinions about work-related issues, intended to bring improvement or change.[6] Therefore speaking up can manifest in various forms,[6,7] highlighting the conceptual overlap within its behavioural dimensions.[4] Speaking up requires specific skills that can be taught.[8–11] For example, simulation-based training helps professionals practice speaking up in various situations.[9,10] However, speaking up also depends on internal motivation, not just skills. This motivation is shaped by factors associated with team culture, such as power dynamics,[4,7,12–18] and perceived psychological safety.[18–21] It also depends on fear of negative consequences and previous personal experiences,[4,22] all of which influence perceived social risks. Therefore, creating supportive team environments increases the likelihood of speaking up. Offering structured training opportunities further strengthens this critical behaviour in practice. In this context, IPI serves as a source of intrinsic motivation for interprofessional collaboration (IPC). This process involves teamwork among diverse healthcare professionals to jointly discuss and provide quality, patient-centred care.[23] However, little is known about the relationship between IPI with speaking up.

IPI likely plays a crucial role in speaking up within mixed-profession groups. IPI, as a form of social identity, is associated with an individual's psychological connection to a group or social category.[3] In psychology, the term "social identity" refers to an individual's identification with a social group or category.[24] Derived from Tajfel's definition of social identity,[25] IPI is the part of an individual's self-concept that stems from their membership of an interprofessional group. The emotional significance they attach to that membership is included in this self-concept.[2,3] While several theories describe and explain IPI,[3] only EPIT has demonstrated strong construct validity through the Extended Professional Identity Scale (EPIS).[3,26–28] According to EPIT, IPI encompasses feelings of belonging (interprofessional belonging), affective commitment (interprofessional commitment), and a self-concept related to IPC, as associated with the identity group (interprofessional beliefs).[3] Importantly, EPIT demonstrates clear links between IPI and identity-congruent behaviours, such as exchanging questions and sharing information among members of mixed-profession groups.[2] Due to a mechanism of identity–behaviour congruence, IPI can predict collaborative behaviours.[29] Activation of IPI depends on identity triggers. These are contextual cues related to IPC that make this social identity more salient and encourage related behaviours.[3] It is likely that the strength and impact of these identity triggers vary, affecting the extent to which individuals engage in speaking-up behaviour (Figure 1). To date, this relationship has not been investigated specifically for different conversational topics.

Speaking up, identity triggers, and IPI have never been studied together. However, their relationship may be essential to understanding what motivates healthcare professionals to speak up. Contextual cues that serve as identity triggers can be found in the physical environment, such as the interpretation of certain observed challenges or problems. They can also be found in the individuals present or the topics of conversation. These elements can activate a specific social identity, such as IPI. Once activated, this identity can motivate behaviour that aligns with it. Additionally, the relevance of the cue to the individual matters. A discussion about a shared challenge in patient care may trigger someone's IPI because it is relevant for IPC. The more this identity is emotionally important to them (stronger commitment), the more likely it is to increase their willingness to speak up (identity-congruent behaviour). Examples of certain conversational topics related to IPC that may act as IPI triggers are: roles and responsibilities,[30,31] occupational stereotypes,[32] pitfalls during collaboration,[33] interprofessional priorities,[34] legal and ethical issues during collaboration,[35,36] improvements in joint care,[37] opportunities for joint care,[38] and interprofessional co-creation.[39,40] These topics are explained in Table 1. Understanding the dynamics of conversational topics as identity triggers for IPI is essential for exploring how IPI influences speaking-up behaviour in mixed-profession groups. This study aims to investigate whether conversational topics act as triggers of IPI affecting speaking-up behaviour, and whether the strength of their influence varies across different conversational topics.

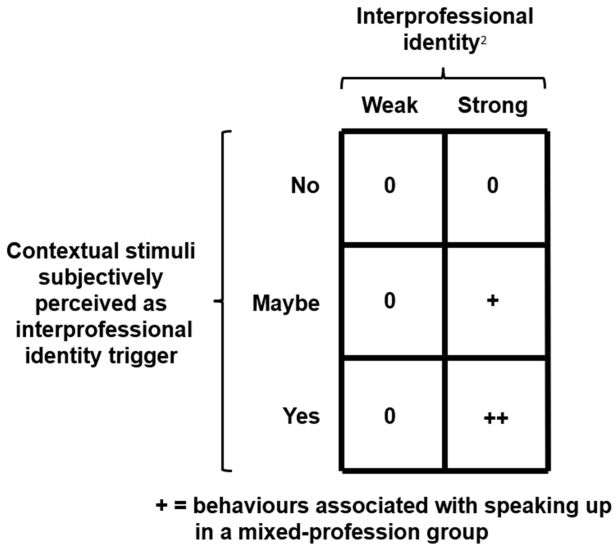

Figure 1 Conceptual model: Interprofessional identity triggers influencing engagement in speaking up.

Methods

Study Design

This study employed a two group double-blinded pre-test-only design with assessment of speaking up (Figure 2). IPI was measured eight weeks prior to a mixed-profession simulation as part of enrolment. Students were assigned into weak or strong identity group conditions based on their EPIS levels. This resulted in two mixed professional group conditions, each composed of 50% of the weakest and 50% of the strongest IPI. This division was determined by first calculating the average of the scores of each professional group, which were linearly transformed to a 5-point Likert scale to enhance interpretability. Based on these transformed scores, the split was then made. Within each condition, students were

Table 1 Conversational Topics: Explanation and Examples From Healthcare Practice

Conversational Topic	Explanation and Examples
1. **Roles and responsibilities**.[30,31]	Defining, clarifying, or dividing each healthcare professional's tasks and responsibilities within a team. For example: (1) Healthcare staff informing and coordinating with doctors to deliver patient treatments. (2) Agreements on how to handle leadership roles in acute care situations.
2. **Occupational stereotypes**.[32]	Professional stereotypes in work settings are assumptions or strong beliefs about the characteristics of people based on their profession. For example: (1) Nurses are believed to consistently communicate from an compassionate perspective. (2) Doctors are assumed to be highly intelligent and expected to know everything.
3. **Pitfalls during collaboration**.[33]	Potential problems or challenges that arise from situations concerning communication, coordination of patient care, or misunderstandings due to unfamiliar roles. For example: (1) Resistance to new methods. (2) Misaligned information or goals in patient care.
4. **Interprofessional priorities**.[34]	Different professional groups focus on patient care, communication, and teamwork for better outcomes. For example: (1) Discussing approaches to shared goals regarding treatment plans. (2) Encouraging a culture of team-based care.
5. **Legal and ethical issues during collaboration**.[35,36]	Challenges and conflicts over responsibilities, rules, values, and authorities. For example: (1) Differing values and beliefs concerning interventions in patient care. (2) Doctors excluding other professions from collaborative decision-making.
6. **Improvements in joint care**.[37]	Enhancements in collaborative care for better collaboration between different healthcare professionals. For example: (1) The joint development of patient care guidelines. (2) Joint training sessions to optimise collaboration and communication.

(*Continued*)

Table 1 (Continued).

Conversational Topic	Explanation and Examples
7. **Opportunities for joint care**.[38]	Potential (new) areas for collaboration between healthcare professionals. For example: (1) Methods for sharing knowledge and resources. (2) Integrated care approaches or models.
8. **Interprofessional co-creation**.[39,40]	The joint development of solutions or practices in healthcare by different professional groups. For example: (1) Jointly developing a new curriculum for interprofessional education. (2) Jointly creating personalised care plans for complex patients.

allocated based on the alphabetical order of the initial letter of participants' surnames. Participants had no prior experience with mixed-profession scenarios or IPC. All groups received eight conversational topics to discuss (see Table 1) and were asked to provide up to ten ideas for each topic. Two independent psychologists assessed and validated the ideas documented in each group's portfolios. To ensure consistency in content-related assessments, several psychologists underwent training. Instead of calculating inter-rater reliability retrospectively, a rotation schedule was implemented throughout the simulation period. This approach aimed to minimize individual differences in rating stringency, thereby reducing bias linked to specific psychologists. Assessments were conducted in pairs, with two psychologists independently evaluating each case without access to each other's assessments. A separate assessment coordinator compiled the paired evaluations. This process prevented unintended distortions between conditions that could otherwise stem from individual raters rather than the conditions themselves. Discrepancies in assessments were rare due to prior training. When they occurred, the assessment coordinator provided the deciding assessment. However, such cases were minimal across all assignments in the simulation sessions. The assessment approach of psychologists replicated the research methodology of a previous study.[2]

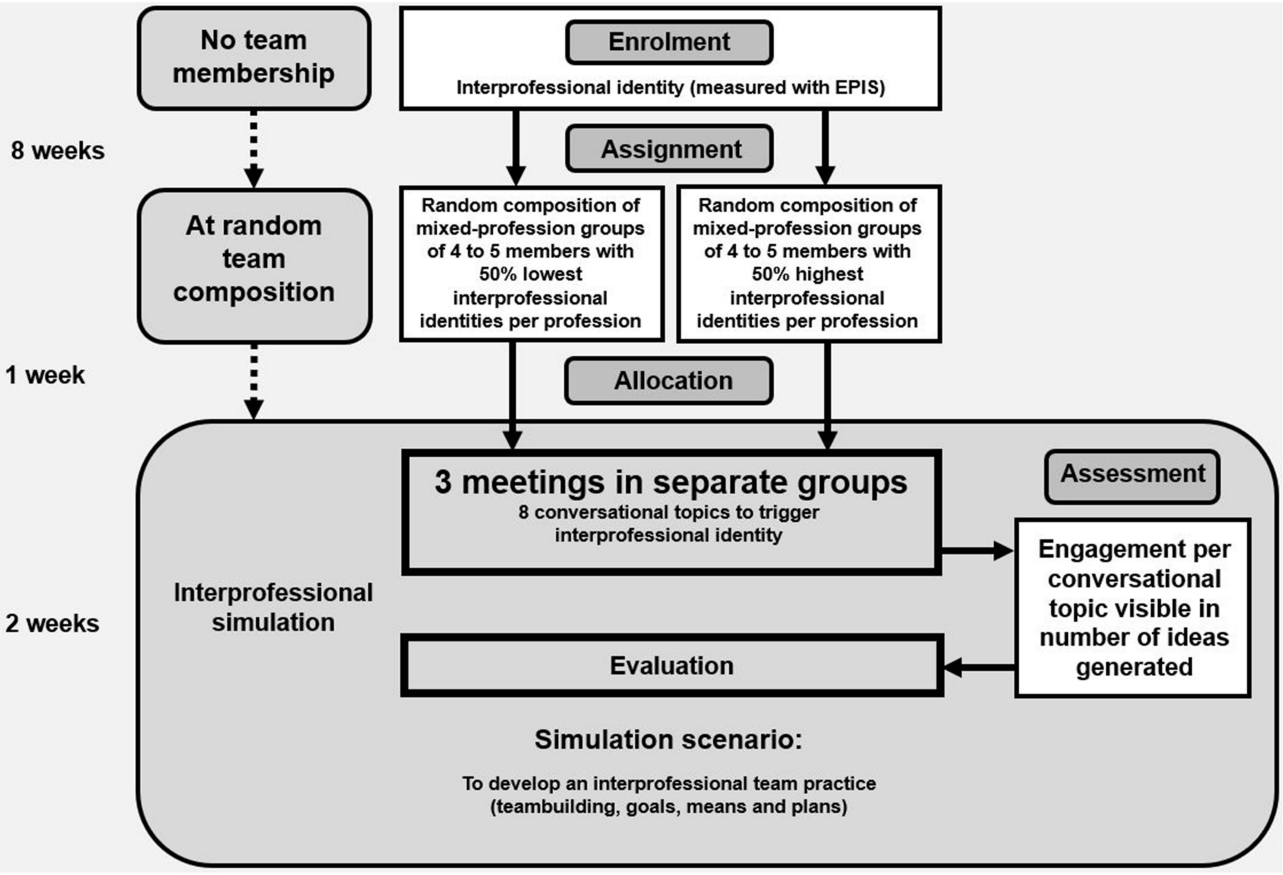

Figure 2 Study design.

The context of this study was a first-time mixed-profession simulation for third-year dental bachelor students and second-year dental hygiene students. The simulation was part of a mandatory course. It aimed at creating an in-depth understanding of each other's professions and fostering IPC. This study was not designed as training, nor to measure the effect of the simulation session. Students could provide consent to participate by completing an informed consent form included in an online questionnaire. The Institutional Review Board of the University Medical Center Groningen reviewed and approved the study protocol (METc 2022/064 and METc 2022/297).

The simulation scenario involved the establishment of an interprofessional team practice, and this simulation took place without supervision. Each mixed-profession group met in person for three separate simulation sessions, held in dedicated rooms. Initially, the groups were tasked with designing their own interprofessional team practice. In this process, they provided their visions and engaged in joint decision-making about the facility's design. Then, the actual simulation started and consisted of three structured group meetings conducted over a fixed two-week period. All groups discussed the eight conversational topics in sequence, proceeding at their own pace. Students were instructed to ensure all topics were covered by the end of the three meetings. The ideas generated for each topic were numbered and documented in each group portfolio. Numbering each separate idea ensured that these could be assessed as distinct alternatives compared to other ideas. Furthermore, groups recorded their own sessions and were required to submit the recordings digitally within a predetermined deadline. This practice aimed to eventually ensure that ideas were generated collaboratively by the group during the scenarios. All recordings and portfolios were distributed to individual psychologists using a rotation schedule, ensuring that no psychologist consistently evaluated the same groups. Notably, the quality of the ideas was associated with competence rather than IPI as the motivational source.

Participants

In total, 95 students were approached to participate in the study. Of these, 84 students participated, comprising 41 dental students and 43 dental hygiene students. In the Netherlands, dentistry training consists of an undergraduate (three-year bachelor) and graduate (three-year master) program. Dental hygiene consists of an undergraduate (four-year bachelor) program. The final sample of participants all voluntarily agreed to be involved in our simulation study.

Data Collection and Operationalisation

Speaking Up

Speaking up was operationalised as the number of ideas generated per conversational topic within mixed-profession groups. More speaking up in groups with a relatively strong IPI would indicate behaviour congruence.

Interprofessional Identity

IPI was measured by the extended professional identity scale (EPIS) which consists of 12 items evenly divided over three subscales: interprofessional belonging, interprofessional commitment and interprofessional beliefs.[26] Some example items of EPIS are: "I enjoy learning and collaborating with people from other health professions" (interprofessional belonging), "I am proud to be a part of an interprofessional team" (interprofessional commitment), and "All members of an interprofessional team should be involved in goal setting for each patient" (interprofessional beliefs). Internal consistency of subscales is 0.79, 0.81 and 0.80, respectively, and 0.89 of the overall scale of the original EPIS.[26] Responses were possible on a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree).

Speaking Up in a Mixed-Profession Group

Speaking up in a mixed-profession group was measured as the number of ideas generated. Portfolios written by each group, containing responses to all topics, were submitted. The validity of ideas were assessed by two psychologists. The counted number of valid ideas was used as the output for each conversational topic. The total numbers for all conversational topics per group condition were calculated as percentages.

Data Analyses

Cut-off values for internal consistency of EPIS were determined after calculating Cronbach's alpha and were deemed sufficient when larger than 0.70.[41,42] Chi-squared test was used comparing gender distribution between dental bachelor and dental hygiene students. Independent two sample *t*-tests were used for comparing the average age of dental bachelor and dental

hygiene students. In addition, the test was also used for comparing IPI differences with regard to gender and profession. Furthermore, mean differences between weak versus strong identifiers on speaking up were analysed per conversational topic using independent two sample t-tests. This test was performed using 95% confidence interval ($p<0.05$). Regarding correlations between conversational topics, Cohen's threshold values (0.10 for small, 0.30 for medium, and 0.50 for large) were applied to enhance interpretation. These values were used as cut-off points.[43,44] Analyses were conducted using SPSS (Statistical Package for the Social Sciences), a statistical software program for the social sciences.[45]

Results

All participants that voluntarily agreed to be involved in our simulation study consisted of 41 (49%) dental bachelor and 43 (51%) dental hygiene students. Gender distribution was different between professions (dental bachelor n=31 (75%) vs dental hygiene n=40 (93%) women; $Chi^2(1) = 4.865$, $p=0.036$). The average age of both professions was not different (M=22.6 years, SD=1.8 vs M=21.7 years, SD=2.5, respectively; $t(82) = 1.749$, $p=0.084$). No IPI differences were found with regard to gender, $t(82)= -0.120$, $p=0.905$, and with profession, $t(82) = 1.262$, $p=0.210$. The mean identification difference between groups with weak versus strong IPI was 0.9 (M=3.3, SD=0.7 and M=4.2, SD=0.3, respectively; $t(82) = -7.888$, $p<0.001$).

Speaking Up in a Mixed-Profession Group: Weak Versus Strong IPI

Figure 3 illustrates the degree of speaking up across various conversational topics in mixed-profession groups. Most of the presented conversational topics led to the generation of more ideas during group discussions when group members have

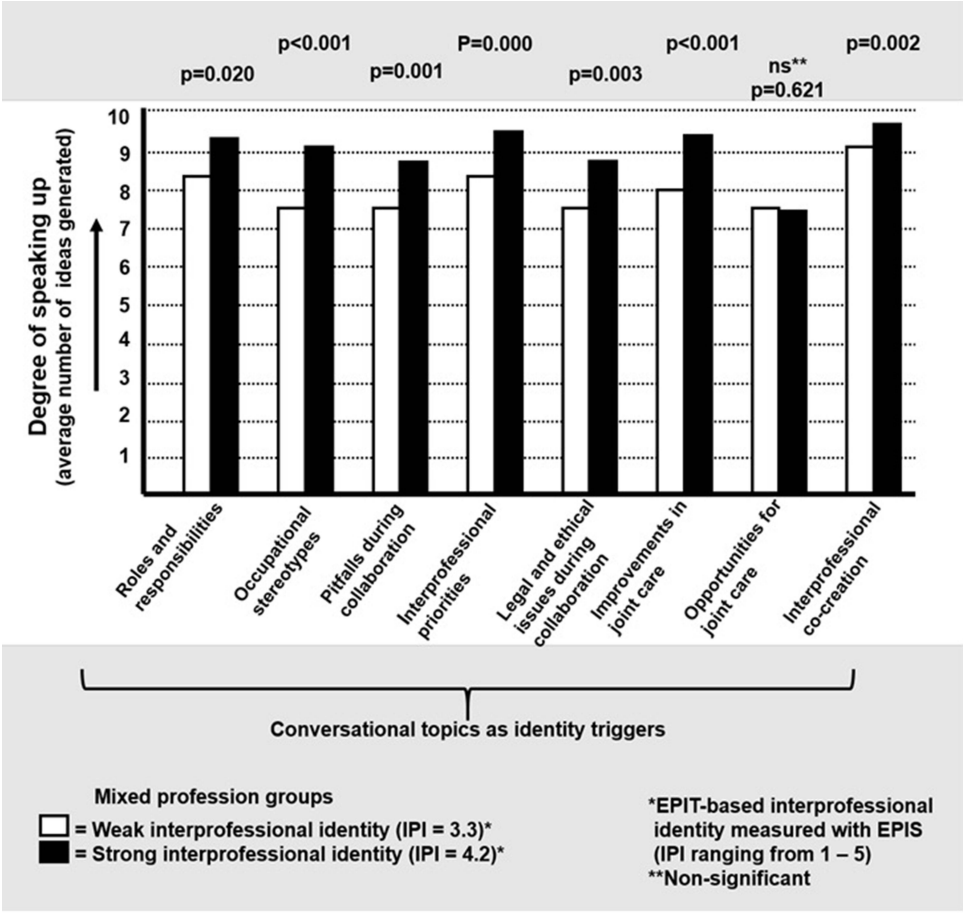

Figure 3 The degree of speaking up across various conversational topics in mixed-profession groups.

Table 2 Conversational Topics as Triggers of Interprofessional Identity (n=84)

Ideas Generated Related to…	Average Number of Ideas Generated (SD)				p
	Weak IPI	Strong IPI	t	df	
1. Roles and responsibilities	8.3 (2.1)	9.3 (1.8)	−2.368	82	0.020
2. Occupational stereotypes	7.6 (1.6)	9.1 (1.5)	−4.315	82	<0.001
3. Pitfalls during collaboration	7.6 (1.7)	8.8 (1.4)	−3.459	82	0.001
4. Interprofessional priorities	8.3 (1.1)	9.6 (0.8)	−6.043	82	0.000
5. Legal and ethical issues during collaboration	7.6 (2.2)	8.8 (1.6)	−3.003	77.144	0.003
6. Improvements in joint care	8.0 (1.9)	9.4 (0.8)	−4.242	59.367	<0.001
7. Opportunities for joint care	7.6 (1.9)	7.3 (3.2)	0.479	64.807	0.621
8. Interprofessional co-creation	9.1 (1.4)	9.8 (0.6)	−3.194	56.938	0.002

Table 3 Correlations Between Conversational Topics in Mixed Profession Groups (n=84)

Conversational Topics	1	2	3	4	5	6	7	8
1. Roles and responsibilities	–							
2. Occupational stereotypes	0.240*	–						
3. Pitfalls during collaboration	0.036	0.689***	–					
4. Interprofessional priorities	−0.064	0.469***	0.419***	–				
5. Legal and ethical issues during collaboration	−0.131	0.209	0.423***	0.362**	–			
6. Improvements in joint care	0.053	0.336**	0.371**	0.549***	0.643***	–		
7. Opportunities for joint care	−0.260*	0.418***	0.187	0.158	0.162	0.261*	–	
8. Interprofessional co-creation	−0.214	0.096	−0.144	0.348**	0.293**	0.137	0.214	-

Notes: **p<0.05; **p<0.01; ***p<0.001*; correlation cut-off values: 0.10 = small, 0.30 = medium, 0.50 = large[43,44].

a relatively strong IPI. Only discussing "opportunities for joint care" does not result in generating more ideas within mixed-profession groups.

Table 2 describes the average number of ideas generated for each conversational topic in the mixed-profession group, where members have either a relatively weak or strong IPI. The majority of groups with strong IPI generated ten ideas across all conversational topics. In mixed-profession groups with low interprofessional identities, most groups generated five to ten ideas.

Groups with relatively strong interprofessional identities, generate almost twelve percent more ideas compared to groups with weak interprofessional identities (93% vs 81%, $t(82) = -7209$, $p<0.001$). This percentage excludes one conversational topic, "opportunities for joint care", which did not trigger identity related differences in speaking up between groups in either condition. As such, it was not considered an IPI trigger for the purpose of comparing the effects of weak versus strong IPI.

Correlational Analysis of Conversational Topics in Mixed-Profession Groups

Table 3 describes the correlations between conversational topics in mixed-profession groups. The largest correlations were found between occupational stereotypes with pitfalls during collaboration, $r(84)=0.69$, $p<0.001$ and legal and ethical issues during collaboration with improvements in joint care, $r(84)=0.64$, $p<0.001$. Discussing improvements in joint care also has a large correlation with discussing interprofessional priorities, $r(84)=0.55$, $p<0.001$. Interprofessional priorities and improvements in joint care were correlated with most of the conversational topics.

Discussion

This study aimed to investigate whether conversational topics act as triggers of IPI affecting speaking-up behaviour, and whether the strength of their influence varies across different conversational topics. Our findings show that conversational topics can trigger IPI, activating more speaking up within mixed-profession groups with a relatively strong IPI. This

underscores the importance of incorporating EPIT and effective IPI triggers into simulation designs. Based on psychological theories, EPIT explains the coexistence of professional and interprofessional identities, and predicts associated behaviours. In the context of interprofessional education (IPE), it also emphasizes the importance of combining IPI formation with developing interprofessional competencies and adapting to environmental factors.[3] This aligns with research on speaking up about safety concerns and supports interventions aimed at fostering a shared interprofessional approach among healthcare professionals. These interventions could enhance speaking-up communication, influenced by intergroup dynamics, group memberships, interpersonal history, and social context.[46] Furthermore, a study on teaching speaking up recommended interprofessional team strategies, which are believed to help overcome barriers such as power dynamics and foster psychological safety.[47] Notably, in interprofessional settings, identity formation occurs through learning during preparation and evaluation. Identity activation and associated behaviours occur during the execution of tasks. According to EPIT, IPI formation involves extensive social identification processes with a "wider" interprofessional group or social category. This requires long-term strategies to foster sustainable interprofessional identification through higher commitment, belonging, and beliefs. In the process of activating IPI and making identity salient, interprofessional beliefs are crucial, as they serve as guiding cognitions for actions,[3] such as speaking-up behaviours. All of these processes can be facilitated during IPE. Our study focused on IPI activation during a simulation session. However, identity formation is crucial and can be facilitated during simulation debriefing. Research showed that this does not necessarily mean the involvement of interprofessional co-debriefing.[48] Additionally, by applying and developing workplace learning[49] and lifelong learning,[50] the processes of interprofessional socialisation can be further supported through the utilisation of learned triggers.

On average, the act of speaking up occurs more frequently in mixed-profession groups with members who have a relatively strong IPI. This supports the idea that IPI is a source of intrinsic motivation towards IPC[2] because identity should predict congruent behaviours.[29] A stronger IPI represents a stronger intention to initiate IPC, independent of competence and environmental factors.[3] This is in line with an earlier study showing that mixed-profession groups with relatively strong IPI share more solutions and output for a shared problem domain.[2] Additionally, another study examined the effect of a training programme on the IPI of healthcare professionals and the quality of care. The results demonstrated that an improvement in IPI was associated with enhanced IPC and a significant reduction in inpatient days.[51] The findings from these studies, can be explained by the fact that IPI functions as an intrinsic motivational source for IPC. The concept of motivation influences the intensity, direction, and persistence of an individual's efforts towards attaining desired goals.[52] Subsequently, individuals holding strong IPI beliefs are more likely to proactively engage in IPC and align their actions accordingly.[3] Based on our study, this involved the sharing of ideas through speaking up about work-related conversational topics in oral health care.

The activating potential of conversational topics in triggering IPI and encouraging speaking up varies. One particular conversational topic (ie "opportunities for joint care") did not trigger IPI related to speaking up despite being linked to IPC. Notably, the students lacked practical experience in joint care and IPC. They also had a limited understanding of their own professional roles and expertise, as well as those of their group members. This could have made them hesitant to also display proactive behaviours. Additionally, based on social learning theory,[53,54] and the concept of observational learning,[55] students may have been less motivated to engage in proactive behaviours. This reduced motivation could occur if they observed limited collaboration or speaking up among peers in the group. However, the two-group double-blinded pre-test-only design controls for peer influence, as both groups experienced the same scenario without knowing their identity classification. Since only the strong identity group showed increased speaking up and never the reverse, peer modelling is an unlikely explanation. Our findings show that certain identity triggers can activate IPI and promote speaking up. By embedding effective IPI triggers into the design of simulations more immersive learning environments can be created. In the context of IPE, simulations offer controlled environments that can closely mimic real-life healthcare settings.[10] This enables IPE and simulation facilitators to manipulate contextual stimuli that resemble the clinical environment and can act as IPI triggers. When embedded within the simulation scenario and environment, these triggers can activate identity-congruent behaviours. These behaviours, such as speaking up, thereby enhance the authenticity of the simulation. This authenticity reflects the alignment between identity and action in real-time performance. In contrast, the preparatory phase and debriefing of simulation-based education provide structured opportunities

for IPI development. This is the case when they are designed in accordance with the psychological conditions for IPI formation as defined by the EPIT and replicated in several studies.[51,56,57] Although both identity formation and identity activation are essential, only the latter directly contributes to the authenticity of the simulation by activating identity in action. In this context, participants not only learn clinical and interprofessional competencies but can also internalise IPI. Similar to interprofessional competence, individuals carry their IPI with them across workplaces, irrespective of their (new) team members or networks.[3] Future studies of identity triggers for IPI related to speaking up should also include the role of speaking-up competencies. This will help in understanding how interprofessional competence influences speaking-up behaviours in mixed-profession groups with varying IPI.

The strongest positive associations in our study were found between occupational stereotypes and pitfalls during collaboration. This highlights their significant impact on communication effectiveness. Speaking up is crucial in healthcare to address quality and safety and reduce avoidable harm. This is particularly important for overcoming collaboration pitfalls such as poor communication and teamwork.[1] Stereotyping, often automatic, can hinder open dialogue by creating preconceived notions about roles and capabilities.[32] This can limit speaking up and responsibility, and reinforcing hierarchical constraints.[10,58] Moreover, power dynamics within the healthcare hierarchy, reinforced by role expectations and professional stereotypes, can further limit speaking up,[4,7,12–18] and mixed-profession team effectiveness.[59] Particularly, medical dominance can restrict IPC and teamwork.[14,60–62] Complex hierarchies exist even among students, though IPE can reshape these patterns if it fosters interprofessional identification.[2,63–65] Stronger IPI is associated with less hierarchical communication and greater willingness to share.[2,65] Short IPE interventions have improved perceptions of IPC and reduced stereotypes.[66]

Our study shows significant differences in speaking up between strong and weak IPI groups. Strong IPI groups generated nearly twelve percent more ideas. This might seem small but, depending on the nature of information exchange, could have far-reaching consequences in real-world situations. This suggests that an interprofessional mindset, related to a shared identity, is a precondition for speaking up and leveraging diverse perspectives in healthcare. Simulation-based IPE research supports viewing "interprofessional" as "interprofessional group working". This "in-group" concept could act as a strong psychological mechanism to enhance team-based care through shared identity.[67] Unlike team identity, which is tied to a fixed team or mixed-profession group, IPI offers an advantage. It is applicable across diverse and changing group compositions. Promoting IPI strengthens IPC, communication, and commitment to patient safety, enriching healthcare professionals working in temporary, changing teams.[68]

Limitations

This study has the following limitations that should be addressed in future research. First, using a convenience sample may have introduced a restriction of range in interprofessional identification. However, the fact that significant differences still emerged between the two group conditions strengthens the validity of our findings. These results are consistent with those reported in an earlier study by Reinders and Krijnen.[2] Second, our focus on dental and dental hygiene students may limit the generalisability of the findings to other healthcare students and professionals. However, EPIT, which underpins our operationalisation of IPI, is grounded in robust psychological theory. It is supported by empirical evidence across a wide range of professional and non-professional groups.[3] Third, the ecological validity of the simulation setting might be overestimated, as participants may respond differently in real-world IPC scenarios. Nonetheless, recent research supports the ecological validity of EPIT-based IPI related to IPC associated with improved team dynamics.[51] Fourth, speaking up was solely operationalised as the generation of ideas, despite encompassing additional characteristics. For instance, speaking up to raise concerns about patient safety issues could also be considered.[69] The findings of our study provide only an indication of how members of mixed-profession groups express themselves and contribute ideas. Replication and extension in actual practice settings are necessary to validate and deepen these insights. Future research should further explore this distinction and examine how conversational topics influence IPI and speak-up behaviours in naturalistic settings. Fifth, we recognise that to establish clearer links between IPI and speaking up, it is essential to control for potential confounding variables. However, methodological precautions have been implemented to optimally control for the influence of these factors. For instance, IPI was measured eight weeks prior to the interprofessional simulation. Moreover, a double-blind design was used for both participants and

assessors. In a previous study partially using the same design, the presence of confounding factors was also assessed.[2] Based on the methodological precautions taken, it is likely that the results regarding speaking up can be attributed to the influence of IPI. Finally, our study is grounded in EPIT, which holds specific implications for the measurement of IPI. Other approaches, such as Khalili's theory on dual identity,[70] have different theoretical propositions. These propositions are partially contradictory to the propositions of EPIT and should also be tested and compared. However, EPIT was preferred because of the underlying identity-behaviour congruence mechanism. This mechanism requires a specific self-concept as a group member in order to predict congruent behaviours.[25,29] Furthermore, several studies have confirmed the construct validity and reliability of EPIS independent of country, profession, and career stage.[3,26–28]

Conclusions

In conclusion, this study shows that certain conversational topics can trigger interprofessional identity (IPI), leading to more speaking up in mixed-profession groups with strong IPI. The study also highlights the importance of including EPIT and effective IPI triggers in simulation designs. In interprofessional education (IPE), learned triggers can activate IPI. Facilitators can use contextual cues as identity triggers to encourage behaviours like speaking up that fit with one's IPI.

Although IPI influences speaking up, interprofessional competence also plays a role. IPI triggers are learned as knowledge and therefore part of interprofessional competence. Developing interprofessional competencies is closely linked to forming a strong IPI. Part of these competencies involves knowing when and not only how to speak up. Speaking up is an important interprofessional skill related to understanding group and social dynamics. In interprofessional settings, IPI formation happens through learning during preparation and debriefing, while IPI activation happens during task execution. Workplace and lifelong learning can support interprofessional socialisation by reinforcing these learned triggers.

Future research should explore how IPI and IPI triggers promote different types of speaking-up behaviour. It should also clarify how IPI formation and speaking-up competencies work together. Our data suggest that activating IPI leads to interprofessional behaviour and supports better collaboration. With ongoing interprofessional socialisation, this can improve team processes, patient safety, and quality of care.

Availabilty of Data and Materials

The data and materials are not publicly available. Request for further information about the data can be directed to kuipersr@mzh.nl and j.j.reinders@umcg.nl.

Ethical Approval

Students could provide their consent to join this study by completing an informed consent form included in an online questionnaire. Prior to this, they could read about the study's purpose and the assurance of voluntary participation. Additionally, students were informed about the study during a lecture, where they had the opportunity to ask questions about it either during or after the session. The Institutional Review Board of the University Medical Center Groningen reviewed and approved the study protocol (METc 2022/064 and METc 2022/297).

Consent for Publication

All participants involved in the study were provided with detailed information about the study's purpose, procedures, and the potential implications of the research findings, including its publication.

Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

RK was responsible for the study design, methodology, data curation, formal analysis, interpretation of data, visualisation, project administration, writing and editing the original research work, selection of a journal for the submission of the research article.

LR was responsible for the interpretation of data, reviewing, final approval of the research paper, accuracy of any part of the research work, and agreement on the selection of a journal for submitting the research article.

JT was responsible for the interpretation of data, reviewing, final approval of the research paper, accuracy of any part of the research work, and agreement on the selection of a journal for submitting the research article.

JJR was responsible for the study design, methodology, data curation, formal analysis, interpretation of data, visualisation, reviewing, general supervision, accuracy of any part of the research work, final approval of the research paper, and agreement on the selection of a journal for submitting the research article.

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Disclosure

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