Sensemaking in supervisor-doctoral student relationships: revealing schemas on the fulfillment of basic psychological needs

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ABSTRACT
Mentoring relationships between research supervisors and doctoral students play a key role in doctoral students’ success. Self-determination theory assumes that the quality of these relationships can be defined in terms of fulfillment of students’ basic psychological needs for autonomy, competence, and relatedness. Studies on how supervisors and students build need-supportive relationships are, however, lacking. Taking a schema-based perspective, this article investigates supervisors’ and doctoral students’ (mis)alignments in schemas on how to fulfill students’ basic needs in their relationship. Qualitative data were obtained from a sample of 18 interviews (nine dyads) to reveal the schema-driven sensemaking of students and their supervisors. Findings show that the idea of schema similarity might be too simple: For each of the three basic needs, tensions arise between students’ and supervisors’ schemas. These need-based schemas in action offer a fresh perspective for understanding why some supervisor-doctoral student relationships are experienced as successful while others are not.

KEYWORDS
Doctoral education; self-determination theory; mentoring schema theory; basic needs; sensemaking

Introduction
Mentoring relationships are crucial for students’ professional, cognitive, and emotional development (Bell-Ellison and Dedrick 2008) with far-reaching implications for their careers (Minor 2003; Noy and Ray 2012). Research supervisors are important mentors for doctoral students: They advise on research problems, provide them with research opportunities, and serve as role models (Barnes and Austin 2009; Bell-Ellison and Dedrick 2008). Given their role in students’ development and success, it is important to study why some supervisor-student relationships become high-quality relationships while others do not.

Using self-determination theory (SDT), scholars have shown that the fulfillment of individuals’ basic psychological needs for autonomy, competence, and relatedness is crucial for people’s individual and relational functioning (Deci et al. 2006; Patrick et al. 2007). Despite ample empirical evidence for the importance of need-satisfaction, the literature offers little insight into the process of how need-satisfaction is established in high-quality mentoring relationships (Janssen, Van Vuuren, and De Jong 2016).

Relational mentoring theory (Ragins and Verbos 2007) argues that the success of high-quality relationships depends on mentoring schemas: a collection of implicit mental maps of what mentors and protégés should do in their relationship, what the relationship provides, and how it functions (Ragins 2012; Ragins and Verbos 2007). Schemas have been conceptualized as outlines
of expectations (Rumelhart 1984) capturing the range of information individuals use to make sense of life (Bieber and Worley 2006). Schema-driven sensemaking involves categorizing an event or person (‘What or who is it?’) and searching for meaning on how to respond (‘What does this mean to me and what should I do in response?’) (Harris 1994).

Schema similarity between mentors and protégés can be expected to contribute to relationship experiences (Ragins and Verbos 2007). The challenge for members of any interpersonal relationship is that schema-guided sensemaking often occurs unconsciously (Gioia and Poole 1984). To date, little attention has been paid to schemas in supervisor-student relationships. How students and supervisors establish schema similarity is an important topic, as it has been argued that schemas guide members’ interpretations of past, present, and future (Ragins and Verbos 2007). Therefore, we ask: What are supervisors’ and students’ schemas on the fulfillment of students’ basic needs for autonomy, competence, and relatedness in their mentoring relationship?

We address this question in a qualitative dyadic study of supervisor-student relationships, by drawing on the literature of both SDT (Deci and Ryan 2014) and relational schema theory (Baldwin 1992; Planalp 1985, 1987; Ragins 2012). For each of the three basic needs, tensions occurred in members’ relational schemas. The implicit negotiation on specific ways in which students’ basic needs are fulfilled appeared to be a complex interaction.

Conceptual framework

In every interpersonal experience, people hold and develop cognitions about their relationships. Relational schema theory states that such cognitions—relational schemas—tell people what to expect from their relationships, how to behave in interactions, and how the other is likely to respond (Baldwin 1992; Planalp 1985, 1987). People hold self-schemas, other-schemas, and interpersonal scripts for every interpersonal relationship. Self-schemas involve cognitive structures on ‘who I am when I am with you.’ Other-schemas encompass cognitive structures of how a relational partner should behave. Interactions of these schemas result in interpersonal scripts: ‘cognitive structure[s] representing a sequence of actions and events that define a stereotyped relational pattern’ (Baldwin 1992, 468). Relational schemas help people to make sense of their interpersonal relationships.

Relational mentoring (Ragins 2012) proposes that mentoring partners hold mentoring schemas: ‘cognitive maps derived from past experiences and relationships that guide mentors’ and protégés’ perceptions, expectations, and behaviors in mentoring relationships’ (Ragins and Verbos 2007, 101). Each member holds self- and other-schemas. Relational mentoring posits that mentoring partners will more likely develop high-quality relationships when their schemas align than when they have different views of their role and the role of the other. In practice, however, relational members may have different perspectives on their roles (Huang, Lv, and Wu 2016).

In this study, we analyzed research supervisors’ and doctoral students’ schemas on how students’ needs for autonomy, competence, and relatedness are fulfilled. According to SDT, need-satisfaction is necessary for high-quality relationships to develop (Deci and Ryan 2014). SDT is a theory of human motivation and sees people as innate growth-oriented organisms, striving for intrinsic functioning (Deci et al. 1994). The theory distinguishes between self-determined and controlled types of motivations. Individuals are self-determined or intrinsically motivated when engaged in activities that are inherently interesting and enjoyable (e.g. studying subjects because of own interest). When behaviors aim at obtaining outcomes that are separable from the activities themselves (e.g. studying to get a good grade), they are controlled or extrinsically motivated (Ryan and Deci 2000). Several studies throughout the last decades show how intrinsic motivation relates to favorable educational outcomes across the lifespan (Deci et al. 1991; Ryan and Deci 2020), including school and courses persistence (Renaud-Dubé et al. 2015; Vallerand and Bissonnette 1992), school achievement (Froiland and Worrrell 2016; Taylor et al. 2014), and better conceptual learning and memory (Grolnick, Ryan, and Deci 1991).
Individuals’ social contexts can either facilitate or impede intrinsic motivation, by supporting or thwarting their basic need-fulfillment (Ryan and Deci 2000). Previous studies showed that students’ perceptions of need-supportive teachers relate to increased educational outcomes (Ryan and Deci 2020; Deci et al. 1991). For example, students’ perceptions of their instructors’ autonomy-supportive behaviors explained increases in their interest in the material (Black and Deci 2000; Patall et al. 2019). Cheon, Reeve, and Vansteenkiste (2020) showed how teachers who learned to provide structure in an autonomy-supportive way were able to generate important benefits both for themselves (e.g. in terms of teaching effectiveness and well-being) and their students (e.g. in terms of classroom engagement and skill development). In interviews with high-school biology students about their experiences with teachers who incorporated students’ questions into their teaching, Hagay and Baram-Tsabari (2015) identified several themes reflecting need-fulfillment, including allowing asking unlimited questions (autonomy), feelings of success and pride (competence), and improving teacher-student and peer relations (relatedness). Litalien and Guay (2015) found that doctoral students who completed their Ph.D. perceived interactions with their advisors as more need-supportive than students who dropped out. Consistent with these findings, Van der Linden et al. (2018) also found need support and need satisfaction to be predictors of doctoral persistence.

Given that the literature often highlights tensions in supervisor-student relationships (Acker, Hill, and Black 1994; Mainhard et al. 2009), supervisors and students may not always reach schema similarity on how students’ basic needs should be fulfilled. Both build schemas based on previous and present experiences and must make sense of uncertain situations in their mentoring relationships. By conducting dyadic interviews, we aimed to reveal members’ schema-driven sensemaking on need-fulfillment in supervisor-student relationships.

Method

Studies on how supervisors and students actually build need-supportive relationships are lacking and thus, the topic of this study asks for an open-ended inquiry. Because structured questionnaires and interviews give participants only limited means to communicate their experiences, a qualitative approach was most appropriate. Semi-structured interviews enabled us to broaden our understanding of supervisors’ and students’ perspectives on their relationships and help us to advance theory building of why some of these relationships are successful and others are not. Our choice to include dyads rather than a sample of only supervisors or students enabled us to explore different facets of the relationships under study, thus enhancing the trustworthiness of our research.

Participants

We selected alumni doctoral students and their research supervisors from our home university, which is located in the Netherlands and offers programs on engineering and social sciences. In the Netherlands, most doctoral students are hired as regular employees and work (nearly) full-time on their thesis for three to five years. They are supervised by a full professor, often in cooperation with an associate or assistant professor. They often work on an article-based dissertation consisting of international refereed articles co-authored by their supervisors. At the time of the study, doctoral education and training at this specific university took place following the traditional master-apprentice model and not yet within the framework of a doctoral program or graduate school.

Doctoral students who had finished their dissertation between 2011 and 2015 were invited to participate. Names of possible participants were obtained from alumni records provided by the university’s alumni office. To ensure a safe interview context, we only invited graduated students who were no longer employed by the university. In our recruitment letter, we focused on positive mentoring relationships. However, we also received responses from graduates who regarded their supervisor-student relationship as neutral or negative. To improve the diversity of our data and enhance the credibility of our findings, we included them as well. Next, we invited the corresponding supervisors
to participate. Although all agreed to participate, one supervisor did not respond to the invitation for an appointment so (s)he and the corresponding student were eventually not included.

As we sampled alumni doctoral students and supervisors from our home university, we took several steps to minimize methodological limitations caused by doing insiders research. First, to foster our self-awareness of preunderstandings about the research context and topics (Brannick and Coghlan 2007), we worked with three coders during the analyses and held extensive discussions about our independent analyses. A second challenge was our proximity to participants as the supervisors – with the exception of one Emeritus Professor – were members of our home organization, which could have disadvantages in terms of trust relations between the researchers and the participants (Brannick and Coghlan 2007). To diminish a social desirability bias in their answers, we ensured that the supervisors were no direct colleagues of our own department. We also assured participants that the research would not affect them academically or personally in any way: only the first author knew the names of the participants, and all names and any other identifying information were changed by this first author during transcription to protect the participants’ privacy. Also, because we worked with pairs, we chose to not present coupled data in our results section as our participants would then be able to identify their own quotes and thus, what their corresponding mentoring partner had said.

Our final sample consisted of nine former supervisor-student dyads. Former doctoral students (seven men, two women) were aged between 28 and 59 years (mean = 35), and the average time spent on their dissertation was 4.7 years. They represented both engineering and social sciences. Supervisors (six men, three women) were aged between 49 and 67 years (mean = 56). Average organizational tenure was 14.3 years (ranging from 7 to 24 years) and average job tenure was 10.1 years. They were six full professors, one associate professor, one senior researcher, and one emeritus professor.

**Interview guide**

Data were collected using semi-structured interviews. Supervisors and students were interviewed separately so that they could talk openly about their experiences. All interviews were conducted by the first author and were recorded after permission. Separate but comparable interview protocols were developed for students and for supervisors. Interview topics were the course of the research project, positive and negative events in their relationship, support functions provided by the supervisor, and the fulfillment of the needs for autonomy, competence, and relatedness in the relationship. We explained the meaning of these needs based on previous work (Deci and Ryan 2000; Janssen, Van Vuuren, and De Jong 2013) and probed for specific examples of (non-)supportive behaviors. At the end of each interview, we asked participants to what extent their expectations were met in the relationship, to describe their current relationship, and to share any other information that they felt was relevant. Interviews typically lasted about an hour.

**Analysis**

All interviews were transcribed verbatim and anonymized by the first author. To ensure qualitative credibility and deepen our understanding of the data, all three authors were involved in the data analysis. Using a constant comparative method for dyadic interviews (Boeije 2002), coding in ATLAS.ti consisted of three steps: (1) comparisons within and between single interviews, (2) comparisons in pairs at the level of the dyad, and (3) comparisons of dyads. In the first coding round, all three authors independently performed open coding and coded the single interviews. After that, the authors applied axial coding and wrote memos with core messages of each interview regarding the role of autonomy, competence, and relatedness. These memos were discussed until consensus on the coding was reached and then all relevant fragments of the interviews were coded. As we aimed to discover common patterns and ideas in participants’ stories, subcategories represented...
by a single comment made by one participant were not included in the next round of coding. In this second coding round, we discussed (mis)alignments from what the two members of each dyad said about basic need-fulfillment and the relationship. These discussions were recorded and together with the previous memos, they formed a basis for conceptual summaries of need-fulfillment in each relationship. As a last step, these summaries were discussed by the three authors in multiple other meetings to look for themes and patterns between the accounts of the various dyads. The resulting themes reflect the central self- and other-schemas present in supervisors’ and students’ accounts that shaped their relationships.

Findings

Analyzing the narratives, we noticed several themes in students’ and supervisors’ viewpoints. Each revolves around the schemas held by supervisors and students on how basic needs (autonomy, competence, and relatedness) should be fulfilled in their relationship. Below we describe how these need-based schemas in action featured in supervisor-student relationships and which challenges and complexities they imposed to supervisors and students.

Schemas on autonomy

Expecting the other to take the lead

A prominent theme in the interviews was supervisors’ and students’ conflicting schemas on who should take the lead during the dissertation project. Most students initially held an other-schema which entailed that their supervisors should take the lead because of their research experience. Some students held self-schemas of not being in the position to lead the project because they had limited research experience. Students also held other-schemas based on organizational roles, expecting their supervisor to take the lead based on formal positions:

[Supervisor] is the leader and knows what she wants and what not and if something is a good idea or not. And probably, [supervisor] is right in that. [Student]

When both supervisor and student held schemas of the supervisor as a leader who manages the student through the project, this worked well. However, schemas on autonomy differed in several dyads, resulting in difficulties. Many supervisors perceived cooperation with their student as a project in which both had equal participation in how the project would look like:

I like that the most, side by side and shoulder to shoulder. That you work together / … / I would have liked it if [student] would have delved a little deeper. And [student] didn’t do that. Of course I can tighten the screws and say: ‘I think you should do this again.’ But I also think that someone has to follow his own path, has his or her own style. And who am I to say no? [Supervisor]

These supervisors were reluctant to tell their student what to do, which caused dissatisfaction among students who initially had an other-schema of their supervisor as the leader.

As a complicating factor, a tension between autonomy and competence was present in many interviews. Supervisors expressed difficulties in choosing a balance between creating enough freedom to let students make their own choices (supporting autonomy) and protecting students from being overwhelmed by giving clear structure on what to do (supporting competence). Although students differed in the extent to which they expressed their need for it, all wanted to experience a sense of ownership of the project. This meant that students had other-schemas in which supervisors would offer opportunities for choice and encourage initiatives. At the same time, they wanted to have a sense of competence, and therefore needed to experience progress and success. According to students’ other-schemas, this required that their supervisors would sometimes give direction to the project.
All supervisors held other-schemas in which students were seen as mature researchers when showing autonomous behavior. Students’ self-schemas often corresponded. However, supervisors’ ideas of when students had to show autonomous behavior varied. Most supervisors perceived research projects as processes in which autonomy gradually develops: At first, students need a lot of guidance; when students become more confident, know everything about conducting research and experience a sense of competence, they are trusted to make own decisions. Other supervisors, however, demanded an autonomous attitude of their students from the start, making it a conditional ingredient for successful cooperation:

I assume that someone will shape the project by him or herself. And by monitoring that, you assess if that is correct /…/ my way of working is not that I tell them beforehand what to do and that I give then more freedom after a while /…/ initially, I already assume a certain amount of autonomy. [Supervisor]

In some dyads, this high amount of autonomy worked well. Students explained that they liked to design their work themselves and appreciated the freedom created by their supervisors. In other dyads, expectations on when students should show autonomous behavior misaligned. Some students felt like being thrown in the deep end, and the amount of freedom given or demanded by their supervisors threatened the success of their projects:

In the beginning, it was like I was being dropped, I was just being thrown in the deep end and there was no guidance. It is nice to do what you think is best, but you also have to gain experience. And in the end, time is running out and then you are forced to focus. [Student]

Although one could say this student experiences much autonomy, a lack of competence support caused time pressure, which may be experienced as external pressure and control and hinder the satisfaction of the need for autonomy (Deci and Ryan 2000).

Schemas on competence

Supervisors as all-inclusive role models

Almost all students seem to hold other-schemas implying that their supervisors should be role models in a comprehensive set of fields: as content expert (having comprehensive domain knowledge), process expert (having ample research experience), and skills expert (being a specialist in writing, presenting, and statistics). Most likely, this role-modeling process results in ‘selective imitation’ (Ibarra 1999), as it is rare to find one person who can meet all mentoring needs.

Indeed, sooner or later, students experienced that their supervisors could not live up to this other-schema and that their expertise had limitations. Strikingly, only few students saw their supervisor as a content expert, with extensive relevant domain knowledge. In these cases, supervisors served as inspiring role models. In other dyads, supervisors took the role of process experts. Their role was then to provide clear, consistent, and reasonable expectations and help students to plan their project. These supervisors prevented students from being overwhelmed by the challenges of their projects. This worked well for most students, as supervisors allowed them to find other developers for specific knowledge and skills. Again, the fulfillment of autonomy and competence are related here:

It is important that you also give them the freedom to look for competencies from others. You sometimes notice that a professor has an attitude of ‘you are my PhD-student, you do what I tell you to do.’ [Supervisor]

Other students, however, stated that they did not have access to alternative inspiring role models in their field. And few students even questioned their supervisor’s expertise, finding the difference between their own and their supervisors’ knowledge too small.

High hopes of students as ‘real researchers’

Most supervisors saw the mentoring relationship as a time to find out if the student is ‘a real researcher,’ who belongs to the scientific community and deserves a place in academia. However,
ideas of what makes a real researcher were often based on a fuzzy set of skills, attitudes, and traits (see Hogg and Reid 2006). The competencies and characteristics of real researchers were loosely described in supervisors’ accounts. Most supervisors mentioned characteristics of students who turned out not to be real researchers: having no intrinsic drive to investigate problems in-depth, not looking for challenges, and an impatience to investigate things thoroughly. Students who showed an eagerness to learn and to excel and who were curious were fitting supervisors’ other-schemas best. Students lacking these characteristics were described as competent workers but no real researchers. Some even devalued their student, arguing that their student was provincial (instead of cosmopolitan) or simple (instead of striving for profundity). In line with self-categorization processes (Hogg and Terry 2000), students who did not meet their supervisors’ idea of how a researcher would behave were seen as belonging to a different social category:

[Student] once said: ‘Yeah, all those intelligent and complicated things, it does not necessarily make you happy / … / and I think that’s something from [student’s] family. Like, we have a home, we put flowers on the table, we have enough food, we have our hobbies, a couple of friends, well, then it’s good / … / and yeah, why would you complicate things then? I think that’s the way [student] sees things in life. [Supervisor]

In turn, students also used the period of their doctoral research to make sense of their self-schema and estimate if they would pursue an academic career. Some students had the feeling that they did not belong to academia and, similarly to supervisors, they described other-schemas of their supervisor in terms of an outgroup:

I concluded that they are researchers, they have many good ideas, the ideas they held weren’t bad at all. And they are nice people. / … / But [supervisor] is a scientist, and I am not, I’m not a real scientist. I thought I was, but it appeared to be different. I am more practically oriented. [Student]

**Students’ self-doubts not resolved by supervisors**

To have a sense of competence, students should feel able to meet the challenges of their project (Niemiec and Ryan 2009). During the project students often reflected on their self-schema of being a confident and effective researcher. They asked themselves whether they are good enough. Their answers to this question varied. For most students, their doctoral journey was an uncertain period filled with challenges and doubts about their competencies, the added value of their research, and their planning.

An important need-supportive function of supervisors is to confirm students’ competence and give them enough confidence to succeed. An important way was by providing structure: Supervisors typically prioritized research activities on which students should focus, which helped them to have a grip on their project. Supervisors also helped students to set realistic expectations. For example, concerning publications, they talked about the difficulty to find the right balance between high ambitions and realistic expectations:

How ambitious are you? Because, at some point, you want success, you need that. And you just know that the higher your ambitions are for journals, the more often you will hear no. Sometimes you must have the courage to say: ‘Let’s submit to a lower-ranked journal.’ [Supervisor]

Supervisors also affirmed their students’ sense of competence by showing appreciation for their work, by giving compliments, or by increasing their exposure and visibility when they mentioned the students’ qualities in meetings with others. Last, when students got a rejection from a journal or a request to revise and resubmit, supervisors helped them to value this feedback, to improve the manuscript, and to not give up.

However, in almost every dyad, students’ needs for confirmation was not completely fulfilled by their supervisors. Sometimes this was because both students and supervisors held organization schemas (Harris 1994) acknowledging that academic culture always asks for more and better:

I also think, that is science / … / You can always do better. And sometimes that causes a feeling of: ‘Am I good enough?’ [Student]
We don’t think that way, do we? [laughs] We always think like: This has to improve. [Supervisor]

In other accounts, students held other-schemas expecting that their supervisors would provide feedback and confirmation frequently but these expectations were not always met. They then looked for other clues to get a sense of competence. Especially publications formed an important source of feedback (Mantai 2017):

The first year, two years maybe, my papers were rejected. And at a certain point you notice that you’re losing control. If this will continue this way, it will get problematic. And [supervisor] never gave me the confirmation I was looking for. I only got the control back when I had my first publications. [Student]

In turn, supervisors stated that it was sometimes difficult to judge the extent to which they actually confirmed their students’ need for competence, as this was rarely a subject of conversation. Without interacting about it, it is difficult to reach schema similarity (Harris 1994). Some supervisors held other-schemas of their students assuming that they were confident researchers, while their students’ accounts revealed that they had doubts about themselves as researchers. One supervisor argued that, especially with successful projects it can be a pitfall to think that a student needs no confirmation.

**Schemas on relatedness**

**Balancing a professional and personal relationship**

The extent to which self-disclosure occurred was an important theme in the accounts on relatedness. Most participants talked about the extent to which they shared private matters and disclosed emotionally relevant information to each other, or how they got along with each other in private time. Several participants struggled with finding the right amount of informal contact in their relationship, mainly because they also had a professional and hierarchical relationship. In dyads where participants expressed to have an entirely professional relationship, participants came up with explanations and excuses for this:

I don’t think it was that close. I mean, I don’t even live here / …/ so I could not even join them when they were going out or something. [Supervisor]

Supervisors and students held schemas assuming that it is important to share private matters and time outside of work to feel a sense of belongingness. The extent to which they did so differed across the dyads. Some participants explained that they intentionally separated their professional and private identity. For example, the following supervisor held an other-schema which prescribed that students’ self-disclosure can be good, while his self-schema imposed to not reciprocate:

Most times I’m a little bit reluctant with extending things in private time. We talked about things, private things, hobbies, or what I did. But I feel that’s a little bit a one-way direction. So I want to know something about the student, but my worries, that’s not their business, I would say. [Supervisor]

In some dyads, this worked well as students held other-schemas affirming that their supervisor was interested in them. In other dyads, however, students missed this feeling of sincere interest of their supervisor. Sometimes this was disastrous for their sense of relatedness, as students experienced the relationship with their supervisor as more instrumental than relational. As one student explained:

I think that [supervisor] just thinks like: I need to have doctoral students. And by chance, that was me this time, but if it were you, it was the same / …/ I realize that, in that way, I was replaceable with everyone else. [Student]

Contrary to previous findings on mentoring relationships (Janssen, Van Vuuren, and De Jong 2013), intimacy was not necessarily present as a theme in participants’ accounts. Participants had various explanations for this, and in line with a similarity-attraction paradigm (Byrne 1971), they often referred to (dis)similarities when they talked about their sense of relatedness. Comparable to previous studies (Eby et al. 2013; Hu, Baranik, and Wu 2014), felt similarities seemed to serve as a sign of
relatedness and successfulness of the relationship. When participants experienced low levels of relatedness, they reported their dissimilarities, such as differences in age, ways of communicating, and personalities.

Supervisors’ responsibility in creating belongingness

Furthermore, our findings suggest that most supervisors and students held a schema suggesting that it is the supervisors’ responsibility to create a sense of belongingness. In several dyads, students noticed that the mentoring relationship is inherently more meaningful for students than for supervisors. Consequently, most participants regarded their relationship as one-sided, with the supervisor in a giving and caring role. This feeling of responsibility to take care of students was sometimes strengthened by students’ circumstances, which imposed a supervisor’s other-schema to pay special attention to this specific student. When supervisors felt they did not support their students’ needs for relatedness, they also attributed that to the fact that there were no personal circumstances that required this.

Last, most supervisors held a schema regarding relatedness in which relatedness was not necessarily something occurring between supervisor and student, but something that they had to take care of for the student. Supervisors talked about how they took care of their student by monitoring that their student’s need for relatedness was fulfilled by other colleagues:

What was good about having a large group of doctoral students is that, I mean, [student] had an important role in that group. And then you think: Oh, thank goodness. You almost feel like, you have to understand that I don’t want to take a motherly role, especially with male students, that’s something you shouldn’t do. But you are of course responsible for someone’s development. And when you see the dynamics with the others in the group / … / that’s lovely. [Supervisor]

Discussion

This study aimed to provide insight into research supervisors’ and doctoral students’ schemas on how to fulfill students’ basic needs in their relationship. Prior work has noticed the importance of need-fulfillment in individual and relational success (Deci et al. 2006; Patrick et al. 2007; Sheldon, Ryan, and Reis 1996), but mainly focused on the relationship between need-fulfillment and educational outcomes (Feri, Soemantri, and Jusuf 2016; Hagay and Baram-Tsabari 2015; Ng, Liu, and Wang 2016; Niemiec and Ryan 2009). Studies on the specific ways in which supervisors and students build need-supportive relationships are lacking. Building on (mentoring) schema theory (Baldwin 1992; Ragins and Verbos 2007), our study offers a fresh perspective for understanding why some supervisor-student relationships are experienced as successful or satisfying while others are not.

Table 1. Need-Based Schemas in Action in Supervisor-Student Relationships.

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<thead>
<tr>
<th>Basic need</th>
<th>Need-based schemas in action</th>
<th>Explanation</th>
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<tbody>
<tr>
<td>Autonomy</td>
<td>Expecting the other to take the lead</td>
<td>Both students’ and supervisors’ other-schemas entail that the other should take the lead, and some supervisors expect this from their student from the beginning onwards.</td>
</tr>
<tr>
<td>Competence</td>
<td>Supervisors as all-inclusive role models</td>
<td>Students’ other-schemas state that supervisors should be content, process, and skills experts. Supervisors can rarely live up to this.</td>
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<td></td>
<td>High hopes of students as ‘real researchers’</td>
<td>Supervisors’ other-schemas state that students should be ‘real researchers’ but these schemas are often based on a fuzzy set of skills, attitudes, and traits.</td>
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<td></td>
<td>Students’ self-doubts not resolved by supervisors</td>
<td>Students doubt being a competent researcher. Supervisors are hardly able to help them overcome their self-doubts.</td>
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<tr>
<td>Relatedness</td>
<td>Balancing a professional and personal relationship</td>
<td>Both supervisors’ and students’ schemas imply that they should build a personal relationship, yet not disclose too many personal matters.</td>
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<td></td>
<td>Supervisors’ responsibility in creating belongingness</td>
<td>Supervisors’ and students’ schemas imply that the supervisor should create belongingness for the student, either in the supervisor-student relationship or with colleagues outside this relationship.</td>
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Summarized in Table 1, the results of this qualitative dyadic study enrich our understanding of how students’ and supervisors’ self- and other-schemas guide the fulfillment of students’ basic needs. In line with literature on doctoral supervision (Acker, Hill, and Black 1994; Kam 1997), our study shows that implicit negotiations on how students’ basic needs are fulfilled is a complex interaction. For each of the three needs, tensions arise. In that sense, the idea of schema similarity (Harris 1994; Ragins and Verbos 2007) might be too simple.

Concerning autonomy, we found that satisfaction of students’ autonomy in supervisor-student relationships is closely related to their need for competence. By showing autonomous behavior, students can show their competency. Autonomy is not only a basic need of students but is also a requirement set by their supervisors. A challenge for supervisors and students is to find the right balance in this interplay of autonomy and competence. This raises questions about conditions and situations in which supervisors and students can create functional synergy between the needs (Ryan and Deci 2017) and those that may engender tensions.

Regarding competence, both supervisors and students appeared to use their relationship as a context in which they can decide if the student has the competencies for belonging to the scientific community. Supervisors tend to build their expectations on fuzzy attributes (Hogg and Reid 2006) and may have difficulties estimating to what extent their students’ need for competence is fulfilled. Students explained that their need for competence is rarely completely satisfied by the supervisor-student relationship. Students’ high expectations of their supervisors further complicated the fulfillment of students’ for competence: They expect them to be a role model in many aspects but most supervisors cannot meet these expectations. These findings support the idea of mentoring as a multiple relationship phenomenon (Baker and Lattuca 2010; Higgins and Kram 2001). For students, it may be important to get support from other developers as well (e.g. other researchers, faculty advisors, or peers).

Regarding relatedness, an important finding was that most supervisors and students hold a schema suggesting that it is required to share private matters and get along with each other in private time. In terms of SDT, however, a sense of relatedness does not necessarily require such an informal relationship, but rather a relationship in which one feels mutual respect, caring, and reliance (Deci et al. 2001). Furthermore, participants described how they had to find a balance between showing their professional and personal identity, a finding which resonates with previous research (Lee 2008). This suggests that research supervisors might experience multiplexity (Verbrugge 1979) as they have to fulfill different roles.

It is important to note that the results might not be transferable to other organizational or national cultures. Given the universal nature of the three basic needs, we argue that many of the findings will be relevant to individuals in supervisor-student relationships in a variety of higher education systems. However, schemas are also likely to be influenced by organization culture (Harris 1994), so we encourage scholars to use other samples so that we can compare and extend our findings.

**Recommendations**

Given governments’ and universities’ increased interest in completion times (Ives and Rowley 2005), we need insight into the factors that contribute to students’ satisfaction and study success. This study offers research-based guidance for the design of graduate programs, specifically for how to teach and mentor graduate students during their research. The findings urge us to put students’ basic need-fulfillment and motivation central in graduate programs. Supervisors and students should interact about their expectations in terms of autonomy, competence, and relatedness. Most supervisors and students may not be aware of their expectations of the fulfillment of basic needs. Our study showed the difficulties to come to a shared understanding of the role of these three needs in supervisor-student relationships. Communication about these basic needs seems to be an important condition for reaching greater schema-similarity.
Supervisors, faculty advisors, and other mentors could be trained in recognizing and developing students’ basic needs. Furthermore, program managers could decide on incorporating need-fulfillment in participants’ ongoing evaluation of the doctoral education program. This way, mentors and students can shape and monitor their mentoring relationship employing the three needs. Paying attention to these motivational elements in mentoring relationships and teacher-student interactions might be an important factor in students’ success and relational satisfaction.

Conclusion

On the basis of the perceptions and experiences of supervisors and doctoral students regarding their dyadic relationship, we conclude that a schema-based perspective on basic need-fulfillment offers a relevant framework for supervisor-doctoral student relationships. Our description of the tensions in the fulfillment of the three basic needs can be seen as a first step towards an understanding of why some supervisor-doctoral student relationships are successful and others are not. From a theoretical point of view, the framework enhances our understanding of need-based schemas in action. From a practical point of view, it provides insight in how to put students’ basic need-fulfillment and motivation central in supervisor-doctoral students relationships and graduate programs.

Disclosure statement

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