

“This is no Eden:” Three generations of researchers coping with team conflicts in an outstanding research environment

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Based on interviews with three generations of professors reflecting upon their development as early career researchers in an outstanding research environment within the STEM-field, this study aimed to explore how they had coped with relationship conflicts in the environment, how this had an impact on their team socialisation, and how their development was framed by their supervisors' leadership. Using theoretical thematic analysis, we found four conflict responses used by each generation when they were early career researchers. In external competition, they had *performed beyond the big bang(s)*, and when there was a temporary armistice among the senior researchers, they had *collaborated for success*. Within the environment, they had *engaged in quasi-collaboration* and *navigated in secrecy* to evade conflict with their supervisors. Their evasive conflict responses reveal an epistemic living space where the senior researchers' defensive approach had restricted their scope of learning as doctoral students, and junior scientists had struggled for independence. Seeing that each generation had developed a defensive approach themselves as leaders in their postdoctoral careers, we hold that the real issue in this case is about leadership. Leading doctoral education is not only about leading *research*, but also about leading *education* with a caring and systemic approach.

Keywords: conflict response, doctoral education, leadership, research collaboration, team socialisation

INTRODUCTION

Successful research environments have attracted attention in a number of studies exploring, for instance, their organisational and social evolutionary development (Kalpazidou Schmidt & Graversen, 2018; López-Yáñez & Altopiedi, 2015), community of practice (Degn et al., 2018), teamwork quality (Gao et al., 2019), processes of scientific knowledge creation (Travaille & Hendriks, 2010), and collective identity formation among the researchers (Schönbauer, 2019). However, how doctoral students cope with relationship conflicts in such research environments, and how this affects their team socialisation have not yet attracted attention in research. Still, this knowledge is important for understanding the conditions for doctoral students' development in such competitive settings, where they are expected to contribute to distinguished research while also engaging in “the acquisition of knowledge, behaviors, and attitudes needed to participate fully as a member of the team,” i.e., team socialisation (Cooper et al., 2021, p. 129).

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Previous survey studies have shown that research collaboration is generally related to positive experiences among both doctoral students and faculty (Anderson, 1996), and that it promotes extended networks for the students (Patricio & Santos, 2020). From an educational point of view, the various social interactions and relationships also create variations in what is learned (Baker & Lattuca, 2010). Yet in their study of two highly regarded research environments within medicine and science, Hakkarainen et al. (2014) found that some doctoral students additionally noted tensions and conflicts caused by competition among peers, or by the lack of support for their project ideas by steering supervisors.

In relation to team socialisation, the situation becomes even more complicated since newcomers within an organisation may develop multiple partnerships with incumbents who are not aligned (Cooper et al., 2021). Thus, novice doctoral students enter not only the current research environment, but also its concealed history of task-related conflicts – which in competitive environments can be intricately conflated with relationship conflicts among rivals (Chang & Chen, 2012). While such tensions reasonably complicate development for junior researchers, another related issue is how supervisors' leadership structures the epistemic living space for doctoral students. On the one hand, supervisors should take on the role as research leaders focusing on research *per se*, while on the other hand, they should also function as educational leaders including exhibiting concern for the overall learning environment. However, it occasionally happens that these two forms of leadership are not combined in doctoral education. From this point of departure, we will explore this problem over three generations of researchers in a research environment that has been successful since the 1960s. Besides an original angle on existing research within the field, our results may contribute to further discussions on how to improve the conditions for doctoral students in collaborative and competitive research environments.

SCOPE AND PURPOSE

The scope of our study is within a globally outstanding research environment in the STEM (Science, Technology, Engineering, Mathematics) field. In a former analysis of this environment, focus was on identifying its vertical and horizontal tensions, for instance between supervisors and doctoral students, on the one hand, and among peers, on the other. According to the results, these tensions could have both destructive and constructive social consequences for those involved, while the environment *per se* continued to thrive in its scientific development over time (Sewerin, 2019).

Through the voices of three generations of professors, who had all attained their doctoral degrees and pursued their entire academic careers in this environment filled with creative research, scientific competition, and relationship conflicts, the current study portrays their development as junior team members. Focusing on the professors' retrospective stories about their doctoral student and postdoctoral experiences, we will in each generation outline: (1) how they coped with the environment's relationship conflicts, (2) how their conflict responses were related to external versus internal scientific competition, (3) how this had an impact on their team socialisation, (4) and how their development was framed by their supervisors' leadership. We will highlight similarities and differences between the generations in these regards and discuss the results from educational and leadership perspectives.

SITUATING THE CASE

Our case is situated in an old research-oriented university in Sweden, where the three generations of researchers had pursued their entire careers in the same research environment. The first

generation of researchers were supervised by the scientific founder of the milieu, and they graduated in the late 1960s/early 1970s. Hence, they conducted most of their doctoral studies before the doctoral education reform of 1969,¹ i.e., when doctoral education had not yet been regulated as a structured *education*. Further on, these pioneering researchers became the supervisors of the second generation who graduated in the 1980s, a decade recognised for increased state funding for research to the universities (Heyman & Lundberg, 2002).

When the second generation pursued their postdoctoral careers, the general financial conditions for research changed in the 1990s. In Swedish academia, certain research areas now became politically prioritised, and the need for external funding increased since more state funding was needed to finance expanding undergraduate education (Heyman & Lundberg, 2002). Even though our case belonged to the prioritised research areas with initial strong faculty support, the individual researchers still had to adapt to the new circumstances and compete for funding to a much larger extent than before. Under these conditions, the second generation became supervisors of the third generation, who graduated in the beginning of the 2000s. Thus, the third generation of doctoral students followed the regulations of the 1998 doctoral education reform, which implied that full funding for four years of doctoral studies had to be guaranteed for admission to doctoral education. Within the STEM-field, now and then, this generally means that doctoral students are financed by the supervisors' external funding obtained on a competitive basis (Brodin et al., 2020).

When data were collected for this study, the third generation of researchers had recently become professors and supervisors of a new generation of doctoral students. However, this new generation was not included in our data collection, since we wished to follow how the same individuals acted as *both* doctoral students and supervisors over time.

FRAMING THE CONTEXT IN THEORY

Epistemic living space

Overall, our study is theoretically framed by the notion of *epistemic living space*, where the “interdependence of epistemic practices, institutional rationales, individual biographical decisions, as well as political and broader societal frameworks” is in focus (Felt et al., 2013, p. 513). Assuming that this complex structure both enables and restricts researchers' scope of knowledge, agency, and epistemic action, we are theoretically concerned with the “work researchers have to do to stabilise, protect or extend their room for manoeuvre” in their continuously changing scientific context (Felt et al., 2013, p. 513). Although doctoral students' room for manoeuvre is influenced on many levels, we will in this study concentrate on the supervisor–student relationship at the micro level, and the overall research environment and its team members at the meso level. At the macro level, external scientific competition is assumed to have an impact on doctoral students' team socialisation as well.

Competition and conflict responses

Within competitive research environments, striving for scientific recognition and research grants may be bordered by substantive and affective conflicts within a team (Pelled, 1996). Substantive conflicts relate to the *task*, where group members disagree about, for example, what needs to be done, how it should be done, and why. Task issues may lead to affective *relationship* conflicts

¹ Among other things, it was stipulated in the reform of 1969 that doctoral education should comprise four years of studies leading to a doctoral degree (Brodin et al., 2020).

when group members become emotional about the task, and the two conflicts then fuse into one (Pelled, 1996). A typical such entangled conflict that frequently appears in academia is disagreement about the order of authors on joint publications – or who should be acknowledged as an author at all – particularly in cases of doctoral students’ co-authorship with senior researchers (Dinc, 2014; Morse, 2009).

When (affective) relationship conflicts occur, team members can either choose to *collaborate* with each other to find mutually acceptable solutions, *compete* to gain ground for their own aims and perspectives, or *evade* the conflict by not interacting further with the people involved or just disregarding the problem (Putnam & Wilson, 1982).² According to our preunderstanding, coping with relationship conflicts is energy draining (Isaksen & Ekvall, 2010), whereas dealing with contradicting opinions in task-related conflicts may instead lead to improvement of creativity and performance at both individual and group levels (Isaksen & Ekvall, 2010; Savery et al., 2015; Schulz-Hardt et al., 2008). We nevertheless believe that any type of conflict has an impact on doctoral students’ team socialisation, since the students must somehow cope with the situation.

Leadership in doctoral education

How doctoral students stabilise, protect, or extend their room for manoeuvre and respond to conflicts are assumed to reflect the kind of leadership they are subordinated to. Within the micro and meso system levels of doctoral education, we suggest that senior researchers command two “leadership rooms” in this regard, where one is oriented towards *research* and the other towards *education* (Sewerin & Holmberg, 2017). While both connect to the same epistemic living space for doctoral students, each leadership room follows its own sometimes contradictory logic, and supervisors can be inclined to lead primarily from one of the rooms, dependent solely on their conceptualisation of what doctoral education should be all about – to produce research or to educate researchers. An ideal case would be that the senior researchers used both rooms by adopting a “caring craftwork” in their leadership (Davies & Horst, 2015). In their study of such research leaders, Davies and Horst (2015) found that these leaders “emphasized not their own career, nor the development of particular research opportunities, nor even the science in and of itself; rather, they described themselves as producing and tending to groups” (p. 377), because in their view, this was key to good science. Also, in their leadership they “set the tone for the entire group” (p. 380).

Since leaders’ behaviour affects the entire organisational and social environment in a way that may reconstrue the moral compasses of their colleagues (Moore et al., 2019), it is noteworthy that the participants in our study had pursued their entire academic careers in the same environment. Thus, in our case, we assume that the leadership of doctoral education reflects a social heritage across the generations, where doctoral students learn how to behave as future leaders in the environment for the (academically moral) sake of scientific success. According to Bandura (1999), individuals’ moral standards may change across social contexts, and even more importantly: these standards tend to follow the individual’s situated position in diverse settings. This means that leadership behaviour which may be experienced as harmful by doctoral students, and does not serve them educationally, could later be reconstructed as defensible once the students become research leaders themselves. Striving to produce distinguished research may then override educational care in a process of *moral justification* where one’s “detrimental [leadership]

² In the original work of Putnam and Wilson (1982), these responses to conflicts are labelled as *solution-orientation* (collaborating), *control* (competing), and *non-confrontation* (evading), respectively.

conduct is [...] personally and socially accepted by portraying it as serving socially worthy or moral [e.g., ego-centred scientifically successful] purposes” (Bandura, 1999, s. 194). Thus, senior researchers who embody “caring craftwork” in their leadership seem to be key to preventing that the same patterns of entangled task and relationship conflicts are transferred over generations. On the other hand, this might be a challenge in an outstanding research environment where competition can take over.

METHOD

Instrumental case study

This study was based on an instrumental case study design which is suitable for exploring a particular phenomenon within a case that is ideal for its concrete manifestation (Stake, 1995). In our case study, the phenomenon studied is early career researchers’ *responses to relationship conflicts* among the senior researchers in their research environment and how these function in team-socialising ways, while the case consists of a globally successful research environment within the STEM-field. Based on retrospective stories from three generations of professors in this environment, we could follow how the same individuals acted as *both* doctoral students and supervisors over the generations. This means that our research design allowed us not only to study patterns of team socialisation both within and across the generational groups, but also how the junior team members’ socialising patterns were framed by their supervisory leadership – and how this leadership could be transferred from the one generation to the next.

One might argue that the professors’ retrospective stories of their periods as junior team members (which also reflected their supervisors’ leadership) were based on reconstructed memories, and hence not completely reliable with respect to capturing the local and temporal meanings of their experiences. However, we argue the opposite – that their historical distance to their own development instead enabled deeper understanding of the bigger picture – what actually happened and why, and how this affected their development.

Epistemological approach

Overall, our case study is framed within a constructionist approach to knowledge production. This entails that we are epistemologically interested in the local and temporal meanings of the participants’ experiences, and that we understand our interpretation of these meanings as dependent on both our own and the participants’ perspectives (Gergen, 1994, 1999). For these reasons the epistemic value of this case study is not generalisation, but learning and utility (Flyvbjerg, 2011) in that it creates a reference point to analyse and understand the conditions for early career researchers’ team socialisation in other similar contexts.

Participants

All participants in our study had continued to pursue their careers in the environment of this study. The scientific founder of the environment, and twelve researchers (nine men and three women) from the three following generations consented to participate in the study, giving an age span stretching from 35 to 87 years of age. Taken together, the sample consists of almost all researchers from the first and second generations of doctoral students, while, for practical reasons, the third generation had fewer participants. On the one hand, the entire environment was subjected to institutional reorganisation when the last interviews were planned, which complicated contact with potential participants from this generation. On the other hand, the final data collection confirmed data from previous participants rather than adding new perspectives to the studied phenomenon, indicating data saturation.

On the basis of these premises, the first generation of early career researchers consists of six doctoral students who were supervised by the founder, and who later became professors and supervisors of four doctoral students in the second generation. In turn, all doctoral students from the second generation also became professors and supervisors for the two doctoral students in the third generation, who graduated in the beginning of the 2000s. See Table 1 for an overview of the generations, where the participants are labelled in relation to their generation (1–3), and named as individuals (a–l).

Table 1. Generations of researchers in the study

1960s ----->	2000s		
Establishment of the environment by the scientific founder	Researchers generation 1	Researchers generation 2	Researchers generation 3
	1a–f	2g–j	3k–l
Graduated:	Late 1960s/early 1970s	In the 1980s	In the early 2000s
Supervised by:	Scientific founder	Generation 1	Generation 2

Data collection

Data were collected by the second author through unstructured, in-depth interviews around a set of focused themes, where the participants were asked to retrospectively reflect upon their doctoral student experiences in this research environment. The themes covered their doctoral work related to scientific breakthroughs, social relationships within the team, tensions and conflicts along the way, and the environment's overall scientific and organisational development. To create a sound background for interpreting their stories – especially from the first generation – the scientific founder was interviewed as well. Each of the interviews lasted for one and a half to two hours, and all were recorded and transcribed verbatim for analysis. All quotes in this article have been translated from Swedish into English.

Analysis

The interview transcriptions were analysed by both authors using *theoretical thematic analysis*, as defined by Braun and Clarke (2006). This meant that we initially read through the transcripts to grasp the whole environment, and thereafter created the data set for analysis by focusing on content related to scientific competition and relationship conflicts that forced the students to somehow “stabilise, protect or extend their room for manoeuvre” in their *epistemic living space* (Felt et al., 2013, p. 513). After these preparations our subsequent thematic analysis was informed by the theoretical framework of Putnam and Wilson (1982) including the three categories of competitive, collaborative, and evasive conflict responses.

Ethics

According to Swedish law, ethical approval was not needed for this study (SFS 2003:460). All participants were informed about the purpose of the study, how the results would be distributed, and that all participation was voluntary and could be withdrawn at any time. To protect the identities of the participants, all names and places have been replaced by coded alternatives. Moreover, all participants were invited to comment on quotations from their own interviews before the results were distributed to others.

RESULTS

Many interviews revealed the positive notes of this environment's history, including its climate, rituals, and joyful collaborations. For instance, one researcher from the second generation said that: "I've been working in a candy store all my life" (2g). On the other side, there were also stories from all generations about less pleasant events and tensions that they had to deal with, and a researcher from the same generation explained that: "This is no Eden; just beneath the surface there is plenty of rivalry and strife" (2h). Focusing on the latter circumstances in this study, four themes in our results illustrate the early career researchers' team-socialising conflict responses: *performing beyond the big bang(s)*, *engaging in quasi-collaboration*, *navigating in secrecy*, and *collaborating for success*.

Performing beyond the big bang(s)

The environment was originally established by a senior researcher and his doctoral student who collaborated on a joint, ground-breaking discovery. Soon after this advance the senior researcher became a professor at a competing university in Sweden and built a new research team with young scientists there. This caused a serious and irreversible rift between the two researchers, so they agreed to divide their broader research field into roughly two halves, where each of their own teams would research only one of the areas. The younger founder who stayed in the original environment, explained that: "We saw reasons for fierce competition immediately and we did not want any unpleasantness between our two teams."

However, the professor at the competing university retired soon thereafter, and immediately a narrative about which of the two founders had contributed the most to the discovery was kindled. The younger founder, who was still active in the field, experienced a lack of scientific recognition and felt that it caused him "a lot of pain" – and his bitterness towards the competing team at the other university had a significant effect on the collaborative climate of his own team. For instance, members from the first generation of doctoral students recalled that he did not attend any meetings with the other group, and collaboration between the competing university teams was certainly not encouraged. Hence, the founder adopted an evasive conflict response to the whole situation.

After a while, it turned out that the solution of dividing the research field into two separate parts did not work out in practice, and the research territories of the two university laboratories started to overlap. This further increased the antagonism between them, and one researcher from the first generation of doctoral students confirmed this:

Early on, when the discovery was used to map phenomena in this field, there were only two centres of relevance for this research in the world – and they hardly had any contact with each other. (1b)

However, among the students this antipathy triggered their competitive minds, so they applied a competitive conflict response toward their external rivals. From the same generation, one researcher explained that "we disliked them altogether, no doubt about that" (1c), and another said that "there was competition, and this created enthusiasm among us younger investigators" (1d). Thus, the students worked harder to *perform beyond the big bang(s)*, and having external antagonists was rewarded by a greater team commitment: "When the surroundings become unfriendly or hostile, then you must bring together your forces. I think we did that rather well" (1b). Accordingly, by competing against the external team, the students stabilised and protected not only their room for manoeuvre, but their entire epistemic living space.

Engaging in quasi-collaboration

When the founder became a full professor and took on a formal administrative role leading the department, he handed over his laboratory to his former doctoral students, who were now senior researchers. With the growing number of internal teams, new territories emerged, and a researcher from the second generation recalled that some postdoctoral researchers “could not even be in the same room” (2j). The internal territorial conflicts and their subsequent evasive conflict responses also became more intense with the increasing demands for external funding in academia, as a researcher from the third generation illustrated:

Some researchers are very careful about defending their territories. They have sort of pissed around a certain territory and nobody is allowed in there. The most common tension, I think. Then there is the doctrine: If you are not with us, you are against us. If you are friends with him, you cannot be friends with us. (3l)

However, all of the researchers still belonged to the same research environment, and had to act accordingly to strengthen their positions in the external scientific competition. As a golden mean out of this team-socialising dilemma, the students adopted an evasive conflict response in their social practices, and concurrently engaged in scientific *quasi-collaboration* by relating to each other's work at a scholarly level (e.g. in their papers). To keep themselves updated with the research frontier, similar quasi-collaboration could be noticed in relation to the external team as well. In this sense, team socialisation meant acquiring the all-embracing knowledge needed for professional performance without challenging any territorial boundaries.

Within the environment, another form of quasi-collaboration could occur as well – although not for too long. This happened when the founder wanted to be co-author on his previous doctoral students' articles without actually contributing. As he had played an important role in their development, the younger scientists were initially willing to symbolically pay back their debt of gratitude by including him in the list of authors on publications. Yet the situation became tension-filled over time, since the postdoctoral researchers now pursued their own careers, and such quasi-collaboration was not accepted by their own doctoral students. Given that the new generation of students had no personal history of gratitude to the founder, they were not willing to adopt an evasive conflict response. Thus, their supervisor had to put the quasi-collaboration to an end:

Well, it became awkward. I had my own PhD students now who reasonably questioned whether the procedure was appropriate and correct, so I was under pressure to explain to my former supervisor that from now on we are publishing our own papers. (1b)

Thereby, the second generation of doctoral students contributed to changing the rules for team action in the environment's epistemic living space.

Navigating in secrecy

From the researchers' stories, it appeared that the territories encircled a borderless land of secrecy, which enabled junior researchers to clandestinely collaborate across the seniors' boundaries. For the postdoctoral researchers, it was considered necessary to hide new discoveries from the former supervisor with whom they had started their scientific career, and this evasive approach to potential conflicts could be found in all generations. A researcher from the first generation told how he combined visiting his family in the external competitors' university town with meeting

a researcher in the competing team. Even though this alliance was beneficial for his scientific development, he kept it secret from his supervisor:

I never dared to tell my old supervisor that I was there and had contact with them. I knew there was a sting to it, and the memory still lingers. (1b)

Another report from the same generation (1f) revealed that secretly making slight changes to the original discovery caused considerable worry to the founder who became dissatisfied with them and claimed they had gone too far when he later discovered their adjustments. And a similar pattern was repeated in the following generations. One researcher from the third generation explained:

Clashes and rivalry have been mounting among the seniors here. Each one thinks that he is the boss. I have always worked closely with one of them, but lately I have started to work with another [...] but I have to hide this collaboration, as if I'm over on the other side. (3k)

The postdoctoral researchers' secret collaborations across the seniors' territories turned out to be beneficial for the environment's overall scientific development, since such secrecy could be noticed prior to just about every significant new discovery – in method, theory, or results. However, the situation complicated the epistemic living space for their doctoral students since they had to play the same secret game as their junior supervisors did. Also, with increasing complexity within the research field and, in addition, the policies of grant providers, the conditions for navigating the landscape of secrecy changed over time. Accordingly, the third and following generations of doctoral students additionally had to hide their work in progress from each other, their peers, so there was now a situation in which everyone was hiding everything from everyone else – except when they belonged to the same internal team:

When people don't dare to disclose what they have been up to recently, that is not good, I think. [...] When I was a PhD student [in the 1980s], I did not experience this. I was never forbidden to share my findings with the others. But I know that today's students are not allowed that here any longer. There is so much investment in each report so that it is unique when published. (2i)

Collaborating for success

In order to survive as scientists, the researchers had to *collaborate for success* – even when their scientific ideas were not compatible. At the micro level the students of the third generation endeavoured to receive extra attention from their supervisors to promote their career development in the team. Those who succeeded in this struggle were all extremely talented and hard-working while also being predominantly “young, hungry, and competitive” in their approach, as one researcher (2i) from the second generation expressed it. However, close and successful collaboration with one's supervisor did not necessarily involve a conformable approach in these students, but rather the reverse, as a researcher from the third generation noticed in his role as supervisor:

My best PhD student was extremely obstinate. We had discussions where my other students thought we would get into a physical fight. But nowadays we are best friends and get along privately too. [...] The best work we have done has arrived through a contest, when one has had to sharpen the arguments to think in new pathways. (3g)

Thus, an initially competitive conflict response in this case evolved into a *collaborative conflict response* related to both the external and internal competition. Since the scientific outcome would be a win-win-situation for both parties, the student could by this means both protect and extend his room of manoeuvre without any cracks in the supervisor–student-relationship.

At the meso level, doctoral students of the later generations occasionally witnessed an armistice among the otherwise combative senior researchers. This happened when the funding conditions required them to adopt a collaborative conflict response to the threat of losing resources, meaning that they had to remain united up front in order to obtain grants for further research. From a senior researcher's perspective, a participant from the second generation explained the situation in the following way:

When we apply for grants, we compete individually with each other and this does not especially encourage teamwork, but it has nevertheless inspired a strategic positioning. We are all aware that in order to receive strategic grants for environmental scientific efforts, we know we have to set up collaborations, so we do. (2h)

On the other hand, still other researchers speaking from their postdoctoral experience also thought that you cannot win as an individual every single time. Thus, instead of minding their own business, they developed a strong sense of identification with the whole environment:

My colleague and I, we contend for the same positions and grants all the time. But it is not a problem since we know that not all of us will receive everything all the time. His success is good for me in the long run, and likewise mine for him. (3k)

However, far from all senior researchers shared this collective spirit of mind, and the moments of armistice and collaboration within the environment ceased when the resources were secured. Accordingly, all that changed in practice through the *collaboration for success* were the delineations of territorial borders, and the doctoral students still had to engage in quasi-collaboration and navigate in secrecy across the team constellations.

Summary

Taken together, the researchers' stories revealed four manifestations of team-socialising conflict responses in scientific competition including: (i) *perform beyond the big bang(s)* based on a competitive conflict response, (ii) *engage in quasi-collaboration* and (iii) *navigate in secrecy* through evasive conflict responses, and (iv) *collaborate for success* related to a collaborative conflict response. Whereas all of these four team-socialising conflict responses were elicited by external competition, the two evasive conflict responses of *engaging in quasi-collaboration* and *navigating in secrecy* were, respectively, also related to the internal competition within the environment.

Searching for similarities and differences across the generations, we find that all generations of doctoral students were engaged in scientific competition against external team(s) which made them *perform beyond the big bang(s)* and *collaborate for success*. Also, in all generations, the students had to *navigate in secrecy* and *engage in quasi-collaboration* to avoid clashes with their supervisors. Along with the increased competition for funding over the years, the later generations of students also had to navigate in secrecy among peers. Furthermore, a salient pattern through the history of this environment was that each generation of doctoral students worked with research leaders who strongly defended their research territories. This result cannot be explained by external circumstances, since the academic conditions for producing research

changed radically over the generations, while doctoral education was also subjected to educational reforms in 1969 and 1998. Rather, the defensive leadership approach seemed to be a social heritage from the one generation to the next, and therefore, the same type of conflict responses could be seen across the generations. For an overview, see Figure 1.

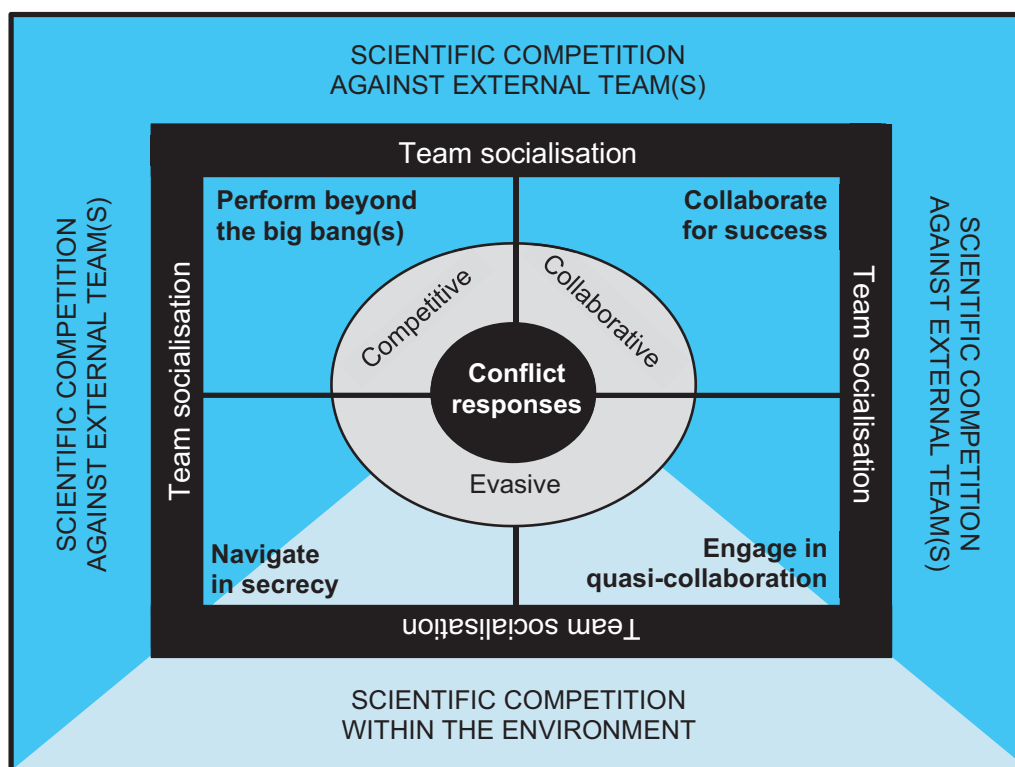


Figure 1. Generational team-socialising conflict responses among early career researchers in scientific competition

DISCUSSION

Already in the 1930s, Mead held that nothing unifies a group faster than the threat of, or actual conflict with, another group (Athens, 2012). This was clearly the case in our study, where the doctoral students pushed themselves to collectively *perform beyond the big bang(s)* after a serious relationship conflict between the two senior team leaders. Although the competitive situation certainly helped develop the students into distinguished scientists, their scope of learning was restricted by signals from the founder that networking with the other team was unthinkable. Since various social interactions are beneficial for widening one's learning mind (Baker & Lattuca, 2010), such restrictions hinder the progress of both early career researchers and science. Even though some younger scientists circumvented the territorial boundaries by *navigating in secrecy*, their supervisors' defensive leadership nonetheless created an epistemic living space where the students' actions (obedient and disobedient alike) were ensnared by their supervisors' power.

The doctoral students' socialisation into a dependent approach was also confirmed by the fact that they continued to symbolically pay their debt of gratitude to their supervisor as postdoctoral researchers by including him in the list of authors on publications, even though he had not in practice contributed to the work. In a sense the same scenario illustrates collaborative failure as well. Sacco (2020) suggests that "complete success" in research collaboration entails both bibliometric outputs and experiences of a supportive environment, while "visible success" involves bibliometric outputs, but is coupled with "experiential failure" with respect to the collaborators' interpersonal relationships and resources. It appears that the junior researchers in our case were mainly predestined to experience the latter, since their struggling for independence came with a high risk of becoming a victim in still another relationship conflict. Hence, the entire environment was led from the "research leadership room" (Sewerin & Holmberg, 2017) with little concern for educational "caring craftwork" beyond the leader's own ego (Davies & Horst, 2015).

When the environment was founded in the 1960s, doctoral studies were not yet regulated as a formal *education* (Brodin et al., 2020). Combined with hard competition against an external research team, it appears that the scientific founder and supervisor of the first generation of doctoral students cared rather more about protecting his research field than widening the opportunities for learning. When the first generation became supervisors of the second generation in the 1980s, doctoral education was now formally regulated as such, and the competition for research funding was not yet too severe (Heyman & Lundberg, 2002). Thus, the external conditions for including an educational leadership approach should have been promising in this decade. Still, the new cohort of supervisors acted in ways similar to those of their former supervisors, which means that their leadership was primarily a matter of defending research territories. Hence, the students kept *engaging in quasi-collaboration* and *navigating in secrecy*. Furthermore, with the significantly increased competition for research funding in the 1990s and afterward (Heyman & Lundberg, 2002), the later generations of students experienced the same leadership behaviour from their supervisors. However, they also experienced temporary periods of armistice when there was a need to *collaborate for success* in receiving research grants.

Given that our participants, as junior team members, had no pleasant memories of the defensive approaches from the senior researchers, it is noteworthy that they continued along the same lines when they became professors themselves. While the external circumstances certainly enabled a defensive research leadership to thrive in the environment over the years, there are examples in the literature where leading research *and* education is possible with a caring approach (Davies & Horst, 2015). Also, considering the second generation of researchers who had no personal conflicts with the external team members, or experienced a harsh competition for research funding as did the later generations, the continuous defensive research leadership cannot be explained by external factors only. Rather, this result suggests that the participants' moral compasses were reconstrued by the environment's leadership over time (Moore et al., 2019), and that their changed career positions enabled the moral justification (Bandura, 1999) for using a defensive approach in their own leadership. In other words, the students' evasive conflict responses and the supervisors' defensive leadership are just two sides of the same coin of socialisation: a learned successful way to protect their scientific careers, while their power positions determined which way would be the most successful.

A possible end of the story

One might argue that a caring leadership is linked to certain personalities of the leaders, but recent research within organisational psychology points rather to a more systemic approach to

leading. In line with this research, we suggest that a defensive approach may well be transformed into a caring approach by considering doctoral education as a system to be led in parallel from the two “leadership rooms” of *research* and *education*, respectively (Sewerin & Holmberg, 2017). Whenever the logics of these two rooms are in conflict, for instance when the institutional pressure to rapidly publish articles is incompatible with doctoral students’ winding and slower learning process (Hakkarainen et al., 2014), we advocate that the educational leadership room should decide the direction for further action. After all, doctoral education is in its essence a place for *learning* by doing research (Brodin et al., 2020).

Of course, a caring leadership approach will not eliminate relationship conflicts in collaborative environments, since such conflicts usually emerge in any teamwork (De Dreu & Gelfand, 2008). However, by connecting leading research with leading education in a caring approach, we suggest that it would be possible to use the “educational leadership room” as a less tension-filled space to jointly discuss and reflect upon relationship conflicts occurring in the “research leadership room” – and how to solve them for pedagogical reasons. A concrete example of such a space could be the “supervising committee for supervisors,” where supervisors meet regularly to improve the conditions for doctoral students’ learning. Within such a committee there could be continuous discussions, e.g., about ethics in supervision, how to promote students’ creative and independent development in doctoral education (Brodin et al., 2020), and the *Vancouver convention* offering recommendations for the inclusion and order of authors on publications. Nonetheless, in the end, we claim that it is in principle up to each individual supervisor to adopt a caring approach in his or her supervision.

CONCLUSION

In this case study, we explored how three generations of researchers coped with relationship conflicts in a globally outstanding research environment within the STEM-field, and how this affected their team socialisation as doctoral students, and further on, their leadership as supervisors. The most important findings are that all generations of younger scientists *navigated in secrecy* and *engaged in quasi-collaboration* across the senior researchers’ research territories to develop as researchers without creating conflict with their supervisors. Overall, the students’ evasive conflict responses reveal an epistemic living space where the senior researchers’ defensive approach restricted the students’ scope of learning, and the junior scientists also struggled for independence in relation to their supervisors. Still, the younger scientists ultimately developed a defensive approach themselves as leaders in their postdoctoral careers, which indicates that the senior researchers had functioned as role models during the doctoral studies of the younger researchers. Notwithstanding that scientific competition may reinforce a defensive approach among researchers, we hold that the real issue in this case is about leadership. Leadership in doctoral education is not solely about leading research, but it is essentially also a matter of educational leadership, including care for the entire social environment and all its associated extended developmental networks that are beneficial for doctoral students’ team socialisation and overall scientific development.

AUTHOR CONTRIBUTIONS

This article was written by Eva M. Brodin, who was also responsible for conceptualising the problem, and analysing the results. Throughout the process, there has been a close dialogue with the second author, Thomas Sewerin, who conducted the interviews.

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