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### Deciding upon a career within the medical field

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# CHAPTER 3

## Medical Applicants' Study Expectations: A Comparison with Medical Students' Actual Study Experiences<sup>2</sup>

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<sup>2</sup> This Chapter is under review as: Guntern, S., Korpershoek, H., & van der Werf, G. Medical Applicants' Study Expectations: A Comparison with Medical Students' Actual Study Experiences.

## **Abstract**

The expectations of medical applicants about the medical curriculum have an influence on their study behavior. Expectations which are not accurate may lead to disappointments during the study trajectory and, in the worst case, to drop-out. To prevent this situation, medical applicants need to be properly informed on the study of medicine before making their study choice. In this study, a sample of medical applicants was matched for gender, academic performance and study places with a sample of medical students ( $N = 334$ ). The medical applicants and the medical students were requested to evaluate identical statements about the medical curriculum. The medical applicants rated the statements based on their expectations about the study, whereas the students used their actual study experiences. The accurateness of the applicants' study expectations was determined by comparing the responses of the two groups. The findings showed the largest differences between the groups for statements about the standard study period, rote learning, a realistic impression of the medical professions and enough time to understand the study contents. The medical applicants underestimated the standard study period, which means that they were less positive about finishing the studies in the designated time frame. They also underestimated the need for rote learning and the available time to understand the study contents. On the other hand, the medical applicants overestimated the statement that during the studies a realistic picture is provided of the medical professions. In the study, we also point out how expectations can be linked to the vocational theory of Holland.

*Keywords:* Medical study – Applicants' study expectations – Students' actual study experiences – Practical focus – Workload – Learning strategy – Study demands

## Introduction and Problem Statement

Prior research has shown that students generally enter universities with high expectations (Baker, McNeil, & Siryk, 1985; Tinto, 1975). Typically, their expectations regarding the university setting exceed their actual experiences, often referred to as the 'freshman myth' (Baker et al., 1985; Pancer, Hunsberger, Pratt, & Alisat, 2000). In particular, students' expectations about the environmental characteristics, such as the social and academic orientation of the university, are more positive than their actual experiences (Baker et al., 1985). This is problematic because the behavior of students is influenced by an interaction between individual and environment (Pace, 1963, p. 3, as cited by Yonge, 1968). If students' expectations are not met, they may become disappointed, which undermines their integration in the new environment (Draper & Louw, 2007; Pike, 2006; Tinto, 1975). More specifically, students whose expectations of the university environment are too high (or inaccurate) may participate less, perform poorer and drop-out on a more frequent basis (see Baker et al., 1985; Pike, 2006; Tinto, 1975). Therefore, to prevent them from disappointment, it has been recommended to inform upcoming students in advance about what to expect from the study (Farrokhi-Khajeh-Pasha, Nedjat, Mohammadi, Rad, & Majdzadeh, 2014; Gąsiorowski & Rudowicz, 2014; Marley & Carman, 1999; Miles & Leinster, 2007; Pancer et al., 2000; Tiberius, Sackin, & McLean, 1989).

Referring to the university setting of medical studies, it is well acknowledged that the study requirements are relatively rigorous. The pressure during examination periods and the amount of knowledge which students have to acquire is high (Gąsiorowski & Rudowicz, 2014). In addition, the working conditions after graduation are physically (e.g., long and irregular work hours) and emotionally (e.g., confrontation with diseases) demanding (Draper & Louw, 2007). Therefore, studying medicine should be a decision which is well-thought-out. However, previous research has shown that many medical students do not have adequate knowledge about the medical studies (e.g., Marley & Carman, 1999). Besides the wish to help others and the intellectual challenge, applicants have mentioned promising career perspectives (e.g., earning a lot of money, low risk of unemployment) as another reason to study medicine (Farrokhi-Khajeh-Pasha et al., 2014; McHugh, Corrigan, Sheikh, Lehane, Broe, & Hill, 2011). Yet, a relatively high percentage of students and physicians would in hindsight not be willing to choose the medical studies again. This has

been the case for approximately 5% of the students in the first study year and nearly 22% of the students in the last study year (Gąsiorowski & Rudowicz, 2014). Additionally, approximately 30% of the physicians would have made another study choice in retrospect (Cohen, Cantor, Barker, & Hughes, 1990). These people presumably became disappointed during their education. Common areas of disappointment within the medical field have been workload (e.g., less leisure time than expected) and the study's structure (e.g., unexpected focus on the natural sciences in the pre-clinical years). Gąsiorowski and Rudowicz (2014) reported that around one third of the first year students and over 57% of the students in the last study year recognized *the teaching and learning process* as one area where their expectations differed from their experiences. In the first year, for example, students mentioned that *the academic program was badly constructed* and that they *had to learn more than expected*. In the last year, they reported the following areas of disparity: *too little practice and too much theory (lectures, seminars), acquiring adequate knowledge/skills for future work, student groups are too large and pressure on rote learning and passing exams*. In a study of Marley and Carman (1999), less than 25% of the academic staff indicated *rote learning ability* and *being exceptionally bright* to be significant preconditions for studying medicine. The majority of the staff considered *problem solving, critical thinking, communication skills* and *empathy skills* to be important for the medical studies.

The main focus of prior research has been on the study expectations of medical students (Draper & Louw, 2007; Gąsiorowski & Rudowicz, 2014; Marley & Carman, 1999; Miles & Leinster, 2007; Tiberius et al., 1989). The current study, however, expands earlier studies by investigating the study expectations of medical applicants, which has thus far been a neglected group. Our research intention was to find out if their study expectations match the medical students' actual perceptions of the study environment. The vocational theory of Holland (1959), which states that individuals typically search for environments that allow them to satisfy their interests, has provided a useful framework to investigate this research topic. Therefore, in the next section we will briefly explain this theory and point out how expectations can be linked to it.

## **Expectations Linked to the Vocational Choice Theory of Holland**

Holland's theory provides a useful framework for the investigation of persons' interactions with environments (Holland, 1959, 1997). Even though the theory was developed for the vocational context, it can also be applied to the educational field (Holland, 1997). The three main assumptions of Holland's theory and its connections with students' expectations are the following.

First, Holland's theory is based on the assumption that persons (p) and environments (e) can be classified based on the same six personality types (realistic, investigative, artistic, social, enterprising, conventional). Second, "*persons search for environments that will let them exercise their abilities, skills, express their attitudes and values and take on agreeable problems and roles*" (Holland, 1997, p. 4). This aspect of the theory, the process of self-selection, has been less frequently investigated than the other aspects (Pike, 2006). Holland (1997) mainly stated that person's previous experiences have an influence on the environments they select. However, other explanations are also possible. Pike (2006) argued that expectations play an important role in students' study choice. Students are expected to select those studies that allow them to carry out the activities they like. Thus, it has been suggested that students choose a certain study because of their expectations (Baker et al., 1985). At the most basic level, expectations can have an influence on students' study choice (Pike, 2006). Third, Holland (1997) argued that "*behavior is determined by an interaction between personality and environment*" (p. 4). Applied to the educational context, statements can be made based on the level of P-E fit about students' academic performance. A person's behavior is reinforced if his/her personality fits the environment, and will be corrected if his/her personality does not fit the environment (aspect of congruence). There are several ways in which a person might react in case of incongruence. According to Holland (1997), a person could leave the environment (refers to dropouts in the educational context), try to change the environment, or try to adjust his/her behavior to the environment. Because most students have expectations about their studies, these beliefs influence their behaviors as a function of their experiences. Thus, expectations may also have an influence at this deeper level, once persons entered a certain environment (Pike, 2006).

Generally, it is argued that unmet expectations lead to lower engagement, poorer academic achievement and higher drop-out rates (Baker et al., 1985; Braxton, Vesper, & Hossler, 1995; Herr, 1971; Pike, 2006; Pike, Smart, & Ethington, 2012). This is especially presumed to be the case for students whose expectations about the study environment are too high, as discussed in connection with the freshman myth. Nevertheless, some of these students may be able to adjust to the study environment (Feldman, Smart, & Ethington, 2004; Holland, 1997; Jackson, Pancer, Pratt, & Hunsberger, 2000). Nevertheless, there remains a group of students who are at risk of leaving the study setting. Prior research has argued that students who are properly prepared for a study are better able to adjust to the study environment, even in case of unmet expectations (Feldman et al., 2004; Jackson et al., 2000). In this research the prepared group has been described as having anticipated possible areas of difficulties, which is why they have already thought of ways to cope with them (Jackson et al., 2000). Thus, applicants should not only be given the opportunity to explore their expectations about the study environment, but also to design coping strategies on how to deal with unmet expectations. This aspect should be part of their examination.

## **The Present Study**

The focus of the present study was to investigate the accurateness of medical applicants' study expectations. To this end, medical applicants and medical students were asked to judge identical statements about the characteristics of the medical studies. The medical applicants were asked to rate the statements based on their expectations about the study, while the students were asked to use their actual study experiences. The accurateness of the medical applicants' study expectations was indicated by comparing the responses of the two groups with respect to *practical focus*, *workload*, *learning strategies* and *study demands*, which were the most important aspects found in literature.

According to the argumentation above, (study) expectations not only have an influence on applicants' study choices, but have also an effect on study behaviors during the curriculum. Accurate expectations are supposed to protect future students from getting disappointed during the study program. This study has therefore examined common misconceptions of applicants regarding the medical curriculum. No concrete hypotheses could be formulated based on the current knowledge base, because prior studies have

concentrated on the study expectations of medical students rather than on those of medical applicants. We formulated the following research question:

- 1) To what extent do applicants over- or underestimate the statements presented to them about the practical focus of the medical studies, the workload, the learning strategies and the study demands compared to the actual experiences of the students, and for which statements are the differences the largest?

It has been proposed that accurate expectations of the medical curriculum influence students' study performance. In order to prevent prospective students from getting disappointed, this study has aimed to find out more about those characteristics of the medical studies regarding which expectations of applicants may deviate the most from the actual experiences of the current students. This knowledge could be used to provide applicants with better information about the curriculum of the medical studies, so they can make better study choices.

## **Method**

### **Participants**

This study is based on two surveys about statements on the study curriculum of medicine. First, medical students from four different universities in Austria and Switzerland were asked to rate the statements based on their actual study experiences. The students were informed that their responses would be used to support applicants in their study decision. In total 347 students in their first two study years filled out the questionnaire (196 female: 56%, 151 male: 44%).

Second, the applicants who applied for these medical studies were asked to rate the same statements based on their study expectations. This data collection took place during the universities' admission procedures. In total 1899 applicants participated in the survey containing 1197 female applicants (63%) and 702 male applicants (37%). After finishing the questionnaire, the applicants received individualized feedback together with some general information about the medical study curriculum. For our study purpose, we performed a one-to-one matching to eliminate the impact of potential confounders (Tassoni,



Chen, & Chu, 2012). The medical curriculum, for example, is known to differ among universities. Some offer a more traditional curriculum, while other ones provide a problem-based program. Other variables that could impact applicants' study expectations are gender and academic performance. So here we matched our samples for gender, study place and academic performance. More information about the samples is presented in the table below.

*Table 1: Overview samples*

Confounding variables		Samples					
		APPL		STU		Matched	
		<i>N</i>	%	<i>N</i>	%	<i>N</i>	%
<b>Gender</b>	Male	702	37.0	151	43.5	141	42.2
	Female	1197	63.0	196	56.5	193	57.8
<b>Study place</b>	1	605	31.9	112	32.3	112	33.5
	2	1081	56.9	127	36.6	127	38.0
	3	64	3.4	39	11.2	31	9.3
	4	149	7.8	69	19.9	64	19.2
<b>Performance third</b>	Upper third	1123	59.1	173	49.9	173	51.8
	Middle third	732	38.5	155	44.7	150	44.9
	Lower third	44	2.3	19	5.5	11	3.3
<b>Samples</b>	Total	1899	100	347	100	334	96.3 <sup>a</sup>

APPL = Applicants; STU = Students.

<sup>a</sup>. The student sample had to be reduced because of unavailable corresponding data in the sample of applicants. No matches were found for the following 13 combinations: 5 males & study place 4 & middle performance third, 3 males & study place 4 & lowest performance third, 2 males & study place 6 & lowest performance third, 3 females & study place 6 & lowest performance third.

## Questionnaire and Data Analyses

The questionnaire used was especially developed for the purpose of this study. Its design was based on a qualitative online questionnaire among medical students ( $n = 496$ , 77%), lecturers ( $n = 94$ , 14%) and physicians ( $n = 57$ , 9%). They were asked about the most common misconceptions about the medical curriculum. These data were then used to construct statements about the medical study curriculum. Experts evaluated the comprehensibility of the statements before the questionnaire was finalized. Table 2 presents an overview of the set of items. The answering options ranged from (1) *not true at all* to (4) *completely true*. Based on the content of the statements, the items could be categorized into

the following topics: practical focus of the study, workload, learning strategies and study demands.

As the items show, the statements focused on different aspects of a particular topic. For example, two items associated with the practical focus of the studies emphasized the learning material taught (item 1 and item 3), while the other two focused on the interaction with patients (item 2 and item 4). The items concerning the learning strategies measured the learning style (item 9 and item 10) as well as the expected focal point of the study contents (item 8 and item 11). Furthermore, we asked the medical students about how intensively they had considered their study choice (referred to as study choice examination). The answering options ranged from (1) *not intensive* to (4) *very intensive*. Additionally, we asked the students if their study expectations were fulfilled (referred to as expectation fulfillment). The answering options here ranged from (1) *not fulfilled* to (4) *fulfilled*.

We started our analyses by first having a look at the associations between the medical students' study choice examination and their expectation fulfillment. We performed a Pearson Chi-Square test to examine whether the two variables were significantly related to one another. Subsequently, we concentrated on analyzing the differences between the medical applicants' study expectations and the students' actual study experiences. Due to the relatively broad variety of the statement contents, we decided to compare the scores of the two groups on an item level. To this end, we first summarized their answers into the categories *percentage of agreement* and *percentage of disagreement*. In this way, we obtained an overview of the similarities between their statement ratings. Second, we used paired t-tests to compare the mean scores for the matched sample on the item-level.

## Results

**Pearson Chi-Square test.** The results of this test showed that the medical students' study choice examination and their expectation fulfillment were significantly related ( $\chi^2(9) = 28.58$ ;  $p < 0.01$ ;  $N = 334$ ). This means that the expectations of students who had more intensively considered their study choice were fulfilled on a more frequent basis.

**Rating similarity.** Table 2 compares the ratings of the applicants with those of the students for the same statements. Both the medical applicants and the medical students viewed natural sciences to be the basis of the study of medicine (item 8: 96.4% of the

applicants agreed; 88.6% of the students agreed). Both groups also highly agreed that team work is important in the medical studies (item 11: 92.5% of the applicants agreed; 82.0% of the students agreed). On the other hand, the applicants and the students highly disagreed on the statement that having a readiness of mind is sufficient for successfully complete the medical studies (item 10: 88.6% of the applicants disagreed; 84.7% of the students disagreed). Moreover, they also disagreed on the statement that contact with patients is part of the program in the first study years (item 4: 84.7% of the applicants disagreed: 75.4% of the students disagreed). Table 2 furthermore displays that the directions of the applicants' and the students' ratings run in the same direction with one exception: the demand for rote learning (item 9). Here, the applicants did not expect rote learning to be important for the medical studies (33.2% of the applicants agreed), whereas the students recognized its importance (54.8% of the students agreed).

Table 2: Comparison between the applicants' and the students' study statement ratings

Items	APPL		STU	
	% AGR	% DAGR	% AGR	% DAGR
<b>Practical focus</b>				
1) During the studies you get a realistic impression of the medical profession	70.4	29.6	54.8	45.2
2) During the medical studies you learn to interact with patients	51.8	48.2	62.3	37.7
3) Practically relevant issues are covered during the lessons/classes	82.9	17.1	72.5	27.5
4) Contact with patients is already covered in the first year during the medical studies	15.3	84.7	24.6	75.4
<b>Workload</b>				
5) You are given enough time to get to understand the study contents	24.9	75.1	46.4	53.6
6) The standard study period is sufficient to finish one's degree	72.5	27.5	89.5	10.5
7) The learning load is manageable	77.5	22.5	71.9	28.1
<b>Learning strategies</b>				
8) Being interested in natural sciences is the basis for studying medicine	96.4	3.6	88.6	11.4
9) Learning by rote is required in the medical studies	33.2	66.8	54.8	45.2
10) A readiness of mind is sufficient to successfully complete the medical studies	11.4	88.6	15.3	84.7
11) You have to like working in a team if you are considering to study medicine	92.5	7.5	82.0	18.0
<b>Study demands</b>				
12) Endurance is the most important personality characteristic required for the medical studies	92.5	7.5	88.6	11.4
13) The first study years are the hardest	91.0	9.0	81.7	18.3
14) A medical study is the most ambitious study within the university curriculums	77.2	22.8	65.3	34.7

APPL = Applicants; STU = Students; % AGR = Percent Agreement; % DAGR = Percent Disagreement.

**Paired t-tests for the items.** Table 3 shows the means, standard deviations and effect sizes for the students' and applicants' responses. Scores lower or equal than 2 indicate that on average the participants disagreed on a statement (1 = *I do not agree at all*; 2 = *I do not agree*), whereas scores higher than 2 indicate agreement on a statement (3 = *I agree*; 4 = *I agree completely*). In general, both samples agreed on all statements with two exceptions: patient contact during the first study years (item 4;  $M_{app} = 1.78$ ,  $SD_{app} = 0.80$ ;  $M_{stud} = 1.94$ ,  $SD_{stud} = 1.02$ ) and a readiness of mind is sufficient to successfully complete the medical studies (item 10;  $M_{app} = 1.86$ ,  $SD_{app} = 0.64$ ;  $M_{stud} = 1.84$ ,  $SD_{stud} = 0.76$ ).

The subsequent description of significant differences between the medical applicants and the medical students is presented in order of size, starting with the largest effect size (Cohen's  $d$ ). Negative effect sizes show higher item scores for the medical students than for the medical applicants (referring to an underestimation of the applicants), whereas positive effect sizes indicate higher item scores for the medical applicants than for the medical students (referring to an overestimation of the applicants). For example, the two groups were asked to rate the statement the standard study period is sufficient to finish one's degree (item 6). Compared to the medical students, the medical applicants scored significantly lower on this statement (item 6,  $d = -0.40$ ,  $p < 0.01$ ), indicating that the latter group underestimated the standard study period. This outcome means that according to the medical applicants, the study time was believed to be insufficient to handle the workload of the program. In addition, a relatively large difference was found for learning on rote (item 9,  $d = -0.34$ ,  $p < 0.01$ ) where the medical students ( $M = 2.53$ ,  $SD = 0.84$ ) scored higher than the medical applicants ( $M = 2.15$ ,  $SD = 0.78$ ). The medical applicants also scored lower than the students on getting enough time to understand the study contents (item 5,  $d = -0.29$ ,  $p < 0.01$ ). Thus, the medical applicants seemed to overestimate the workload.

The other areas of the comparison showed that the medical applicants also overestimated other aspects of the studies. For example, they overestimated the practical focus with regard to obtaining a realistic impression of the medical profession (item 1,  $d = 0.29$ ,  $p < 0.01$ ). In addition, the medical applicants scored higher than the students on the following statements: you have to like working in a team if you are considering to study medicine (item 11,  $d = 0.26$ ,  $p < 0.01$ ), I am interested in natural sciences (item 8,  $d = 0.24$ ,  $p < 0.01$ ) and during the curriculum practical relevant issues are covered (item 3,  $d = 0.21$ ,

$p < 0.01$ ). Finally, the medical applicants overestimated all statements focusing on the study demands: the first study years are the hardest (item 13;  $M_{app} = 3.27$ ,  $SD_{app} = 0.64$ ;  $M_{stud} = 3.05$ ,  $SD_{stud} = 0.70$ ;  $p < 0.01$ ), endurance is the most important personality characteristics (item 12;  $M_{app} = 3.42$ ,  $SD_{app} = 0.66$ ;  $M_{stud} = 3.23$ ,  $SD_{stud} = 0.65$ ;  $p < 0.01$ ), and medicine is the most ambitious study within the university curriculums (item 14;  $M_{app} = 2.91$ ,  $SD_{app} = 0.71$ ;  $M_{stud} = 2.73$ ,  $SD_{stud} = 0.88$ ;  $p = 0.01$ ).

Table 3: Paired *t*-tests for items

Items	APPL		STU		T-Test <sup>a</sup>		ES <sup>b</sup>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>T</i>	Sig.	<i>d</i>
<b>Practical focus</b>							
1) During the studies you get a realistic impression of the medical profession	2.87	0.71	2.57	0.72	5.34	< 0.01**	0.29
2) During the medical studies you learn to interact with patients	2.59	0.84	2.69	0.75	-1.59	0.11	-0.09
3) Practically relevant issues are covered during the lessons/classes	3.04	0.67	2.84	0.68	3.91	< 0.01**	0.21
4) Contact with patients is already covered in the first year during the medical studies	1.78	0.80	1.94	1.02	-2.23	0.03*	-0.12
<b>Workload</b>							
5) You are given enough time to get to understand the study contents	2.19	0.56	2.44	0.74	-5.35	< 0.01**	-0.29
6) The standard study period is sufficient to finish one's degree	2.87	0.76	3.28	0.74	-7.38	< 0.01**	-0.40
7) The learning load is manageable	2.86	0.56	2.81	0.64	0.99	0.32	0.05
<b>Learning strategies</b>							
8) Being interested in natural sciences is the basis for studying medicine	3.49	0.57	3.26	0.71	4.40	< 0.01**	0.24
9) Learning by rote is required in the medical studies	2.15	0.78	2.53	0.84	-6.24	< 0.01**	-0.34
10) A readiness of mind is sufficient to successfully complete the medical studies	1.86	0.64	1.84	0.76	0.33	0.74	0.02
11) You have to like working in a team if you are considering to study medicine	3.27	0.59	3.04	0.67	4.75	< 0.01**	0.26

Items	APPL		STU		T-Test <sup>a</sup>		ES <sup>b</sup>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>T</i>	Sig.	<i>d</i>
12) Endurance is the most important personality characteristic required for the medical studies	3.42	0.66	3.23	0.65	3.79	< 0.01**	0.21
13) The first study years are the hardest	3.27	0.64	3.05	0.70	4.13	< 0.01**	0.23
14) A medical study is the most ambitious study within the university curriculums	2.91	0.71	2.73	0.88	2.80	0.01*	0.15

APPL = Applicants; STU = Students; ES = Effect size.

<sup>a</sup>. *df* = 333; <sup>b</sup>. Positive effect sizes: Applicants score higher than students (referred to as an overestimation of applicants); Negative effect sizes: Applicants score lower than students (referred to as an underestimation of applicants); \*  $p < 0.05$ ; \*\*  $p < 0.01$ .

## Discussion

The present study investigated the differences between medical applicants' study expectations and medical students' actual study experiences. This was done by comparing the two groups' responses to identical statements about the medical study. The high rates of agreement on the statements about natural sciences (item 8) and having an interest in team work (item 11) were not surprising. Medical studies are known to combine the acquirement of scientific knowledge in the pre-clinical study years (Antony, 1998; McHugh et al., 2011) with the interaction between students and patients during the clinical study years.

The statements were categorized into the topics practical focus, workload, learning strategies and study demands. The analysis on item level, which compared the answers of the applicants and the students (matched sample), showed that the first group overestimated the statements on the practical focus (item 1: realistic impression; item 3: practical issues), the study demands (item 12: endurance; item 13: challenge of the first study years; item 14: most ambitious study course) and the learning strategies (item 8: natural sciences; item 11: team work). This finding means that the medical applicants scored higher on these statements than the students, with one exception (item 9: rote learning). The medical applicants underestimated the demand for rote learning, which means that they presumably

were not aware that this learning strategy is important for passing the examinations in the medical curriculum. In our opinion, this result is surprising, knowing that the workload for medical studies is high. For example, in a study of Rosenthal and Ogden (1998), 75% of the medical students agreed that the curriculum was overburdened with factual load. In line with this result, first year students in a study of Gąsiorowski and Rudowicz (2014) reported that they expected to learn less. In our sample, a relatively high amount of the participants did not agree that rote learning is required for the medical studies (66.8% of the applicants and 45.2% of the students). A possible explanation could be that applicants are under the impression that being smart enough is sufficient to pass the medical studies. Although the percentage was small, there was a group of medical applicants who agreed on this statement (item 10; 11.4% of the applicants agreed compared to 15.3% of the students). Another explanation for the rote learning results could be the type of curriculum. In general, the traditional curricula are more focused on rote learning than the clinical programs, which typically include problem-based learning (Regan-Smith, Obenshain, Woodward, Richards, Zeitz, & Small, 1994 as cited in Pinto & Zeitz, 1997). Nevertheless, applicants should be aware that memorizing facts are inevitable for passing the exams in the medical curriculum, especially in the pre-clinical years where natural sciences form an integrative part of the studies.

The medical applicants underestimated the statement that the study time provided in the medical programs is sufficient to successfully graduate from university (item 6). Thus, the medical applicants were less positive than the medical students about completing the studies in time (72.5% of the applicants agreed compared to 89.5% of the students). However, providing applicants with the feedback that medical students are quite optimistic about the study time could be counterproductive. It may provoke them to underestimate the study demands. Some medical applicants even believe that passing the admission test is the most challenging part of the studies. This is all the more reason to make it clear to this group that studying medicine is very challenging. So what could be the reasons that the medical applicants were less optimistic about the study time? One explanation could be that the sample of applicants was more heterogeneous with regard to cognitive abilities because the selection test had not yet been administered. Studies have demonstrated that medical students with higher point average scores need less time to graduate successfully (Cohen-Schotanus, Muijtjens, Reinders, Agsteribbe, van Rossum, & van der Vleuten, 2006). Other



sources of study retention discussed in the literature have been self-efficacy (e.g., Pintrich & De Groot, 1990; Robbins, Lauver, Le, Davis, Langley, & Carlstrom, 2004) as well as academic-related skills (e.g., time-management skills, study skills and habits, problem-solving and coping strategies) and academic goals (e.g., goal commitment).

Our study further revealed that the applicants overestimated the statement about being given a realistic impression of the medical profession. Considering that altruistic needs are a common motivation for studying medicine, applicants are at risk of becoming disappointed, especially because the first two years are particularly focused on acquiring a scientific basis. Our results complement those of an earlier study of Gąsiorowski and Rudowicz (2014) with medical students, showing that medical applicants were sometimes too optimistic with regard to the practical impact of the studies. The findings imply that, on average, medical applicants would like the practical input of the studies to be greater. On the other hand, one should bear in mind that students have to be sufficiently prepared for patient contacts. Therefore, the first study year may be too early to confront students with this component of the curriculum. Being still unfamiliar with clinical situations, students may, for example, develop fears such as harming the patient or themselves (Smithson, Hart, & Wass, 2010). At the same time, however, Smithson et al. (2010) pointed out that early patient contact, which provides students with realistic knowledge about the clinical part of the studies, may in fact facilitate the transition from the pre-clinical to the clinical study years.

The largest disparities between the applicants' and the students' judgments concerned the standard study period (item 6:  $d = -0.40$ ), the demand for rote learning (item 9:  $d = -0.34$ ), the realistic impression of the medical professions (item 1:  $d = 0.29$ ) and enough time to understand the study contents (item 5:  $d = -0.29$ ). Not being sufficiently aware that memorizing facts forms an integral part of the studies may lead to disappointment during the curriculum. The same holds true for the misconception that the practical input is big, whereas in reality this is less the case. Therefore, efforts should be made to help applicants in developing realistic expectations regarding the medical studies, since unrealistic impressions could have an impact on their study behavior (Baker et al., 1985; Pike, 2006; Tinto, 1975). Based on the hypotheses of congruence, it could therefore be argued that medical students presumably perform better if their study expectations match the actual medical study environment.

## **Practical Implications**

In the transition from high school to university, expectations play a major role (Brinkworth, McCann, Matthews, & Nordström, 2009; Pancer et al., 2000). Students, for example, have to adjust to an entirely new environment, which puts great demands on their intellectual and social abilities. Having realistic expectations is assumed to facilitate students' transition to the university setting. According to Holland's theory of vocational choice, a person's behavior in a new environment is influenced by the P-E fit. To make a good study decision, it is therefore crucial that applicants for the medical studies are given the proper information about the medical curriculum. However, most medical students do not seem to have adequate knowledge prior to making their study decision (Marley & Carman, 1999). This situation is problematic, considering that misconceptions about the medical curriculum can lead to disappointment, while an accumulation of disappointments is likely to result in negative attitudes toward the studies (Tiberius et al., 1989). Therefore, while making a decision of this magnitude, applicants should not be left without guidance. This is undesirable and could be avoided, especially since applicants could easily be provided with better information during the selection trajectory, which is a standard procedure of most medical universities. In addition, Jackson et al. (2000) showed that better prepared students report lower levels of stress. Our results indicated that medical students who had more thoroughly considered their study choice seemed to be more satisfied with their chosen study. Therefore, given the positive effects of having realistic expectations on study success variables, the implementation of an expectation tool during the admission process is advisable. Feedback on coping strategies should be an integrative part of this tool to advise future students on how to deal with unexpected situations. Then, in the case that their study expectations are not met, they will nonetheless have some strategies at their disposal to help them deal with the disappointments.

## **Study Limitations**

There are several limitations to this study. First, for both the medical applicants and the medical students, the study participation was on a voluntary basis. This non-obligational aspect may have led to a selection bias. As a result, a larger number of applicants who were more motivated to study medicine may have participated in the assessment. Moreover, the

self-selection rate of the students who were pleased with the studies was probably higher than that of the unsatisfied students. Our data support this assumption with approximately 90% of the participating students who indicated that their study expectations were met. This high percentage seems to suggest that – as far as the medical students were concerned – the description of the ‘study reality’ is accurate.

A 4-point Likert scale was used, so that the participants had to express an opinion regarding all items. It is discussable if offering a midpoint option would have changed the study results. This option would have allowed the participants to ‘skip’ responses without reflecting on them (see Dawis, 1987), which would presumably have undermined the purpose of our investigation. In hindsight, perhaps it might have been more effective if we had used a 5-point Likert scale, including an option ‘not applicable’. This would have allowed the participants to give a neutral answer in case of insecurity (applicants may not always have an expectation) or in case of indecision (students may have contradictory experiences).

## **Future Research**

For future research, a longitudinal research design would be recommended. Such a design is optimal for investigating the impact of identical variables for a longer time period. Due to rules concerning the protection of data privacy, however, this approach was not feasible for our study. Instead, we performed a one-to-one matching to eliminate the effects of confounding variables. Furthermore, our study focused on a comparison between medical applicants and medical students in their pre-clinical years. The development of a questionnaire that investigates medical applicants’ expectations with respect to the higher clinical study years is, however, regarded to be useful as well. The study requirements within the medical studies are known to change during the higher study years (see Gąsiorowski & Rudowicz, 2014). In the pre-clinical years, for example, the students particularly have to acquire a great deal of factual knowledge and become familiar with the new environment, while in the clinical years the interaction with patients forms an important part of the curriculum. In this context, further research should also focus on the students’ transition to the work environment of physicians. Applicants (and students) would likely benefit from knowing more about what to expect during the different phases of their education.

Future studies are also required to investigate the impact of the expectation-experience incongruence on academic success. Although research (Draper & Louw, 2007; Farrokhi-Khajeh-Pasha et al., 2014; Miles & Leinster, 2007; Pancer et al., 2000; Tiberius et al., 1989) has already indicated that unmet expectations are associated with study failure, other outcomes may also be possible. For example, there will undoubtedly be students who are nonetheless able to adjust to the 'unexpected situation' and still develop the abilities and interests demanded (Feldman et al., 2004; Pancer et al., 2000). Therefore, more knowledge about who succeeds in overcoming these difficulties and who fails to complete the curriculum successfully would be beneficial in better preparing both applicants and freshman students for the medical studies.

## **Conclusion**

Our study showed that in a number of respects, medical applicants' study expectations significantly differ from the actual experiences of medical students. These differences apply to several aspects of the medical study like the practical focus, the workload, the learning strategies and the study demands. Based on Holland's hypotheses of congruence, we argued that it is important for medical applicants to have accurate expectations about the medical curriculum to avoid disappointment during their study trajectory. Therefore, medical applicants should be timely provided with the proper information about, among other issues, the most common misconceptions about the medical studies. In this way, they will be given the best opportunity to carefully consider their study choice in the medical field and ultimately make the 'right' decision.

