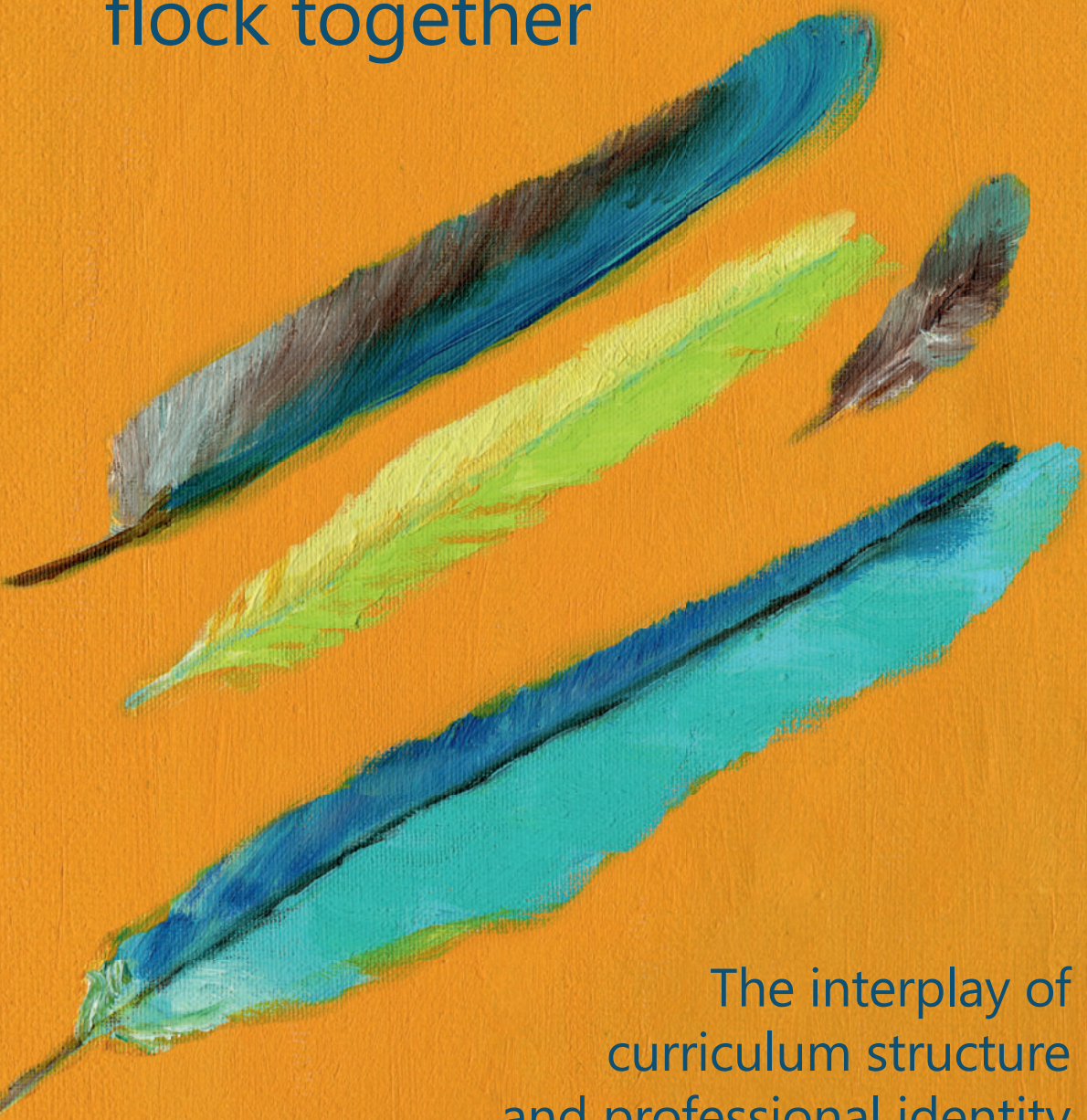
Birds of a feather flock together



The interplay of curriculum structure and professional identity formation of medical students

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The interplay of curriculum structure and professional identity formation of medical students

Birds of a feather flock together

De wisselwerking tussen de structuur van het curriculum en professionele identiteitsvorming van geneeskundestudenten

(met een samenvatting in het Nederlands)

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Chapter 1

General introduction

Student Ellis is in her third year of medical training. In her six year medical school program she experiences her first 12 weeks of clinical clerkships in the third year. After these clerkships she does not feel like she fits in a medical career. However, she does not want to leave medical school without a diploma while she is already half way. She therefore decides to continue the program and continues her professional training.

Three years later, student Carly is in her third year of medical training in the same medical school. Now the school has switched to a structure in which students receive a bachelor degree after completing three years successfully, following international agreements in Europe. After her third year clerkships Carly does not feel like she fits in a medical career. With a medical bachelor degree she has the choice to continue medical training and enter the medical master program to obtain a medical degree. But she can also decide to do another master program that connects to her medical school bachelor degree. She decides to continue professional training in a master of health sciences.

Ellis is at the same moment in her final year of medical school. The final year at this medical school is designed as a so called 'transitional year' to postgraduate education. All trainees are called 'semi-physicians' during this year and are challenged to function at or approaching the level of a starting resident, of course under strict supervision. Ellis still feels like not fitting in a medical career. The transitional year has a lot of electives as it is meant to have students focus on their future postgraduate training. Mandatory is a clinical rotation of 12 weeks, at a department of choice. Ellis chooses General Practice. While performing this rotation as a semi-physician with increased clinical responsibilities, she experiences how she can really be of help to patients who consult her. This makes her feel to belong to the professional group for the first time. The feeling is strengthened by her collaboration with supervisors, doctor's assistants, psychologists and the pharmacist in the institution, who give her a feeling of being part of a team. Maybe she does belong to the medical profession in the end?

Curriculum structures

All medical schools have in common that they aim to train lay persons to become medical doctors.[1] However, the routes students are to follow to become a doctor take several forms in different curricula.[2] The main structures of medical education in most countries are determined by national rules and agreements. Between countries, however, medical training formats vary in exact structure and length of training, degrees that are to be obtained and moments of full registration as a medical doctor.[3] Next, individual medical schools can influence the structure due to local educational interventions, such as adding electives during preclinical training, or elective rotations. Or applying a form of integration. For example, *vertical integration* has profound consequences for the curricular structure. In vertically integrated curricula basic sciences and clinical skills and knowledge are taught in an integrated form throughout all the years of the curriculum. This means that clinical experiences are programmed early in medical school, and sometimes a progressive increase of responsibility for patient care is allowed to trainees.[4,5]

The curricular model used in a specific medical school sets out the main roads and the timing for important transitions for the learners. At what moment 'on the route' should trainees from preclinical education be ready to enter clinical education? Next, if the curriculum model creates opportunities for 'side tracks' students can take during their training. Are there opportunities to take time for experiences outside medical training, for example starting a PhD track or taking courses not related to medicine? Are there options to interrupt medical training? Each trainee's journey in becoming a doctor is unique.[6] As the introductory examples of Ellis and Carly show, the curricular structure used in the medical school impacts trainees' experiences, and can thereby interact with the process of their professional identity formation as a doctor.

Professional identity formation

Taking the route through medical education is more than just learning the knowledge and skills required to perform the tasks of a physician. It will lead to "the transformation of the self into new ways of thinking and relating"[7] and by that to 'becoming' a physician, i.e. adopting the professional identity. There are many definitions of professional identity.[8] A commonly used definition is Ibarra's definition of professional identity as "the relatively stable and enduring constellation of attributes, beliefs, values, motives, and experiences in terms of which people define themselves in a professional role".[9] Following Dialogical Self Theory[10], professional identity can be seen as a specific work-oriented aspect of the self, constructed in constant internal dialogue with other aspects of the individual, as well as in interaction with the social environment. For physicians specifically professional identity is defined as "a representation of self, achieved in stages over time during which the characteristics, values, and norms of the medical profession are internalized, resulting in an individual thinking, acting, and feeling like a physician".[11] Although professional identity formation will continue through a doctor's entire career, an important part takes place during medical school and residency, even already during pre-clinical training.[12,13]

Professional identity formation has received much attention in medical education in the past decade.[6,7,11,14–20] The focus on the formation of the physician's identity was presented in the 2010 Carnegie Foundation report as one of the four pillars for the reform of medical education.[21] It is thought to enable individuals to practice with confidence[22] and to affect career success and psychological health of individuals.[20] The strength of an individual's professional identity has been linked to professional behavior.[22–24] A hampered development of professional identity may cause behavior that conflicts with the professional role, while a strong professional identity could prevent lapses in professional behavior.[11,22]

Because of its importance for the training of medical professionals, several authors started to explore the process of professional identity formation and factors of influence on this process.[11,25] The process of identity formation is described as "an adaptive, developmental process that happens simultaneously at two levels: (1) at the level of the individual, which involves the psychological development of the person, and (2) at the collective level, which involves a socialization of the person into appropriate roles and forms of participation in the community's work".[26]

Professional identity formation at the individual level and the curriculum structure

Professional identity formation at the individual level should not be seen as a gradual process; it has developmental stages.[6,26] In each separate stage the individual has a different way of understanding one's environment and one's place in this environment. For example, a starting medical trainee may be primarily motivated to 'act as a doctor' and to display the behavior that is expected of her correctly, but norms and values may not be fully internalized. When she further develops, she may come to internalize the professional norms and values as part of her identity and display the behavior as a doctor more naturally. In a subsequent stage she might even develop a more complex understanding of 'what a doctor is' and not only display the expected behavior but build a personal system of values as a doctor.[6] Moving from one developmental stage to the next happens through the influence of 'crises'. These crises are provoked by discrepancies between one's understanding of the self and the experiences and challenges faced.[26] For example, experiencing the death of a patient for the first time may provoke a shift in seeing oneself as 'a healer' to a more complex understanding of what it means to be a doctor.[26]

While moving through the medical training continuum, trainees experience several roles, such as pre-clinical medical student, clerk and resident. Each new role is not simply a step forward in developing the identity of a physician, but these roles have

their own identities ('being a clerk'), and trainees move through stages of identity formation for each role separately.[6,26] A transition to a new role means losing the old identity and starting to internalize the new identity. *En route* to becoming a physician, trainees thus construct and abandon a series of successive identities, each with its own developmental stages and crises. These roles and the timing of transitions to new roles are determined by curriculum structures. For example, in vertically integrated curricula students enter clinical education earlier during medical school than in traditional curricula, allowing for students to experience crises related to patient care earlier than in non-vertically integrated curricula.

Professional identity formation at the collective level and the curriculum structure

Simultaneously with identity formation at the individual level, students form their identities by classifying their place in the world as members of collectives.[7] For this process social interaction is fundamental.[7,26] At this level medical students form their professional identities through the process of socialization, which is "the process by which a person learns to function within a particular society or group by internalizing its values and norms".[27] The concept 'community of practice'[28] helps to understand professional identity formation through socialization. A community of practice is "a persistent, sustained social network of individuals who share and develop an overlapping knowledge base, set of beliefs, values, history and experiences focused on a common practice and/or mutual enterprise".[29] Identity formation as a doctor takes place as the learner moves from 'legitimate peripheral participation' to full participation in the community of practice of medical professionals. The context of medical school provides trainees with opportunities for participation in this community, for example by immersion in the clinical environment. This provides opportunities for interactions with role models and patients, which are known to be important factors of influence on identity formation.[6,11] Communities of practice encountered by medical students often also contain members of other health care

professionals. Students' professional identities are formed in interaction with these other professions in multiprofessional teams.[30] Such team collaboration, for example in early interprofessional learning, may also impact identity formation.[14,31] Although socialization is influenced more by the informal and hidden curricula than formal teaching experiences,[7] the curriculum model determines the context in which the learning takes place and at what moment, and thereby influences the socialization process of medical trainees.

Professional identity formation in the context of two curriculum structures

The previous section explains how curricular structure can influence both the individual and the collective level of professional identity formation. Vice versa the development of students' emerging identities may influence choices they make *en route* to become a doctor, for example choices for electives or experiences outside medical training. Hence there may be an interplay between curriculum structure and professional identity formation. Often changes in the curriculum structure are not deliberately made to affect processes of professional identity formation. It is then hardly ever known what the curricular model would mean for trainees' identity formation. In this thesis we explored how trainees develop their professional identities in the context of two recent changes in the structure of the medical undergraduate curriculum: The European bachelor-master structure and the Dutch transitional year to graduation.

A two-cycle degree model: The European bachelor-master structure

A change in the structure of medical undergraduate education in some European countries has been the introduction of two-cycle degree model, the bachelor-master structure. This structure was not designed for medical education in particular. In 1999 international agreements were made among European governments to implement this model in all higher education programs in Europe by signing the Bologna

Declaration.[32] By introducing this model with comparable degrees all over Europe it was aimed to promote international mobility, quality assurance and collaboration. Individual students could benefit from more flexible options to create their own, unique profile.[33]

For medical undergraduate education, unified programs that were usually six years in length were split up in two cycles, a medical bachelor and a medical master program. With a bachelor degree students have evidence of successful completion of the first cycle of medical education. This gives them several options. They can start a medical master program at the same or another medical school. With successful completion of the medical master program trainees obtain a medical degree and a medical licence. But they can also switch to a non-medical master program, or use their bachelor diploma as evidence of successful completion of a rounded program and enter the job market. The moment of receiving a bachelor degree is also a manifest moment to pause medical education. Students could use this break for other activities such as participating in other educational programs, travelling or working.

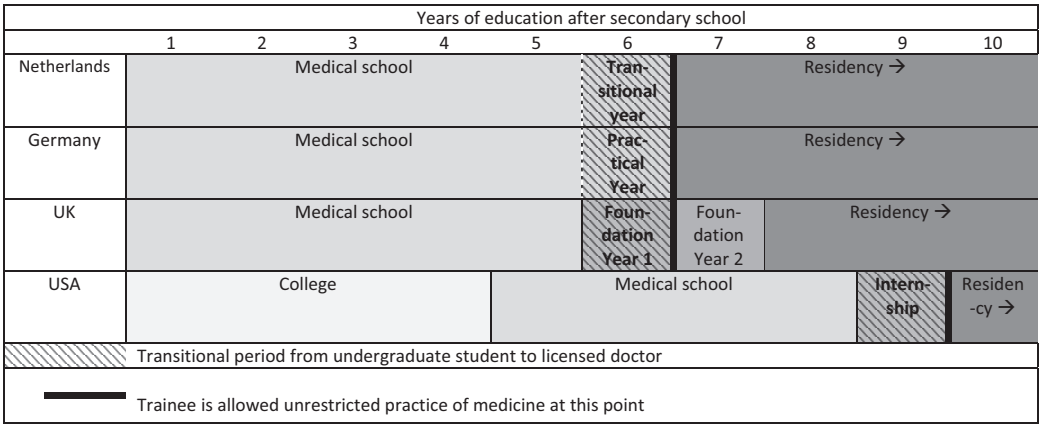
A transitional year to graduation: The final year of medical school in The Netherlands

The main part of this thesis has a focus on the final phase of undergraduate education. This is an important time for trainees' professional identity formation as they face the transition from student to practitioner.[34] A major change of the past two decades in medical schools in The Netherlands has been the reshaping of the final year of undergraduate training to a so called "transitional year".[35] One aim of this year is to provide a smooth transition to postgraduate training. During 12-week rotations at a department of the trainee's choice, trainees are called semi-physicians and work in patient care with more responsibilities than in earlier years of training.

Such an educational model is not limited to the Netherlands. Other medical training models have implemented similar transitional periods for the transition from

undergraduate student to licensed doctor (figure 1). For example, around the same time as the introduction of the transitional year in the Netherland, the Foundation Programme was introduced in the UK. Medical trainees enter this programme after finishing medical school. During the programme of 2 years trainees experience several clinical placements lasting a minimum of four months, including electives. After successful completion of Foundation Year 1 the trainee meets the requirements for full registration as a doctor.[36] And in Germany the "Practical Year" represents the final stage of medical studies, in which trainees experience several 16-weeks trimester of clinical placements before their final exam to be licensed as a medical doctor.[37]

Figure 1: Examples of curricular models with transitional periods from undergraduate student to licensed doctor



In the Netherlands specifically, the aim of the transitional year was also to shorten total training time to medical specialist certification. In many countries medical school graduates immediately apply for a position in residency. In the Netherlands a period of clinical experience or research experience between graduation from medical school and starting residency training is not mandatory but common.[3] It takes most junior doctors in The Netherlands up to a few years to find and start a residency training program after finishing medical school.[38] This results in a long total training time of

medical doctors. The electives in the transitional year were therefore meant to support students to orientate in and profile themselves for a residency training.[39–41]

The Social Identity Approach as a lens to study professional identity formation in the transitional year

Professional identity formation can be explored from various theoretical perspectives.[42] To study professional identity formation in the context of the transitional year we chose Social Identity Approach (SIA) as a lens. SIA is composed of two inseparable theories, Social Identity Theory[43] and its later extension, Self-Categorization Theory.[44] These theories address identity formation at the level of social group memberships. SIA provides a social perspective to identity formation, and thus the collective level of identity development.

SIA explains how people in social circumstances categorize themselves and the people around them as belonging to social groups, and how certain group memberships are established as an important component of their self-concepts, forming social identities. This influences thinking and behavior, as in many social situations it becomes in accordance with the values and norms of the groups a person identifies with. It depends on the situation and context if a group identity becomes salient, but every person holds a mental representation of the groups he or she belongs to, and some are more prominent to the person than other groups. To think, act and feel like a doctor, medical trainees are to integrate the group membership of the profession into their social identity. Social identity is defined as "that part of the individuals' self-concept which derives from their knowledge of their membership of a social group (or groups) together with the value and emotional significance attached to that membership".[45] At the final stage of undergraduate training, the shift to identifying with the group of doctors is important as the moment of full licensing as a doctor is approaching.

Social identification and authentic interprofessional collaboration in the transitional year

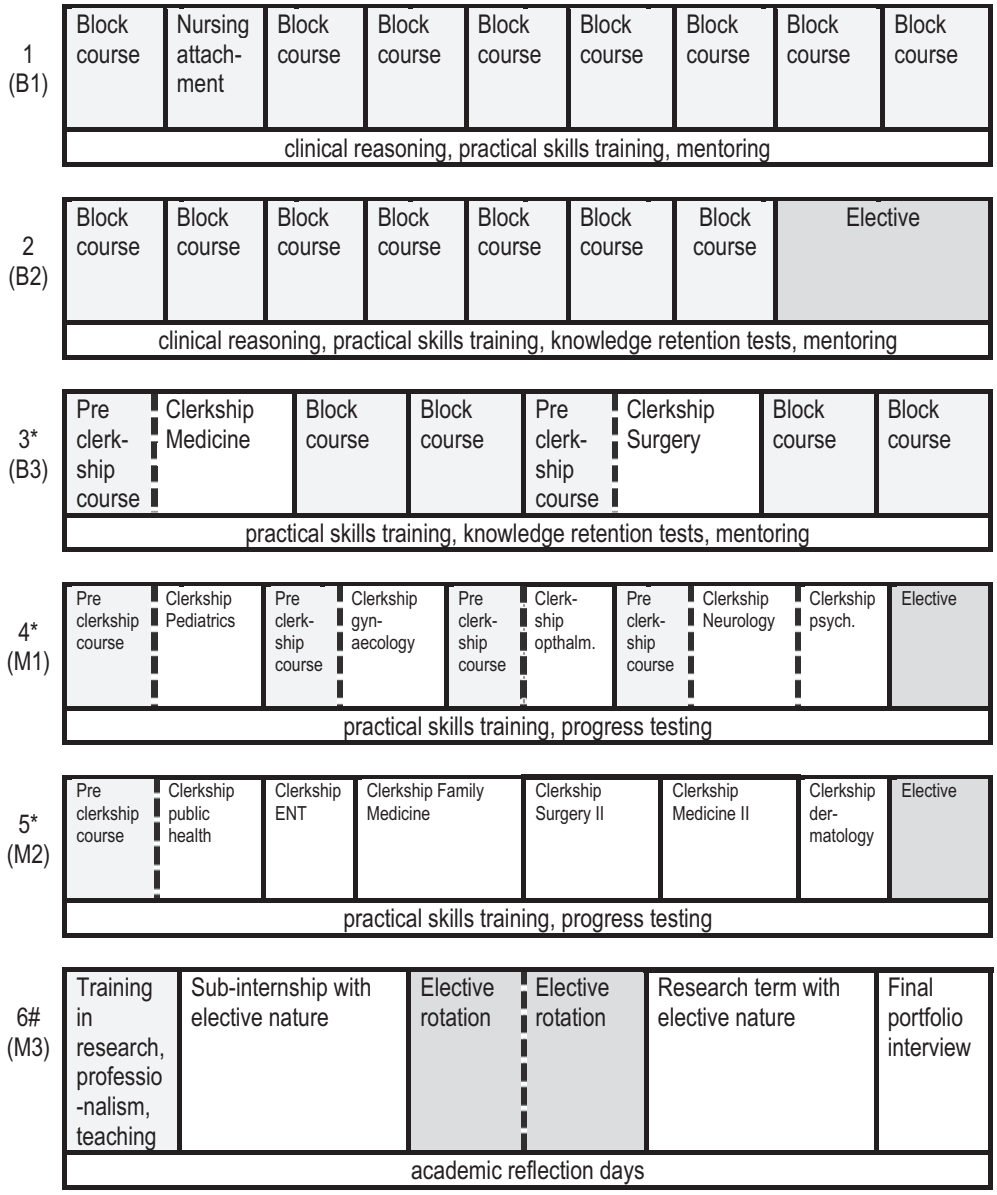
As mentioned, in the transitional year of Dutch curricula trainees perform clinical tasks approaching the level of a starting medical graduate.[46] This includes collaborating with nurses and consulting professionals from other disciplines. Although not specifically meant as an interprofessional education intervention, these trainees get a significant experience in interprofessional collaboration. This is beneficial, as becoming a collaborative interprofessional team member is an important facet of medical education.[47] At the same time, as described earlier, trainees' professional identity formation is in a crucial stage, as they approach the moment of full licensing as a medical doctor. When explored through the lens of SIA questions arise whether these two goals of training are compatible.[48–50] According to SIA, a need for a positive self-esteem drives us to have unconscious psychological strategies to see the group we identify with, our 'in-group', as more favorable than other groups, the 'out-groups'. Social identification will, according to the social setting, result in positive attitudes towards in-group members (*in-group favoritism*) and negative attitudes towards out-group members (*out-group derogation*). On the one hand a strong social identification with the professional group, as an instance of a strong professional identity, is seen as beneficial. On the other hand, social group dynamics may hamper interprofessional collaboration and learning as a result of stereotypical views of the other professional groups and out-group derogation.[49,51,52] Also, an early focus on team collaboration may influence trainees' identity formation with their professional group.[14,31]

Context of the research projects in this thesis

All studies in this thesis are conducted at the University Medical Center Utrecht medical school in the CRU2006 curriculum (figure 2, copied with permission from Ten Cate et al., 2018[46]). This medical school has a vertically integrated curriculum with a three-year bachelor program and a three year master program. In the first three years, the bachelor program (B1-B3), students learn basic sciences integrated in conjunction with clinical cases in blocks of 5 weeks arranged around a theme. At the same time they have practical skills and communication training and clinical reasoning courses, all preparing for their first clinical rotations. These clinical rotations are placed during the third year of the bachelor program, allowing for early clinical placement.[46]

After finishing the bachelor program and obtaining a bachelor degree in Medicine, students automatically have access to the medical master program in Utrecht (M1-M3). The medical master consists of a series of clinical rotations preceded by preparatory courses. The third and final year of the medical master program is the transitional year.[35] The transitional year in Utrecht was introduced in 2004. During this year students take, in a varying order, a 12-week major clinical elective and a 12-week research elective, both at departments of their choice. And they have 12-weeks to fill in completely by choice with a clinical or science rotation, or with a teaching rotation or a health management or medical ethics elective or other. A more detailed description of this year is found in chapters 3 and 5 of this thesis.

Figure 2. Schematic representation of the CRU2006 curriculum. Adapted from Ten Cate et al., 2018.[46]



* Courses and rotations are scheduled in a different order for subgroup of students

\# Sub-internship, research term and elective rotations are scheduled in a different order for each student

Outline of this thesis

This thesis explores the interaction between professional identity formation and two recently introduced curricular structures, aiming to answer the questions:

- Does the two-cycle degree model (the bachelor-master structure), introduced in many medical schools in Europe and providing an option to interrupt or terminate studies, affect students' decision to pursue a medical career?
- How do students develop their professional identities in the context of the final year of medical school designed as a transitional year to graduation, as introduced in several schools in The Netherlands?

Professional identity formation and the bachelor-master structure

Whether the bachelor-master structure would be beneficial for medical education has been an issue of considerable debate.[53–55] The aim of medical schools is to train medical doctors, and only completing the second cycle, the master's program, leads to obtaining a Medical Degree. This raised questions on the usefulness of splitting up the medical curriculum. In addition, splitting up theoretically creates a new transition in the medical training continuum with options for new routes or side tracks in the journey of becoming a professional. It is not known how this is experienced by students. A permanent stop would of course mean a disruption of the identity formation as a doctor. If the bachelor degree stimulates students to interrupt their training for a longer period of time it is not clear what this would mean for professional identity formation. In chapter 2 the effect of the bachelor-master structure on medical students' considerations to interrupt or terminate their medical training is explored with a questionnaire study.

Professional identity formation and the transitional year program

In The Netherlands the final year of medical school has been designed as a "transitional year".[35] This year allows for a large variety of elective choice which could interact with identity formation. Electives in the transitional year may not only give an early focus on skills and knowledge acquisition required for specific postgraduate education training. It may hypothetically also 'speed up' the process of specialty choice and socialization in the community of a specific specialty. In chapter 3 a questionnaire study is described, exploring how medical students use the transitional-year electives to prepare for transition to postgraduate training.

During the transitional year students work in authentic clinical settings for a longer period of time with more clinical responsibilities than in their earlier clerkships, i.e. approaching the level of a starting resident be it under strict supervision. In chapter 4 we explain why we think such a curricular model, with a gradual increase in clinical responsibilities, reflects the true purpose of vertical integration in undergraduate medical education.

As the semi-physician role in the transitional year is a role beyond the regular clerkship role while still for students in the undergraduate program, this can be seen as a separate stage in the continuum to become a doctor. This may influence professional identity formation as students in this role move to more full participation in the community of practice during medical school. In chapter 5 an interview study is used to explore social identification with the profession during such a curriculum structure, using Social Identity Approach as a lens.[43,44]

The gradual increase in responsibilities during the transitional year has interprofessional collaboration as an important element. There are questions whether students' professional identity formation and their interprofessional learning are influenced by one another.[48,50,51] In chapter 6 we describe the theoretical background of these questions and present the results of a questionnaire study exploring final-

year medical and nursing students' strength of social identification with their professional group and with their interprofessional team, and their views on interprofessional learning.

Finally, chapter 7 is the concluding chapter that highlights the main findings of this thesis and describes suggestions for further research and implications for practice.

Note: This thesis is based on a collection of published journal articles and submissions for journal articles. Chapters 2-6 were written as stand-alone manuscripts and therefore some overlap across chapters occurs.

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Chapter 2

Effect of the Bologna bachelor degree on considerations of medical students to interrupt or terminate their medical training

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Abstract

Background: The bachelor-master system potentially enables medical students to stop or temporary interrupt their training after obtaining a bachelor degree. A survey at the time of introduction of this two-cycle model in Dutch medical education showed little interest among students in these possibilities.

Aims: To investigate students' considerations to stop or pause now that this model is well established.

Methods: Questionnaires were sent to 314 second year and 348 third year bachelor students and 256 first year master students at University Medical Center Utrecht.

Results: Response rates were 33.4% for the second year and 42.0% for the third year bachelor students and 48.8% for the master students. Of all these students, one to three percent seriously considered a permanent stop. Of the bachelor students, about one quarter seriously considered a temporary stop after finishing the bachelor program. Of the master students, one in seven indicated that they did take a break at that opportunity.

Conclusions: Awarding the bachelor degree does not particularly encourage students to discontinue their medical study. Our results are comparable to the results of the survey at the time of the introduction of the bachelor-master system, which supports our previous conclusion.

Introduction

The Bologna declaration for higher education in Europe[1] describes the introduction of a two-cycle system by which higher education programs should be divided into two phases or 'cycles': the bachelor program and the master program. For medical education, the implementation of this system, referred to as the bachelor-master (bama) system, has been an issue of debate.[2–5] Many countries and medical schools seem not convinced about the usefulness and suitability of the bama system for medicine.[3] Since 2003, only 7 of the 47 Bologna signatory countries introduced the bama system in their medical schools.[6]

The bachelor degree provides students with evidence of successful completion of the first cycle of medical education. In theory, this gives them several opportunities. They can start a master program at the same medical school, they can switch to another medical school for the medical master program, they can switch to a non-medical master program, or they can stop education and enter the labour market.

Because of these last two options, there is some concern that the bama system could encourage medical students to drop out of school after obtaining their bachelor degree. Opponents of the bama system quote that this will cause a waste of funds, spent on bachelor students who may not be planning a future career in medicine.[4,7–9]

The bama system also creates a manifest moment to pause medical education at the moment students receive a degree after three years, in contrast with the more continuous pre-bama curriculum. Students could use this break to experience other educational programs (especially if they are reconsidering their career), to travel, or to find a temporary job to earn money for the continuation of their study activities. Breaks during medical school are common, however, a break in between the bachelor and the master program might be prolonged more easily, as it might not feel as an unnatural interruption. If students would decide to take this break on a large scale

then it could disrupt the medical training continuum, requiring program adjustments. Also, this would result in a longer total training time to a medical specialty.

In 2008 and 2009, a few years after the implementation of the bama system in Utrecht in 2006, we carried out a survey about the considerations of medical students to use their bachelor degree for the previously mentioned options.[10] At that time, only very few students definitely considered a permanent stop, and there were no major differences found between the bama and pre-bama students in plans for a temporary stop. Also, only a very few students had considered a transfer to another medical school for their master degree.[10]

It can be argued that the results of the questionnaires at 2008 and 2009, when the bama system was just introduced, do not represent the more permanent situation, as felt for instance in 2012. Today, the bama system is a common practice among all medical schools in The Netherlands and the first bama students have now graduated as MDs. To investigate the interest of students to stop or interrupt their medical course after obtaining their bachelor degree now that the bama system is better established, the 2008/2009 questionnaire[10] was updated and redistributed among bama student cohorts of Utrecht in the second and third year of the bachelor program and in the first year of the master program in 2012.

Methods

Sample

In May and June 2012 the questionnaires were sent electronically to all 314 second and 348 third year medical bachelor students, and all 256 first year medical master students of University Medical Center Utrecht. These students all started medical school in the bama system. The master students had already obtained their bachelor degree.

Baseline characteristics of the groups were compared with characteristics of the total cohorts using the Pearson's chi-squared test for independence for gender and the independent-samples T test for age.

Questionnaires

The questionnaires used in 2012 contained similar questions as the 2008 and 2009 questionnaire.

All questionnaires contained items about biography (age, sex, final high school Grade Point Average (GPA) and lag time and activities between high school and medical school), and questions on students' considerations about their educational career: whether they would consider a temporary or permanent stop, the duration of a possible temporary stop, the reasons for a stop, the planned activities during or after a stop (or for the master students: what they did during a stop in between their bachelor and master program) and the utility of the bachelor degree for these plans. Students were also asked about their considerations to switch to another university for the medical master. The questions had a closed-end answer format. Students could clarify their answers or make comments in open remark sections. The questions about students' considerations to temporarily or permanently stop contained three answer options: ''no'', ''yes, I definitely consider this'' and ''I sometimes consider this, but I have no fixed plans''. The distinction between ''definitely considering this'' and ''sometimes considering this'' was made to get an impression of the certainty students have about their plans.

For the question on plans after a permanent or temporary stop, the answer options ''research'', ''travelling'' and ''function in a student board'' were added compared to the 2008/2009 questionnaire, because these options had often been mentioned in the open remark sections of the 2008/2009 questionnaire.

Ethical considerations

In accordance with national practice in the Netherlands, ethical approval was not required for such educational studies. Given the fact that this study is a continuation of a previous study that was executed before the existence of the NVMO ethical review board, approval was not sought. However, participants could freely decide whether they wanted to respond to the questionnaire. They were assured anonymity. Participants could not be identified from the material presented and no plausible harm to participating individuals could be caused by this study.

Results

Sample

Responses were received from 105 second year (33.4%) and 146 third year (42.0%) bachelor students and 125 first year master students (48.8%). The distributions of the baseline characteristics gender and age for each group were in accordance with characteristics in the total cohort of students per group.

Permanent stop

Of the bachelor students, 10.5% and 13.0%, and of the master students 16.0% indicated to consider about a permanent stop sometimes, but without fixed plans. Of all the students 1.0–3.4% was ''definitely considering'' a permanent stop (Table 1).

Temporary stop

Of the second year bachelor (B2) students 24.8% ''definitely'' considered a temporary stop, 41.9% ''sometimes''; among the third year bachelor (B3) students, these percentages were 27.4 and 32.2, respectively. Of the first year master (M1) students 13.6% indicated they actually had taken a break in between their bachelor and master program.

Table 1. Percentages of respondents considering interruptions during medical school

	Bachelor students		Master students	
	B2 (N = 105)	**B3 (N = 146)**	**M1 (N = 125)**	
Do / did you consider a temporary stop after the bachelor's program?	N = 105	N = 146	N = 125 *Did you stop after bachelor?*	N = 125 *Considering stop during master?*
- No	33.3	40.4	86.4	23.2
- Yes, definitely	24.8	27.4	13.6	38.4
- Sometimes, but no fixed plans	41.9	32.2	-	38.4
For how long did / would you stop?*	N = 70	N = 60	N = 19 *Between bachelor-master*	N = 95 *During master*
- < 3 months	2.9	12.8	10.5	37.9
- 3 months – 6 months	12.9	37.2	21.1	44.2
- 6 months – 1 year	80.0	39.5	47.4	14.7
- 1 year – 2 years	4.3	8.1	21.1 ≥	3.2
- > 2 years	0.0	2.3	*1 year*	0.0
Do you consider a permanent stop of your medical training (after the bachelor's program)?	N = 105	N = 146	N = 125	
- No	88.6	83.6	81.6	
- Yes, definitely	1.0	3.4	2.4	
- Sometimes, but no fixed plans	10.5	13.0	16.0	
Reasons for a (temporary or permanent) stop* (more than one answer possible)	N = 71	N = 88	N = 98	
- Dislike of clinical clerkships	NA	11.4	6.1	
- Another study is more appealing	9.8	14.8	2.0	
- Achieving poor results	5.6	3.4	1.0	
- Study of medicine (bachelor and master) takes too long	14.1	19.3	19.4	
- Other reason(s)	95.8	80.7	89.8	

What have you done / would you do when you stop?*	N = 73	N = 89	N = 17 *Between bachelor-master*	N = 97 *During master*
- Different master program	5.5	2.2	5.9 *other study*	1.0
- Different (non-master) study	4.1	7.9		5.2
- Take a job	2.7	2.2	0.0	3.1
- Research	2.7	1.1	0.0	8.2
- Travelling	65.8	64.0	47.1	67.0
- Function in student board	6.8	6.7	23.5	4.1
- Other	2.7	7.9	23.5	7.2
- Don't know yet	9.6	7.9	NA	4.1
Is / was your bachelor degree useful or required for these plans*	**N = 72**	**N = 62**	**N = 24 *Between bachelor-master***	**N = 90 *During master***
- Yes	22.2	23.8	33.3	22.2
- No	59.7	58.3	62.5	64.4
- Don't know	18.1	17.9	4.2	13.3
Do / did you considering a transfer to another university for your medical master?	**N = 104**	**N = 146**	**N = 124**	
- No	79.8	82.9	85.5	
- Yes, definitely	4.8	6.2	3.2	
- Sometimes, but no fixed plans	15.4	11.0	11.3	

NA = not asked
* This question originally contained an answer option: `not applicable, not considering a stop`. Percentages are calculated with exclusion of participants who choose this answer option.

Of the M1 students 38.4% definitely considered to take a break during their master's program, and the same percentage of students considered this but had no fixed plans yet at the time of the questionnaire. Of the M1 students who are planning a stop, the majority would stop for a period shorter than six months; 17.9% would stop for six months or longer. The majority of B3 students who plan a stop planned a break of 3–6 months (37.2%) and 6–12 months (39.5%). Of the B2 students who considered a stop, 80% was thinking of a pause of six months to one year.

Plans after a (temporary or permanent) stop and usefulness of the bachelor degree

The majority of students considered a temporary stop to travel, whether in between the bachelor and master program or during the master program (47.1–67.0%). In all cohorts, the majority of students who planned a stop (bachelor students) or did pause (master students) between their bachelor and master program, stated that the bachelor degree would not be or was not useful or required for their plans.

Reasons for a (temporary or permanent) stop

Some students indicated that they were dissatisfied with the clerkships as a reason to stop (6.1–11.4%); others preferred a different master program (2.0–14.8%); still others considered medical training to be too long (14.1–19.4%). Large percentages (80.7–95.8%) indicated they had another reason for planning a stop. In the remark section of the questionnaires, many students (both bachelor and master) mentioned a desire to take a break before they would start at, or proceeded with the clinical clerkships of the master. They indicated they wanted to travel, or apply for temporary paid work or follow another educational course to broaden their life experiences before entering or continuing with the stressful clinical phase of their medical training. They did not expect to still have time for this during or directly after their master or their postgraduate medical training. They indicated to feel too young to start the serious clinical working life. A few would take time to rethink their study career, to add

experiences to their curriculum vitae, or to have time for sports or for their families. Many master students planned to combine a (clinical or research) internships abroad with travelling.

Transfer to another medical school

A transfer to another medical school for the master program was considered as a possibility by around 20% of both bachelor cohorts, of which 4.8–6.2% were definite in their opinion. Almost 15% of the master students had considered this, 3.2% of them definitely, but it turned out not to be possible for them.

Discussion

We found that obtaining a bachelor degree does not encourage students to permanently stop their medical training. Students seem to consider undergraduate medical training to remain a continuum in spite of the division into the two cycles, bachelor and master. As far as transfer possibilities of the bama system is concerned, only a small number of students consider switching to another medical school for the subsequent medical master program. These results are comparable to the results of the survey at the time of the introduction of the bama system.[10] Although the bama system is well established now, students still do not seem to use the flexible study pathways created by this structure, i.e. to switch their study pathway or career after the bachelor program. This can also be seen as a reassurance, as it contrasts with concerns that the bama system could easily encourage students to drop out of medical school after obtaining their bachelor degree.[4,7–9]

The low interest of students in switching study pathways is something we can explain. Only a small number of all who are interested in becoming a doctor can be admitted to Dutch medical schools, as is the case in many countries worldwide. Once students have managed to enter medical school, this may not be something they would give up easily. This may be one reason why students are eager to finish their total medical course.

Several students indicated that the possibilities of a medical bachelor degree, besides entering the medical master program, were unknown to them. This lack of information about other options may cause small numbers of students who consider a permanent stop seriously. This also may underpin the criticism that in fact there is lack of possibilities for students with a medical bachelor degree other than continuing to the medical Master program.[6]

The small number of students who consider a switch to another medical school was not unexpected. In the Netherlands, the possibilities for a switch are still limited, because of insufficient placements and regulatory obstacles. In addition, with a Dutch bachelor degree, students are guaranteed a place in the medical master program at the same university, but not at a different medical school. Also, a switch to another medical school for master training would be more attractive to students if each medical master program would have a specific profile. In the Netherlands all medical master programs are roughly equal and there is no financial difference. For many students, geographical reasons may prevail, rather than reasons of content or quality when choices for a school are made or when students decide to switch to another university for their master's training.

A large number of bachelor students consider a temporary stop after the bachelor program. A substantial percentage of them (80.7–95.8%) indicated ''other reasons'' as a reason for this stop. In the open remark section students explained being prone to take the opportunity for seeing more of the world outside the medical study, and expect this the last possibility to do so before graduation.

Most of them are planning to travel abroad, and/or use this time to gain knowledge and experiences at a wider field than their medical training. Students generally do not feel the need to have a bachelor degree to carry out their plans. They may see completing the bachelor program just as an appropriate moment to insert a pause.

However, it seems that only a few students actually turn their plans into action, as only a small number of first year master students have indicated that they actually did take a break. In addition, a large number of master students consider a temporary stop during their master program. They also indicated in large numbers to have travel plans. In the open remark section many students specified that they were planning a clinical clerkship or research internship abroad, combined with travelling. This is rather common and certainly possible during the medical master in the Netherlands, and is not different than it was before the introduction of the bama system. This can explain why also a lot of these students see no need for a bachelor degree for their plans.

This study focuses on the considerations of student to choose another study pathway themselves after finishing the medical bachelor. The bama structure also creates an opportunity to make students switch study pathways, in case their professional behavior is found to be inappropriate to continue working in patient care,[11] or if they do not seem to be suited for work in patient care for other reasons. In the Netherlands, it is legally possible to provide these students an adjusted (''free'') bachelor degree, which gives them entry into several masters, but not to a medical master and a medical degree.

At University Medical Center Utrecht, students get experience in medical practice extensively during the third year of the bachelor program, in twelve weeks of early clerkships.[12] As a result, their professional behavior in patient care can be assessed during the bachelor. So far, at this school a few students have opted for a free bachelor degree instead of the medical bachelor degree. We consider it a major advantage that it is now possible to redirect students early during medical training if the medical profession does not suit them, while providing a degree for successful completion of non-clinical courses.

Our study has some limitations. The response rates were low. Although the distributions of the baseline characteristics gender and age for each group were in

accordance with characteristics in the total cohorts, a response bias cannot be ruled out entirely. Students who were considering a stop may have been more inclined to respond. However, in that case the actual number of students who considered stopping would have been lower. This would only support our main conclusion that the bama system does not encourage students to stop their medical training. Also, the low response rates do not cause a problem for the comparison with the results of the 2008 and 2009 questionnaires, since the numbers of participants in 2012 were similar to the number of participants in 2008 and 2009.

Another limitation is that all the participants are students from one medical school, and therefore results should be generalized with caution. The master students who participated in this study were all students who already chose to start a medical master in Utrecht. Their colleagues who chose to switch after their bachelor program already left our medical school and were not included.

We asked students about their ''considerations'', which could cover a wide range of certainty about plans. Many bachelor students indicated to consider a (long) break after obtaining their bachelor degree. However in our survey only a small number of master students actually had done this. Apparently, making plans for a (long) break is common, but in the end few students turn these plans into action.

Despite of these limitations, the results of this study reflect the interest of Dutch medical students to stop their medical training after receiving their bachelor degree, six years after implementing the bama structure.

Recommendations

For the results to be generalized, we recommend to expand the study population by including students from other medical schools, also in other countries which implemented the bama system in medical education. It would be interesting to follow-up a cohort of bachelor students, to verify how many of them actually turn their plans into action.

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Chapter 3

Medical students' preparation for the transition to postgraduate training through final year elective rotations

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Abstract

Objectives: This study adds to the ongoing discussion on how to ease the transition from undergraduate medical training to postgraduate training. In the Netherlands there is no central matching system for admission to residency. Medical school graduates just apply for a position in an open job market. Many choose to acquire general or specialty specific clinical experiences after the medical degree before residency, to further explore career opportunities and to increase their chances to get into their preferred specialty. To shorten this gap between undergraduate and the start of postgraduate training, the sixth and final year of most Dutch medical schools is designed as a 'transitional year'. Students work with more clinical responsibilities than in the earlier clerkships, and this year includes many elective options. Our study focuses on these elective options and explores how medical students use these transitional year electives to prepare for transition to postgraduate training.

Methods: In 2012-2013 we asked all 274 graduating students at one Dutch medical school to complete an open-answer questionnaire with the following topics: 1. their preferred specialty at the start of the transitional year, 2. electives they chose during this year and reasons for these choices, and 3. whether the transitional year electives changed their career considerations. Questionnaire results were coded by two researchers and were discussed with all members of the research team.

Results: A total of 235 students responded (86%). Answers about motivation for choices revealed that most electives where chosen for career orientation and to optimize chances to get into a residency program. Students also focused on additional experiences in specialties related to their preferred specialty. Many students chose electives logically related to each other, e.g. combinations of surgery and radiology. About two-thirds of the respondents stated that their elective experiences did confirm their specialty preferences or resulted in a more clear insight.

Conclusion: We conclude that students use the transitional year electives to focus on their future postgraduate training program, i.e. for orientation and to align their curriculum vitae with their preferred specialty, resulting in spontaneous early specialty streaming. To take advantages of this streaming, and to make sure students can transfer their experiences to other specialties if their career preferences change, individual elective Entrustable Professional Activities (EPAs), next to the core EPAs for all medical students, may serve to prepare a smooth transition to a specialty of choice and should be fully documented.

Introduction

The continuum of undergraduate and postgraduate medical education is becoming more important, while the importance of the medical degree decreases.[1] Therefore, it is increasingly relevant to understand the dynamics of orientation and preparation for residency during medical school. The final year of medical school could be of major importance for this purpose. The structure and content of this year, and how this year could successfully prepare students to enter postgraduate education, is therefore a topic of debate.[2,3]

Differently than in for instance the USA, the Netherlands has no national matching system for residency training programs. Medical graduates just apply for a position in an open job market. Many graduates choose to acquire general or specialty-specific clinical experiences after the medical degree and before applying for residency training. Or they try to obtain a PhD position, to further enhance career opportunities, and to increase the chances to get into their preferred specialty training program. A survey in 2013 revealed that there is a time lag of 28.5 months on average between the medical degree and starting residency in the Netherlands, outliers excluded.[4] There is widely held opinion that this intervening period needs to be shortened, to decrease the total training time from secondary school student to medical specialist, and to allow specialists to practice for a longer period of their lives. One way to reduce the length of the intervening period is to better gear medical school towards postgraduate training. The final year of most medical schools in the Netherlands is designed as a so-called "transitional year" since about one decade.[5,6] During this year, which is part of undergraduate training, students work with more clinical responsibilities than in the earlier clerkships, at the level of a starting resident under strict supervision. This increase in clinical responsibilities for students has shown to improve graduates preparation for residency at the level of their skills and knowledge. In a questionnaire study among supervisors of postgraduate training programs, graduates from a curriculum with such a structure were judged to be more

capable to work independently, to solve clinical problems, to manage unfamiliar medical situations, to prioritize tasks, to collaborate with other professionals, to judge when they need help from their supervisors and to reflect on their activities.[7]

In addition, also in order to stimulate the transition into residency, the transitional year includes many elective options, with the intention to have students choose specialties they want to gain more in-depth experience in. While students can gain more knowledge and skills in their areas of interest, supervisors may observe and identify future applicants for specialty training.[6,8] Recently, the Dutch government has demanded to shorten the medical training continuum within the constraints of the EU rules. One intervention that is being introduced is to change the "transitional year" with its electives into a "dedicated transitional year". This means that students focus on a specific future residency training program, by spending their final year at a set of predetermined rotations, in most cases limited to a specific specialty. After successful completion these junior doctors can participate in a program of reduced length for the first year of residency. It is not clear yet how useful this approach will be. It is common sense among students that the success of the transitional year with electives is in the creation of individual pathways.

In the light of these developments on the structure of the final year of undergraduate training, we aimed to explore whether and which spontaneous specialty streaming emerges in elective choices of medical students during their final year, what students' rationales are in choosing these electives, and how considerations for residency training change during the final year electives, in the context of a transitional year program.

Methods

Context: The Transitional Year program at Utrecht Medical School

Our study was conducted at one Dutch medical school with a transitional year program, namely Utrecht University medical school. The transitional year at this

medical school was introduced in 2004. Students start the transitional year with a mandatory 6-week training course in evidence based medicine, medical professionalism and teacher training. Then, in a varying order, students must take a 12-week major clinical elective at a department of their choice, a 12-week research elective at a department of their choice, and have 12-weeks to fill in freely. Students can take these 12-weeks additional electives at any clinical, science or other department they want, or choose for a teaching rotation, health management or medical ethics elective. Splitting up in two times six weeks is also allowed for these 12-week additional electives. For the 12-week major clinical elective, choices are restricted to make sure students will obtain experience with a sufficiently broad range of clinical problems. Departments students can choose from include family medicine, general internal medicine, general surgery, geriatrics, neurology, obstetrics and gynecology and pediatrics. Ophthalmology, ENT and anesthesiology are among the specialties that cannot serve as a major clinical elective, but are allowed as departments for an additional research or clinical elective in the 12 weeks students can fill in freely.

Population and instrument

We asked all 274 students who graduated between July 2012 and July 2013 from Utrecht University medical school to participate. All students participated voluntary and signed an informed consent form. Ethical approval for this study was obtained from the ethical review board of the Netherlands Association for Medical Education. Around graduation, all participants were asked to fill out an open-answer paper-based questionnaire about their specialty preferences at the start of the transitional year, their elective choices with motivation during this year, and whether their specialty preferences had changed and how. We choose a paper-based questionnaire to stimulate response rate. We choose open-ended questions, in order to explore the full width of considerations students have about their elective choices.

Data analysis

Each specific area of specialty where students did electives was given a code, as well as for the electives in other fields such as the teaching rotation or medical ethics. We grouped some specialties, such as surgical subspecialties to “surgery” and internal medicine subspecialties to “internal medicine”, in discussion with all members of the research team. We used Dedoose® version 6.1.18 to support our data analysis and to generate an overview of the co-occurrence of electives in elective tracks of respondents to the questionnaire.

Answers about motivation for choosing an elective, and whether and how specialty preference had changed during the transitional year, could be interpreted more subjectively and coding of these answers therefore involved five consecutive steps. The first step involved the review of and familiarization with the data by three researchers (MWM, MD and SB). Stage 2 involved identifying themes by open coding to develop a code framework discussed by MWM, MD and SB. Stage 3 involved a try-out coding for a part of the data by two researchers (MWM and SB), after which the codes were slightly revised. Stage 4 included coding of another part of the data by the same two researchers, after which a satisfactory interrater reliability was reached. Interrater reliability was computed using SPSS Statistics version 20.0 Cohens’ Kappa test for interrater agreement. Stage 5 was the final coding of the data by one researcher (SB), in case of doubt answers were discussed with a second researcher (MWM) and if necessary a third researcher (MD). While coding the data the process was regularly reviewed and discussed with all research team members.

Results

A total of 236 students filled out the questionnaire (response rate 86%). One participant was excluded, as this questionnaire yielded unusable data. For coding of the answers about motivation for choosing an elective, a Kappa measure of

agreement of 0.82 was reached, and for the answers whether specialty preference had changed during the transitional year a Kappa of 0.69 was found.

Career interests at start of the transitional year

When asked about specialty preferences, students reported up to six specialties of interest, with a mean of 1.99 (SD 0.99). Of all participants, 153 students reported a specific ranking in their preferences, or reported only one specialty of preference at the start of the transitional year. Internal medicine with its subspecialties was most popular (N=33, 21.6%), followed by family medicine (N=30, 19.6%), surgery (N=24, 15.7%), pediatrics (N=17, 11.1%), and other specialties with percentages below 10. The other 81 participants may have had a ranking in mind while starting their transitional year, but this ranking was not clearly identifiable in their answers.

Rationales for choice of transitional year electives

The analysis about rationales for choice of transitional year electives yielded three predominant groups:

1. To orient toward a residency, i.e. try out if, or affirm that a specialty would be a suitable option.
2. To maximize chances to be selected for a postgraduate program of choice, i.e. to either build experience in that specialty, or to obtain experience in related domains presumably highly valued by the program of choice (e.g. neonatology for a gynecology choice). Some students also described a combination of orientation and maximizing their changes. We also included these answers in this category.
3. "Other reasons" not related to specific considerations about a future career, for example because it took little effort to arrange a certain elective, or because the students wanted to fill gaps in their knowledge and skills in general.

Table 1: Co-occurrence of electives in elective tracks of respondents

% of respondents doing elective(s) at specialty in the vertical row who choose another elective at specialty in the horizontal row

	Anesthesiology	Cardiology	Dermatology	ENT/opht/urology	EM	Family Medicine	Geriatrics	Gynecology	ICU	Internal Medicine	Neurology	Other*	Pediatrics	Psychiatry	Public Health	Radiology/therapy	Surgery	Teaching rotation
Anesthesiology (N=31)		3.2	3.2	3.2	6.5	3.2	3.2	6.5	19.4	12.9	0.0	9.6	3.2	0.0	3.2	6.5	16.1	0.0
Cardiology (N=36)	2.8		0.0	2.8	13.9	8.3	2.8	5.5	19.4	8.3	0.0	2.8	0.0	2.8	2.8	16.6	8.3	2.8
Dermatology (N=32)	3.1	0.0		0.0	6.3	15.6	9.4	0.0	3.1	9.4	0.0	12.5	9.4	0.0	0.0	3.1	15.6	12.5
ENT/ophth/uro (N=38)	2.6	2.6	0.0		5.3	7.9	0.0	2.6	7.9	15.8	2.6	7.9	7.9	2.6	2.6	5.3	26.3	0.0
EM (N=107)	1.9	4.7	1.9	1.9		15.0	4.7	3.7	8.4	16.8	3.7	14.0	4.7	5.6	0.9	1.9	5.6	4.7
Family Medicine (N=99)	1.0	3.0	5.1	3.0	16.2		8.1	4.1	3.0	18.2	2.0	13.1	5.1	5.1	2.0	3.0	2.0	6.1
Geriatrics (N=57)	1.8	1.8	5.2	0.0	8.8	14.0		3.5	0.0	15.8	1.8	21.1	5.2	5.2	3.5	7.0	0.0	5.2
Gynecology (N=50)	4.0	4.0	0.0	2.0	8.0	8.0	4.0		6.0	8.0	0.0	18.0	12.0	2.0	4.0	6.0	4.0	10.0
ICU (N=71)	8.5	9.9	1.4	4.2	12.7	4.2	0.0	4.2		18.3	1.4	8.5	5.6	0.0	2.8	5.6	9.9	2.8
Int. Medicine (N=140)	2.9	2.1	2.1	4.2	12.9	12.9	6.4	2.9	9.2		2.1	14.3	7.9	0.7	1.4	7.9	3.6	6.4
Neurology (N=44)	0.0	0.0	0.0	2.3	9.1	4.5	2.3	0.0	2.3	6.8		20.5	4.5	18.2	0.0	13.6	6.8	9.1
Other* (N=134)	2.2	0.7	2.9	2.2	11.2	9.7	9.0	6.7	4.5	14.9	6.7		6.0	4.5	1.5	4.5	6.7	6.0
Pediatrics (N=69)	1.4	0.0	4.3	4.3	7.2	7.2	4.3	8.7	5.8	15.9	2.9	11.6		11.6	5.8	2.9	2.9	2.9
Psychiatry (N=47)	0.0	2.1	0.0	2.1	12.8	10.6	6.4	2.1	0.0	2.1	17.0	12.8	17.0		2.1	6.4	0.0	6.4
Public Health (N=21)	4.8	4.8	0.0	4.8	4.8	9.5	9.5	9.5	9.5	9.5	0.0	9.5	19.0	4.8		0.0	0.0	0.0
Radiology/ therapy (N=73)	2.7	8.2	1.4	2.7	2.7	4.1	5.5	4.1	5.5	15.1	8.2	8.2	2.7	4.1	0.0		21.9	2.7
Surgery (N=77)	6.5	3.9	6.5	12.9	7.8	2.6	0.0	2.6	9.1	6.5	3.9	11.7	2.6	0.0	0.0	20.8		2.6
Teaching (N=56)	0.0	1.8	7.1	0.0	8.9	10.7	5.4	8.9	3.6	16.1	7.1	14.2	3.6	5.4	0.0	3.6	3.6	

0.0-4.9 % | 5.0-9.9% | 10.0-14.9% | 15.0-19.9% | ≥20.0%

* Other: electives in epidemiology, pharmacology, health care law, clinical genetics, medical ethics, medical psychology, sports medicine, tropical medicine, pathology, rehabilitation medicine

The major clinical and research electives in the transitional year were mostly used for orientation and maximizing changes to be selected for a postgraduate program (80% and 75% respectively), while for the additional electives other reasons were mentioned more frequently (around 40%).

Frequent combinations of electives during the transitional year

Table 1 gives an overview of co-occurrence of electives in elective tracks of our respondents. We found some electives to be frequently chosen in combination with specific other electives. For example, 19.4 percent of students who did at least one elective at anesthesiology, also choose at least one elective at the ICU (upper row). In addition, 58.3% (N=137) did two, 3.8% (N=9) did three, and 0.4% (N=1) of the students did four electives at the same specialty out of a maximum of 4 different elective periods.

Change in considerations for residency during the transitional year

Three groups of considerations to change residency preference after the final year electives were identified:

1. Two-thirds of the students reported that the transitional year confirmed an earlier preference for a residency, or resulted in a more clear insight into their preferences.
2. One sixth of the students reported to still be in doubt when finishing the transitional year.
3. One sixth of the students reported that the elective experiences had caused substantial doubts about their specialty preference or resulted in new insights about their preferences.

Discussion

The transitional year program was introduced in Dutch medical schools to optimally prepare students for postgraduate training. Next to the increase in clinical

responsibilities, an important aspect of the transitional year is that students have a lot of elective choices. We conclude that students use these electives with a strong focus to prepare for residency. These results are not surprising, and resonate with findings of other studies on students' perspectives on their final year of medical school. Externally driven goals, like identifying a preferred specialty and obtaining a job after graduation, play a major role in students' choices for the final year.[9,10] Additionally, we found that when students have a free choice, they choose electives with these purposes, while at the same time making sure that they still gain a broad experience in other specialties.

Many students still have multiple career interests at the start of the final year. They appear to compose the final year in such a way that they are able to further explore career interests, and at the same time maximize their changes to be selected for a postgraduate training program. In the Netherlands, medical graduates have to apply for residency in an open job market. The shortage of available places for some residency programs may serve as a motivation for elective choices in the transitional year. For example, we found many students choosing a clinical elective in surgery or internal medicine because of its breadth. In the answers on the questionnaires students stated that they see an elective at these departments as an adequate preparation for almost every career option. We also see students choosing electives at departments logically related to each other, such as surgery with radiology, cardiology with Intensive Care, anesthesiology with surgery and Intensive Care, and family medicine with emergency medicine (see table 1). Students mentioned that they see their final year electives as an opportunity to gain additional experiences with related specialties of their specialty of preference, which might not be part of their specialty training, but could be useful in their future career.

An intervention being introduced in the Netherlands is to reconstruct the final year of medical school to a so-called "dedicated transitional year". Students must then choose all, or most, final year rotations in a specific specialty direction. After

successful completion these junior doctors may participate in a reduced program for the first year of residency of this specialty. The actual effective success of such mandatory early specialty streaming for the training of physicians is not clear. On one hand, students simply get an opportunity to learn in depth in a field they might start working in after graduation, which probably eases their transition to residency. On the other hand, a possible threat is that this could limit the students' broad development as physician. We found that when students have a free choice, they choose electives to prepare for residency while at the same time guaranteeing a broad experience in other specialties. One way to further support this finding is to give students the opportunity to record their individual capacities, apart from the specialty where they did their electives. The registration of their development by for example using Entrustable Professional Activities (EPAs)[11] could be useful for this purpose. Next to the core EPAs for all medical students, individual elective EPAs could be implemented, by which students can develop and show unique profiles.[12] These elective EPAs might be more specialty specific. However, students can work on these EPAs at several departments, and are not necessarily limited to electives at specific specialties. For example, an EPA obtained at a surgical department could be very useful when interested in a future career in dermatology. Students can still strengthen their resumes by working on specific skill development, but they can do this at any department. For most students in this study their elective experiences confirmed their decision for a specialty, or resulted in a more clear insight into their preferences for residency training programs. However, not all of these students can get into the residency they had in mind, given the limited training capacity for some specialties, and also a not insignificant number of students changed their specialty preference. A registration of EPAs could be useful when applying for a job after graduation, also when applying for a specialty that does not match the focus of their electives during the final year.

Secondly, it is not clear how mandatory early specialty streaming, already at the level of medical school, affects students' professional development. During medical

training, students go through a process of socialization, by which they learn to function within the medical profession by internalizing its values and norms.[13] This process of socialization and developing a professional identity is strongly influenced by external factors, such as role models, and the interaction with patients and peers.[14,15] It is therefore important to gain insight into the professional identity development of undergraduate medical students, and how this could be affected by mandatory early specialty streaming.

Transitional year programs in Dutch medical schools are part of the regular six years of training time for undergraduate medical education in the Netherlands. Their purpose is educational. Students are not meant to be scheduled in as employees during this year, and do not receive payment. Thus, the transitional year does not create a 'cheap labor' environment for junior doctors who have not yet secured a residency position. After successful completion, students graduate and enter an open job market for residency. However, transitional year programs do give students the opportunity to identify careers early and develop unique profiles, which can serve as stepping stones in their career as young doctors. There are indications that adequate transitional years lead to more rapid admission into residency,[16] and that consequently the desire to be employed as a junior doctor in an interim period before residency may decrease.

Our study has strengths and limitations. The open nature of the questions in the questionnaire, in combination with a high response rate, gives a good insight into the considerations of final year students in choosing their electives. However, we conducted this study only for one cohort of medical students at one medical school. Therefore conclusions should be generalized with caution. Students were asked about preferences for residency training at the start of the transitional year, and their reasons for choosing their electives, but we only asked this in retrospect. Students might have changed their mind about career preferences during the year. This could have resulted in students mentioning other reasons for choosing an elective than

actually were the case at the time of making those decisions, or in students switching their elective choices. Also, we do not have information about other activities of students to focus on a future residency training program, such as extracurricular research activities. It is important to realize that the shortage of places for some residency training programs may serve as an extrinsic motivation for elective choices, thus we do not consider elective choices in the transitional year as purely intrinsic considerations.

This study was meant to be explorative, and to provide insight in medical students' use of electives during a transitional year to prepare for postgraduate education. To obtain deeper insight whether this indeed results in a better preparation we recommend to follow up cohorts of students.

Conclusion

Final year medical students use electives to create experiences that ease the transition from undergraduate to postgraduate medical training programs, resulting in spontaneous early specialty streaming, while still guaranteeing their broad development as a physician. It is not clear whether mandatory early specialty streaming, as is being discussed and starting to be implemented in the Netherlands, will show an improvement on this preparation for residency.

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Chapter 4

When I Say... Vertical Integration

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Submitted

"Integration" has been a buzz word since decades. It expresses the desired aim of collaboration between disciplines to establish a coherent medical curriculum that focuses on general objectives of medical education, rather than a stack of separate courses and clerkships with their own culture, professors, rules, and exams. Before integration was qualified as a key component of modern medical education in Harden's SPICES model (1984)[1], the ideas emerged already in the 1950s, when the Association of American Medical Colleges (AAMC) clearly stated that the objectives of undergraduate medical education should not include the learning of detailed systematic knowledge of several basic sciences, or the techniques required for the successful practice of various specialties, separately. Instead, AAMC spelled out a list with goals for the medical school curriculum, all focused on learning necessary general knowledge and basic skills related directly to patient care.[2]

Today, two main forms of integration can be distinguished in curriculum models. Horizontal integration is the “integration across disciplines but within a finite period of time“[3], for example within a block course, usually referring to the basic sciences. Vertical integration means integration across time.[3] Traditionally, vertically integrated curricula (VICs) present basic sciences imbedded in a clinical context by early experiences with clinical problems and with clinical health care. Further learning then proceeds through repetitive and progressive development of concepts and their applications throughout the curriculum. During the years the amount of time spend on theoretical training decreases while the amount of clinical practice increases, which can be visually represented as a “Z-shaped curriculum model”.[3] In contrast, in a traditional “H-shaped curriculum” classroom teaching is programmed in the first years of medical school and clinical training in the final years.

Vertical integration has been defined as "the integration between the clinical and basic science parts of the curriculum".[4] We believe this definition of vertical integration is too limited, and propose to define vertical integration as *a deliberate*

attempt to shape the curriculum to enable a gradual increase of learner engagement in clinical practice.

The aim of vertical integration is to support meaningful learning in a broad sense. VICs provide relevance to basic sciences for clinical practice, to match learning with the way the knowledge is to be used.[3] There is evidence that vertical integration benefits learners. Students from VICs make a grounded choice for specialization earlier than students from more traditional curricula, and need less time and fewer applications to obtain a position for a postgraduate training program. They report to feel better prepared for the transfer to clinical work and postgraduate training than students trained in non-VICs.[5] Supervisors consider graduates from VICs more capable to working independently, solving medical problems, managing unfamiliar medical situations, prioritizing tasks, collaborating with others, knowing when to consult supervisors, and reflecting on their activities than graduates from non-VICs.[6]

The cognitive effects of VICs are important but limited. We believe that learner engagement in clinical practice has effects on emotion, motivation and identity formation. In a simulated authentic clinical performance assessment, testing recent medical graduates from a VI and a non-VI curriculum on a very busy clinical day, our group found little differences in clinical performance.[7] However, VI graduates scored higher for features of professional development (critical attitude towards themselves, reflection and asking for feedback). The VIC was defined as "a deliberate developmental structure to gradually increase participation in the professional community of practice through graduated responsibilities [in patient care]".[8]

Providing clinical context for acquiring foundational knowledge in a medical curriculum can be understood for three perspectives: A physical dimension, referring to the physical environment of teaching and learning (e.g. a hospital versus a classroom), a semantic, or cognitive dimension where foundational information is continuously enriched with illustrations from patient care (e.g. case-based approaches), and a commitment/affective dimension.[9] This dimension incudes

learning with the responsibility for patient care, as happens in VICs with a broad definition of vertical integration. The progressive increase of clinical responsibility makes a strong appeal to students, resulting in an increase in their commitment for learning. This may especially be reflected in features of their professional development.

Considering this, we believe the use of the common definition of vertical integration, i.e. "the integration between the clinical and basic science parts of the curriculum"[4] is too limited. In a curriculum in which merely the structure is rearranged, teaching topic may become fragmented and reduced to curricular scheduling, losing sight of the intended ultimate learning outcome, i.e. patient care.[10] We think vertical integration should be considered a broader philosophy of education.

Using a broad definition of vertical integration may create awareness among both learners and teachers that the aim of all learning activities in preclinical and clinical education serve to prepare students for clinical care responsibilities. This awareness and consequent curricular philosophy is likely to affect students' professional identity formation. Identity formation is considered to happen simultaneously at the level of the individual (i.e. the psychological development of the person), and at the collective level (i.e. the socialization into the community).[11] Identity development at the individual level has developmental stages. Moving from one stage to the next happens through the influence of 'crises' provoked by the experiences and challenges faced.[11] In a curriculum holding a broad philosophy of vertical integration trainees meet moments of crises as they are longitudinally challenged to take subsequent steps in responsibilities in patient care. Simultaneously, at the social level the trainees gradually move from peripheral to full participation in the community of practice and learn to function within the group of doctors by internalizing its values and norms.

We believe that true vertical integration in a coherent medical curriculum will prepare students well for their role as responsible practitioners. A broader perspective to vertical integration, defining vertical integration as *a deliberate attempt to shape the*

curriculum to enable a gradual increase of learner engagement in clinical practice, can help medical educators to make use of the full potential of this curriculum structure.

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Chapter 5

Social identification with the medical profession in the transition from student to practitioner

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Abstract

Phenomenon: This study explores professional identity formation during a final year of medical school designed to ease the transition from student to practitioner. Although still part of the undergraduate curriculum, this "transitional year" gives trainees more clinical responsibilities than in earlier rotations. Trainees are no longer regarded as regular clerks but work in a unique position as 'semi-physicians', performing similar tasks as a junior resident during extended rotations.

Approach: We analyzed transcripts from interviews with 21 transitional-year medical trainees at University Medical Center Utrecht about workplace experiences that affect the development of professional identity. We used Social Identity Approach as a lens for analysis. This is a theoretical approach from social psychology that explores how group memberships constitute an important component of individual self-concepts in a process called 'social identification'. The transcripts were analyzed using thematic analysis, with a focus on how three dimensions of social identification with the professional group emerge in the context of a transitional year: cognitive centrality (the prominence of the group for self-definition), in-group affect (positivity of feelings associated with group membership) and in-group ties (perception of fit and ties with group members).

Findings: Students were very aware of being a practitioner versus a student in the position of semi-physician and performing tasks successfully (i.e., cognitive centrality). Students experienced more continuity in patient care in transitional-year rotations than in previous clerkships and felt increased clinical responsibility. As a semi-physician they felt they could make a significant contribution to patient care. Students experienced a sense of pride and purpose when being more central to their patients' care (i.e., in-group affect). Finally, in extended rotations, the trainees became integrated into daily social routines with colleagues, and they had close contact with their supervisors who could confirm their fit with the group, giving them a sense of belonging (i.e., in-group ties).

Insights: Using the three-dimension model of social identification revealed how students come to identify with the social group of practitioners in the context of a transitional year with extended rotations, increased clinical responsibilities, and being in the position of a 'semi-physician'. These findings shed light on the identity transition from student to practitioner within such a curricular structure.

Introduction

The transition from student to practitioner is critical for medical trainees and is marked by increased responsibilities in patient care.[1] Graduation from medical education is not just completion of academic study but leads to membership in a group licensed for special privileges and responsibilities and to a prestigious new identity. Becoming a member of such a new group and preparing for it can be stressful.[2–4] Medical schools and educators have been trying to find ways to ease that transition.[5,6] In the UK, the General Medical Council has decreased the length of undergraduate education from 6 to 5 years and introduced a mandatory two year 'foundation program' before postgraduate training. In the USA, medical graduates first have an intern year before they are designated as 'residents.' In the Netherlands, medical schools have been paying special attention to this transition in curricular reforms since the turn of the century. One intervention to ease it has been the restructuring of the final year as a "transitional year,"[7,8] with several characteristics (see Box 1).

Box 1: Features of the transitional year in 6-year Dutch medical school programs

1. Trainees have clinical responsibilities for the care of a limited number of patients comparable to junior residents.[8]
2. Trainees are called 'semi-physicians' to distinguish them from 'students' in earlier clerkships.
3. Semi-physician rotations are relatively long (12 up to 18 weeks) allowing for continuity in patientcare and supervision.
4. Semi-physician rotations allow for a large variety of elective choice to meet student preferences.[29]

The effect of a such a transitional year on transition to postgraduate education has been studied with a focus on preparedness for work, career choice, and residency

programs.[9,10] A transitional year may also support the transformation of one's professional identity in moving from medical student to medical doctor.[11,12] The focus of this study is on this profound shift in identity. Because professional identity is linked to the professional behavior, career success and psychological health of medical professionals,[13–15] it is important to understand trainees' identity development during such a transition.

Professional identity formation can be understood from various theoretical perspectives.[16] Social Identity Approach (SIA), whose relevance for research on professional identity formation in medical education has been described before,[17] provides a social perspective to identity formation while still accounting for the individual psychological processes involved. SIA encompasses two intertwined theories, which share key assumptions. The first is Social Identity Theory (SIT), originating in the early 1970s and further developed by its creator, social psychologist Henri Tajfel, in subsequent decades.[18] SIT posits that in many social situations people think of themselves and others as group members rather than as unique individuals, and it explains how doing so affects their thinking and behavior in accordance with group values and norms. The constituent theory of SIA is Self-Categorization Theory (SCT), developed by Tajfel's colleague John Turner in the 1980s.[19] It elaborates on the cognitive process that results in group-level conceptions of the self and others rather than individual-level conceptions. Specifically, it deals with the psychological mechanisms that make individuals define themselves in terms of particular group memberships and act accordingly.

Importantly, SIA posits that individuals incorporate social category membership into their self-concept or "social identity." In Tajfel's words, social identity is ". . . that part of the individuals' self-concept which derives from their knowledge of their membership of a social group (or groups) together with the value and emotional significance attached to that membership."[20(p2)] As a result of social identification, individuals come to perceive themselves as belonging to in-groups, as opposed to

out-groups. Every individual holds a mental representation of the social groups to which he or she belongs. In this way, SIA addresses identity development at the level of social group memberships, relevant for our aim of exploring a trainee's shift in identifying with the one group (medical students) to identifying with another (medical practitioners). In the process of becoming a physician (i.e., adopting a medical professional identity), individuals integrate this group membership into their social identity.

Since SIA's development, many researchers in various domains have used it to further conceptualize the construct of social identification. It is assumed that social identification includes multiple dimensions.[21] For this study we use the dimensions distinguished in the three-factor model of social identification suggested by Cameron,[22] as this model stays close to Tajfel's definition of social identity.[20] These dimensions are as follows:[22,23]

1. Cognitive centrality. This is the cognitive awareness and prominence of one's group membership. It can be conceptualized as the frequency with which group membership comes to mind and the subjective importance of the group to one's self-image. This concept is closely linked to a central element of the SCT, category salience. Category salience can be explained as the readiness of a given group membership to be activated to serve as sources of self-definition at a specific moment.[24] A self-category is more likely to be activated if it has frequently or recently been activated,[25] and in that way may gain a more enduring cognitive prominence for the individual. In such cases, social identification can be said to be relatively central.
2. In-group affect: This is the dimension of social identification concerning one's emotional evaluation of group membership, with either positive or negative emotions. For example, one can feel proud to belong to a highly valued group or ashamed when belonging to a devalued group.[26]

3. In-group ties: This dimension refers to one's emotional involvement with or psychological ties to the group and to one's perception of similarity to and bonds with group members. It is operationalized as a sense of connectedness with other group members, "a sense of belonging with the group," a perception that one "fits in," "has strong ties," or "shares a common bond" with the group and its members.[22]

In this project we apply SIA as a lens to study professional identity formation with the aim of exploring how the three above-mentioned dimensions of social identification emerge in the context of a transitional year. Using SIA, and exploring identity formation in the sense of self-categorizing as a member of the professional group, the results of this study can extend our knowledge of medical trainees' professional identity development to include a social perspective. The focus on the transition from student to practitioner may offer insight into how to provide effective support during this stage of medical training.

Methods

This qualitative study was conducted using transcripts of semi-structured interviews analyzed using thematic analysis from an interpretivist worldview.[27] Using SIA, we see identity development as a process in which identities are created and co-created within a social world but represented in the minds of individuals.[16]

Context

Our study was conducted at Utrecht University medical school, a Dutch medical school that implemented a transitional year, as described in the introduction, in 2004. In The Netherlands, medical school programs last six years and can be entered directly following secondary school.[7] The Utrecht University medical school has a curriculum with regular clinical block rotations and several electives in Years 3-5 that prepare learners for the final transitional year.[8] During the mandatory transitional year all trainees must take, in varying order, a 12-week major clinical elective at a

department of their choice, a 12-week research elective at a department of their choice, and a 12-week block to fill in at a clinical, science, or other department they choose.

During the transitional year trainees are called 'semi-physicians' (literal translation of the Dutch term), a label used in our school and other Dutch schools for students in this stage of training. Semi-physicians' work is similar to that in sub-internships or acting internships in US medical schools or that in the first foundation year in the UK, and it approaches the level of a starting medical practitioner. The duration of transitional year rotations (12 weeks) is longer than those in the preceding clerkships (~6 weeks at the time of this study). This allows for continuity in both patient care and supervision.[28]

After successful completion of the transitional year, students obtain their medical degree and license. Many graduates first work as a junior clinical doctor before applying for residency training. The Netherlands has no national matching system for residency selection, and graduates must apply for a position in an open job market. More detailed descriptions of the Utrecht medical school curriculum and its transitional year have been published elsewhere.[8,29]

Population

Students can start the transitional year program at several times during a year. We invited all 67 students who started the transitional year between May and October 2014 to participate in an interview study. We explained the project during teaching sessions and then invited students via email. We included all who volunteered to participate.

Reflexivity

The researchers in this project have backgrounds as medical doctors, medical educators, and medical education researchers. SvdB was trained medically in the same program as the research participants, but five years earlier. Her personal

experiences were deliberately used when designing the project and interpreting the data. She conducted half of the interviews and had a central role in data analysis. SQ, at that time a policy advisor at the Royal Dutch Medical Association, represented an outsider point of view and conducted the other half of the interviews. MWM, an educational scientist, and SQ contributed to the rigor of the study by conducting iterative checks on the data analysis carried out by SvdB. MWM, MvD and OtC are experienced medical educators, involved in teaching in the transitional-year program. OtC was instrumental in introducing the transitional year in Dutch medical schools, and MWM studied effects of the transitional year as a PhD research topic. MWM, MvD, and OtC were not involved with data collection, but had access to de-identified data.

Data collection

Data were collected via semi-structured interviews conducted at the start and end of the transitional year for two purposes: (1) to explore significant workplace experiences during the transitional year and how these influenced professional identity development of the medical trainees, and (2) to uncover factors that specifically influence medical students' career choice.[30] The interview guide, translated from Dutch to English, is included in Appendix 1. For the present study, which is part of the larger project about identity development, we analyzed the interviews conducted at the end of the transitional year, around the date of graduation. All interviews lasted about one hour. Summaries of the transcripts were sent to the interviewee to verify whether they reflected their views and experiences correctly. Only minor textual corrections were returned.

Analysis

In a first round of data analysis, interview transcripts were coded line by line in an open coding process, followed by axial coding to identify main themes. SvdB analyzed all transcripts, and SQ and MWM analyzed a subset of the data for analytical

rigor purposes. Findings were discussed with all members of the research team. This led to a phase of theory exploration to enhance the understanding of the identified themes. The literature on professional identity formation was revisited, and a strong match was found between the themes we identified and SIA. In a new round of analysis, interview transcripts were analyzed using thematic analysis,[31] with knowledge of SIA providing guidance.

In this round, analysis was performed by SvdB and MWM and consisted of three phases. In the first phase, all data were analyzed using the three dimensions of social identification (cognitive centrality, in-group affect and in-group ties) as a lens. A set of six interviews was used for preliminary coding. We then further analyzed the interview transcripts using this coding scheme, pausing to modify the scheme after each reading of three to four new transcripts. New codes were discussed and inserted, and existing ones were redefined until all relevant data were coded. SvdB completed this phase by applying the resulting revised coding scheme to the full data set.

In the second phase, all data segments relevant to social identification were coded again, this time with an initial coding template based on the transitional-year characteristics as listed in Box 1 [excluding the fourth characteristic (elective choices) as it is not related to students' daily experiences during the rotations]. A code for items that had "no link with transitional-year characteristics" was added, as we discovered data extracts that could be linked to dimensions of social identification but were not bound to a transitional-year characteristic. SvdB then coded the full data set, while MWM analyzed subsets of data during several steps and discussed findings in detail with SvdB. During this phase, the earlier coding for social identification was concealed.

In the third phase, we generated an overview of the co-occurrence of codes from both coding schemes (social identification and transitional-year characteristics),

identified themes and subthemes at the interpretative level and discussed their relationships to understand the data in relation to our research question.

During all steps there was input from other members of the research team via discussion and interpretation of findings and definition of further steps in data analysis. We used Dedoose® version 7.6.6 to support our data analysis.[32] Extracts were translated from Dutch for this publication.

Ethical approval

Ethical approval for this project was obtained from the Netherlands Association for Medical Education Ethical Review Board (NERB dossier number 333).

Results

Twenty-two trainees participated in the interviews at the end of the transitional year. One of these interviews was not recorded due to technical problems, yielding 21 interview transcripts. The interviewees ranged in age from 24 to 27 years; 17 were female, reflecting an overrepresentation of females, although the medical school does have more female than male medical students. In the interviews, trainees elaborated on transitional year experiences they found significant or remembered as being particularly impactful, and how these contributed to or lessened their sense of being a doctor.

The cognitive centrality dimension – Working with increased clinical responsibility as a semi-physician

During the transitional year, clinical work triggered students' awareness of feeling like a practitioner, including increased responsibilities in patient care and altered relationships with junior clerks and supervisors. In the interviews, students were asked about, or spontaneously mentioned, moments when they were aware of feeling more like a doctor than a student. For example:

Well, [when I was a semi-physician] I worked much more independently [...] I succeeded much better than I had anticipated in getting a clear picture of patients and their problems. And in creating a management plan, and getting it all organized. That went really well. One evening shift [...] attendings were called for a caesarean section while there were still six other patients either on the ward or at the ER. I went to see these other patients while they [were busy] and later we discussed them, and then [my supervisor] said like "Okay, I agree, that is a good idea." That really made me think, "Wow, okay, I apparently act as a doctor quite well". - Student 10, female

Increased clinical responsibility is an important characteristic of the transitional year. Via 'full tasks' in patient care, trainees are responsible (albeit under strict supervision) for every step of a patient consultation or a patient's hospital admission, including designing a treatment plan, communicating with the patient, consulting other professionals, and completing administration and documentation procedures. Like the student quoted above, other interviewees described clear moments during their rotations when performing these clinical tasks made them aware of being a doctor:

[What else made you be more of a doctor?] [...] that they trusted me to do almost everything independently [...], such as relying on my judgment and having me arrange things with other doctors, consulting other doctors. - Student 8, female

I had my own patients, my own consulting room. I really felt like a doctor. - Student 13, male.

In contrast, when trainees were placed back in the role of a student (for example, being limited to observing or performing only very selective clinical tasks such as taking a history) they would not experience such feelings of identity, and some even reported a diminished sense of being a doctor, as did the student in the following passage:

My final rotation this year was disappointing [...], due to how this department assumed my role. I had just finished another semi-physician rotation and really felt like I was a doctor. I could do so much in patient care. That boosted my confidence. I think I could have been a resident in that department. But in this final rotation I felt like I was starting from scratch. [...] None of my own patient consultations, no responsibilities. In fact, I started skipping clinic at times and no-one would even notice! That was truly disappointing. - Student 8, female

In the position of semi-physician, trainees experience a new hierarchical position relative to supervisors, colleagues, and more junior trainees. Semi-physicians may consult other professionals themselves instead of having their supervisors do that. In most cases, semi-physicians are supervised directly by senior staff members, while clerks are supervised by junior doctors:

[You said it was the first time you felt like becoming a doctor. Can you explain what happened to you?] Well, it is the responsibility you have [...] When things happen, you need to call the senior staff member yourself, not someone between you and the senior staff. It's more kind of real. - Student 11, female.

And semi-physicians may sometimes supervise junior clerks, as this trainee did:

[Can you think of a pivotal moment when you realized 'I'm a doctor and not a student'?] Yes. In the penultimate week of my [semi-physician] rotation on the internal medicine ward. This hospital also has clerks [who are junior by one year]. Initially I felt insecure, anticipating they wouldn't have much less background knowledge. But on a ward round with one clerk I noticed how I had progressed. We rounded my patients, about nine, one of which was assigned to her. I found myself teaching her about dull thorax percussion signs and bronchial abnormalities. This experience made me suddenly think, "Wow, so this is how an attending acts. Now I feel like a doctor." That was really nice to notice. - Student 14, male

These quotes illustrate how interviewees described their experience being in the position of a semi-physician as a position similar to a starting doctor. They felt more like a medical practitioner than a clerk.

The in-group affect dimension - Contributing to patient care

Most students experienced strong positive feelings when they were able to help and support patients. These moments were remembered as significant to their sense of feeling like a doctor.

> *[Can you describe moments during your semi-physician rotation when you had the feeling of being a doctor and not a student anymore?] At the start of my semi-physician rotation, there was a delirious patient with a fever. […] It was at the start of my rotation, and I did not have a lot of patients to take care of yet, and I spent much of my time on this patient's case. He was transferred to the ICU. When I visited him one afternoon at the ICU, his family was there. I took time to talk to them. I wanted to know how he was doing and I thought about the family being shocked by all that happened. So I went there to talk to them, taking care everything was clear to them. And then, when they left, I sensed they felt grateful I was there for them, that I did not leave them alone, but that they had someone who was there and could explain treatment plans and things to them. That is something that stays with me. – Student 20, male*

> *A moment of impact was when I passed the room of one of my patients who had an end-stage malignancy. […] He had always been fairly cheerful when I visited him during morning rounds. But when I passed by his room now, I saw something was wrong and stood still. He was in his bed […] and I sat next to him. He cried briefly when I was there. I was touched. It is one of these moments you can't do anything, but in fact you can. […] And I felt grateful, for experiencing that moment and grateful to be able to be there for this patient. – Student 14, male*

In these examples, students as semi-physicians were able to see patients and contribute to their care longitudinally through different stages in the development of a disease. Their engagement with the patient's case allowed them to be there for them and their families at difficult moments. Students also described how observing the effects of the care they played part in and experiencing patients' gratitude led to positive feelings:

> *There was this patient who had been on my [psychiatry] ward months before, who came back for his psychotherapy. And we accidently met in the hallway, and he told me he wanted to speak to me. [...] He had some questions about a program I introduced him to, but he also wanted to tell me how satisfied he was with the treatment at the ward, and how much it helped him. [...] Another time I had attended a woman who had been admitted for a depression. [...] a few weeks later I accidently met her in the hallway. She looked so happy [...]. Wonderful to see how patients benefit from what we do [...] it strikes me that these patients are happy to see me and want to thank me, I find that so flattering. To me it is a sign that I apparently did well. – Student 2, female*

This immersion in the core business of practitioners seemed to make participants experience the value of being in this professional group. Participants also described how they highly respect the social group of doctors:

> *When I visit the OR I see the surgeons at work. They use robotics in esophagus surgery - gigantic operations up to six hours. That we can actually do this, it feels superhumanly. – Student 18, female.*

This respect was usually related to the ability of physicians to make a significant contribution to people's health and to have an important supportive role in times of illness.

The in-group ties dimension – Contact with supervisors and colleagues

Students' roles during the transitional year made them relate differently to supervisors and other health professionals. They felt more like being a colleague, triggering feelings of being a doctor. In most cases trainees were directly and longitudinally supervised by a senior staff member, and this contact with their supervisors was described as more intensive.

> *I had a great rotation in the ICU and the head of the department acted as a personal counsellor for me; we got along really well. I had never had a connection that felt so honest with someone working in the hospital. […] it all felt very natural. He was really enthusiastic about me. He said: "You are doing pretty good. You seem at ease here". And that is how I felt as well. Every day I came home and I thought: "Yes, this is what I really like." And then he asked me to apply at his unit after graduation. – Student 6, female*

As evident in this example, some participants described a special connection with their supervisors. They described them as mentors and role models whom they observed as a source of prototypical behavior and traits for their professional group. Trainees gauged whether they shared these behaviors and traits, i.e., whether they were or could be 'the same type of person':

> *During my [senior clerkship] I worked with a supervisor who was a rather quiet man. […] With humor, but he knew what he was talking about … treating everyone friendly. Not dominant. I guess I can identify with him. Like he didn't need to have the last say in everything. – Student 1, female*

Supervisors also served as a source of feedback on fit with the professional group. They might tell the trainee directly that they saw a match with the group. In the quotes above, Student 6 even had her supervisor explicitly stating she 'could belong to the group' by encouraging her to apply for a job at his department. But just having

a personal connection with a supervisor already seemed to be a confirmation of this fit for trainees:

> *I remember my supervisor - she truly was a role model [...] When I left, she read a poem out loud for me. I'm not sure if that actually affected my image of a good doctor, but I thought: this is also a way to supervise people. That gesture really gave a special feeling. It made me feel very special there. – Student 8, female.*

Finally, a theme frequently heard in the interviews was the significance of team membership. Over the course of the transitional year, participants reported feeling increasingly drawn in as an equal team member rather than a student.

> *[What has been a highlight for you this year?] Significant was how I felt with the cardiology team. And the atmosphere at their grand rounds meetings. I don't mean related to any medical content, actually. It was more... how I engaged with them. I was there for a longer period of time, and that makes a difference. It takes some time before you're at ease in a rotation, and you are often gone again by then. But here I was really involved with the group. [...] They were interested in who I was, and why I was interested in cardiology. They noticed I was enthusiastic. And they told me about themselves. I was treated as someone equal. – Student 21, female*

> *I felt being part of a real team. That included psychiatry nurses and others; almost all also confirmed that they felt similarly. That was nice. - Student 8, female*

> *Those residents were really nice among themselves. For the first time, I found myself being part of such a group. They were also kind of colleagues. In earlier rotations as a clerk, they treat you friendly but they... I don't know, you are not part of their team. And now I was, that was really nice to notice, how it works having colleagues lunch together or, sometimes on Friday, to feel invited as a*

semi-physician to go along for a drink together. That atmosphere was great. It had an impact. – Student 11, female

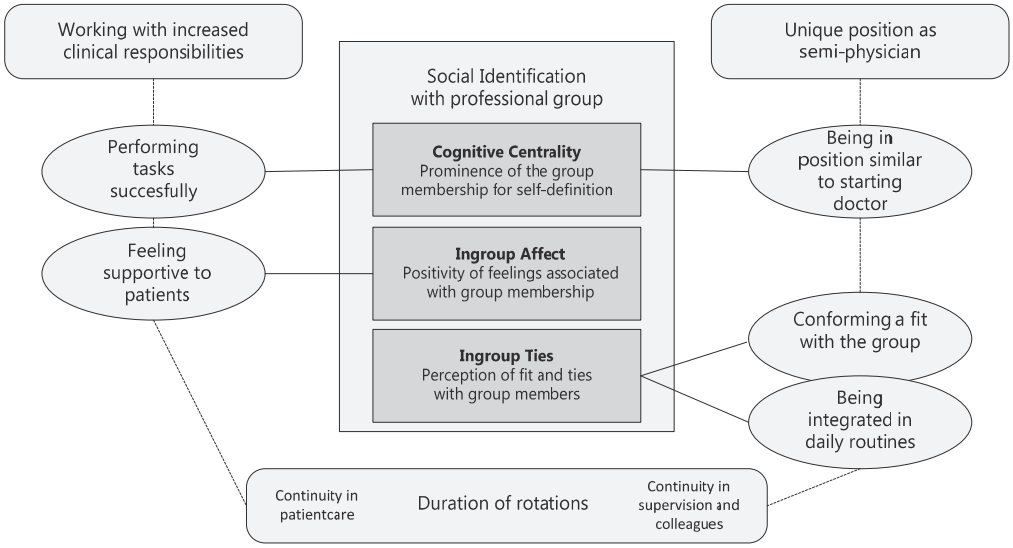
The quotes above from the interviews with Students 21 and 8 describe the importance of being 'treated as someone equal' or of having it confirmed they were seen as someone who belongs to the team. The feeling of being treated as a colleague happened in work-related situations and in social situations, and was described as contributing especially strongly to the feeling of being a group member. The duration of rotations in the transitional year appeared not only to lead to continuity in supervision but also to continuity in relationships with other colleagues. Some described their earlier rotations as too short to get integrated in a team, such as Student 21 in the example above.

Discussion

When relating transitional-year students' experiences to dimensions of social identification and transitional-year characteristics, a pattern emerges (Figure 1). Working successfully with increased clinical responsibilities creates moments when students are aware of being a practitioner rather than a student. The role of semi-physician positions students hierarchically close or similar to a starting doctor, which prompts awareness of their transition from student to practitioner and makes identification as a doctor more salient in how trainees see themselves. Combined with successfully exercising increased clinical responsibilities, continuity in patient care allows students to experience the significant contributions they can make to patients' care. This experience generates positive feelings like pride in being a doctor (i.e., an in-group member). Continuity in supervision and close contact with supervisors helps students observe whether they can be 'the same type of person' and to value highly the moments when supervisors confirm their fit with (i.e., ties to) the in-group. Students experience continuity in contact not only with supervisors but with other healthcare team members. They feel integrated in the teams as they are included in

daily routines and in social activities. These social ties make them feel like a colleague and support their identification as an emerging doctor.

Figure 1: Dimensions of social identification related to transitional year characteristics



Our finding that feeling like a doctor emerges when students are challenged with greater patient care responsibilities resonates with findings from other studies of professional identity formation.[33,34] Using SIA as a theoretical framework helps us understand trainees' shift from identifying as students to identifying as practitioners in the context of a transitional year. Students who have had the experience of a near-doctor role are likely to experience the student role in a subsequent rotation as a setback and not conducive to learning. In our interviews, participants clearly identified situations in which they felt setback, i.e. assigned to 'student' tasks such as observing or shadowing, or in which they were not able to fulfill their expected role because tasks were too fragmented and there was no follow-up of patients.

Giving more clinical tasks alone may not have the same effect on social identification as a transitional year. In the Netherlands, we use the label of 'semi-physician' to signify students who are ready for increased responsibilities and *en route* to becoming a full physician. By clearly defining it as a unique stage in the learning continuum, the transition year encourages trainees to take on not only more responsibilities in patient care, but also a new position in relation to their supervisors, colleagues and more junior students. This resonates with an educational model called 'Learning Oriented Teaching'[35] in which a desirable 'constructive friction' between teaching and learning is achieved when learners are challenged to perform with slightly less guidance than they might feel comfortable with. Destructive friction occurs when there is too little or too much guidance.[36] The position of semi-physician may bridge the gap between the guidance a trainee requires and gets as a 'student' and as a 'practitioner'.

Not surprisingly, the increased clinical responsibility and the duration of the rotations in the transitional year allowed trainees in our study to follow up with patients through several stages of a hospital admission or illness progression.[28] Other studies have shown how students from longitudinal integrated clerkships are seen by patients as critical member of their care team.[37] In our results, we found trainees were more likely to notice their value as doctors when they fulfill this role. They described, although in many cases implicitly, how this made them feel grateful and proud, enhancing their in-group experience. In earlier rotations, trainees contributed to patient care, such as by taking a history and performing a physical examination, but limited rotation durations and a limited clinical responsibility may have precluded deep engagement that might result from following-up patients. There may be opportunities to stimulate the in-group affect dimension early in training.[38,39] Yet, many medical curricula offer only rotations in which students shadow physicians at work. Our findings support earlier recommendations to give medical trainees the opportunities to perform low-complexity but significant tasks in direct patient care, and to have them participate in the community of practice.[39] Hospitals with only

high-complexity patients may not be ideal from the perspective of social identification if no legitimate roles can be given to students.

Finally, we found that supervisors and other healthcare team members play an important role in students' identity formation. The transitional-year curricular design appears not only to allow for continuity with supervisors but also for continuity with colleagues. Frequently mentioned by our interviewees as important to their identification as doctors was the feeling of being treated as a colleague by all members of the interprofessional group. Trainees may regard colleagues and supervisors not only as role models but also as points of comparison allowing the trainees to gauge the extent to which they fit with the professional group. However, supervisors and other healthcare team members may not always be aware of their significance for trainee identity development. Short block rotations with frequent transitions may hamper integration of students in teams. For the team, high student turnover hampers the ability to involve students and get to know them personally, which is a condition for entrusting students with critical patient care tasks.[40] Curriculum designs incorporating additional strategies for more extensive and intensive engagement during clerkship may be particularly helpful for this aspect of identity development.

Trainee perceptions of fit with the group appear to be based on short-lived experiences and seemingly small moments with large impact. Such experiences, important to identity formation for students, would not necessarily be recognized as remarkable by others.[34] To support students in their explorations of fit with the professional group, educators might consider encouraging conscious reflection on such experiences.

This study has limitations. It was performed in the context of the Dutch healthcare system and at one Dutch medical school. As always in qualitative research, caution is advised in transferring the results to other settings. The overrepresentation of female participants should be considered a limitation. However, the stories of the male

students did not appear to describe a different process. We started data analysis with an inductive approach, and we stayed open to other interpretations when conducting the next phase of analysis with SIA as a framework. Still, by using a specific theoretical framework, there was a risk of overlooking meaningful themes when these did not fit the theory or a tendency to fit the data into the theory. We used conscious reflections on this aspect during data analysis to minimize this risk. Much of social identification happens unconsciously and is not easy to reveal, however, the interviews were not conducted with SIA as a framework in mind. This resulted in some data units in the interviews which could not be explored in greater depth; had the interviews been conducted with SIA in mind, such data units might have prompted requests from the interviewer for greater elaboration. We therefore consider our study a first exploration.

The transition from student to practitioner is a critical phase in medical training involving a major transformative process in trainees' professional identity. Our exploration revealed how students come to identify with the social group of doctors in the context of a transitional year with a gradual increase in clinical responsibilities, having a position as semi-physician and continuity with patients, supervisors and colleagues. In our study we have specifically explored trainees' experiences through the lens of SIA. This theory has proven its applicability in many domains and helped us to explain our own findings. Our results may inform medical educators interested in theoretical models of trainees' professional identity development, as well as in curriculum developments aiming to ease transitions to next stages of training. The problem of 'transfer' from medical student to practitioner may be recognized in many places. Recently, general principles were described to support identity formation as an educational objective in medical education, including "providing faculty development, establishing and transmitting the cognitive base of knowledge of the subject, engaging students in the development of their own identity, providing a welcoming community, and assisting students as they follow the progress of their own identity development."[41] Our results support these principles, and we propose to

add a further one: reconsidering curricular structures to create clearly defined stages as to support professional identity formation.

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Appendix 1: Interview guide

Interview guide used for data collection project to explore significant workplace experiences during the transitional year and how these influenced professional identity development of the medical trainees:

- How would you describe a doctor?
- To what extent do you already see yourself as a doctor? Why?
- Can you express that as a percentage of this scale? [introducing 100 mm visual analog scale from not-at-all to fully*] You do not have to concern about having sufficient skills or knowledge to be a doctor, this question is about identifying with doctors.
- Can you further explain why you chose this point on the scale?
- [Questions 2-4 are repeated for the preferred specialty of the interviewee for a residency]
- Can you mention specific experiences during the transitional year that had an influence on your feeling of being a doctor? [Discuss the different locations where interviewee did a transitional year rotations. Further questions: Can you give an example of something that had a positive influence, and/or something that had a negative influence?]
- Do you have the feeling you fit in the group of doctor? Would they welcome you? Why do you feel that way?

* To stimulate the interviewees' thinking when answering these questions, we asked them to estimate their identification of being a doctor in general and of being their preferred specialist on a 100 mm visual analog scale (from not-at-all to fully). This was not indented to be used for quantitative measurements, but as an introductory question to have them elaborate on the reasons they indicated this particular point on the scale.

Interview guide used for data collection project to study factors influencing career considerations:

- What are you career preferences? Can you explain for each of these why and since when?
- How familiar are you with these preferences? And what have you done to become familiar with them?
- Can you reflect on your transitional year in relation to your career preferences? How did your electives influence your preferences?
- What is the opinion of your family, friends or others about your career preference? And what does that opinion mean to you?
- Tell me your strategy to get into the residency of your choice?
- Did any changes occur in your life of influence on your career preference over the last year?
- What would be your definite choice just for the upcoming five minutes?

Follow-up questions were used to probe explanations of the answers more deeply.

Chapter 6

Professional and interprofessional group identities of final year medical and nursing students

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Submitted

Abstract

Background and Purpose: This study explores group identification among healthcare students. Identifying with a professional group serves professional identity formation. Social Identity Theory however shows how social identification with a group can result in less favourable attitudes towards 'out-groups', possibly other health professions.

Method: 276 Final-year nursing and medical students received a questionnaire measuring strength of social identification (SSI) with their professional group and their interprofessional team, and their views on interprofessional feedback and who they viewed as team members.

Results: 38 Medical and 15 nursing students responded. Mean SSI differences were found favouring the professional group, statistically significant for the nursing students. Participants had a broad view of their interprofessional team and valued interprofessional feedback.

Discussion and conclusions: Despite the mean SSI differences, final year students' broad perspective of team members and openness to interprofessional feedback suggest that group processes do not hinder the development of inclusive, interprofessional attitudes.

Introduction

Professional identity formation and interprofessional collaborative skills are two topics, high on agendas for innovation in health professions education.[1–4] When exploring these multifaceted professional requirements through the lens of Social Identity Theory (SIT),[5] a theoretical approach from social psychology, questions arise whether these two important goals of training may give rise to tension.[6,7]

SIT, with its later extension of Self-Categorization Theory (SCT),[8] explains how humans in social circumstances categorise themselves and the people around them as belonging to social groups. It posits that people can incorporate these social group memberships into their self-concept or 'social identity', which is defined by Henri Tajfel, the creator of SIT, as "that part of an individuals' self-concept which derives from their knowledge of their membership of a social group (or groups) together with the value and emotional significance attached to that membership".[9] As a result of social identification, people behave in accordance with the values and norms of the social group they identify with, in particular with the social group which is salient in the social situation at hand. According to SIT, a need for a positive self-esteem drives people to have unconscious psychological strategies to see the group they identify with as the 'in-group', and as more favourable than other groups, the 'out-groups'. Social identification can therefore result in positive attitudes towards in-group members (in-group favouritism) and negative attitudes towards out-group members (out-group derogation).[5,6]

A professional group is such a social group.[6,10] A strong identification with members of the professional group can be regarded as beneficial, as a professional is expected to think, act and behave in accordance with the profession's norms and values.[11] However, from the perspective of interprofessional collaboration and learning, a strong mono-professional identity formation may not be only beneficial. It can be hypothesised that professionals and healthcare students with a strong professional identity could exhibit lower readiness for interprofessional collaboration and learning,

as they will strongly use the perspective from their own professional group in patientcare.[3] Also, interprofessional collaboration and learning might be hindered as a result of out-group derogation.[6,12,13]

On the other hand, group processes may also be beneficial to interprofessional collaboration and learning. In an interprofessional team, professionals may come to develop their identities as members of the broader team, including members of different professions as in-group members.[14,15] The literature shows conflicting views regarding this topic.[16] Some authors propose to stimulate team identities as a solution to break through professional silos, others are sceptic whether this is possible, due to the complexity of professional dynamics and differences in status between groups.[6,16]

Similar dynamics will occur for healthcare students who are exposed to interprofessional collaboration during their rotations. In many undergraduate medical and nursing curricula students experience an increase in clinical responsibility, building up to a final year in which the trainees perform clinical tasks approaching the level of a starting postgraduate trainee.[17] This includes authentic exposure to interprofessional medicine-nursing collaboration.

The aim of our study was to measure and compare these students' strength of social identification with the own professional group and with the interprofessional team. Additionally, we aimed to gain insight in how these identifications affect students' views in practice by exploring which professionals they perceive as members of the interprofessional team in the workplace, and whether they would be open to interprofessional feedback.

Methods

In October 2018 all final-year medical and nursing students of Utrecht University School of Medicine and Utrecht University of Applied Sciences School of Nursing respectively, who at that moment had completed a final year clinical hospital ward

rotation of eight to twelve weeks, were invited by email to fill out an electronic questionnaire using Formdesk® (N= 164 medical and N=112 nursing students). The questionnaires contained items about biography (age, gender and study program of the student). Furthermore, Cameron's "Three Dimensional Strength of Group Identification Scale"[18,19] was used to measure Strength of Social Identification (SSI). The scale was translated to Dutch through forward and backward translation by three bilinguals. It consists of twelve statements to be rated on a seven-point Likert scale (1= completely disagree, 7= completely agree). The instrument assumes that social identification includes multiple dimensions.[20] The 12 statements had been developed based on a three dimensional model of social identification that stays close to Tajfel's definition of social identity.[9] These dimensions are cognitive centrality (the cognitive prominence of group membership), in-group affect (the emotional evaluation of group membership) and in-group ties (the perception of bonds with other group members).[18] Examples of statements from the scale are "I often think about being an [in-group member]" and "I feel strong ties to other [in-group members]" (representing cognitive centrality and in-group ties respectively). The scale was presented to each participant twice: First to rate the statements with the professional group with which they had worked during that rotation in mind (nurses for the nursing students and physicians for the medical students); Next, to rate the statements regarding the interdisciplinary team of healthcare professionals with whom they worked in patient care on a regular basis in the same rotation. Finally, students were asked to answer two open-ended questions: "Which professionals do you view as belonging to the interprofessional team?" and "How would you feel about being assessed by or receiving feedback from the members of another profession than your own about your clinical performance?" The online questionnaire was available for two weeks; one reminder was sent after one week.

Normality of the data was assessed to determine that parametric analysis was suitable. The difference in mean SSI scores of the professional group and interprofessional team was assessed by paired-samples t-tests for the medical and

nursing students using IBM SPSS® software version 25. Analysis of the answers on the open-ended questions was performed by CT, SB and TW. First they independently reviewed the data, followed by a discussion with all three authors together.

The research proposal was approved by the ethical review board of the Netherlands Association for Medical Education (NVMO), file number 2018.6.10. Participation was voluntary, informed consent of participants was obtained, and no personally identifiable information was collected. In reporting our findings we used numbers (1-53) followed by N (nursing student) or M (medical student) to distinguish between different participants.

Results

The questionnaire was completed by 15 nursing students and 38 medical students (response rate 13.4 and 23.2%). Mean ages were approximately representative for the total cohorts of students (mean (SD) 22.7 (2.55) and 25.1 (1.49) for nursing and medical students). The number of participating male students was low (N=1 for nursing and N=9 for medicine), but also approximately representative for this cohort. All participating nursing students were in a clinical rotation during data collection. For the medical students, nine were in a clinical rotation during data collection, fourteen others had finished the relevant clinical rotation less than three months prior, and the others three to eight months prior.

Based on Shapiro-Wilk's test on the difference in SSI scores of professional and interprofessional team ($p > 0.05$ for nursing and $p = 0.042$ for medical) in combination with the sample sizes, and a visual inspection of their histograms, normal Q-Q plots and box plots, the assumption of normality for paired T tests was deemed justified. For the nursing students there was a statistically significant higher mean SSI score for the professional group than for the interprofessional team (Table 1), with a mean difference of 0.64 on a 7 point Likert-scale (Cohen's d is 0.65). For the

medical students this was just not statistically significant different, with a mean difference of 0.29 (Cohen's d is 0.32).

Table 1. Within group Strength of Social Identification (SSI)

		Professional	**Interprofessional**	**p-value**
Medical	Mean (SD)	5.16 (0.77)	4.87 (0.76)	0.055
N=38	Mean difference (SD) 95% CI, Cohen's d	0.29 (0.91) (-0.01 ; 0.59), 0.32		
Nursing	Mean (SD)	5.15 (0.62)	4.51 (0.62)	0.025*
N=15	Mean difference (SD) 95% CI, Cohen's d	0.64 (0.98) (0.10; 1.18), 0.65		
* = p < 0.05				

In the answers to the question which professionals the participants regard as belonging to the interprofessional team we found three levels of extensiveness. A few just mentioned (a) several types of physicians and nurses (Figure 1), while most respondents (b) also included several paramedical professionals or (c) even supportive personnel.

Almost all participants (N=49, 92.5%) indicated they would value being assessed by or receiving feedback from the members of the interprofessional team other than from their own profession. In their reactions they mentioned it would be "useful", "a good idea", "informative", "good" or other reflections of a positive attitude. Some of them indicated they had already taken the initiative to ask for interprofessional feedback. Many explained that they thought or experienced that interprofessional feedback could give insights on their functioning from a different perspective, or could give useful feedback on specific skills such as teamwork and communication. - *"I would like that! I think you can learn a lot from it, because you would also get feedback on other aspects than those your own professional group pays attention to."* #36N - A few participants mentioned conditions they viewed as necessary: the interprofessional feedback would only be useful when provided by someone with whom they had enough contact during work.

Figure 1. Three levels of interprofessional team extensiveness as mentioned by the participants with examples of mentioned professionals

Also, the feedback providers would need to be familiar with the expected level of expertise of the learner. Final assessments should be done by someone from their own profession. Two participants expressed they would not consider interprofessional feedback necessary or would "find it difficult" without specifying. -*"Not always the right view, for they probably aren't clear about what they should be assessing me on. Besides, for doctors, for example, it would be difficult to assess me because they might expect me to think at their level of expertise."* #19N-

Discussion

As we proposed earlier, a strong identification with the professional group could theoretically hinder students' readiness for interprofessional collaboration.[3,5,6] In this first exploration among final year healthcare students we found relatively small differences between strength of identification with professional and interprofessional groups, favouring the professional group. Although this was significant for the nursing students only, we found a substantial overlap in the confidence intervals of the differences for the nursing and the medical students. This implies that the observed dissimilarity in the differences in how medical and nursing students identify with both groups could be coincidental. If there is an actual difference, we can speculate about the cause. It may be that nursing students feel a stronger connection with their professional group as the daily work of a nurse involves more working as a team with the other nurses primarily. It would also be interesting to explore whether hierarchical or group status differences between medical and nursing students may play a role.

The group that all students perceive as 'interprofessional team members' includes a wide variety of colleagues who collaborate in patient care. The vast majority of participants included paramedical personnel in addition to physicians and nurses. Many also mentioned supportive personnel and management. These findings suggest that students have a broad/inclusive perspective of an interprofessional team. It would be interesting to learn what such a wide definition of this group means for students' readiness to see the interprofessional team as an in-group. It is known that individuals create a hierarchy for their multiple social identities in which its 'ranking' determines the probability of a single identity to become salient in a given context.[10] It could be that when the interprofessional team is defined more exclusively, with a smaller range of members, it would make this team identity more accessible.

We also learned that, despite the stronger identification with the professional group compared to the interprofessional group, students are open to feedback from other

professionals. Students especially value the possibility to receive feedback about competencies on which their own supervisors would not have a clear view, namely teamwork skills like interprofessional communication. Students also mentioned conditions under which interprofessional feedback should occur, such as: the feedback givers should have enough opportunities to observe and be familiar with the training program of the receiver to know what their expected level of expertise could be. These reflect themes found for residents perceptions of interprofessional feedback.[21]

One limitation is that our study was conducted among students of one medical and one nursing school. Other schools and other countries may show different findings. Another important limitation is the low response rate and the possible bias this brings. Participation was voluntary, which may have attracted students already open to interprofessional learning or more aware of group processes in the workplace. We collected participants' answers anonymously, however there may still be some socially desirable responses. We also defined the professional group as the group of all nurses for the nursing students and all physicians for the medical students with whom they work(ed) during their (latest) rotation. We considered this to be clear to the participants. For future use, we would now consider defining this more broadly, as the professional group one comes to identify with is not limited to the few professionals at one specific department.

This study is a small explorative study. The findings suggest that group processes do not hinder interprofessional collaboration in final year medical and nursing students. With publication of the findings we aim to highlight the possible effects of group processes on interprofessional learning and contribute to the discussions regarding professional identity formation and its consequences for interprofessional learning. Furthermore, it would be interesting to find out how the strength of social identification with both the professional group and the interprofessional team develops over the years as the experience of health care professionals grows.

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Chapter 7

General discussion

Medical education takes place within curricular structures that are determined by rules prescribed by countries, universities and schools, and by curriculum committees with their own curriculum philosophies. No two medical curricula are alike. Taking the route through medical education, and thus through these structures, is more than just acquiring the knowledge and skills required to perform the tasks of a physician. It is about 'becoming' a physician, i.e. adopting a professional identity.[1,2] The curricular structure used in the medical school impacts trainees' experiences, and thereby interacts with the process of their professional identity formation as a doctor. Vice versa, the development of trainees' emerging identities influences choices they make *en route* to becoming a doctor if the curriculum model allows for it. There is an interplay between curriculum structure and professional identity formation. Curricula are often not deliberately designed with professional identity formation of students in mind. In this thesis we explored how trainees develop their professional identities in the context of two recent changes in the structure of the medical undergraduate curriculum: introducing a two-cycle degree model for undergraduate medical education (the bachelor-master structure) and the final year of medical school as a transitional year to graduation.

Main findings

Professional identity formation and the bachelor-master structure

The Bologna declaration for higher education in Europe, signed by European ministers responsible for education, introduced a two-cycle degree model for many higher education programs in Europe.[3] The programs are split in two cycles, a bachelor program and a master program. Each cycle leads to a degree. With the degree after the first cycle, the bachelor degree, students can continue their education in the second cycle in several master programs. Aim was to create mobility among students, and to force education programs to collaborate and align their programs.[3]

For medical education the introduction of the bachelor-master model meant that a traditionally unified program has now been divided in two parts. This led to concerns among medical students and educators, and many countries who signed the Bologna Declaration did not introduce this two cycle system in medical undergraduate education. One of the main concerns was the loss of integration in the medical curriculum. Integration represents collaboration between disciplines to establish a coherent medical curriculum.[4] Especially for vertical integration a unified curriculum is important. Vertically integrated curricula present basic sciences imbedded in a clinical context from early on in the program, aiming to support meaningful learning.[4] And, as we indicated in chapter 4, in a true vertically integrated curriculum all learning activities, from early in the program, would serve to prepare students for clinical care responsibilities. Spending teaching efforts on bachelor students who may not continue a career in medicine can be considered a waste of funds. Some authors warned that, if many students would decide to leave medical training after the first cycle, medical schools would schedule clinical training only during the second cycle.[5–7] Then the bachelor-master structure would lead to a return to medical curricula with a hard division between theory and clinical training.

The Netherlands followed the Bologna Declaration and introduced a two-cycle system for medical education. This led to regulations that students with a medical bachelor degree have guaranteed access to the medical master program in their school that leads to obtaining a medical degree. Students could also access several other master programs. In chapter 2 we studied students' considerations on these options. Leaving the medical training continuum after the bachelor program, as Carly did in the introductory example of this thesis, terminates identity formation as a doctor. The concern that this would occur with many students turned out to be an unfounded assumption, at least in The Netherlands. We found that Dutch medical students in a program with a two-cycle structure are not interested to stop their medical training permanently.

The bachelor-master model could also stimulate students to temporarily interrupt their training, as there is now a manifest moment to take a break. The results of the study reported in chapter 2 show how breaks are taken both at the transition from the bachelor to the master program and during the master program, suggesting that the two-cycle model does not necessarily stimulate taking breaks. When students take time off during the program, there appears to be a tendency to locate a long break (6 or more months) at the moment of the bachelor-master transition. Important to mention, these considerations for taking a break happen on the students' own initiative, and are not forced by the curricular structure. Most students use their planned breaks to travel, with or without a clerkship abroad combined. It is not clear what this would mean to their professional identity formation. When a student chooses activities not related to medicine during the break, this could be seen as an interruption of the process of professional socialization. A break may also create opportunities for experiences that can contribute to professional identity formation by doing work in an environment that leads to internalizing characteristics, values and norms beneficial for a doctor's identity.

In the study in chapter 2 many participants stated to feel the urge to take a break as they see it as "the last moment they will have time for such things as travelling". Students seem to anticipate loosing parts of their existing lifestyle when they become doctors, and try to postpone the continuation of medical training. While this can be seen as a natural development for most, for some students these feelings may be considered a worrisome signal in the light of professional identity formation. For some medical students the experience of adapting to the role of a doctor seem to yield to becoming 'narrower people'.[8] Students may feel that becoming a professional means losing or suppressing parts of their personal identity.[9] These students may be struggling with their identities in becoming 'the right kind of physicians'.[10] In severe forms such 'identity dissonance' between personal and professional identity may lead to rejection of the professional role and the display of unprofessional behaviour.[11]

Professional identity formation in the context of a transitional year to graduation

The transition to working as a licensed medical doctor is a critical transition in medical training.[12] In The Netherlands, this transition occurs at the moment of graduation from medical school.[13] With the aim to prepare for a smooth transition to postgraduate education, the final year of medical school has been reshaped as a "transitional year" in most Dutch medical schools.[14,15]

Electives in a transitional year and early specialty preference streaming

Students from vertically integrated curricula that include a transitional year make a specialty choice earlier than students from a traditional curriculum.[16] The findings in this thesis suggest that the transitional year contributes significantly to this decision process. This year allows for a large variety of elective choices. This was introduced to stimulate growth in responsibility and have students develop a personal profile in the direction of a specific residency training.[17–19] The study in chapter 3 confirms that students choose electives for career orientation purposes and to increase chances to get into a preferred residency program. Also, electives chosen by students are logically related to each other in relation to specialty profiles. These findings thus suggest that the transitional year leads to early specialty streaming or a form of pre-specialization.[20] This may speed up the process of socialization in the professional community of a specific specialty of influence on professional identity formation.

Social identification with the professional group in the transitional year

Next to the wide variety of elective choices for students, the Dutch transitional year to graduation has other characteristics. In chapter 4 we proposed to define vertical integration as *a deliberate attempt to shape the curriculum to enable a gradual increase of learner engagement in clinical practice*. Dutch medical curricula that build up clinical training to a transitional year can be seen as an example of such vertical integration. In the transitional year undergraduate students have clinical

responsibilities for a limited number of patients similar to a junior doctor, be it under strict supervision. In this role students are distinguished from regular clerks and called a 'semi-physician'. Next, rotations are relatively long, and allow for continuity in patient care and supervision. In chapter 5 the Social Identity Approach (SIA)[21,22] was used to explore how students develop their professional identities in the context of a curriculum structure with these characteristics.

Social identification includes multiple dimensions.[23] The three-dimensional model that stays close to the original definition of social identity[24] describes these dimensions as cognitive centrality (the prominence of the group for self-definition), ingroup affect (positivity of feelings associated with the group membership), and ingroup ties (perception of fit and ties with other group members).[25,26] We explored how these dimensions emerge in the context of a transitional year. It is known that performing authentic tasks in patient care stimulates identity formation.[27] Relating transitional year characteristics to the three dimensions of social identification helped us explain how. First, performing clinical tasks successfully makes students aware of being a doctor rather than a student. And the unique role of the semi-physician positions students hierarchically close to a starting doctor, which makes them aware of the transition from student to doctor. This reflects the cognitive centrality dimension. Next, due to the combination of continuity in patient care and increased clinical responsibilities students can make a significant contribution to patient care and feel supportive to patients. A sense of pride and purpose of students as a result of this reflect the ingroup affect dimension. Finally, extended rotations and the role of semi-physician resulted in trainees becoming integrated in daily social routines with colleagues and in having close contact with their supervisors, who could confirm their fit with the group. This reflects the ingroup ties dimension.

Social identification in the transitional year and interprofessional collaboration

In chapter 6 we explored professional identity formation in the context of authentic interprofessional collaboration during the transitional year as, theoretically, these two

might be in conflict. Both developing a professional identity[11,28,29] and becoming a collaborative interprofessional team member[30] are important goals of medical training. However, professional identity formation and integration in interprofessional teams may influence one another due to underlying social group processes. These dynamics are explained in chapter 6, including the presentation of the results of a small explorative study on this topic. As the results in chapter 5 indicate the transitional year is an important year for professional identity formation, we were especially interested whether this would cause negative attitudes among students to interprofessional collaboration and learning.

In the study in chapter 6 among final year students we found relatively small differences between strength of social identification with professional and interprofessional groups, favouring the professional group. This may be seen in the light of the results from chapter 5; medical students may even need their interprofessional team members to create a feeling of being a doctor. Both medical and nursing students include a wide variety of professionals as team members and are open to interprofessional feedback from these team members. It therefore seems that in this stage of the medical training continuum social identification with the professional group does not hinder students' readiness for interprofessional collaboration.

Strengths and limitations

A strength of this thesis is in the relevance of the topic. The focus on professional identity formation in medical education was presented in the 2010 Carnegie Foundation report.[28,31] It is linked to professional behavior, career success and psychological health of doctors.[11,32–34] However, often changes in the structure of undergraduate medical education are not deliberately based on processes of professional identity formation. Moreover, in modern healthcare the nature of the professional identity of doctors obtaining the undergraduate medical degree is

changing,[35] stressing an urge for further investigating the interplay between professional identity formation and curriculum structure. Another strength is in the connection of the research to relevant theory from social psychology[36] in chapter 5 and 6.

This thesis has limitations. First, this thesis focusses on interplay between professional identity formation and curriculum structure. However, the non-experimental designs of the studies do not allow for claims on causality between curriculum structure changes and identity formation. As multiple factors can be of influence on professional identity formation, both in students' professional and personal lives,[1] and identities are formed over the course of the entire curriculum, true experimental studies which exclude all factors of influence on identity formation other than the curricular structure would be practically impossible. We believe that by exploring professional identity formation in depth and from different perspectives, and by giving rich descriptions of the curricular structures, our studies give a fair understanding of the relation between professional identity formation and curricular structure.

Next, no specific model or theoretical framework of professional identity formation was used for the design of the studies described in chapter 2 and 3. The relation with professional identity formation should be found in the premise that choices for continuation of the medical training program and interrupting the program (chapter 2), and elective choices *en route* to medical graduation, reflect aspects of professional identity formation.

There are threats to the generalizability of findings. For the questionnaires in chapter 2 and chapter 6 the response rates are low, which is a known disadvantages of using electronically sent questionnaires.[37] However, for practical reasons, collecting data with an electronic questionnaire was considered most feasible, and allowed us to reach all students that met the inclusion criteria. Next, all data was collected in the context of the Dutch healthcare system, and in the context of one medical school. The

two-cycle bachelor-master model as described in chapter 2 is applied in several countries in Europe. Other aspects such as tuition fees and options for non-medical master programs to enter after a bachelor program can influence any considerations to interrupt or terminate medical training programs. As these factors may differ per country, our findings should only be generalized with caution. However, we believe studying this topic in one country could inform other countries using the same curricular structure. Also, the transitional year as described in this thesis (chapter 3, 5 and 6) has been implemented in this form in the Netherlands only. Other countries can have similar transitional periods,[38,39] and we believe the results can inform curriculum design in other countries. However, local context and situations will be of influence on the many factors that are of influence on identity formation simultaneously.[1] To allow readers of our work to draw their own inferences about transferring the results to other settings,[40] we offered a detailed description of the transitional year in The Netherlands in chapters 3 and 5.

Implications for practice

Professional identity formation in the first cycle in a two-cycle curriculum model

In chapter 2 we found that only few students consider leaving medical school after obtaining a bachelor degree. Of note, options in the Netherlands for a switch to a non-medical master program after the medical bachelor are limited or require an additional pre-master program. We do not know whether the numbers of students considering leaving with a bachelor degree would increase if more master programs would be easily accessible.

Interestingly, this study was performed in a medical school were students experience 12 weeks of early clerkships already during the bachelor program. In many other medical schools in The Netherlands clerkships are programmed from the start of the master. On the one hand clerkship experience could stimulate motivation for medical

school[41] and thus a motivation to continue to the medical master program. On the other hand, it could also be a moment to find that a medical career is not appealing. We consider it to be a benefit of the two-cycle model that the few students who find that a medical career is not appealing to them now have options to switch their education while having a diploma of a completed program. As students in The Netherlands can enter medical school directly after secondary school at age about 18, and many do so, it is conceivable that some need to rethink their initial choice after gaining some more life experience. We think a decision to leave medical school can be better substantiated after a solid introduction to clinical practice. We would therefore advise medical schools with a two-cycle model to add some form of clinical experience during the first cycle. Of note, if many students would want to leave medical training after the bachelor program, higher numbers of students should be admitted to this first cycle. Otherwise too few students would be entering the second cycle to train the doctors needed for the medical workforce. In that case it may no longer be workable to offer all trainees clerkship experience during the bachelor program due to limitations in placement of students on clinical wards.

Another possibility within the two-cycle model could be to discard the idea of a *medical* bachelor program. Instead, a broad bachelor in life sciences could be designed, which, after successful completion, gives entry to several master programs, among which a medical master. Then students can choose for a future career after a broad education in the field of healthcare. Also students who are now not included in medical training, as they only find out later in life a medical career suits them, then have the option to enter medical school. In the current situation options for lateral entry to the medical master program with other non-medical bachelor degrees are very limited in The Netherlands. Such a drastic redesign of medical undergraduate training however needs to overcome many practical obstacles. The idea raises questions such as: What would be the content of the curriculum of such a bachelor program? To which master programs would this bachelor offer entry? What would be entry requirements for the medical master program, and what would this mean for a

selection procedure for the medical master? How should the medical master program be redesigned, and should it be extended, to still guarantee adequate training of doctors? In addition, it is not clear what such a broad bachelor would mean for students professional identity formation, as with such a curricular structure identity formation as a doctor will probably start at a later moment during undergraduate training.

We should note that the decision whether to continue medical training or not with a bachelor degree would always be based on only limited exposure to medical practice. Students enter medical school with an existing personal identity, and, during medical school, they will gradually meld their personal and professional identities.[1,42] During the bachelor program in particular students might still be struggling in finding ways to align who they are (their personal identity) with their (perceived) future professional identity.[10] The medical workforce will benefit from diversity,[43] and losing students who feel they do not fit in a 'standard identity' may be a loss for the diversity of the medical workforce. For some students these feelings may cause serious doubts about a medical career and they might leave medical school, stimulated by the option to enter other master programs. Maybe these students would choose differently if they would achieve a stage in which they feel more comfortable with integrating their personal and professional identities. See the fictional but possible cases of Ellis and Carly in the introduction section of this thesis. They both are in doubt whether a medical career suits them after their first clerkships. Carly has the option to leave with a bachelor degree and does so. Ellis does not have this option and continues medical training despite her doubts, and becomes more comfortable with her professional role in later clinical experience.

The struggle in aligning personal and professional identity during medical school may also be reflected by students stating they want to interrupt their medical training as they foresee time for broader life experiences will be limited when they continue their medical training. An implication for practice could be the need to design support

programs for students with such identity struggles. For example, students can be confronted with a wide variety of role models and examples of various lifestyles of doctors' early in their training program. This does not necessarily require a lot of extra effort. Daily teachers and mentors of medical students, for example the clinicians who give lectures, can tell students more about their process of career choice, who they are besides 'the professional', and what their workdays look like. Next, reflective exercises could be scheduled in, guided by mentors or coaches, at which learners are encouraged to identify where they are on the journey to become a doctor and which factors are of influence on this process. In such exercises attention can be paid to identity struggles, as being a normal part in the process of becoming a physician. This aligns with recommendations to support identity formation in medical curricula by assisting students as they follow the progress of their own identity development.[42]

Possibilities for early specialty streaming in undergraduate medical education

A challenge for medical education is in adjusting training programs to modern healthcare. On the one hand, scientific knowledge and technological possibilities are expanding exponentially and healthcare systems become more complex. As a result, healthcare professionals must deal with expanding and more complex tasks.[28] Naturally, this should require a more extensive training for doctors. On the other hand, due to costs, there is pressure to shorten the total training time from lay person to medical specialist.[44,45] This forces medical training programs to offer elective choices for students toward specialties early in the medical training continuum. We found that the Dutch transitional year with electives leads to students developing a personal profile for a specific area of medicine (chapter 3). Such a curriculum structure can thus be a way to organize early specialty streaming or pre-specialization.[20]

A few years after the implementation of the transitional year as studied in this thesis, an additional intervention was introduced. The Dutch government aimed to further shorten total training time of medical specialists by creating more collaboration between undergraduate and postgraduate medical training programs. Rules were introduced in which trainees could shorten their specialty training based on earlier experiences, for example during the transitional year. Dutch medical schools then introduced so called "*dedicated* transitional year". In such a year students follow a predetermined set of transitional year rotations in preparation for specific residency training program.[46] After successful completion these junior doctors may participate in an adapted program for the first year of residency, which may be shortened based on the trainees previous clinical training. The results in chapter 3 however, show that when students have a free choice, they already gear all or most transitional year electives to a specific residency training program.

In the future, other more far-reaching curricular interventions may be considered, for example the possibility for medical students to enter medical master programs with a specific profile (e.g. a specific medical master program for those students interested in a future in one of the surgical specialties). Medical educators will have to consider how to organize such pre-specializations.[20] At what moment in the training continuum can we expect students to be ready to choose a profile? How should such profiles be organized? Would it still be possible to switch to other specialties once chosen? In the study of chapter 3 we found that for a majority of students transitional year electives confirmed their earlier specialty preference or at least resulted in a more clear insight into preferences. However, some students leave the transitional year with substantial doubts about their earlier preferences. How could their experiences still be useful for their future careers in other specialties? This introduces the idea of offering a flexible curriculum that is more individualized and tailored toward the individual trainees' career development.[31] The usefulness of training experiences for further education and future practice is in most cases not limited to a specific specialty. To create more flexible pathways in medical training it should be

made explicitly visible what a trainee is trained for. A way to record trainees' individual experience could be with the use of dynamic portfolio's with EPAs.[47] EPAs are "units of professional practice that can be fully entrusted to a learner or physician once he or she has demonstrated the necessary competence to execute the activity unsupervised".[48] Some of a trainee's mastered EPAs in one setting or area of specialty could be maintained and expanded in further training in other settings. Other EPAs are not practiced anymore and can lose validity. This should be documented in a dynamic portfolio.[48] Of note, in extreme forms of pre-specialization, the MD will no longer indicate a physician trained in all areas of medicine.[20] It could even be the question whether there would still be a common "doctor" identity.[35] Again, such a drastic redesign of medical undergraduate training needs to overcome many practical obstacles and threats to professional identity formation, as not to lead to more fragmentation in the delivery of care.

A curriculum structure with 'stepping stones' for identity formation

During the transitional year students have a role that clearly distinguishes them from regular clerks. Being a semi-physician seems to serve as a stepping stone that makes the 'giant leap' from student to practitioner more manageable. While a curriculum with too many transitions may hamper identity formation -a transition to a new role means losing the old identity and starting to internalize a new identity which can be stressful[49] - for major transitions, such as from student to practitioner, an 'in between identity' as stepping stone can be beneficial. It seems to create opportunities for a more gradual adoption of the identity. Other transitions in the medical training continuum may also benefit from such stepping stones. For example the transition from pre-clinical to clinical student, or the transition from resident to fully trained doctor.[50] In such a 'stepping stone' stage trainees would benefit from clearly distinguished roles to indicate their next step in development. This challenges the trainee to take the next step in responsibilities in patient care. And at the same time they can be challenged to perform with slightly less guidance than they might feel

comfortable with. This resonates with an educational model called 'Learning Oriented Teaching'.[51] This model explains how desirable moments of 'constructive friction' between teaching and learning, comparable to Vygotsky's zone of proximal development, can serve learning.[52]

Curriculum structures that allow for integration in healthcare teams

Communities of practice in clinical settings consist of teams with members of both the medical profession and members of other healthcare professions.[53] We found that feeling integrated in such teams plays an important role in identity formation (chapter 5). Additionally, we found that interactions on a personal or private life level with colleagues had an impact. Feeling welcomed as a team member includes more than being treated as a colleague at the work level. We suppose a connection with other team members at the personal level is important, as students may still struggle with feeling competent in their professional role, making their identities unstable. The *ingroup ties* dimension of social identification may be secured by a bond on the personal level, also when one feels incompetent. This may explain why stress levels and feelings of anxiety in newly-qualified doctors are lower among those who feel to be part of a team.[54]

For clinical teams it may not be easy to integrate students in their team as they usually only stay for short periods of time and have limited tasks. In many medical schools trainees move through a series of clinical rotations switching every few weeks. In addition, within rotations they transfer to different departments (e.g. first two weeks on the clinical ward, next two weeks on the emergency room). These transitions allow exposure to multiple disciplines, but may impede or delay adequate socialisation.[55] Possibilities for early specialty streaming, as described earlier, may mean students can focus on a limited number of rotations and in that way spend more time at each department. Students then have time to get to know the team members, and find a routine and become confident in performing the clinical tasks at the department. At the same time supervisors get time to trust trainees in performing

these tasks and gradually decrease supervision.[56] This may facilitate students' legitimate participation in clinical practice already early in training.[57]

Next, another benefit of supporting integration in clinical teams may be that students develop a deeper understanding of the teams' culture. SIA postulates that identifying with a group means the person will incorporate the values and norms of the group and display the according behaviour.[21] Due to limited time spend in a team, trainees may not always get a fair idea of the values and norms. They may make up their own story based on a few impactful situations and as a result integrate misunderstood values and norms as part of their identity. Next to stimulating team integration, an implication for practice could be the implementation of group discussion sessions among students, guided by a mentor or a coach, aimed to reveal how students experience the culture in clinical teams during undergraduate medical training. This may encourage trainees to become aware of their personal interpretations of their experiences in teams and to consider these from different perspectives.[58]

Suggestions for further research

The research in this thesis is explorative and the findings described reveal many opportunities for further research. Overall, our findings suggest the importance of curricular structure for identity formation, stressing the importance of studying professional identity formation in the context of curricular structures. A few specific topics for a subsequent research agenda are described below.

Effects of interruption of medical education

In chapter 2 we found that many students consider pausing medical training. In further research, it would be interesting to find out what these breaks mean for professional identity formation. Most students seem to consider a break for non-medical activities, such as travelling, or extracurricular activities such as a position in a student board. Does this lead to experiences that contribute to their identity

formation, and if so, how? Does such a break during medical school lead to another type of doctors, as students might have acquired more life experience at the moment of graduating medical school? Or should such temporary stops be discouraged as it means an interruption of the socialization process early in the education continuum, which might have negative consequences? And if so, which negative consequences?

Effects of early specialty streaming

Future research may focus on the effects of early specialty streaming. In the traditional structure of the medical training continuum, students are trained to become "undifferentiated" physicians in medical undergraduate education. It is very likely that their professional identities do not reflect an "undifferentiated" physician identity, as the nature of their identities will include preferences for a future career.[59] With early specialty streaming, this effect may become stronger. If early specialty streaming would evolve further, do students then still develop a common 'doctor-identity'? And what would it mean if they do not?

In this thesis, we explored social identification as an instance of professional identity formation. Social identification is complex. One person identifies with different groups at different levels. People structure the perception of their multiple identities according to different models, some more inclusive and others with sharper ingroup–outgroup distinctions.[11,60] This has implications for interactions with ingroup and outgroup members. Being a physician and being a member of a specific specialty are related group identities, as they are 'nested'. This means a 'lower-order' identity (being a dermatologist) is nested within a 'higher-order' identity (being a doctor), the latter being more inclusive.[29] Lower-order identities are more proximal to the individual and therefore have more impact in daily life.

In chapter 6 we highlighted the concern that a strong identification with the professional group could hamper collaboration with other healthcare team members. However, a similar concern could be raised for early specialty streaming. When

students would not develop a common 'doctor-identity' anymore, but already during undergraduate training develop a strong specialty specific professional identity as a result of early specialty streaming, would this effect the collaboration with other specialists due to underlying group processes?[61] A research agenda on this topic is important as the new era of health care requires collaborative, team-based, patient-centered practice[28,62]; not *more* fragmentation of health care.

Effects of early integration in healthcare teams

Positive experiences of being accepted and integrated in a team during medical school seem to support the ingroup ties dimension of group identification (chapter 5). It is not clear whether such immersion in teams stimulates professional identity formation as a doctor, or actually reflects identity formation as a member of a healthcare team. Medical trainees should be prepared to work in interprofessional healthcare teams. Many interprofessional education initiatives are launched in medical schools, but with varying success.[63] Group dynamics may play a role, as interprofessional collaboration and learning might be hindered as a result of a strong identification with the professional group.[64,65] A future research agenda on group identification in relation to professional identity formation and identifying with interprofessional groups is interesting. How will social identification with members of an interprofessional team and professional identity formation influence one another?[65–67] And at what moments during a career do trainees identify with which groups? In an exploration described in chapter 6 was found both group-identities were present in final year medical trainees. How do these dynamics change over the course of training and doctors' careers?

A final note

In the near future medical education faces major innovations.[31] Medical training programs will have to adjust to modern healthcare. This may mean considering reforms such as pre-specialization in undergraduate medical training in order to

adapt to the expanding medical knowledge, and joint training programs for healthcare professionals with different backgrounds to promote interdisciplinary and interprofessional collaboration.

This thesis highlights the interplay between curriculum structure and professional identity formation. Professional identity formation is a complex process which happens at both the individual and the collective level.[49] At the individual level, trainees move through several role transitions during the training program with their own 'crises' in identity development, and gradually meld their professional identity with their personal identity. Too abrupt transitions during training can lead to problems with integrating professional identities into personal identities leading to rejection of the professional role.[11] At the collective level, medical students form their identities in a process of socialization. The curriculum structure determines the groups in which this socialization process takes place. This can lead to 'birds of a feather that flock together'. Students who strongly identify with the professional group in general, or with a specialty group. Or students who identify with 'birds of different feather', e.g. members of an interprofessional team. Where do students seek their nest? Group processes due to this group identification can impact interprofessional and intraprofessional collaborations during medical school or in future work.

Recently, recommendations are made to support identity formation during medical training.[42] These include "establishing professional identity as an educational objective, providing faculty development, establishing and transmitting the cognitive base of knowledge of the subject, engaging students in the development of their own identity, providing a welcoming community, and assisting students as they follow the progress of their own identity development".[42] We would like to add as a recommendation to this list to consciously consider the influence on professional identity formation when planning a curriculum structure reform.

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Appendices

Summary

Chapter 1

Chapter 1 is the general introduction of the thesis. It introduces the subject of professional identity formation of medical students. The process of professional identity formation during medical training happens simultaneously at the level of the individual (the psychological development of the person) and the collective (socialization of the person into the community of practice). The curricular structure used in medical schools can influence this process at both levels. Vice versa the development of students' emerging identities may influence choices they make *en route* to become a doctor, such as choices for electives or extracurricular activities. This chapter introduces the two curricular models of which this interplay between professional identity formation and the curricular structure is explored, and the questions this thesis aims to answer: Does the two-cycle degree model (the bachelor-master structure), introduced in many medical schools in Europe and providing an option to interrupt or terminate studies, affect students' decision to pursue a medical career? How do students develop their professional identities in the context of the final year of medical school designed as a transitional year to graduation, as introduced in several schools in The Netherlands?

Chapter 2

For medical education the introduction of the bachelor-master structure means that a traditionally unified program is now split in a three-year bachelor program and a three-year master program. In the Netherlands, students who have obtained a medical bachelor degree have guaranteed access to the medical master program that leads to obtaining a medical degree, but they also have access to several masters outside medical programs. There have been concerns this would stimulate students to leave medical training prematurely. Chapter 2 describes the results of a questionnaire study on students' considerations to stop or pause their medical

training after obtaining a bachelor degree. All participants were students at the University Medical Center Utrecht in The Netherlands. Of the 105 participating second year bachelor students (response rate 33.4%), 146 third year bachelor students (response rate 42.0%), and 125 master students (response rate 48.8%), only one to three percent seriously considered a permanent stop. We therefore concluded the bachelor diploma does not seem to encourage students to terminate medical training. A temporary stop after finishing the bachelor program was seriously considered by about one quarter of the bachelor students. One in seven of the master students indicated that they did take a break at that opportunity, and three-quarters of them considered to pause during their master program. Students thus often make plans for study breaks, both at the transition from the bachelor to the master program and during the master program, suggesting that the two-cycle model does not necessarily stimulate taking breaks. There seems to be a tendency to locate a long break (6 or more months) at the moment of the bachelor-master transition. Most students indicated to plan a study break to travel. It is not clear what this would mean to their professional identity formation. When a student chooses activities not related to medicine during the break, this could be seen as an interruption of the process of professional socialization. A pause may also create opportunities for experiences that can contribute to professional identity formation, for example doing work in an environment that leads to internalizing characteristics, values and norms beneficial for a doctor's identity.

Chapter 3

The sixth and final year of most Dutch medical schools is designed as a "transitional year". This year includes many elective options with the aim to ease the transition from undergraduate medical training to postgraduate training. The study in chapter 3 explores how medical students use these transitional year electives to prepare for transition to postgraduate training. All graduating students from one year at the University Medical Center Utrecht medical school, of whom 235 students responded

(86%), were asked to complete an open-answer questionnaire about their preferred specialty at the start of the transitional year, electives they chose during the transitional year and reasons for these choices, and whether the transitional year electives changed their career considerations. We found most electives were chosen for career orientation and to optimize chances to get into a residency program. Many students chose electives logically related to each other, e.g. combinations of surgery and radiology. We therefore concluded that students use the transitional year electives to focus on their future postgraduate training program, resulting in spontaneous early specialty streaming. However, one sixth of the students reported that these elective experiences had caused substantial doubts about their specialty preference or resulted in new insights about their preferences at the end of the transitional year. This should be taken in consideration when such a curriculum structure would be used as a way to organize pre-specialization in undergraduate medical education.

Chapter 4

Next to the electives, another characteristic of the transitional year is that students work in authentic clinical settings for a longer period of time with more clinical responsibilities than in their earlier clerkships, i.e. approaching the level of a starting resident be it under strict supervision. Students are no longer regarded as regular clerks but are called “semi-physicians”. In chapter 4 we explain why we think such a curricular model with a gradual increase in clinical responsibilities reflects true vertical integration in undergraduate medical education. Integration represents collaboration between disciplines to establish a coherent medical curriculum, and vertical integration specifically is defined as “the integration between the clinical and basic science parts of the curriculum”. We believe vertical integration should be considered a philosophy of education, with impact on professional identity formation of students and awareness of teachers that learning experiences both in classrooms and in clinical contexts all serve to prepare students for clinical care responsibilities. In chapter 4 we

therefore propose to define vertical integration as *a deliberate attempt to shape the curriculum to enable a gradual increase of learner engagement in clinical practice*.

Chapter 5

The Social Identity Approach, a theoretical approach from social psychology, addresses identity formation at the level of social group memberships. This theory explains how people categorize themselves and the people around them as belonging to social groups, and how certain group memberships are established as an important component of their self-concepts, forming social identities. Professional identity is an instance of social identity. In chapter 5 the Social Identity Approach was used as a lens to analyse transcripts from interviews with twenty-one transitional-year students at University Medical Center Utrecht about workplace experiences that affect the development of a professional identity. We explored how three dimensions of social identification with the group of doctors emerge in the context of the transitional year; the cognitive centrality dimension (the prominence of the group for self-definition), the ingroup affect dimension (positivity of feelings associated with group membership), and the ingroup ties dimension (perception of fit and ties with group members). We found that students were very aware of being a doctor rather than a student ('cognitive centrality' dimension) when they were in the position of semi-physician and performing tasks successfully. As a semi-physician they felt they could make a significant contribution to patient care, and they experienced a sense of pride and purpose when being more central to their patients' care ('ingroup affect' dimension). Finally, in transitional-year rotations students became integrated in daily social routines with colleagues from clinical teams, possible by the extended duration of the electives compared to earlier clerkships. And they had close contact with their supervisors, who could confirm their fit with the group. This gave them a sense of belonging ('ingroup ties' dimension). These findings extend our knowledge of medical trainees' professional identity formation, and give further insights into how

to provide effective support during the transition from student to medical practitioner.

Chapter 6

Social Identity Approach explains how group processes can result in less favourable attitudes towards non group ('out-group') members. Therefore theoretically a strong professional identity (a strong social identification with the professional group) could hamper collaboration with other healthcare team members. At the same time a strong identification with the members of an interprofessional team could influence social identification with the professional group. Transitional-year students work in authentic clinical situations and therefore experience authentic interprofessional teamwork already during medical school. In chapter 6 we explored group identifications of these medical students. We also included final-year nursing students. With a questionnaire study we measured their strength of social identification (SSI) with their own professional group and with their interprofessional team. For the 38 medical and 15 nursing students who responded, small mean SSI differences were found, favouring the own professional group (significant for the nursing students only). The survey also included open-ended questions on who they define as interprofessional team members and about their views on interprofessional feedback. Participants had a broad view of their interprofessional team, and included for example supporting and management staff. They valued interprofessional feedback, especially when it regarded teamwork skills and communication. Despite the small number of study participants these findings suggest that group processes do not hinder the development of inclusive, interprofessional attitudes, and highlight new questions for future research in this field.

Chapter 7

Finally, chapter 7 summarizes the key findings of this thesis. With regard to the two-cycle degree model (the bachelor-master structure) the main conclusion is that this

curricular model does not affect students' decision to pursue a medical career. We did find many students feel the urge to take a pause during undergraduate medical training. In future research it would be interesting to find out what these breaks mean for professional identity formation. In chapter 7 we further reflect on professional identity formation in the first cycle of the bachelor-master structure and possible future innovations, such as a broad bachelor program in life sciences instead of a medical bachelor. With regard to the transitional year we found students use their transitional-year electives to prepare for a smooth transition to a postgraduate training program, which seem to lead to spontaneous early specialty streaming. Next, the results of this thesis suggest that clearly defining the final year of medical school as a separate stage in training, with increased clinical responsibilities and the integration of students in healthcare teams, is important for professional identity formation. We consider practical implications of these findings, and a future research agenda on group identification in relation to professional identity formation and identifying with interprofessional groups. Chapter 7 further addresses the strengths and limitations of this thesis.

Samenvatting

Hoofdstuk 1

Hoofdstuk 1 is de algemene inleiding van dit proefschrift, waarin het onderwerp professionele identiteitsvorming van geneeskundestudenten wordt geïntroduceerd. Professionele identiteitsvorming tijdens de geneeskundeopleiding vindt plaats op zowel het niveau van psychologische ontwikkeling van het individu als op het niveau van socialisatie van het individu in de 'community of practice' van de beroepsgroep. Hoe de geneeskundeopleiding is opgebouwd, oftewel de structuur van de opleiding, kan van invloed zijn op beide niveaus. Andersom zal hoe studenten hun identiteit ontwikkelen tijdens de opleiding ook van invloed zijn op keuzes die ze tijdens de opleiding maken, bijvoorbeeld voor keuzevakken of extra curriculaire activiteiten. In dit proefschrift wordt van twee relatief nieuwe curriculum structuren deze wisselwerking tussen de structuur van het curriculum en professionele identiteitsvorming onderzocht. Dit zijn 1) de Europese bachelor-masterstructuur, die de basisopleiding geneeskunde opdeelt in twee delen, en 2) het laatste jaar van de basisopleiding ingericht als schakeljaar naar de medische vervolgopleidingen, zoals geïntroduceerd in veel geneeskundeopleidingen in Nederland. De volgende twee overkoepelende vragen worden in dit proefschrift onderzocht: Beïnvloedt de bachelor-masterstructuur de overwegingen van studenten om hun medische opleiding voort te zetten? Hoe ontwikkelen geneeskundestudenten hun professionele identiteit in de context van het schakeljaar?

Hoofdstuk 2

Voor medisch onderwijs betekende de introductie van de bachelor-masterstructuur dat de geneeskundeopleiding in tweeën werd gesplitst in een bachelor opleiding van drie jaar en een master opleiding van drie jaar. In Nederland hebben studenten met een geneeskunde bachelordiploma gegarandeerd toegang tot de geneeskunde masteropleiding. Maar ze hebben ook toegang tot andere master opleidingen. Er zijn

zorgen geweest dat dit studenten zou stimuleren om de medische opleiding vroegtijdig te verlaten. In hoofdstuk 2 worden de resultaten beschreven van een vragenlijstonderzoek naar overwegingen van studenten om de geneeskundeopleiding te stoppen of te onderbreken na het ontvangen van een bachelordiploma. De vragenlijst werd afgenomen bij Nederlandse geneeskundestudenten van het Universitair Medisch Centrum Utrecht. Van de 105 deelnemende tweedejaars bachelorstudenten (responspercentage 33,4%), 146 derdejaars bachelorstudenten (responspercentage 42,0%) en 125 masterstudenten (responspercentage 48,8%) overwoog slechts een tot drie procent serieus om definitief te stoppen. We concludeerden daarom dat een bachelordiploma studenten niet aan lijkt te moedigen om de medische opleiding te beëindigen. Ongeveer een kwart van de bachelorstudenten overwoog serieus om de geneeskundeopleiding tijdelijk te onderbreken na het afronden van de bacheloropleiding. Eén op zeven masterstudenten gaf aan hun opleiding daadwerkelijk gepauzeerd te hebben tussen de bachelor- en masteropleiding. Driekwart van hen overwoog de opleiding te pauzeren tijdens hun master. Studenten maken dus vaak plannen voor studieonderbrekingen, zowel tijdens de overgang van de bachelor- naar de masteropleiding als tijdens de masteropleiding. Dit suggereert dat de transitie naar de bachelor-master structuur een studieonderbreking niet noodzakelijkerwijs stimuleert. Er lijkt wel een trend te zijn om een lange onderbreking (van 6 of meer maanden) te plannen tussen de bachelor- en de masteropleiding. De meeste studenten geven aan dat ze tijdens een onderbreking van de studie willen reizen. Wat een onderbreking betekent voor de professionele identiteitsvorming is niet duidelijk. Als studenten tijdens een onderbreking kiezen voor niet-geneeskunde gerelateerde activiteiten, kan dit gezien worden als een onderbreking van het socialisatieproces. Een onderbreking kan ook ruimte bieden voor ervaringen die bijdragen aan professionele identiteitsvorming, bijvoorbeeld door het doen van (vrijwilligers)werk in een omgeving die bijdraagt aan het internaliseren van de kenmerken, normen en waarden die passend zijn bij de identiteit van een arts.

Hoofdstuk 3

Het zesde en laatste jaar van de meeste geneeskundeopleidingen in Nederland is ingericht als een zogenoemd “schakeljaar”. Dit jaar bevat veel keuzestages, met als doel om studenten alvast ervaring op te laten doen in vakgebieden waarin ze geïnteresseerd zijn, en zo de overgang van de basisopleiding naar een medische vervolgopleiding te vergemakkelijken. In hoofdstuk 3 wordt onderzocht hoe geneeskundestudenten hun keuzestages van het schakeljaar inzetten om zich voor te bereiden op deze overgang. Gedurende één jaar werden alle afstuderende studenten aan de geneeskundeopleiding van het Universitair Medisch Centrum Utrecht gevraagd om een vragenlijst in te vullen. Aan de hand van open vragen, werd informatie verzameld over welke medische vervolgopleiding aan de start van hun schakeljaar hun voorkeur had, welke keuzestages zij kozen en met welke reden, en of de ervaringen tijdens de keuzestages hun carrièreoverwegingen hebben beïnvloed. Er hebben 235 studenten gereageerd (responspercentage 86%). We vonden dat de meeste studenten stages kozen om zich te oriënteren op een medische vervolgopleiding en om hun kansen te vergroten om aangenomen te worden voor een vervolgopleiding. Ook vonden we dat bepaalde combinaties van keuzestages vaak werden gekozen, bijvoorbeeld combinaties van keuzestages heelkunde en radiologie. We concludeerden dat studenten hun keuzestages in het schakeljaar gebruiken om te focussen op hun toekomstige medische vervolgopleiding, wat resulteert in differentiatie naar specialisme tijdens de basisopleiding. Belangrijk is dat één zesde van de studenten aangaf dat de ervaringen tijdens hun keuzestages voor serieuze twijfels over hun voorkeursspecialismen hadden gezorgd, of hadden geresulteerd in nieuwe inzichten over hun voorkeuren aan het einde van het schakeljaar. Hier moet rekening mee worden gehouden als een dergelijke opleidingsstructuur ingezet wordt als een manier om pre-specialisatie te realiseren tijdens de basisopleiding.

Hoofdstuk 4

Een ander belangrijk kenmerk van het schakeljaar is dat studenten met meer klinische verantwoordelijkheden werken dan tijdens eerdere coschappen. Het niveau benadert dat van een beginnend arts-assistent, zij het onder strenge supervisie. Studenten worden tijdens dit jaar dan ook niet meer gezien als reguliere coassistenten, maar worden "semi-artsen" genoemd. In hoofdstuk 4 beargumenteren we dat een curriculumstructuur met een dergelijke toename in klinische verantwoordelijkheden gezien kan worden als waarlijk verticaal geïntegreerd onderwijs. Integratie in het medisch onderwijs betekent een verbinding tussen verschillende disciplines om een coherent medisch curriculum te bewerkstelligen. In de literatuur wordt verticale integratie gedefinieerd als "de integratie van de klinische en biomedische onderdelen van het curriculum". We vinden echter dat deze definitie tekortschiet, omdat verticale integratie gezien zou moeten worden als een filosofie op onderwijs. Deze filosofie is van invloed op de professionele identiteitsvorming van studenten en stimuleert bewustwording bij studenten en docenten dat alle leermomenten bedoeld zijn om studenten voor te bereiden op klinische verantwoordelijkheden. We stellen daarom voor om verticale integratie te herdefiniëren als *het doelbewust inrichten van het curriculum om een geleidelijke toename van de betrokkenheid van studenten in de kliniek te bewerkstelligen*.

Hoofdstuk 5

Hoofdstuk 5 beschrijft een interviewstudie met 21 schakeljaarstudenten over hun ervaringen tijdens het schakeljaar en welke invloed dit had op hun professionele identiteitsvorming. We hebben deze interviews geanalyseerd vanuit de sociale identiteitstheorie. Dit is een theorie vanuit de sociale psychologie, die zich richt op identiteitsvorming op het niveau van lidmaatschap van sociale groepen. Deze theorie legt uit hoe mensen zichzelf en anderen categoriseren als leden van bepaalde groepen, en hoe groepslidmaatschappen een belangrijk onderdeel van iemands zelfbeeld kunnen worden, en zo iemands sociale identiteit vormen. Professionele

identiteit is een vorm van sociale identiteit. We onderzochten hoe drie dimensies van sociale identificatie met de beroepsgroep zich voordoen tijdens het schakeljaar bij geneeskundestudenten; de 'cognitive centrality' dimensie (hoe prominent de sociale groep is voor zelfdefinitie), de 'ingroup affect' dimensie (de emotionele gevoelens geassocieerd met het groepslidmaatschap), en de 'ingroup ties' dimensie van sociale identificatie (perceptie van bij de groepsleden passen en banden met de andere groepsleden). Studenten bleken zich bewust van hun groeiende identiteit als arts, en zagen zich niet meer als student ('cognitive centrality' dimensie) als ze als semi-arts hun klinische taken met succes uitvoerden. Als semi-arts voelden de studenten dat ze een significante bijdrage konden leveren aan de zorg van de patiënten, en ze ervoeren positieve gevoelens zoals trots als ze een centrale rol aannamen in de zorg voor hun patiënten (de 'ingroup affect' dimensie). Tot slot vonden we dat schakeljaarstudenten geïntegreerd raakten in dagelijkse routines met collega's in de klinische teams, vermoedelijk vanwege de lange duur van de stages in vergelijking met de eerdere coschappen. En ze hadden een nauwere band met hun begeleiders, die konden bevestigen dat ze bij de groep pasten. Dit gaf hen een gevoel van 'erbij horen'(de 'ingroup ties' dimensie). De bevindingen in dit hoofdstuk geven ons meer kennis over de professionele identiteitsvorming van geneeskundestudenten, en geven inzicht in hoe we de studenten kunnen ondersteunen in de overgang van student naar arts.

Hoofdstuk 6

Volgens de sociale identiteitstheorie kunnen groepsprocessen resulteren in negatieve attitudes ten aanzien van leden van andere groepen. Daarom kan, theoretisch gezien, een sterke professionele identiteit (een sterke identificatie met leden van de professionele groep) de samenwerking belemmeren met leden van andere professionele groepen in een gezondheidszorgteam. Tegelijkertijd kan een sterke sociale identificatie met leden van een interprofessioneel team de identificatie met de professionele groep beïnvloeden. Studenten in het schakeljaar werken tijdens hun

stages in interprofessionele teams. In hoofdstuk 6 onderzochten we de groepsidentificaties van deze studenten. We deden dit ook voor de verpleegkundestudenten in het laatste jaar van hun opleiding. Met behulp van een vragenlijstonderzoek hebben we de sterkte van hun sociale identificatie (SSI) gemeten met hun eigen professionele groep en met leden van het interprofessionele team. Bij de 38 geneeskundestudenten en 15 verpleegkundestudenten die reageerden, vonden we gemiddeld een iets sterkere SSI met de eigen professionele groep dan met leden van het interprofessionele team waarin ze gewerkt hebben tijdens het schakeljaar. Alleen bij de verpleegkundestudenten was dit verschil significant. De vragenlijst bevatte ook enkele open vragen over wie de deelnemers beschouwen als leden van hun interprofessionele team, en wat hun mening is over het ontvangen van interprofessionele feedback. De deelnemers beschouwden veel verschillende professionals als leden van het team; ook professionals die niet direct 'aan het bed staan', zoals ondersteunend personeel en management. Studenten waarderen interprofessionele feedback, met name feedback over samenwerking en communicatie. Ondanks het kleine aantal deelnemers aan dit onderzoek, schetst dit een beeld dat groepsprocessen in deze fase van de opleiding een open houding naar interprofessioneel samenwerken niet in de weg zitten. De resultaten geven aanleiding voor verder onderzoek op dit gebied.

Hoofdstuk 7

Hoofdstuk 7 is een algemene discussie over de bevindingen in dit proefschrift. Kijkend naar de bachelor-masterstructuur concluderen we dat deze curriculumstructuur studenten niet aanzet om hun medische carrière te stoppen. Veel studenten voelen wel de drang om hun opleiding tijdelijk te onderbreken voor andere activiteiten. Toekomstig onderzoek kan zich richten op wat onderbrekingen van de opleiding betekenen voor de professionele identiteitsontwikkeling van studenten. In hoofdstuk 7 belichten we de bachelor-masterstructuur ook in het licht van mogelijke toekomstige innovaties, zoals een brede bachelor in life sciences in

plaats van een medische bachelor. Met betrekking tot het schakeljaar vonden we dat studenten de keuzestages in dit jaar gebruiken om zich voor te bereiden op een overgang naar een medische vervolgopleiding, wat resulteert in een spontane vorm van pre-specialisatie tijdens de basisopleiding. Resultaten uit dit proefschrift laten verder zien dat het gunstig kan zijn voor de professionele identiteitsontwikkeling om het schakeljaar duidelijk te definiëren als een jaar waarin de student meer verantwoordelijkheden in de zorg kan dragen, en om studenten te laten integreren in klinische teams. In hoofdstuk 7 beschrijven we wat de praktische implicaties van deze bevindingen kunnen zijn. Verder onderzoek gericht op groepsidentificatie in relatie tot professionele identiteitsontwikkeling en identificatie met leden van het interprofessionele team is daarbij interessant. In hoofdstuk 7 zijn verder de sterkte punten en beperkingen van het onderzoek in dit proefschrift beschreven.

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Curriculum vitae

Sjoukje van den Broek (1985) studied medicine (2003-2009) at Utrecht University. During her own 'transitional year', as described in this thesis, she encountered the many elective options. One of these, the elective teaching rotation, sparked her interest in medical education.

After graduation from medical school she started working at the Education Center of University Medical Center Utrecht. First she was employed as a junior teacher. She further developed her professional identity as 'medical educator' while working as a policy advisor of the medical program from 2010-2012. She was involved in the daily organization of the medical program, the preparations for the medical school accreditation in 2012 and various projects to further develop the medical schools' courses. This led to her obtaining her University Teaching Qualification (BKO in Dutch). In July 2012 she started as a PhD candidate. Also, she was secretary for the Ethical Review Board of the Netherlands Association for Medical Education (NVMO-ERB) for health professions education research (2014-2018). She also started working as a coach for professional development coaching for medical students, and she kept working as a teacher.

Currently, Sjoukje still works as a teacher and researcher at the Education Center of University Medical Center Utrecht. She is involved in professional development coaching, program coordinator of the Case Base Clinical Reasoning course for Bachelor year 2 medical students and program coordinator of the Study Reflection course for Bachelor year 1-3 medical students. She started supervising students during the teaching rotation elective herself, and she hopes to get more medical trainees excited for medical education.