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Boys and Girls in the Classroom—About Didactical Perspectives in Similarities and Differences

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Abstract: The lower academic performance of boys in compulsory school has long been a well-known fact, but only in the last decade has it been shown in the public debate. Various explanations for boys' underperformance mainly include background, expectations, norms, and hierarchical gender order. Few studies have focused on what can be affected, namely the teaching in the classroom. In addition, studies have not, to any significant extent, focused on the students' perceptions. This study was conducted through eight group interviews with 2nd and 5th-grade students and explored how boys and girls perceive learning in a classroom context. Similarities and differences in perceptions emerged through a reflexive thematic analysis from a didactic theoretical perspective—the similarities in perception concerned the teacher's leadership, interactions, learning strategies, and learning environment. The differences were about reprimands, different developed learning strategies, confidence in the teacher, and the social atmosphere. The result indicates a need for the teacher to be more aware of the processes going on in the classroom and to build both social and learning support structures with a focus on learning strategies.

Keywords: didactical perspectives; differences and similarities; gender in the classroom; primary school

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1. Introduction

A problematic trend has been noticed in recent decades: boys' academic performance has gradually decreased compared to girls. This phenomenon is recognized globally as 'A Boy Crisis' (Farrell & Gray, 2018). However, boys' lower academic performance is not new. A meta-analysis (Voyer & Voyer, 2014) shows that boys' lower performance is not a newly emerging crisis, as researchers in the early 2000s wanted to call it. The meta-analysis results confirm the benefits for female students in most course subjects in the school system for at least fifty years. In the last decade, however, authorities and organizations worldwide have drawn attention to the problem and its effects. An observable pattern within OECD countries underscores the superior scholastic performance of girls, with contemporary disparities indicating a notable gap in educational attainment among boys (OECD, 2022). Sweden and the rest of the Nordic countries excel in students' learning outcomes, for example, in the international measurements of PISA and PIRLS. However, there are still strong indications of gender inequality between boys and girls.

Like in the Nordic countries, girls generally perform better academically than boys in most Western countries, but Sweden exhibits the highest gender differences among Nordic countries (OECD, 2022). Low-performing boys with an immigrant background and/or lower socioeconomic status are particularly affected by these disparities (Broström & Jansson, 2022). According to the National Agency for Education

(Skolverket, 2022), more than 25% of students did not complete their education following the curriculum for compulsory schools. This was particularly prevalent among boys. With the boys, the results showed a more comprehensive range of results, with more high and low performers than among the girls. In reading comprehension, the gap between boys and girls was the largest among the participating countries (OECD, 2022). The significant differences in grades suggest that the school may not fully succeed in balancing and compensating for the varying conditions within the student group, particularly for boys with foreign or lower socioeconomic status (SES) (Skolverket, 2022).

Boys of lower socioeconomic status (SES) face educational challenges, not only in Sweden but in all Nordic countries. The gender differences in school performance described earlier are significant across all socioeconomic groups, but for foreign-born girls, the trend is different from that of boys. In terms of academic success, foreign-born girls have even overtaken native-born boys, while foreign-born boys are the worst performers. Boys with a foreign background are one of the groups facing the greatest challenges in today's school system, which may potentially lead to exclusion both in the labor market and in society at large (Eriksson, 2021).

Surprisingly, little international and national research has been devoted to teaching and what happens in the students' learning environment regarding differences between boys and girls (Samuelsson & Samuelsson, 2016; Stenberg, 2024). Additionally, research about boys' perceptions of their own comprehension of situations in the classroom is limited (Havik & Westergård, 2020; Skipper & Fox, 2022). Relevant questions to ask are how the teaching is designed, how the learning environments support or hinder boys or girls in their learning, and how students learn and use appropriate learning strategies. The limited knowledge of the intertwined relationship between teaching methods, teaching, learning, and classroom strategies, along with a knowledge gap concerning gender differences in the Swedish educational system (Barnombudsmannen, 2021; Eriksson, 2021), form the backdrop of this study. After all, it is the factor in the classroom and through teaching that students' learning can be affected.

In this study, we, therefore, address the existing research gap and examine the case of a Swedish comprehensive school. The study explores how the boys and girls experience and describe the learning environment, teachers' teaching strategies, and their learning. The specific aim of this study is to describe and analyze differences and similarities in perceptions of impacts on their learning in the classroom between boys and girls from a didactical point of view. The following research questions have guided the research process:

- How do boys and girls perceive interactions and teachers' leadership in the classroom?
- How do boys and girls perceive their learning strategies?
- How do boys and girls perceive the learning environment?
- What differences and similarities emerge between the genders?

Examining gender-based perspectives offers valuable insights into potential factors contributing to boys' underachievement in school. This study's results will be important to teachers and provide insights into how teaching can better support boys' learning. They also have implications for parents, policymakers, and others interested in promoting an equitable school and supporting the learning of all students.

2. Previous Research

To contextualize the study, we will base our research on previous didactic studies, starting with the learning environment and then focusing on the teacher, students, the relationship between teachers and the boys, and finally, learning strategies.

2.1. Learning Environment

The concept of learning environment is frequently used in schools, but it is defined differently by different researchers. It is complex and includes many different perspectives and aspects, which interact with each other (Björklid & Fischbein, 2011). In this study, we use the definition of the learning environment as it is described within didactical theory. According to Uljens (1997), the learning environment encompasses the social, psychological, and cultural context in which learning occurs. Didactical theory views this complex system as shaped by multiple factors, such as the teacher's practices, students' engagement, and school and cultural context.

Over the past few decades, research has shown that the environment students perceive in classrooms is a major predictor of their learning outcomes (Koul et al., 2023). Social and emotional interactions between peers, students, and their teachers significantly influence engagement, learning outcomes, and attitudes toward studying. A positive emotional climate in the classroom is characterized by teachers who care and are concerned for students, consider their points of view, encourage cooperation and respect, and are aware of their learning needs. In a study concerning STEM subjects, significantly more negative attitudes could be identified by the girls in all of these aspects. However, some current research indicates that using digital learning resources can benefit boys' achievements (Almusharraf et al., 2023). Overall, there is a research gap concerning the learning environment with gender differences. Instead, research concludes different spectrums, such as teachers and teaching methods. Ralph et al. (2023) show the importance of closer examinations of perceptions of gender in classrooms.

2.2. Teacher

Teacher and teaching quality are critical factors in improving student outcomes, which seems to be the research consensus (cf. Hattie, 2009). Skilled teachers possess pedagogical content knowledge, effective problem-solving strategies, communication skills, awareness of classroom dynamics, and respect for students (Federici & Skaalvik, 2014; Guerriero, 2013; Havik & Westergård, 2020). However, research suggests that a teacher's beliefs about their students, such as their performance level, gender, and background, can significantly affect their behavior towards them (Brandmiller et al., 2020). This can result in different feedback provisions, with high expectations leading to increased support and opportunities that enhance students' motivation and performance. Low expectations may diminish motivation and achievement.

Put in a gender context, Doerfler (2016) describes that due to stronger relations, teachers perceive girls perform better in classroom settings than boys. Conversely, boys with whom the teachers have weaker relations are more dependent on social and educational support from their teachers (Morin, 2020). Concerning gender, research shows that teachers perceive girls as being easier to teach, compliant, and less likely to challenge authority, whereas boys require more authoritarian control for them to be taught (Doerfler, 2016; Frederick, 2023; Younger & Cobbett, 2014).

2.3. Students

There is some research on boys and girls in primary school and perceptions of their learning. Less than a third of students in grade five could express how they learned and displayed unreflected strategies, for example, students use expressions such as "I think I learn best by reading" or "I think I learn best with a friend". A current study from class 3 and class 5 demonstrated (Bostedt et al., 2023) that students learned best when they were allowed to work with peers, when the teacher provided a clear structure for the work, and when the teacher had a varied way of working. The need to have

the knowledge and abilities required in a learning situation seems greater in boys than girls (Manzano-Sánchez et al., 2021). These researchers also established that boys need a certain degree of self-determination (control over their lives) to feel motivated for their studies. Regarding motivation, Vantieghem and Van Houtte (2018) have identified a higher degree of autonomous motivation in boys' groups compared to girls' groups. Research on students' social responsibility has shown that girls, to a greater extent than boys, take more social responsibility for relationships with the teacher and classmates, which results in higher grades for them (Giota & Bergh, 2021; Vantieghem & Van Houtte, 2018). Further, previous Nordic studies have identified a harsh social climate and complex interactions that many boys have to deal with in order to cope both at school and in their peer groups (Åhslund, 2019). Paradoxically, in the Swedish school context, girls seem more critical of schools and teachers than boys (Boström & Bostedt, 2021).

2.4. The Relationship Between the Teacher and the Boys

The relationship between teachers and the boys is crucial for the boys' academic success. Boys at a higher level require secure relationships and relational support to demonstrate motivation and commitment towards their studies (Patrick et al., 2011). Boys' academic performance deteriorates significantly when classrooms lack support and social security. They show less interest and engagement in the classroom and exhibit avoidance strategies (Francis et al., 2010; Patrick et al., 2011). High expectations can inspire students to do their best, while low expectations undermine academic outcomes (Morin, 2020). Gender biases in teacher expectations can also be a significant issue (Doerfler, 2016; Lunabba, 2013). Lunabba (2013) argues that there are boys—mainly quiet and withdrawn—who receive little or no attention and, therefore, do not get the support they need. Expectations about students' abilities and potential can become self-fulfilling prophecies, with high expectations leading to increased support and opportunities that enhance students' motivation and performance (Rubie-Davies et al., 2015). On the contrary, low expectations may result in diminished motivation and achievement (Brandmiller et al., 2020). In a gender context, Doerfler (2016) describes that teachers perceive girls to perform better in classroom settings than boys due to stronger relations. Despite lower expectations, boys rely more on their teachers' social and educational support (Morin, 2020).

2.5. Learning Strategies

Finding a uniform definition of learning strategies is not easy. However, in many contexts, the importance of students developing their learning, becoming autonomous, and acquiring awareness of good "tools" in lifelong learning is emphasized by (Schleicher, 2022). Learning strategies are crucial tools in lifelong learning, and effective strategies reinforce students' self-reliance and awareness (Boström, 2012). Hattie and Donoghue (2016) distinguish four strategies that can help improve learning and understanding: cognitive strategies for deeper understanding, meta-cognitive strategies for regulating the learning process, motivational strategies for engagement, and management strategies for navigating information. Students with more self-regulatory and deep learning techniques tend to be more successful in their learning (OECD, 2013). Self-regulated learning depends on individual autonomy in monitoring, managing, and regulating actions toward a goal (Efklides & Metallidou, 2020). In this study, we follow Boström's (2012) definition of learning strategies, namely "the conscious or unconscious or conscious choices of the learner… (p. 14)" because this gives us a broad understanding of the concept.

Boys and girls handle schoolwork encompassing diverse learning strategies and goal orientations (Hofverberg, 2020; Niemivirta, 2004). According to Niemivirta (2004), girls employ a more learning-orientated (mastery strategy in their academic pursuits. The girls'

strategies focus on acquiring new knowledge, enhancing their knowledge base, and developing their skills, reflecting a learning and success orientation. Boys more often strive to outperform their peers and demonstrate competence, reflecting a performance orientation (Hofverberg, 2020; Johanson & Rowlands, 2012). Niemivirta (2004) noted that some boys actively refused schoolwork to avoid failure. For both boys and girls, the fear of failure, both academically and socially, triggers avoidance strategies as protective mechanisms to preserve self-esteem and social standing (Jackson, 2006; Skolverket, 2022). Avoidance strategies are present among girls but not as pronounced as among boys. In addition, these avoidance strategies may contribute to boys' perception of being disinterested, unmotivated, and disruptive in the classroom, especially in the lower grades, where many boys dislike challenging activities (Myhill, 2002).

3. Theoretical Framework

One way to theoretically illuminate the complexity of factors influencing learning and classroom dynamics is through the German didactic triangle (Künzli, 2000). The German didactic model can be used to illustrate the complexity of teaching practice where different factors interplay (Jank & Meyer, 2003). The didactic triangle, consisting of teacher, student, and subject, constitutes a basic framework for teaching and learning in the classroom environment (Wahlström, 2016). Teaching and learning are complex processes involving interactions between teachers, students, and subjects. The didactic triangle offers a framework for understanding these interactions and how they affect teaching quality and outcomes. The triangle's three corners are the teacher, the student, and the subject. This results in three axes (relationships): subject-student, student-teacher, and the final one, teacher-subject. The different components of the triangle (as depicted in Figure 1) interact in various ways, to different extents, and in different contexts with each other (Hopmann, 1997).

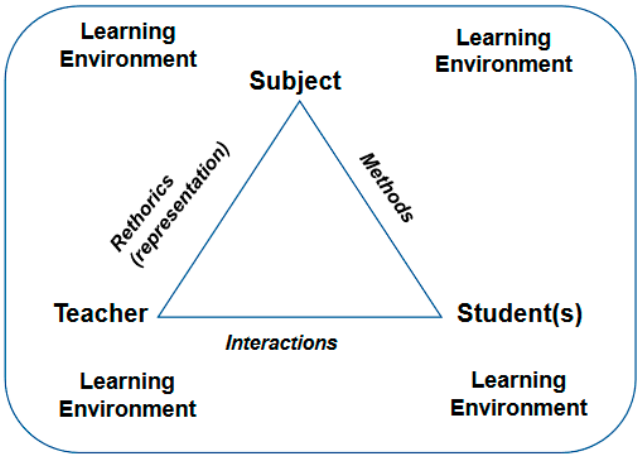


Figure 1. The didactic triangle and the surrounding learning environment (Gidlund & Boström, 2017).

The teacher is a central actor in the didactic triangle. It is the teacher's responsibility to plan and implement the teaching in a way that promotes the students' learning. The teacher acts as a guide and facilitator of learning, and he has a crucial role in organizing and structuring teaching activities, communicating knowledge, and supporting students in their development. The students form the other side of the didactic triangle. Every student has unique needs, interests, and learning strategies. The teacher must adapt the teaching to meet the students' differences and promote their learning in the best possible way. The subject constitutes the teaching content and is the basis for the student's learning. It can cover different subject areas. The axes between these three cornerstones—rhetoric,

interaction, and methodology—characterize the complexity of didactics (Ullström, 2009). The didactic triangle is surrounded by a context, which Ullström calls "teaching rooms" (p. 17), and by Gidlund and Boström's (2017) learning environment.

The model demonstrates the complexity of teaching practice where various factors interact. This implies that the model, starting from teaching and the learning environment, highlights the different factors conditioning learning. Figure 1 illustrates the fundamental aspects of the teaching situation, including the content/form of teaching, the students, and the teacher. The learning environment and teaching situation delimited in this paper are bounded by the classroom context.

Further, we use the didactic triangle to illuminate different aspects of the classroom context based on the interviewed boys' and girls' perceptions of learning and teaching. Furthermore, the didactic triangle provides a tool for systematically reflecting on how teaching can be organized to create the best possible development for each student and specific groups, in this case, boys. By exploring different aspects and their impact on teaching quality and outcomes, development and improvements in the classroom can support both boys' and girls' learning (Wahlström, 2016). By applying the didactic triangle as a theoretical framework in the analysis, we can understand how to use and interpret the significance of the results.

4. Method

This study takes a qualitative approach, analyzing data with reflective thematic analysis (RTA). It aims to examine and delineate variances in boys' and girls' perceptions of different facets of the learning environment and teaching. What factors do they identify as sources of motivation, and what hindrances do they encounter? This qualitative approach, utilizing reflective thematic analysis (RTA), is justified as it effectively explores and delineates gender-based differences in perceptions, identifying motivational factors and hindrances.

One of the principal virtues inherent in qualitative research interviews is their capacity to comprehend individuals' experiences and perspectives profoundly. Through interviews, the researcher gains entry to the subjective realms of respondents, affording a more intricate and multifaceted comprehension of the phenomenon elucidated by preliminary quantitative investigations (Rowley, 2012). In this study, the interviews were customized to fit each respondent's thoughts, needs, and communication style. This flexibility enabled a more nuanced analysis of the data, leading to a better understanding of the gender differences.

4.1. Interview Guide

In this study, we used a semi-structured interview guide following the recommendation by Rowley (2012). A semi-structured interview guide with relatively open-question themes provided a framework, while allowing flexibility to pursue interesting or unexpected responses (Johanson & Rowlands, 2012). The thematic areas of the interview guide were constructed with the ambition of capturing the boys' and girls' narratives while still providing us with support for the areas intended to be explored during the interview.

4.2. The Interviews (Sample and Interview Process)

The setting of the interview was a primary school in one of the more vulnerable socioeconomic areas of a larger municipality in the middle of Sweden. Over 50% of the school's students had parents of immigrant descent. In our study, we conducted eight focus group interviews (a total of thirty-two students participated) to ensure a comprehensive exploration of the research topic, reaching theoretical saturation as no new themes emerged after this number of discussions (Table 1). This sample size was deemed sufficient based on

established qualitative research guidelines and the richness of data collected, allowing us to address our research questions thoroughly. Further, our discussions were anchored in the interview guide for these sessions (Appendices A and B). The interviews lasted 28 to 47 min.

Table 1. Description of the interview.

Year (Group)	Number of Respondents	Gender	Time
2 (1st)	4	Girls	28 min
2 (2nd)	4	Girls	47 min
2 (3rd)	4	Boys	31 min
2 (4th)	4	Boys	29 min
5 (1st)	5	Girls	47 min
5 (2nd)	5	Girls	34 min
5 (3rd)	4	Boys	47 min
5 (4th)	2	Boys	28 min
Total	32		4 h 51 min

The younger second-grade boys responded briefly to several of the interview questions. Cederborg (2010) notes the potential emergence of communication barriers due to children's and adolescents' limited vocabulary. Cederborg emphasizes the importance of posing only open-ended questions that allow the child or youth to articulate themselves in their own words.

The interviews were recorded using an iPhone. The transcription was conducted with meticulous attention to detail and consistency. Before commencing the analysis, it was imperative to listen through the recordings to transcribe respondents' statements into complete sentences, rendering them comprehensible for the analytical process. Additionally, an adaptation was made to account for the respondent's vocal tone, pauses, intonation, and other non-verbal expressions. Since the data analysis was undertaken through an RTA approach, exploring potential codes commenced during the initial review, involving the cautious identification of recurring words, concepts, and events. When quoting, students are referred to by their schoolyear 2 or 5, their gender B (boy)or G (girl), and to which of the group interviews they belonged 1–2. A marking B2 y2 means that the boy behind the statement belonged to schoolyear two and was interviewed in the second group.

4.3. Ethical Considerations

In this study, ensuring no harm was paramount. As Allmark et al. (2009) emphasized, researchers must evaluate potential consequences. For interviews with students aged nine to fifteen, a comprehensive ethical review was conducted and approved by the Ethics Review Authority, with the reference number for the review being Dnr 2023-00147-01, due to possible sensitive disclosures. Great care was taken to ensure voluntariness, prevent exploitation, and maintain confidentiality. Before interviews, classrooms were visited, and educators and students were briefed. A letter of intent and consent form were provided to teachers, students, and guardians, with written consent obtained from all guardians and teachers involved.

4.4. Analysis–Reflective Thematic Analysis

Interview data were analyzed using reflective thematic analysis (RTA) (Braun & Clarke, 2021), focusing on teaching situations described by students. This method identifies and interprets patterns within the data, allowing for theoretically informed interpretations. Reflective analysis involves introspection and reflexivity, considering researchers' biases and assumptions. Following Braun and Clarke's (2021) recommendations, initial open and

descriptive coding was conducted to understand the data. Key steps included familiarization, generating initial codes, seeking themes, and evaluating them. Reflexivity was crucial throughout, ensuring transparency and rigor (Braun & Clarke, 2019). The analysis began during interviews with follow-up questions, continued with post-interview reflections, and involved multiple interpretations by both researchers. Data were transcribed, reread, and coded inductively using Microsoft Word. Researchers independently generated codes, and then collaboratively developed and reviewed themes. The final step involved producing the text, reviewing research questions, coding excerpts, and connecting data with literature.

4.5. Reliability

We, as researchers, conducted the interviews ourselves and did not sense that our gender affected the students. To ensure study quality, we followed Braun and Clarke's (2019) six steps. Data accuracy was checked by comparing transcriptions with audio files. Both researchers coded the data independently and met regularly to discuss impressions, challenge interpretations, and develop themes. A semi-structured interview schedule maintained trustworthiness. The research team, consisting of a doctoral student and a senior researcher with teaching experience, critically considered their positions and assumptions to avoid influencing data interpretations.

5. Findings

The analysis explores the differences in how boys and girls perceive the learning situation in the classroom and aspects that can be beneficial or limiting. Through interviews with students, the research delves into various aspects of social dynamics, teacher interactions, and learning strategies that shape the educational experiences of boys and girls. The analysis identified four significant themes: teacher leadership, teacher-student relations, learning strategies, and learning environment. The themes and sub-themes of the analysis are illustrated in Figure 2.

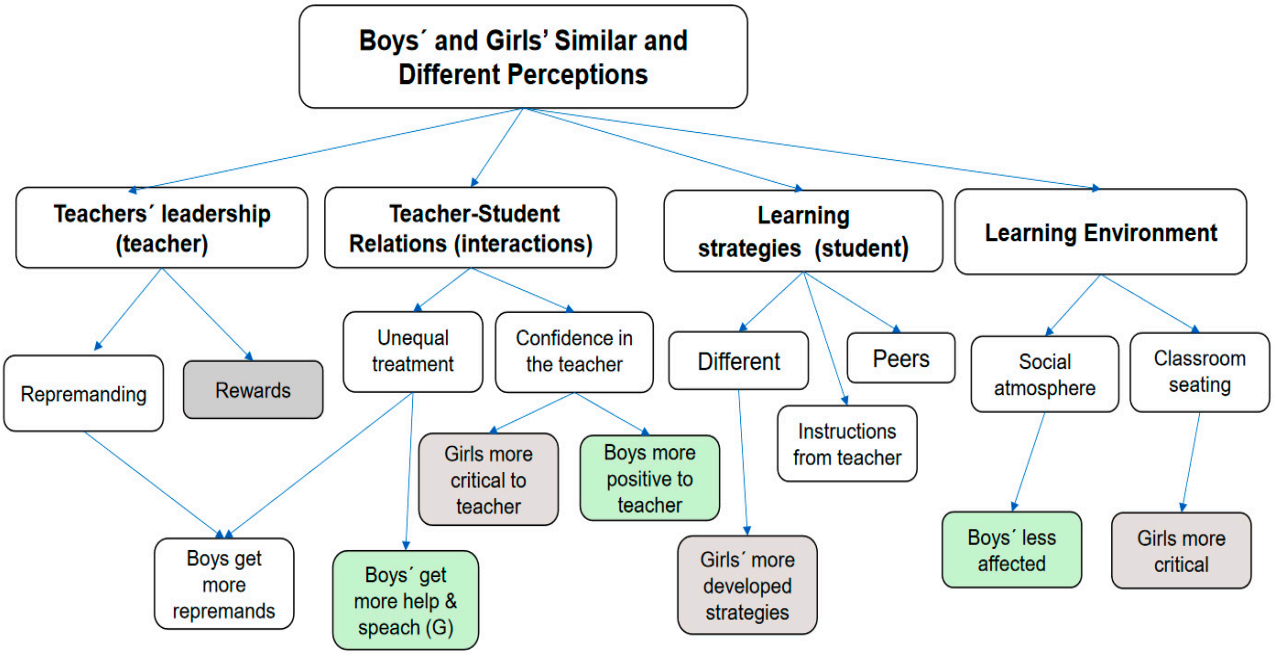


Figure 2. Summary of the results (the white boxes correspond to equal categories, the green boxes correspond to boys' perceptions, and the grey boxes correspond to boys' perceptions).

5.1. Teachers' Leadership

The two identified subthemes, rewards and reprimanding, represent students' descriptions of how the teacher manages and maintains control and power over the students and the classroom situation.

Most of the interviewed girls agree that boys receive more reprimands than girls. "No, then I think you should just approach the disturbing person. It is often mostly the boys who get scolded. (G1 y5)". "They (the teachers) don't listen, but they listen when they hear the boys' voices (B1 y5)". Although several of the younger boys describe that it is hard to get reprimanded, there is a thought that you deserve the reprimand you get. Several girls interviewed describe how unpleasant and extremely embarrassing it is to be reprimanded. "Embarrassing, everyone just stares at you, and you just want to sit like this and go away and eat candy (G2 y5)". The younger girls in year two also say they get angry if scolded, which is unfair. The older girls in year five describe the feelings of shame they comprehend being told off. "It makes my stomach churn a little if you are reprimanded (G1 y5)". The girls fear being reprimanded, but the boys do not object to the custom. The boys say they understand why the teacher is scolding them: "Because you may have done something that is not okay (B1 y2)".

The use of rewards was only identified in the girls' statements. The girls describe how the teacher uses a system where the students are encouraged to save time every day to gain benefits, such as watching a TV show or using Chromebooks. The girls also describe how, on Fridays, they get to do quizzes in the form of Kahoot. "On Friday, then in our classroom, we usually get the last lesson just to check what we learnt on…Kahoot (G2 y2)".

5.2. Teacher-Student Relations (Interactions)

Two subthemes concerning interaction between teacher and student were identified: unequal treatment and confidence in the teacher. In the interviews, students discussed whether they felt their teachers' treated boys and girls equally. Here, responses between the genders differed slightly. Although both boys and girls described that boys and girls did not receive the same treatment, the descriptions of these differences in treatment were not entirely consistent.

The girls we interviewed described clearer differences than the boys did. The girls felt the boys were given more space to talk, help, and do more manageable tasks. The girls also describe the teachers' higher expectations of the girls: "Yes, I think the boys get more help than the girls because the girls are expected to be good (G1 y5)". "But I would say that the boys get easier tasks, or whatever (G2 y5)". The girls say that teachers expect them to be smarter, behave, and manage more. "Because you can be … my teacher in any case treats, for example, a little differently because some boys are not as quick as others to do the tasks, then they are treated differently" (G1 y2). Furthermore, "Yeah, then it's like we have much higher expectations of us than they do because they know boys are like that, and girls are like that (G1 y5)". The girls feel that teachers have higher expectations of them than boys and that boys receive more help and are given easier tasks.

Both the boys and the girls agree that the boys get more reprimands. "Yes, exactly. Boys… sometimes they get disciplined a lot, but sometimes they just get away with what they do (G1 y5)". The older boys in year five said they felt that the girls get away with a lot. "The best thing that has happened once was that the girls had been caught (B1 y5)". The younger boys in these interviews had no notion of boys and girls being treated differently by the teachers. They understood and were fully aware that they were being reprimanded more often. "Because you may have done something that is not okay. (B1 y2)".

The older boys in year five felt to a higher degree that boys were treated unequally in relation to the girls. They argued that the teacher was looking for the boys to fail.

Concerning the teacher's confidence, the girls put many demands on the teacher. According to the girl's descriptions, a teacher should be kind and thoughtful, not cranky, and always ready to help. If a student does something, the teacher must be calm and nice and be able to calm down a person who is angry or in a bad mood. It is also important that the teacher treat everybody equally.

> … the teacher … The teacher should pay attention and see … For example, if the teacher sees that you are feeling sad and … Yes, or … Then the teacher should come up and ask something like this: "How are you doing?" So, "How are you? I've noticed that you're having some difficulty with" Has something happened?" and things like that (G1 y5).

The girls have more demands on their teachers; they are also more critical. They describe teachers they perceive as unreliable and mean. For example, one teacher is described like this (G1 y5): "She gets angry very, very easily … She says we're the worst year group … Yes. And then she says we're a handful … But sometimes I give up because I can't cope with her barking and all that, so I … don't shout, but I say it out loud. I'm like, 'No, but I'm giving up".

The girls also describe how important the teacher's social competence and skills are. The teacher must be able to spot a student who is having a bad day.

The boys seem unreflective in this aspect of the teacher-student relations. The boys foremost want the teacher to be kind, and beyond that, they have not thought about what they want from their teachers: "And so…I don't know how to explain it (B2 y2)". The boys in the interviews generally describe a good teacher as kind but preferably strict. "The teacher is kind and can be a bit strict because you may have done something that is not okay, and they may shout out. (B1 y5)". The boys also describe that the teacher is there to help them. "The teachers help when you need help and explain (B1 y5)".

5.3. The Boys and Girls Learning Strategies

Three subthemes related to learning strategies were identified: different strategies and instructions from teachers and peers. Students' stories revealed different needs and strategies for dealing with schoolwork. Several girls described a need for peace to handle the workload. Something they did not perceive in their present classroom settings: "When all the children are quiet, you think a lot more (G2 y2)". The girls also strongly expressed the need to sit next to a peer for support and help; the boys from the same year group already felt they were sitting with their friends in relation to all in the class as friends.

Regarding how boys and girls describe their approach to classroom work, the boys described a disciplined work approach. They meant that the ideal is to study and work hard. Most interviewed boys preferred to work in the teaching material (book). "Just focus and read (B1 y5)" and "Work a lot (B1 2y2)".

The girls, on the other hand, could describe more varied learning strategies, for example, when doing homework. In year five, the girls also describe how they adapt their choice of strategy to the content they are trying to learn. For example, while doing homework, the girls described applying different strategies, like using a film when it is something to be taught in nature- or society-oriented subjects while reading several times, which is used on other occasions. "First, watch the film, and then you can talk about it, and then you can write down what it was about (G1 y5)". When it came to instructions from the teacher, the analysis made it evident that the girls also appreciated the teacher's lecture and review to a greater extent. In contrast, the boys appreciated working on the book most. "Yes. But when they go through the maths, then I think it's nice that they go through on the board". (G1 y5).

For both genders, peers were important, but to varying degrees. For girls, having friends in school was crucial. The girls describe that one can get encouragement from friends and feel more secure having them. They also argue that friends help one to focus better. The girls argue that being without friends hinders their learning. "Yes, you can be encouraged by friends and feel good about having them (G1 y5)". Several of the interviewed students, both boys and girls, also expressed concern about what happens during break time if one is without companions. The girls emphasized the need for friends of the same gender. In relation to how the students were seated in the classroom (boys and girls were seated together), several girls described how they longed to sit next to a female friend.

For the boys, friends are also important but not crucial. They emphasize the importance of friends during breaks: "Because otherwise, it would have been so hard during the breaks everyone would walk around by themselves and be bored (B2 y2)". When asked about placement in the classroom, the boys say they sat next to a friend in the classroom as they have friends of both genders. While the girls place great importance on having friends and a supportive peer group for their learning, the boys do not view peer relationships as crucial.

5.4. The Learning Environment

Regarding the social learning environment, two subthemes were found where there were differences between the boys and the girls: the social atmosphere and classroom seating.

The girls expressed a specific concern about the social climate. The girls describe that during breaks, they experienced petty fights, foremost among the boys. The girls also describe that the boys were more violent and loud: "That boys, they are a bit more violent towards each other (G1 y2)". The younger girls in year two describe that older boys sometimes were mean to some of the girls: "No, boys in older classes don't usually behave (G2 y2)". The girls also argue that if girls quarrel, it is not serious, more like for fun or a joke. They also claim that everybody knows this, "So nobody takes it seriously (G2 y5)". They claim that, generally, all girls are friends with each other. Girls often characterize boys as being more aggressive and unruly, particularly during breaks. In contrast, the boys generally consider the social atmosphere acceptable, viewing conflicts and teasing as just for fun.

The boys typically found the social atmosphere to be satisfactory. They argue that if there is a fight or if someone is teased, it is just for fun (similar to the girls). One of the boys says that sometimes harsh words are spoken, but otherwise, most are kind. The younger boys in year two confirmed that there was a harsher climate out in the schoolyard.

Both boys and girls object to how the desks are placed in the classroom. The older students believe that sitting alone prevents all cooperation and the opportunity to help each other. "If we were to redo the classroom, we would put many tables together so that you could work together and maybe have the computer on the bench and so on (B1 y5)". The girls are more critical than the boys in one of the interviewed groups and think that the type of bench arrangement called horseshoe is the one they like best because it enables cooperation and participation for everyone. This is a telling quote:

> if it was in first or second grade, we did not all go together. But then it was that some sat in a row, lots of them, and like this, like that, and then there were some in the middle, like in four groups. And then you sat with everyone so that you could get help from many (G1 y5).

6. Discussion

This study aimed to explore and describe differences in how boys and girls perceive different aspects of the learning environment and the teaching methods they encounter. The differences in perceptions and learning strategies between boys and girls are understood through the lens of the didactical triangle and the concept of didactical thinking (Uljens, 1997). Not all aspects of the didactical triangle (Hopmann, 1997) were identified, but teachers, interactions, students' learning strategies, and the surrounding learning environment appeared clearly. The short answer to research question 1, how boys and girls perceive interactions and teachers' leadership in the classroom, could be described like this: both boys and girls perceive that boys receive more reprimands and that teachers use rewards as a leadership strategy. The girls perceived that the teachers had higher expectations of them, while they perceived that the boys received more help and simpler tasks. Boys regarded the reprimands as fair and deserved. They also appreciate teachers who are kind yet firm, whereas girls emphasize the importance of teachers being empathetic and attentive to emotions. Concerning gender differences in perceiving learning strategies (RQ 2, 4), the short answer is that girls seem to use more varied and adaptable learning strategies, showing a higher degree of meta-learning and the ability to adjust their approach based on the subject matter. Boys, on the other hand, often prefer a more disciplined and straightforward work approach, focusing on working directly with teaching materials like textbooks. Girls also appear to place greater importance on peer support and collaborative learning, while boys are not reliant on these social aspects for their learning process. Finally, the answer to gender differences regarding how they experience gender differences, the short answer to research questions 3 and 4 is as follows: the girls expressed more concern about the social climate, describing boys as more disruptive and aggressive, particularly during breaks, while boys generally view the social atmosphere as acceptable and see conflicts as playful. Both genders object to classroom seating arrangements that hinder cooperation, but girls are more critical and specific about their preferred seating in the classroom. Below are more detailed descriptions of the study's results.

6.1. Boys, Girls, and the Teacher

In line with previous research (Brandmiller et al., 2020; Hattie, 2009), this study confirms the teacher's decisive importance for students' results. In this study, two aspects of the teacher were particularly emphasized: the leadership in the classroom and the interactions with the students. Regarding teacher leadership, students expressed that reprimanding and rewards were very important. Teachers give boys more reprimands than girls, both genders thought. This may be because teachers perceive teaching girls is easier (Doerfler, 2016; Younger & Cobbett, 2014). In line with other studies, another possible interpretation is that the boys misbehave, and therefore, they are given more reasons (cf Åhslund, 2019).

Only the girls highlighted rewards as a good strategy for teacher leadership. Whether this only applies to the interviewed group of girls is impossible to say because the sample was too small. However, we can state that reward and punishment are strategies that students perceive in the teachers' leadership, which makes us associate them with a behaviorist leadership perspective (Schunk, 2019).

6.2. Boys and Girls and Interactions in the Classroom

The teacher plays a pivotal role in the educational process and plans and implements teaching strategies that foster student learning. Research suggests that a positive emotional climate in the classroom, where teachers demonstrate care, consider students' perspectives, and are attuned to their learning needs, can foster more positive attitudes among students,

particularly girls (Koul et al., 2023). However, the analysis showed evident differences in the needs and expectations of boys and girls regarding their interactions with teachers.

The boys generally appear to desire kindness from their teachers, with less reflection on specific expectations beyond that. Previous research indicates that good and secure relationships with teachers are significantly more important for boys than girls (Francis et al., 2010; Patrick et al., 2011). Morin (2020) argues that boys, despite lower expectations, rely more on social and educational support from their teachers. Thus, boys' lower reliance on the teacher may indicate that they are more dependent on the relationship and, therefore, less critical. Even though the boys recognized the different treatments, they argued that the treatment was fair because they had misbehaved. Conversely, girls demonstrate more demanding emotional support and social competence expectations from their teachers and are more critical of their interactions (Bostedt et al., 2023). This suggests that girls may perceive more pronounced disparities in treatment and expectations but perhaps also a higher degree of autonomy compared to boys. Another possible explanation for the girls' critical attitude is that they need more challenges.

Teachers with high expectations for their students can act as a catalyst for them to excel, while low expectations can be detrimental to their performance (Brandmiller et al., 2020). Interestingly, our analysis suggests that the girls in the classroom are expected to perform better by their teachers (Doerfler, 2016). However, these gender biases in teacher expectations may create different conditions for boys and girls, further reinforcing existing disparities. Moreover, Lunabba argues that quiet and withdrawn boys often receive inadequate attention and support, which can perpetuate academic inequalities.

6.3. Boys, Girls, and Their Own Learning Strategies?

Learning strategies are crucial in lifelong learning, promoting students' autonomy and awareness (Boström, 2012; Schleicher, 2022). Boys and girls expressed different learning strategies and used them differently. The girls described more strategies and could also show a higher degree of meta-learning. Effective learning strategies can improve learning outcomes, including cognitive, meta-cognitive, motivational, and management strategies (Hattie & Donoghue, 2016). In our study, the female students display a range of techniques when it comes to learning, exhibiting a high degree of adaptability and flexibility in their approach depending on the nature of the subject matter.

The students in our study also expressed concerns about the seating arrangements in the classroom. Regarding the importance of peers, the girls' desire to sit next to female friends for support and companionship. This was not as important for the boys as they considered classmates of both genders' friends. The results indicate the need for guidance and support in developing effective learning strategies and promoting more mastery-oriented approaches for the boys (Jackson, 2006; Niemivirta, 2004). The teacher may need to foster more supportive peer relationships in the classroom and focus on enhancing the boys' self-regulatory skills.

6.4. Boys and Girls and the Learning Environment

Both previous research and this study's theoretical framework underline the importance of the learning environment. Its social, emotional, and relational aspects significantly influence students' engagement, learning outcomes, and attitudes (Koul et al., 2023). Our analysis showed that boys and girls perceive the social environment (atmosphere) differently, reflecting on interactions and conflicts differently. The girls in our study preferred a peaceful environment and sought peer support, while boys prioritized disciplined work approaches. Further, in line with Doerfler's (2016) and Younger and Cobbett's (2014) findings, the girls in this study expressed higher concerns about the social climate, describing boys

as more violent and disruptive, particularly during breaks. This suggests a heightened awareness of safety and discomfort in such situations among girls. The girls' conflicts are often downplayed, seen as playful banter or harmless jokes rather than genuine disputes. Possibly, this also makes the girls more critical of classroom seating, where you do not get to sit with your closest friends.

On the other hand, boys generally perceive the social environment as acceptable., displaying a greater tolerance for rough play or occasional conflicts. While they acknowledge the presence of harsh words and a harsher climate, especially among younger boys, they may perceive such behavior as normal or acceptable within their peer groups. This suggests that boys may have a different threshold for what constitutes acceptable social interaction, perhaps influenced by societal norms surrounding masculinity and aggression.

7. Conclusions

This study, grounded in didactic theory, has illuminated crucial factors that both unite and differentiate boys' and girls' perceptions of learning in the classroom. Our findings reveal significant insights into the dynamics of gender-specific classroom experiences. A key similarity emerged in the perceptions of teachers' leadership, interactions between teachers and students, and learning environments. However, a notable distinction was observed in the distribution of reprimands, with both genders perceiving that boys receive more frequent admonishments. This finding underscores the importance of teachers critically examining their practices regarding the allocation of reprimands, given that the teacher is the most significant factor in student learning (Brandmiller et al., 2020; Hattie, 2009). Contrary to prevailing assumptions in current research (Frederick, 2023; Koul et al., 2023), our didactic analysis did not reveal any precise accentuation of student preferences regarding teaching methods. Notably, we found no indications that boys prefer digital learning resources, a claim often made in existing literature. This unexpected result highlights the need for further research to validate or challenge these assumptions.

Our study emphasizes the critical importance of understanding differing perspectives on social interactions between boys and girls in creating a supportive and inclusive school environment. This insight is particularly relevant in addressing concerns about safety and conflicts, especially among girls, whilst promoting healthy communication and conflict resolution skills for all students. The research also sheds light on the significance of individual learning strategies and gender differences in academic approaches. Previous studies have shown that girls tend to employ more mastery-oriented strategies, focusing on acquiring knowledge and skills, whilst boys more often compete with their peers, applying performance-oriented and avoidance strategies (Efklides & Metallidou, 2020; Hofverberg, 2020). Our findings reinforce the importance of exposing students to various learning competencies early in their educational journey, considering the crucial role of verbalizing and consciously using learning strategies. Furthermore, our study corroborates the association between self-regulatory and deep learning techniques and academic success. Self-regulated learning, which involves monitoring, managing, and regulating one's actions towards achieving a goal, emerges as a critical factor in supporting both boys' and girls' academic development.

In summary, boys' and girls' performance in the classroom needs to be thoroughly researched from different perspectives. Through a didactic framework, important implications for teaching can be made clear to address the problem of boys' underachievement. There are thus opportunities to influence what happens in the classroom concretely. In addition, addressing these disparities could be an important step in supporting the academic success of male students. By examining these gender-based perspectives, the findings offer

valuable insights into potential factors contributing to the underachievement of boys in the school setting.

8. Practical Implications

The results indicate that teachers need to be aware that students perceive that they are treated differently on the basis of gender. To foster a more inclusive and equitable learning environment, teachers could incorporate more diverse teaching methods. For example, classrooms could be furnished to give boys the opportunity to work in groups and to give girls a peaceful space to study. Teachers should explicitly emphasize meta-cognitive skills to provide better opportunities for boys to develop, practice, and reflect on these strategies. Encouraging peer-to-peer learning can leverage boys' preference for social interactions. To adapt their leadership, teachers should balance reprimands with positive reinforcement, ensuring fair treatment across genders. Developing stronger relationships with male students can enhance their engagement and motivation while offering varied forms of emotional and academic support that address the different expectations of boys and girls. However, it is necessary to give girls enough speaking time and develop good relationships with them, too.

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Appendix A. Interview Guide for Students—Boys' School Situation in School Year 2

The template is based on the areas identified as critical in previous research (Åhslund, 2019; Bostedt et al., 2023).

- Physical learning environments
- The social climate in the classroom /relationships.
- Working methods and teaching
- Teacher-student and student-to-student speech patterns.

Perceptions of school

- Why should you go to school?
- What do you think about school?
- What do your parents think about the school?

Educational, social, and physical environment

- When do you learn best?
- What is a good teacher for you?

- Are there lessons you like more? Why this/these particular ones? Please tell us.
- What does it look like in your classroom? Would you like it to be different?

Students' goal orientation

- What are your goals for your schoolwork?
- How are you doing to improve your schoolwork?
- Do you know how your classmates are doing in school? If yes, how do you know?

Communication between teachers and students and between students.

- Do you talk straight or raise your hand during lessons? Who decides who can talk?
- How do you students talk to each other in class?
- How are reprimands used in your class? How do you feel about being reprimanded?

Boys and girls in class

- How much do boys talk compared to girls in class? More, less, the same amount, in the same way…?
- How do boys and girls behave in the classroom? Differences and similarities?
- Are girls and boys treated the same by teachers or others at school? If so, tell us how.
- Are there differences in how boys and girls are interested in school and different subjects? If so, how?

Appendix B. Interview Guide for Students-Boys' School Situation in School Year 5

The template is based on the areas identified as critical in previous research (Åhslund, 2019; Bostedt et al., 2023).

- Physical learning environments
- The social climate in the classroom /relationships.
- Working methods and teaching
- Teacher-student and student-to-student speech patterns.

Perceptions of school

- Is it important to go to school? If yes, why?
- Are you happy at school?

Students' goal orientation

- What are your goals for your schoolwork?
- What strategies do you have for learning at school?
- How do you feel about tests and assignments?
- What do you think about grades?
- What do people in your class think about grades?
- Do you keep track of each other's results?

Educational, social, and physical environment

- What is a good teacher for you?
- Is the organization of teaching important to you? If yes, in what way? Are there teaching methods that you feel are better/worse? How would you like it to be?
- How is the atmosphere in the class? (Help or hinder?)
- How does it look in your classroom? Would you like it to be different?
- Is there anything you would like to change?

Communication between teacher and pupils and between pupils.

- How are words distributed during the lessons? Do you talk straight or do you raise your hand? Who distributes the floor?

- How do you talk to each other? (Kindly or rude?) Is there a difference in the way you talk between girls and boys compared to each other in each group?
- How are reprimands used in your class? How do you feel about being reprimanded? How do you think others react?
- How do teachers talk to boys and how do they talk to girls? Differences and similarities?
- If teachers talk differently to girls than to boys—why do you think this is?

Boys and girls at school

- Do girls and boys behave the same/differently at school?
- Do boys and girls talk as much? Alt How much do girls talk during lessons and how much do boys talk?
- Are there lessons that boys like better than girls? Are there lessons that girls enjoy more than boys?
- How are girls and boys treated by the teachers at school? In the same way or differently?
- How do teachers help boys and how do they help girls during lessons? (Same or different?)
- If teachers help girls differently from boys—why do you think this is?

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