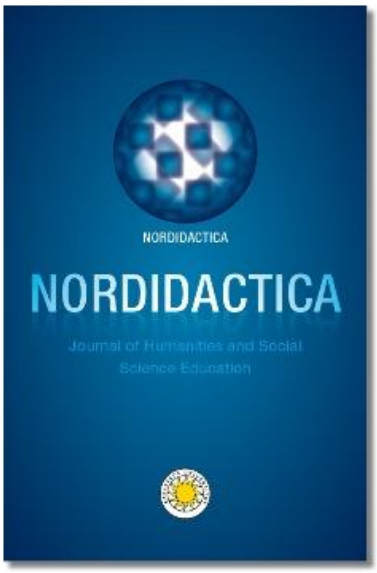
Teaching critical thinking in psychology—focusing on evaluating different psychological perspectives

Anja Thorsten, Alexander Wensby, Rebecca Holmberg, Karin Malmqvist



Nordidactica

- Journal of Humanities and Social Science Education

2025:3

Nordidactica – Journal of Humanities and Social Science Education
Nordidactica 2025:3
ISSN 2000-9879
The online version of this paper can be found at: www.kau.se/nordidactica

NORDIDACTICA – JOURNAL OF HUMANITIES AND SOCIAL SCIENCE EDUCATION
ISSN 2000-9879
2025:3 1-27

Teaching critical thinking in psychology—focusing on evaluating different psychological perspectives

https://doi.org/10.62902/nordidactica.v15i2025:3.27389

Anja Thorsten, Alexander Wensby, Rebecca Holmberg, Karin Malmqvist

Linköpings universitet

Abstract: Critical thinking is a key ability in the humanities yet a contested issue regarding how it should be taught. In the subject of psychology, critical thinking is essential to psychological literacy i.e. the ability to evaluate empirically based psychological perspectives in explaining human phenomena, which is the focus in this study. The study was a Learning Study conducted at upper secondary school level in Sweden with 53 students at three different schools. Variation theory was used as a theoretical framework to design lessons where students processed contrasts of what critical thinking is and is not in psychology, focusing on evaluating different psychological perspectives. In the analysis of student assignments, four critical aspects were identified as essential for developing critical thinking in psychology. The results show that students improved in their ability to think critically about psychology while processing contrasts.

KEYWORDS: PSYCHOLOGICAL LITERACY, CRITICAL THINKING, VARIATION THEORY, LEARNING STUDY, TEACHING PSYCHOLOGICAL PERSPECTIVES

About the authors: Anja Thorsten är docent i pedagogik vid Linköpings univeristet. Hennes forskningsintressen riktas mot undervisningsutveckling och undervisningsskicklighet i flera olika ämnen. Hon genomför ofta praktiknära forskning, bland annat i form av Learning study.

Alexander Wensby är legitimerad lärare i psykologi och arbetade vid studiens genomförande som psykologilärare på Katedralskolan i Linköpings kommun. Numera är han strateg på vård- och äldreförvaltningen i Borås stad.

Rebecca Holmberg är legitimerad gymnasielärare i psykologi och samhällskunskap. Hon arbetar som psykologilärare på vuxenutbildningen i Norrköpings kommun.

Karin Malmquist är legitimerad lärare i psykologi och arbetar som gymnasielärare i Linköpings kommun. Hon deltar i praktiknära forskning med fokus på Learning Study i samarbete med ämneskollegor.

Introduction

Critical thinking is a crucial element in the humanities in teaching subjects based on the reliability of tentative theories and the validity of their empirical evidence. Of those, psychology aims to provide theories that offer explanations for human thoughts, emotions, and actions. Within psychology there are, however, different approaches to understanding human behaviour due to the intrinsic limitations of any scientific pursuit, as it is limited by the sets of assumptions and methods that provide a framework for what kind of answers can be given (Yanchar & Slife, 2004). Teaching these limitations while not discarding the contribution of a psychological approach to understanding human behaviour holistically is challenging. Furthermore, understanding that a plurality of perspectives offers complementary rather than competing explanations is key for psychological literacy (Harris et al., 2021). Students must develop a set of critical thinking skills, involving evaluating the constraints of a theory and interpretation of empirical evidence in discussing multiple perspectives when applying psychology to real world experiences (Harris et al., 2021). This aspect of psychological literacy is also conceptualised in the curriculum for psychology in Sweden (Skolverket, 2011). It is therefore important when teaching psychology to promote students' development of these critical thinking skills: by developing psychological literacy in applying different perspectives to explaining real world phenomena thus achieving academic success in the subject of psychology.

While psychology is a scientific and academic discipline on its own, as a subject in the curricula for both upper secondary and tertiary education in many countries, it differs in aim, purpose, and scope as to what teaching should accomplish (Blåvarg, 2023). In the Swedish curriculum, high school psychology students take a singular course addressing skills ranging from self-reflection to the evaluation of psychological perspectives (Blåvarg, 2023). This offers a teaching challenge regarding how best to balance students' subjective conceptions of behaviour with critical thinking of a more objective nature on scientific studies of behaviour (Tulis, 2018). A subsequent challenge is deciding whether teaching should focus on how students perceive phenomena (Norlander et al., 2005), or on the evaluation of how those phenomena are explained in a complex system of scientific methods (Harmat & Herbert, 2020). As these aspects of teaching diverge, their aims can be understood to either run parallel to each other or to exist in direct conflict with each other, posing a didactic challenge (Tulis, 2018). These aspects are in line with international curricula on developing psychological literacy (Harris et al. 2021). Critical thinking is thus a key aspect in psychology teaching in that students' skills in psychology develop through evaluating how the field's knowledge is constructed using scientific methods subject to certain criteria (Birke et al., 2016).

Whether critical thinking is a general or subject-specific skill is contested in the research literature (Abrami et al., 2015). The argument in favour of viewing critical thinking as subject-specific is that any critical thinking is based on knowledge in a specific field, and that all reflection on knowledge must be in regard to the claims of said field (McPeck, 1990). On the other hand, in practice, psychology as a field has predominantly addressed critical thinking on the premise that it is a general reasoning

skill (Siegel, 1991) which encompasses transferable skills such as interpreting, predicting, analysing, and evaluating knowledge claims (Abrami et al., 2015). Nevertheless, in educational research, it is often reported that students' abilities to transfer critical thinking between different fields are overestimated, and accordingly, it is more difficult for students to be taught general rather than specific critical thinking skills (Dunn, 2008).

Critical thinking in psychology is challenging for many students (Friedrich, 1996; Holmes & Beins, 2009). When developing these skills, it is necessary to identify the prior understanding, misconceptions, and challenges students face (see Marton, 2015). Previous research on undergraduate students shows that students' understanding of psychology is influenced by several sources such as media, personal experiences, family members, and folk wisdom; furthermore, they often use this prior understanding as a base for evaluating psychological perspectives (Thompson & Zamboanga, 2003; Holmes & Beins, 2009). Many researchers (Friedrich 1996; Holmes & Beins 2009; Hughes et al. 2013) assert that students instead need to see psychology as a science in order to be able to apply critical thinking appropriately. While there is consensus on the need for critical thinking in psychology teaching, a consensus of how that is defined, what it entails, or which teaching practices best promote it is lacking. Therefore, it is relevant to study both how students perceive and handle critical thinking and how teaching regarding specific objects of learning can contribute to students developing these skills. Variation theory is a theoretical framework focused on designing teaching that enables students to discern aspects critical for learning a specific object of learning (Marton, 2015). This study contributes knowledge about how teaching can enable students to develop critical thinking skills regarding evaluating different psychological perspectives, using Variation theory as a theoretical tool, addressing the following research questions

- What is critical for students to discern in developing critical thinking in psychology evaluating different perspectives?
- How can principles from Variation Theory be used in teaching to enable students' critical thinking skills in evaluating different psychological perspectives?

Critical thinking in the humanities

What critical thinking should entail in education is not universally agreed upon, nor does any field have hegemony (Halonen, 1995). There are disparate views on the nature, purpose, and application of critical thinking across academic disciplines (Tväråna, 2019). For curricula in the humanities, critical thinking is ubiquitous and considered essential for creating democratic citizens able to defy propaganda and strive for self-fulfilment (Larsson & Andersson, 2023). Ennis' definition of critical thinking as "reasonable reflective thinking that is focused on deciding what to believe or do" (p. 10, 1987) has been expanded to cover a range of skills: interpretation, analysis, evaluation,

inference, explanation, and self-regulation (Facione, 2013). Larsson och Andersson (2023) identify an academic tradition in the humanities which is nonetheless empirically unsupported: to assume critical thinking is a general transferable skill, or is contingent upon subject-specific knowledge. Each approach affects the types of skills conceptualised as necessary in teaching. Nevertheless, a common feature in the humanities is that students need to be exposed to a multitude of perspectives on any specific knowledge claim to develop critical thinking (Ødegaard Borge & Langø, 2023). However, students often struggle with this skill (Dunn, 2008), failing to evaluate phenomena from multiple perspectives (Tväråna, 2019; Ødegaard Borge & Langø, 2023).

Critical thinking in psychology

In order to think critically in psychology students must learn "reflective skepticism" (Gray, p. 68, 1993), where they are motivated to question psychological knowledge from several perspectives. Central to critical thinking in psychology is understanding the significance of empirical evidence for how theories are constructed and being able to present multiple perspectives applying these theories to real world phenomena (Harris et al., 2021). In prior research several key factors have been identified as significant in psychology teaching for promoting students developing critical thinking as based on grasping multiple perspectives and their different empirical foundations and these are: being exposed to misconceptions about psychology as a science and teaching strategies that emphasize questioning assumptions.

Perceptions of psychology as a science

There is substantial research in the teaching of psychology regarding student misconceptions about psychology as a science (Hughes et al., 2013; Lassonde et al., 2016; Menz et al., 2020). Misconceptions are defined as "widely held beliefs contradicted by established scientific evidence" (Gardner & Brown, p. 211, 2013) and are particularly vulnerable in psychology as explanations of human behaviour are ubiquitous in culture, religion, folk wisdom, and personal experience, making them more resistant to challenges from empirical research (Lilienfeld, 2010; Tulis, 2018). Despite tertiary education spanning several years, students persistently hold certain misconceptions about psychology influenced by personal reflections—even if those have been refuted with support of empirical research (Menz et al., 2020). Misconceptions are an obstacle to critical thinking, and some researchers argue for the need to view psychology as a science in order to properly apply critical thinking (Friedrich, 1996; Holmes & Beins, 2009).

In surveys on undergraduate students' attitudes towards science and their scientific literacy and views of psychology as a science, Holmes and Beins (2009) found that while knowledge about scientific methods increased through instruction, students' perception of psychology as a science did not. Rather, whether students view and value empirically based psychological knowledge depends more on their personality and on

career pursuits as clinicians or researchers, than on teaching (Holmes & Beins, 2009). Similarly, Harris et al. (2021) found that psychological literacy was valued more by students pursuing research careers than clinical work. However, the importance assigned to it decreased with each additional year of studying, suggesting that the more students learn about psychology, the less they value the application and critical evaluation of psychology as a science. Friedrich (1996) conducted self-report questionnaires on university students and found that students with high scores on tests assessing their perception of psychology as a science (PAS) had positive correlations with exam scores and end of term results. This would indicate that an emphasis on psychology as a science is indicative of academic performance.

In contrast, Thompson and Zamboanga (2003) found that prior knowledge, even if based on misconceptions, positively influenced learning in undergraduate introductory psychology courses. Amsel (2009) further supports the notion that misconceptions do not necessarily hinder learning psychology by comparing PAS scores in two conditions where students were asked to change their perspectives on psychology. Rather than combating misconceptions, Amsel et al. (2009) argue that their findings suggest that students need to develop an understanding of perspectives and be able to distinguish between 'self' and 'scientific' psychology as two separate views with different epistemological claims. Teaching strategies in psychological perspectives may positively affect students' developing appreciation of psychology as a science, required to develop critical thinking as well.

Teaching strategies

A common feature of teaching critical thinking is explicit instruction and practice (Behar-Horenstein & Niu, 2011). Jakobeuk (1995) reported an increase in student critical thinking by explicitly teaching contrasts between experimental and observational research and practicing drawing valid conclusions based on empirical data. However, Yanchar and Slife (2004) argue for a shift from the method-centred critical thinking traditionally fostered in psychology, as it does not sufficiently incorporate "assumptions that undergird a theory [and] give rise to the unique perspective it offers on scientific questions" (Yanchar & Slife, 2004, p. 86). Brookfield (2012) also suggests that the ideal pedagogical approach for enhancing critical thinking is to explore and analyse underlying assumptions. A key aspect of critical thinking may then be to explore underlying assumptions. However, this can be hard to put into practise while simultaneously promoting student self-reflection, as pursued in the psychology teaching in upper secondary school in Sweden (Norlander et al, 2005 and Harmat & Herbert, 2020). This is significant in light of the findings that students struggle to apply critical thinking without personal beliefs or values, even if they can critique sources of information (Smith & Vasquez, 2008). The teaching approach to question assumptions is not based on clear empirical evidence, albeit consistent with other frameworks to enhance critical thinking through similar strategies such as cooperative learning (Jakoubek, 1995), question-asking (King, 1995), self-assessment practices (Halonen, 1995), and essay-writing refuting students' misconceptions

(Friedrich, 1996; Wade, 1995). There is therefore a need to study how teaching strategies could promote students' critical thinking in psychology at upper secondary level.

Theoretical and methodological framework

To address the research questions, Learning study was used as a research approach. Learning study is a theory-informed, collaborative, iterative method in action research (Carlgren, 2012). The focus is on developing a single lesson, similar to the Japanese Lesson study method (see Lewis, 2009). The present research group consisted of three teachers and one researcher. Therefore, practice-based, theoretical, and methodological knowledge were all considered of value to the research process (Arhar, 2013). In a Learning study, a theory is used to provide an analytical lens of relevance for teaching and learning (Elliot, 2012). Most often variation theory is used, as is the case in the present study.

Variation theory

Variation theory is a theory about teaching and learning that is based on numerous empirical studies (Marton, 2015). The theory has two main assumptions, which have guided the design of the present study.

The first assumption is that all people perceive aspects of the world and which aspects are perceived become essential to how the world is experienced (Marton & Booth, 1997). In a school context, teachers usually want students to develop how they perceive objects of learning. To perceive an object of learning in a certain way, some aspects are necessary to discern. The necessary aspects not yet discerned are called 'critical aspects' (Marton, 2015). These aspects need to be identified, so that they can guide teaching according to what needs to be highlighted in relation to specific objects of learning (Thorsten & Tväråna, 2023).

The second assumption is that teaching can make critical aspects discernible to students. According to variation theory, we learn by discerning differences, rather than similarities (Kullberg et al., 2024; Marton, 2015). Thus, learning is about distinguishing increasingly more aspects. Each aspect can vary and is therefore a dimension of variation. To make an aspect discernible, features in a dimension of variation should be contrasted against an invariant background. For example, if the teacher wants the students to discern what constitutes mental health, 'psychological dysfunction' and 'psychological well-being' could be contrasted. This enables students to discern both the aspect (mental health) and the two features (psychological dysfunction and psychological well-being). For contrasts to be powerful, only the focused aspect should vary; other aspects (such as gender, age, occupation) should be kept invariant (see Marton, 2015).) Another key to achieving powerful contrast is to show contrasts synchronically, at the same time, instead of diachronically. When students have discerned a critical aspect through contrast, Marton (2015) asserts that the next step is generalisation. The focused aspect is then invariant and other aspects vary. In the

previous example, mental health would be invariant and aspects such as age and gender will vary systematically. This will enable students to discern a wider variation in mental health and how other aspects might affect it.

Marton (2015) highlights that all examples need to be embedded in a relevance structure: they need to have a meaning and be put into some kind of relevant context for students. Students also need to be involved in analysing the examples that are used. Studies by Svantesson Wester (2022) have shown that students gain from a lesson designed based on assumptions from variation theory in combination with exploratory talk (see Mercer, 2004). The students need to discuss their thoughts with peers, but it is necessary for the teacher to guide the discussion focusing on making the critical aspects discernible (Svantesson Wester, 2022).

Ethics and contextual background

The study was carried out in a course in psychology at the upper secondary school level. Before students took part in the study, they had been taught the following three perspectives in psychology: cognitive-, biological-, and social psychology. Students were informed about the purpose of the study; and that the study was voluntary and that their names would not be revealed, in accordance with the Swedish Research Council (2017). Data will be safely stored.

Classes from three different schools participated in the study. School A and school C are upper secondary schools where students prepare for tertiary education. School B is adult education with the same psychology course as school A and C. All students in these classes participated in the lessons, but only the students who consented to be part of the study are included in the data material.

Conducting a Learning study

A Learning study is a method that focuses on the relationship between teaching and learning concerning a specific object of learning (Marton, 2015; Kullberg et al., 2024). In the present study, the teachers had identified an object of learning they found challenging to teach successfully: evaluating the different psychological perspectives in relation to different phenomena.

To gain knowledge about how students may handle the object of learning the research team performed a screening. Students from participating schools were asked to evaluate three psychological perspectives in relation to stress. Of these, 10 students were interviewed about their thoughts on the assignment they just wrote. The interviewed students were chosen based on variation in their assignments regarding how well-developed they were. Based on the screening, tentative critical aspects could be identified.

The Learning study was carried out in three cycles. Each cycle consisted of a pre-test, research lesson, post-test, analysis, and revision (see Kullberg et al., 2017). The pre- and post-tests were the same written assignments as the screening. In all cycles, a 90-minute lesson was planned and conducted. Each lesson was conducted by two

teachers and observed by the researcher. The lesson in cycle 1 was also observed by a teacher.

An overview of the data is presented in Table 1. Written assignment includes the screening and pre-and post-tests. Twelve of the written assignments from the screening were made by the same students as in cycle 1, since the same assignment was used as a pre-test in this cycle, which is why '12' is written in brackets in theTable under "Written assignment".

TABLE 1

Overview of data included in the study

	Interview	*Written assignment*	*Video recordings*	*Field notes*
Screening	*10*	*46*	-	-
Cycle 1	-	*(12) + 12*	*90 min*	*X*
Cycle 2	-	*24 + 24*	*90 min*	*X*
Cycle 3	-	*17 + 17*	*90 min*	*X*
Total	*10*	*140*	*270 min*	*3 lessons*

The research lessons

While planning the first research lesson, the teachers intended to create tasks and contrasts that would highlight the critical aspects, based on assumptions from variation theory. Based on an analysis of student learning and variation theory, the research group made revisions to the lesson plan before cycle 2. These revisions primarily concerned how the topic was introduced to students, which contrasts were presented, how the contrasts were carried out with students, and the use of a group assignment. In Table 2, an overview of the lesson structure is shown. The specific content of the lessons will be described in more details in the Results section.

TABLE 2

Lesson structure

Procedure	**Cycle 1**	**Cycle 2**	**Cycle 3**
1 Relationship between perspective, theory, and method—a model and a table	X	-	-
2 Repetition of perspectives, a film	-	X	X
3 Mind map with various phenomena explained by different perspectives	-	X	X
4 Introduction of the concept of evaluation	X	-	-
5 Text contrast 1	X	X	X
6 Introduction of the concept of evaluation	-	X	X
7 Text contrast 2	X	X	X
8 Text contrast 3	X	-	-
9 Group assignment focusing on evaluating a specific method	X	-	-
10 Group assignment focusing on evaluating perspectives in relation to a phenomenon	-	-	X

Analysis

During the Learning study, an initial analysis was performed after the screening and after each cycle. This analysis was based on discussions in the research group concerning student learning, the enactment of the lesson, and how variation theory could be used to promote learning. After the Learning study was finished, a new, subsequent analysis of all the data was conducted.

To address the first question of what students need to discern to develop critical thinking, critical aspects were identified. The analysis of critical aspects was first made based on student texts and interviews from the screening. This analysis was refined during the process in relation to the pre- and post-tests. The focus was on analysing how students perceived and handled the object of learning. First, we read the texts and the transcripts from the interviews in relation to the targeted object of learning, focusing on how students approached the task. We noted passages where the students showed that they could handle the object of learning as expected and passages where they did not. In the next step, we analysed which challenges students faced. We were inspired by phenomenography (see Marton & Booth, 1997), and analysed how they seemed to perceive the object of learning. This resulted in categories that described various ways of handling the object of learning, for example perceiving the object of learning as

offering opinions about the perspectives. These categories were analysed in relation to the targeted object of learning focusing on which aspects the students had yet to discern. This resulted in the critical aspects presented in the results.

The second research question—pertaining to how principles from variation theory could enable learning—was analysed, focusing on the enactment of the object of learning and student learning. In this analysis, pre-and post-tests were analysed, as were the lessons. The written assignments from the pre- and post-tests were assessed in relation to each critical aspect to gain an overview of student learning. Each text was given a point: 2= the aspect is discerned, 1= the aspect is partly discerned, and 0= the aspect is not discerned. The purpose of this was descriptive to gain an overview and indication of the results, not to make calculations of effect sizes for statistical analysis, etc. Large differences between pre-and posttests indicate that students had discerned the aspect, while small differences are harder to interpret based solely on the test results. Therefore, pragmatic validity (see Nuthall, 2004) was central, since this analysis was a useful tool for evaluating student learning. To enhance reliability, the texts were assessed by three to four participants in the research groups individually. Most of the time, the research group concurred on ratings and in cases of different ratings, the texts were discussed, and consensus was reached. Since details cannot be included in this kind of analysis, we also conducted a qualitative analysis in which we noted other relevant things about the texts concerning content and structure.

The lessons were analysed based on principles from variation theory, both during the conduct of the preceding Learning study and in the subsequent analysis. The analysis concerned how the critical aspects were enacted in teaching focusing on a) the construction of contrasts, b) the presentation of contrasts and c) students' participation in the analysis of the object of learning. Contrasts were analysed focusing on which aspects varied, and which were invariant (see Marton, 2015). In this way we could see whether the construction of contrasts could contribute to student learning. After analysing all sequences in the lesson based on what varied and what was invariant, we focused more deeply on how the text contrasts differed in construction between the lessons. We did this because these contrasts were a central part of the teaching in all lessons. After this, we analysed how the contrasts were enacted with students focusing on whether a relevance structure was provided, how the teacher introduced the contrasts, and whether and how students were involved through peer interaction or student–teacher interaction.

Results

Four critical aspects (CA) were identified in this study. They pertain to what students need to discern to evaluate different psychological perspectives. Each critical aspect will be presented based on how it emerged, student results and how it was taught.

CA 1: Psychological perspectives have different research interests, assumptions, and research methods

Students need to discern that each perspective has assumptions and accompanying research interests and methods regarding what can explain behaviours, thoughts, and feelings, and how to study them. This means that they need to see the distinctiveness of each perspective, which also enables them to discern that perspectives can complement each other.

How CA 1 emerged

In the analysis of students' texts, the texts varied regarding how perspectives could be distinguished and how consistent the explanations of the perspectives were. Some students lacked knowledge of a particular perspective's area of interest. For example: "Cognitive: Not quite on board with what this means…", (S[1]3, Pre1), and "I don't really understand what to write" (S25, Screening, text). In other cases, their knowledge about the perspectives was insufficient as a basis for reasoning about said perspectives, as in the following example:

> *Social, cognitive, and biological. Social—norms, values and peer pressure (being pressured to do something). Cognitive—automatic thinking, controlled thinking, stereotyping, and cognitive thinking (…)* (S12, Pre1)

Student 12 was listing keywords from each perspective, showing a partial understanding of the perspectives, but did not show a deeper understanding of them.

In some cases, students made evaluative statements about a specific method, but these statements were not connected to an evaluation of a perspective. Instead, they primarily focused on feasibility and whether respondents will understand the question, as in the following example:

> *The weaknesses of the survey method can be that the questions can be misunderstood. The person taking part in the survey may misinterpret the question and give an incorrect answer.* (S5, Post1)

Student 5 discusses problems that must be taken into account when conducting a survey but does not connect them to any one perspective. In cycle 1, many post-tests were unstructured: the students often focused on research methods and tests had disconnected parts that then focused on perspectives. It seemed as if they did not know how methods and perspectives were connected and that they did not discern that the perspectives had different underlying assumptions.

Teaching CA 1

Results regarding CA 1 differ in the pre-tests between the cycles. In cycle 3, many students already in the pre-test had discerned the aspect. Especially in cycle 2, there was a development in student learning; see Table 3.

[1] S is an abbreviation for 'student'.

TABLE 3

Student results CA1

	Pre 1	**Post 1**	**Pre 2**	**Post 2**	**Pre 3**	**Post 3**
CA 1	0.83	1.08	0.33	1.29	1.47	1.59

Before teaching this object of learning, the students had been taught about the three perspectives during several lessons in all three cycles. Therefore, in cycle 1 it was taken for granted that the students had the basic knowledge needed to fully participate in the lesson. The focus in the research lesson in cycle 1 was primarily on methods (mostly on interviews and surveys), but these methods were not connected to assumptions in the perspectives. After cycle 1, it was clear that the perspectives' assumptions needed to be highlighted. Therefore, perspectives were foregrounded in cycles 2 and 3, instead of research methods. This was primarily addressed through a film, but also through the use of a mind map.

In the film (10 minutes), the three perspectives were contrasted with each other, highlighting differences between them and focusing on their basic assumptions and how they study and explain a phenomenon. Based on variation theory, this film provided an opportunity to simultaneously compare perspectives, which makes it easier for students to both understand each perspective and to see the differences between them. Results in cycle 2 indicate that this helped students expand their knowledge about the perspectives.

After the film, a mind map was used. The mind map centered on a phenomenon which was discussed based on each perspective. The phenomenon was invariant, and the perspectives varied, which directed students' attention to the differences between the perspectives' basic assumptions. To generalise this, the same discussion was made with several phenomena enabling students to discern this as a valid form of discussion for all phenomena. During this task, students asked questions about specific differences between the perspectives, thus increasing their knowledge about them. In cycle 2, a student asked about the difference between the cognitive and the biological perspective, and the teacher clarified this in the following way:

> *This [biological] thing is that you think, the brain works as it should. There is something that happens in the brain that makes you think. But this [cognitive] is what you think, it's the content itself (...) So this [cognitive] is something you can influence more. This [biological] is more our structure, our body.*
>
> (Cycle 2)

By contrasting perspectives against each other, the teacher enabled students to deepen their knowledge about the perspectives and to see the differences between them.

CA 2: There is a difference between focusing on perspectives and phenomena

Students need to distinguish between focusing on psychological perspectives or on the phenomena that are used to evaluate these perspectives. They need to progress from focusing on the phenomena to focusing on the perspectives.

How CA 2 emerged

Many students in the pre-tests focused on describing, explaining, or evaluating the phenomenon of stress. They perceived the task to be that they were asked to focus on the phenomenon. In the following text example, the student discusses and evaluates some aspects of stress based on one of the perspectives, and then highlights pros and cons related to peer pressure.

> *Social psychological stress is peer pressure, it can, for example, cause you to be pressured to do something. It can be both positive and negative. An example is that if a friend says he can't do the homework but then the other two say we do it and then we do something fun, then that person is positively influenced. Weaknesses with peer pressure are that you might be influenced to ignore your homework because your friends don't do it…*(Pre1, Student 2)

The student discusses some parts of the phenomenon itself and does not focus on the perspectives' ability to explain the phenomenon. Instead, students need to focus on how powerfully the perspectives explain a phenomenon like stress, and not on the phenomenon as a relatable experience.

Teaching CA 2

This is a central aspect, but it was challenging to develop teaching that enabled students to learn this in one lesson, as seen in Table 4. Even if scores are higher in the post-test, there are still too many students who do not discern this critical aspect.

TABLE 4

Student results CA2

	Pre 1	**Post 1**	**Pre 2**	**Post 2**	**Pre 3**	**Post 3**
CA 2	0.33	0.83	0.17	0.71	1.71	1.82

The parts of the lesson that handled this aspect were the mind map (cycles 2 and 3) and text contrasts (all cycles). These will be described below in relation to cycle 1 and the other two cycles.

Cycle 1

During cycle 1, two text contrasts were used to highlight this aspect. In each contrast, an authentic student response from the pre-test was contrasted with a teacher-devised

response. The intention was to showcase an appropriate response in relation to the object of learning. When analysing both text contrasts, it was found that several aspects varied aside from the critical aspect. According to variation theory, this decreases students' opportunities to discern the critical aspect, especially if it is new to them.

The first contrast (see Figure 1) contains differences regarding whether the focus is on the phenomenon or on the perspective. However, the background is not invariant since other aspects and features also vary: if it relates to a phenomenon (stress) and if strength or weakness is in focus. Based on variation theory, this decreases students' learning possibilities.

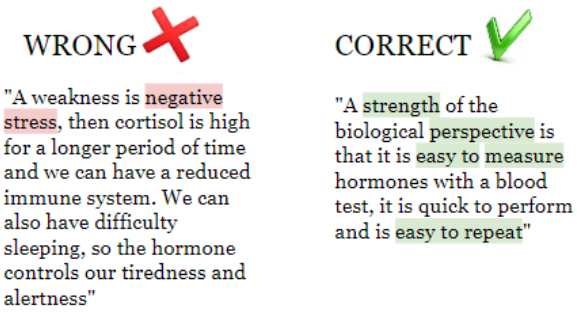


FIGURE 1

Text contrast 1 in cycle 1.

Also, the power of simultaneously demonstrating contrasting examples was not used when the contrast was presented. The teacher read each example and talked about it, one at a time. After both texts had been discussed separately, the teacher summarised them and then actively contrasted them.

> *Here, the student has thought that the phenomenon of stress itself should be expressed as strong or weak...They have evaluated stress itself...The first thing we will look at instead is how to evaluate the perspective...If we look at the right side, highlighted in green...this is what makes this answer correct...A strength of the biological perspective is that it is easy to measure and simple to replicate."* (Cycle 1)

The second contrast (see Figure 2) was also intended to help students distinguish the phenomenon from the perspectives, but the contrasting examples did not make this possible, primarily since there is no contrast between the phenomena and the perspective. Instead, the contrast highlights differences in language, but also the following aspects vary: whether it relates to stress, the mention of a research method, and the length of the text. The invariant feature was the theory of automatic thinking in a classroom setting. Based on assumptions from variation theory, the contrast did not direct students' attention to distinguishing the phenomenon from the perspective, and it was unclear what students could learn by this contrast.

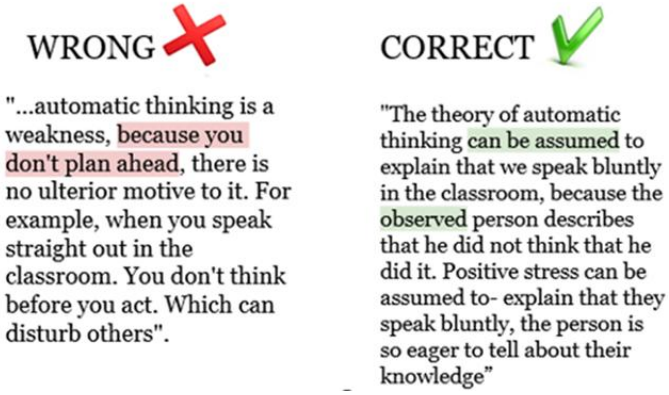


FIGURE 2

Text contrast 2 in cycle 1.

Another problem regards how all text contrasts were carried out with students in cycle 1. Students were passive, and were not invited to discuss or analyse the examples. Instead, they just listened to the teacher. It was noted in the fieldnotes that several students were unfocused and that they did not seem to grasp what the teacher is talking about, especially in the contrast shown in Figure 2. This was confirmed when the teacher asked: "How did you feel about these examples? Can you give us thumbs up or thumbs down?" (Cycle 1). Most students put their thumbs down or in the middle. Very few students showed thumbs up.

Cycle 2 and 3

Revisions were made based on the analysis of cycle 1. The mind map was added to the lesson and new contrasts were designed.

The mind map was used in cycles 2 and 3; aside from highlighting CA 1, it was used to show that different perspectives vary regarding explanations of the same phenomena. By varying the perspectives while keeping the phenomenon invariant, the explanations were highlighted. Then, the phenomenon changed (depression, love, decision-making…) to show that different perspectives can be used to analyse and explain several phenomena.

Even if the teacher intended to focus on the perspectives, it was difficult, since the students were interested in discussing the phenomenon rather than the perspectives. This was especially clear in cycle 2.

> *During the discussion about depression and the perspectives, the students become engaged in discussing and understanding what depression is and what causes it, relating it to personal situations.* (Fieldnotes, cycle 2)

The students became personally engaged in the phenomenon and connected it to their everyday lives. This might hinder them from focusing on critically evaluating the perspectives and might have contributed to the fact that many students in cycle 2 primarily focused on the phenomenon, even after the research lesson.

After the mind map new contrasts were used. A difference between cycle 1 and the other two cycles was that authentic student examples were used in cycle 1, while they were only used as inspiration for the construction of new text samples in the subsequent cycles. Instead, the text contrasts were constructed keeping a specific critical aspect in mind. In the contrast to cycles 2 and 3 the critical aspect was variant; all other aspects were invariant, see Figure 3.

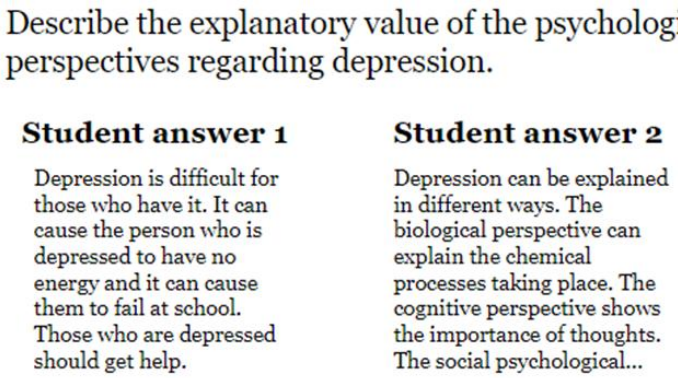


FIGURE 3

First text contrast in cycles 2 and 3.

Another difference regarding how the contrasts were constructed is whether the text examples were connected to an instruction or task. In cycle 1, the texts were not clearly related to an instruction with the implication that there was no relevance structure incorporated into the contrast. In the other cycles, the two texts were related to a clear instruction and students were invited to discuss the examples, which provided a relevance structure. The following excerpt is from the teacher-led discussion after the peer-discussions.

> ***Student 1:*** *The second one describes how it works while the other one is more personal; it describes what happens.*
>
> ***Student 2:*** *Student 1 [text 1] doesn't really get the question. Student 2 [text 2] responds as if they explain that...or from different perspectives.*
>
> ***Teacher:*** *It can be seen that they are talking from the perspectives here, whereas here it was more...*
>
> ***Student 2:*** *... depression in general*
>
> ***Teacher:*** *Or that it describes the phenomenon in general instead, maybe.*
>
> (Cycle 3)

This excerpt shows that the students can discern the critical aspect by comparing the texts. They refer to the difference and verbalise it together with their teacher. Yet another difference from cycle 1 was that after the discussion, some conclusions were

highlighted, both in words and by visual signals, to show which text example could be used as a model, as shown in Figure 4.

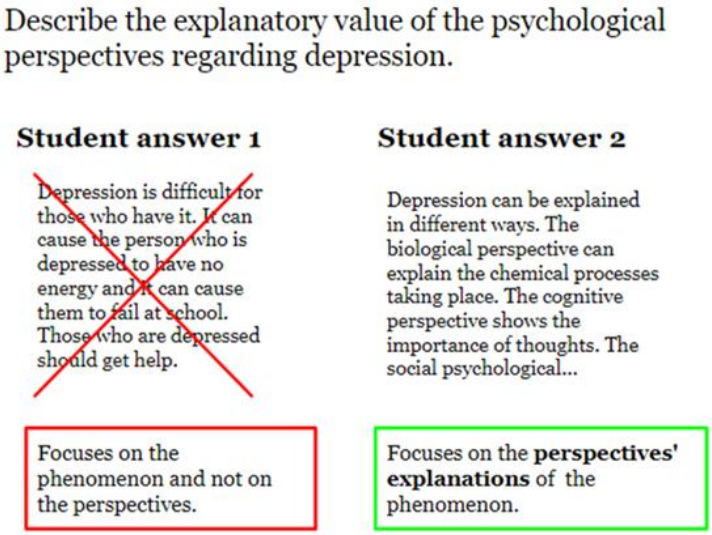


FIGURE 4

Text contrast 2 in cycles 2 and 3, summarising slide.

When analysing the results in cycle 2, there were signs of students learning the aspect, and the texts were coherent compared to cycle 1. Many students still primarily focused on the phenomena. Cycle 3 had the same main content but made sure to focus on the perspectives during the mind map. The lesson also ended with a group assignment where the students could practice, which was not the case in cycle 2. Since the students already had high results regarding CA 3 in cycle 3, it is difficult to know whether these changes would have had an impact in the preceding cycles.

CA 3: There is a difference between describing and evaluating

Students need to distinguish between describing each perspective and critically evaluating each perspective in relation to a specific phenomenon. In an evaluation, the perspectives' strengths and weaknesses in explaining the phenomena are addressed, while in a description the explanations of the perspectives are described.

How CA 3 emerged

When students are asked to evaluate the perspectives, it is common for them to describe the core content of each perspective or to explain a phenomenon by using a perspective, instead of evaluating how it explains the phenomenon.

One student said in the interview that evaluating psychological perspectives means that you should "understand the meaning of the perspectives and how they differ from

each other" (S2, interview). This student focused on understanding each perspective and seeing similarities and differences between the perspectives. This is a foundation for evaluating perspectives, but it is not enough. In another example from a text during the screening, a student wrote about how stress can be explained based on the biological perspective.

> *The biological soul is the substances in the body that are released and cause the emotions you feel under stress to be experienced.* (S10, Screening)

In this example the student does not evaluate the perspective, instead it is used to explain feelings and stress. Another student perceives evaluation as a way of offering "plausible explanations" to what causes situations in her own life. At the end of the interview, he/she said:

> *I don't know what makes it [different social situations] reasonable really maybe something like if it's not just me who did it but others too.* (S5, interview)

The student uses the theories to better understand her own life and how other people can affect her. They help her understand and evaluate other people's behaviour, but she does not critically evaluate the perspectives.

Students need to discern how descriptions contain what explanation a perspective offers, but evaluation entails assessing how much the explanation covers and how valid it is in explaining a specific phenomenon.

Teaching CA 3

The pre-test shows that this was a challenge in all groups, see Table 5. These results indicate that especially in cycles 2 and 3, many students discerned this aspect after the research lesson.

TABLE 5

Student results CA3

	Pre 1	**Post 1**	**Pre 2**	**Post 2**	**Pre 3**	**Post 3**
CA 3	0	0.83	0,08	1.21	0.35	1.59

In cycle 1, this aspect was not clearly addressed. Evaluation was explained in the power point, but the contrasts did not specifically address this. The contrasting texts in Figure 2 are both about how a theory (from a certain perspective) can be used. It does not focus on *evaluating* the theory, or the perspective. The difference between the two texts foremost focuses on the language used when *describing* a theory. It is a risk that these examples served as a model for students who thought that they should only *describe* the perspectives.

In cycle 2, the difference between description and evaluation was highlighted by using a text contrast. In the first contrast (Figures 3 and 4), the focus was on describing

the perspectives and not the phenomena. This was followed by a new contrast, where two examples highlighted the difference between describing and evaluating. In relation to student learning, this contrast seemed to be of importance, since there is a clear development regarding this in cycles 2 and 3. During the peer discussion in these cycles, students could identify that there is a difference between the texts. In one of the discussions in cycle 2, a student says:

> *It just describes what it is (points to text 1). The one on the right [text 2] is what is, you know, good.* (Cycle 2)

The student can identify the main difference between the texts: one describes the perspective and that the other uses evaluative words. This level of analysis was common among the students. Therefore, the teacher needed to provide depth in the analysis. One challenge regarding discerning CA3 concerns how descriptions and evaluations are connected, since descriptions can be a part of an evaluation. This was addressed in the class discussion in both cycles 2 and 3. In cycle 2, a student raised a question:

> ***Student**: Isn't it the case that you need to describe first?*
>
> ***Teacher**: You describe a little first and then you get into evaluating. But if you continue exactly the same then it's wrong. This student describes (points to text 1), and it's like you said earlier, that it's a good start, but if you then go on and evaluate, then you have to do like this (points to text 2) and use strengths and weaknesses in the explanations.* (Cycle 2)

The teacher used the contrasting text examples to explain how descriptions can be connected to a critical evaluation. The contrast used in cycle 2 was refined to make this even clearer in the contrast used in cycle 3. In cycle 3, the teacher-led discussion highlighted how explanations are related to evaluations.

> ***Student:** It's like that one [text 1] rather explains the perspective.*
>
> ***Teacher:** and that's correct, but it doesn't explain the value of the perspectives. It's important that we see what it is we are supposed to do. There are things that use the right information; it's not wrong if you think facts or similarly but it's how you use that factual knowledge that makes it evaluation instead.* (Cycle 3)

In the excerpt, the teacher directs students' attention to how the explanations and the facts about the perspectives need to be evaluated.

CA4: There is a difference between expressing an opinion and doing an evaluation

Students need to distinguish between expressing an opinion and doing an evaluation. They need to discern that evaluating is not about expressing one's own opinions, but about using knowledge about the perspectives in relation to a phenomenon and discussing pros and cons based on this knowledge.

How CA 4 emerged

During the screening and pre-tests, some students mistook evaluation for expressing an opinion about the perspectives. Their opinions were based on their own feelings, thoughts, and values. In an interview a student explained evaluation as follows:

> *Thinking through for yourself. What feels right. Like what is most important? Yes, evaluating...yes, choosing correctly, what's most important in this evaluation? Is this really necessary? Thinking through decisions.* (S7, Interview)

The student talked about personal feelings and thoughts as a basis for evaluation in relation to making decisions in his/her life. This can be interpreted as the student perceiving evaluation to be the same thing as expressing a well-grounded opinion in everyday life. When students were asked to evaluate in the written assignments, some of them expressed their personal thoughts about the perspectives. In the following excerpt, the student used personal evaluating words to express their opinion about the perspectives.

> *The biological is very square. Not so human. But it can be good in combination. Cognitive feels reasonable. Social psychological also feels reasonable. Well, that's how society works. There is truth in all three. No one is worse than the other, except maybe biological.* (S22, Screening)

In this case, the student expressed an opinion about the perspectives unrelated to a phenomenon. In other cases, they expressed an opinion about whether they believe in the perspective; for example, one student writes that s/he doesn't "think that genes/…/ say anything" (S6, interview) about how you handle stress. These statements are only based on the students' own opinions.

In one of the interviews, a student spoke about the written assignment as follows: "I thought it was a silly question because I agree with all three perspectives in different parts." (S10, interview). When the student expressed that it was a "silly question" it shows that the student thought s/she was asked to have an opinion, and that evaluating is perceived as synonymous to expressing an opinion. This was the case in many students.

Teaching CA 4

The results regarding this aspect varied in the pre-test between the three groups. Groups 1 and 2 faced particular challenges which developed after the teaching, see Table 6.

TABLE 6

Student results CA4

	Pre 1	**Post 1**	**Pre 2**	**Post 2**	**Pre 3**	**Post 3**
CA 4	0.08	1.5	0.75	1.58	1.47	1.77

In cycle 1, a contrast that described the difference between expressing an opinion and evaluating was made. The first example starts with "I don't think that genes…", whereas the other example is introduced by "A method in social psychology…" These examples can help students focus on this aspect. However, the contrast could have been clearer. The first example focuses on genes and gender, and the second on social psychology. Therefore, both the aspect in focus and the other aspects varied, which, according to variation theory, makes it more difficult for students to discern the critical aspect. However, the teacher also highlighted the difference in words which made the contrast clearer. Based on the results, most students discerned this aspect in cycle 1 after the research lesson.

In cycles 2 and 3, a contrast regarding CA 4 was not made since it was addressed in relation to other parts of the lesson. Based on the results it seems like this aspect is related to the discernment of the other aspects, since students developed the ability without a specific contrast addressing it.

Discussion

Critical thinking is a key ability in our society (Ennis, 1987; Larsson & Andersson, 2023). This study has contributed to an understanding of how this ability can be taught in psychology using variation theory as a theoretical framework. The results show that there are four aspects that are critical for students to discern to develop critical thinking in psychology when evaluating different perspectives. The seemingly most central aspect is to discern the difference between focusing on the phenomena or the perspectives as well as the difference between description and evaluation of perspectives. Also, the other two aspects (to discern that psychological perspectives have different research interests, assumptions, and research methods and to discern the difference between expressing an opinion and doing an evaluation) were necessary to develop critical thinking in the subject. When teaching the critical aspects, using principles from variation theory, the results show the importance of creating clear contrasts that highlight the critical aspects, but contrasts alone were not sufficient to do so. The contrasts need to be combined with active engagement by the students. Therefore, principles from variation theory benefit from being embedded in a teaching practice where tasks are created that involve analysis and discussions between students and where the teacher concludes the discussion by emphasizing the critical aspects . Following, the results will be discussed in relation to previous research.

In the humanities, critical thinking is central. Whether critical thinking skills can be transferred between subjects is discussed among researchers (Abrami et al. 2015; Larsson & Andersson 2023). Regardless, critical thinking skills are acquired in a context of specific subjects and specific learning objects. The present study focuses on a specific aspect of critical thinking in psychology: evaluating psychological perspectives (i.e., their strengths and weaknesses in explaining phenomena.) This skill shares similarities with areas in other studies in other subjects, such as climate studies in Ødegaard Borge & Langø (2023) and social sciences in Tväråna (2019). The results can therefore probably be of interest in these subjects also. In this study, as in several other studies (McPeck, 1990; McDade, 1995; Jakoubek, 1995), it was found that the students need to have knowledge about the subject content to apply critical thinking skills. Students who had insufficient knowledge about psychological perspectives had difficulties evaluating them. A question raised in relation to this is the quantity and type of knowledge needed to conduct this evaluation. Many of the previous studies in psychology are conducted at university level, where multiple courses provide students with more knowledge about both theories and research methods at different levels, which, in turn, facilitate critical thinking development (Halonen, 1995). Nevertheless, studies show that university students' ability to critically evaluate psychology does not always increase over their years of study as their first beliefs about psychology can remain uncontested and become sedimented (Holmes & Beins, 2009). Therefore, it is necessary to incorporate critical thinking skills early on in the educational system, and do it based on teaching the subject content pertaining to several aspects. In this study, participants are upper secondary or adult students at the same educational level, requiring consideration of how teaching at this stage affects critical thinking development. Unlike tertiary students, they have limited experience evaluating epistemological claims or research methods (Blåvarg, 2023). However, as Holmes and Beins (2009) note, critical thinking depends not just on subject knowledge but on how content is approached and problematized. The findings of this study suggest that critical thinking in psychology can be fostered through teaching strategies suited to upper secondary education as well that utilize variations that enable students to discern critical aspects regarding perspectives, research interests and evaluation. Thus, the key difference from higher education may lie more in pedagogical approach than content depth, which is of relevance when interpreting the results.

Psychology is a subject that is perceived by many students as significantly connected to their personal lives; as something to be used for understanding and interpreting themselves and others (Norlander et al., 2005; Lilienfeld, 2010; Tulis, 2018). In line with this, some studies show that teachers use the subject to promote students' self-insight (Harmat & Herbert, 2020), while other researchers emphasize the necessity of students viewing the subject as a science (Friedrich, 1996; Holmes & Beins, 2009; Hughes et al., 2013). An everyday understanding and a strong connection to themselves can be a hindrance to students' critical thinking in psychology (Friedrich, 1996). In the present study, students were asked to evaluate the perspectives in relation to how they explain a phenomenon they would likely be familiar with: stress. The main challenge for students was that they focused on evaluating the phenomenon instead of the

perspective, often basing their reasoning on personal insights about the phenomenon at hand, leading to expressing opinions about it rather than critically evaluating the perspectives' theories about the phenomenon. These results are similar to those of Tväråna (2019) and Ødegaard Borge and Langø (2023), where students focus on the specific phenomenon instead of principles or perspectives. This might be caused by the fact that the phenomena used as examples in the humanities, especially in psychology, are close to the everyday knowledge of students and are thereby already discussed in many informal settings—for example, on social media and among friends—which is not the case to the same degree in other subjects such as the natural sciences. It might be an advantage to choose examples that are recognisable and relevant to students, since it might facilitate an understanding of psychological theories, but these examples might also stir an interest that can obstruct the adoption of a critical, scientific, and objective approach when evaluating, as this requires students to zoom out from the phenomena. The examples might then hinder students from distinguishing self from scientific psychology, which is central for critical thinking, according to Amsel et al. (2009). Therefore, teachers need to help students shift their attention away from themselves to the scientific way of seeing the subject when they teach critical thinking.

Critical thinking in psychology teaching often focuses on students' ability to evaluate the methods used in psychology (Jakoubek, 1995). Yanchar and Slife (2004) claim that it is more beneficial to focus on the underlying assumptions in psychological perspectives to help students develop critical thinking. In the present study, we first focused on specific methods, but many students did not connect the methods to the perspectives, instead only describing strengths and limitations of a specific research method, which is why we shifted focus to creating tasks in which the perspectives were central. A consequence of this was that students did not evaluate the methods at all. Teaching in psychology likely needs to help students recognise how specific methods align with different perspectives, beginning with an understanding of the underlying assumptions of each perspective.

Variation theory is commonly used as a tool in designing teaching across various subjects (Marton, 2015; Kullberg et al., 2024). Learning objects in humanities are often more challenging to define than those in, for example, mathematics, but it is still important for teachers to think about what learning is in focus in each lesson and how this can contribute to powerful knowledge, such as critical thinking skills. In studies using variation theory, contrasts are used as a tool in teaching. Even if Kullberg et al. (2024) assert that students' ways of handling an object of learning should be a starting point for teaching, this does not necessarily mean that authentic student examples are suitable to use in contrasts. In this study it became obvious that authentic student examples vary in many aspects, which makes them unsuitable to quote in teaching. Instead, students' responses can be used to identify critical aspects and as inspiration when creating contrasts. Contrasts alone are not enough to create powerful teaching tools (Marton, 2015). This study confirms that they need to be presented in a way in which they are synchronically discerned and where students are invited to analyse the contrast.

The use of variation theory makes it possible to highlight aspects that are critical for perceiving specific objects of learning in certain ways. It also provides tools for how teaching can be designed to promote learning. The focus on details regarding aspects and powerful patterns of variation contributes to specified knowledge regarding the object of learning. However, the focus on these details might entail that other relevant issues regarding teaching are not addressed in this study. Other theories about teaching and learning would have provided other lenses through which to analyse the teaching of critical thinking in psychology, which is why the field benefits from research using various perspectives. The lenses provided by this study show the importance of teachers being aware of *what* students need to discern and *how* contrasts can be a powerful tool to do so.

The critical aspects and the teaching design in this study are based on results from a specific subject and educational context. Nevertheless, these results can also be relevant in other contexts. The critical aspects can be seen as a theoretical contribution that can be tested by teachers and researchers with other students (Marton & Runesson, 2015). The examples from the teaching design need to be connected to critical aspects for them to be relevant in other contexts. In forthcoming studies, it would be beneficial to validate both the critical aspects and exercises from the teaching design in other contexts.

References

Abrami, P., Bernard, R., Borokhovski, E., Waddington, D., Wade, C. A., & Persson, T. (2015). Strategies for teaching students to think critically: A meta-analysis. *Review of Educational Research*, 85(2), 275–314. https://doi.org/10.3102/0034654314558493

Amsel, E. (2009). Teaching psychology students to think like psychologists. In Proceedings of the Fifth Annual Science Education at the Crossroads Conference (pp. Sept. 20–22, 2009).

Amsel, E., Johnston, A., Alvarado, E., Kettering, J., Rankin, L., & Ward, M. (2009). The effect of perspective on misconception in psychology: A test of conceptual change theory. *Journal of Instructional Psychology*, 36(4), 289–295.

Arhar, J., Niesz, T., Brossmann, J., Koebley, S., O'Brien, K., Loe, D., & Black, F. (2013). Creating a 'third space' in the context of a university–school partnership: Supporting teacher action research and the research preparation of doctoral students. *Educational Action Research*, 21(2), 218–236. https://doi.org/10.1080/09650792.2013.789719

Behar-Horenstein, L., & Niu, L. (2011). Teaching critical thinking skills in higher education: A review of the literature. *Journal of College Teaching & Learning*, 8(2), 25–41. https://doi.org/10.19030/tlc.v8i2.3554

Birke P., Rosman T., Mayer A. K. (2016). "Entwicklung fachspezifischer epistemologischer Überzeugungen bei Studienanfängern der Psychologie und Informatik." ["Development of subject-specific epistemological beliefs among new pupils in psychology and computer science."]" in *Denken über Wissen und*

Wissenschaft. Epistemologische Überzeugungen. [Epistemological beliefs.], eds Mayer A. K., Rosman T. (Lengerich: Pabst Science Publishers;), 101–119.

Blåvarg, E. C. (2023). *Psykologi på schemat: Formeringen av ett skolämne, 1960–2015* [Doctoral dissertation, Stockholms universitet].

Brookfield, S. D. (2012). *Teaching for critical thinking: Tools and techniques to help students question their assumptions*. San Francisco: Jossey-Bass.

Carlgren, I. (2012). The learning study as an approach for research. *International Journal for Lesson and Learning Studies*, 1(2), 3–13. https://doi.org/10.1108/20468251211179687

Dunn, D. S. (2008). *Teaching critical thinking in psychology: A handbook of best practices.* John Wiley & Sons.

Elliott, J. (2012). Developing a science of teaching through lesson study. *International Journal of Lesson and Learning Studies*, 1(2), 108–125. https://doi.org/10.1108/20468251211224163

Ennis, R. H. (1987). A taxonomy of critical thinking dispositions and abilities. In Baron, J., & Sternberg, R. (ed.) *Teaching thinking skills: Theory and practice*. New York: Freeman.

Facione, P. A. (2013). *Critical thinking: What it is and why it counts. Insight Assessment*, 1–28.

Friedrich, J. (1996). Assessing students' perceptions of psychology as a science: Validation of a self-report measure. *Teaching of Psychology*, 23(1), 6–13. https://doi.org/10.1207/s15328023top2301_1

Gardner, R., & Brown, D. (2013). A test of contemporary misconceptions in psychology. *Learning and Individual Differences*, 24, 211–215. https://doi.org/10.1016/j.lindif.2012.12.004

Gray, P. (1993). Engaging students' intellects: The immersion approach to critical thinking in psychology instruction. *Teaching of Psychology*, 20(2), 68–74. https://doi.org/10.1207/s15328023top2002_5

Halonen, J. S. (1995). Demystifying critical thinking. *Teaching of Psychology*, 22(1), 75–81. https://doi.org/10.1207/s15328023top2201_23

Harmat, L., & Herbert, A. (2020). Complexity thinking as a tool to understand the didactics of psychology. *Frontiers in Psychology*, 11. https://doi.org/10.3389/fpsyg.2020.00510

Harris, R., Pownall, M., Thompson, C., Newell, S. J., & Blundell-Birtill, P. (2021). Students' understanding of psychological literacy in the UK undergraduate curriculum. *Psychology Teaching Review*, 27(1), 56–68. https://doi.org/10.53841/bpsptr.2021.27.1.56

Holmes, J. D., & Beins, C. B. (2009). Psychology is a science: At least some students think so. *Teaching of Psychology*, 36(1), 5–11. https://doi.org/10.1080/00986280802529350

Hughes, S., Lyddy, F., & Lambe, S. (2013). Misconceptions about psychological science: A review. *Psychology Learning & Teaching*, 12(1), 20–31. https://doi.org/10.2304/plat.2013.12.1.20

Jakoubek, J. (1995). Developing critical-thinking skills in psychology content courses. *Teaching of Psychology*, 22(1), 57–59. https://doi.org/10.1207/s15328023top2201_17

Kullberg, A., Ingerman, Å., & Marton, F. (2024). *Planning and Analyzing Teaching: Using the Variation Theory of Learning* (p. 122). Taylor & Francis.

King, A. (1995). Inquiring minds really do want to know: Using questioning to teach critical thinking. *Teaching of Psychology*, 22(1), 13–17. https://doi.org/10.1207/s15328023top2201_5

Larsson, K. & Andersson, K. (2023) Sambandet mellan kunskap och kritiskt tänkande —en empirisk studie av elevers svar på samhällskunskapsfrågor. *Nordidactica* 2023(2), 1–27

Lassonde, K. A., Kendeou, P., & O'Brien, E. J. (2016). Refutation texts: Overcoming psychology misconceptions that are resistant to change. Scholarship of Teaching and *Learning in Psychology*, 2(1), 62–74. https://doi.org/10.1037/stl0000054

Lewis, C. (2009). What is the nature of knowledge development in lesson study? *Educational Action Research*, 17(1), 95–110. DOI: https://doi.org/10.1080/09650790802667477

Lilienfeld, S. O. (2010). Confronting psychological misconceptions in the classroom: Challenges and rewards. *Observer*, 23(4), 36–38.

Marton, F. (2015). *Necessary conditions of learning*. Routledge.

Marton, F., & Booth, S. (1997). *Learning and awareness*. Routledge.

Marton, F. & Runesson, U. (2015). The idea and practice of the Learning Study. I K. Wood & S. V. Sithamparam (Red.), *Realising learning. teachers' professional development through lesson and learning study* (s. 103–121). Routledge.

McDade, S. A. (1995). Case study pedagogy to advance critical thinking. *Teaching of Psychology*, 22(1), 9–10. https://doi.org/10.1207/s15328023top2201_2

McPeck, J. E. (1990). Critical thinking and subject specificity: A reply to Ennis. *Educational Researcher*, 19, 10-12. http://dx.doi.org/10.3102/0013189X019004010

Menz, C., Spinath, B., & Seifried, E. (2020). Misconceptions die hard: Prevalence and reduction of wrong beliefs in topics from educational psychology among preservice teachers. *European Journal of Psychology of Education*, 36(1), 67–85. https://doi.org/10.1007/s10212-020-00494-9

Nuthall, G. (2004). Relating classroom teaching to student learning: A critical analysis of why research has failed to bridge the theory–practice gap. *Harvard Educational Review*, 74, 1–28.

Norlander, T., Blom, A., & Archer, T. (2005). Role of high school teachers in Swedish psychology education: A phenomenological study. *The Qualitative Report*, 10(3), 467–493.

Skolverket. (2011). Ämnesplan för psykologi [Curriculum for psychology].

Thompson, R. A., & Zamboanga, B. L. (2003). Prior knowledge and its relevance to student achievement in Introduction to Psychology. *Teaching of Psychology*, 30(2), 96–101. https://doi.org/10.1207/S15328023TOP3002_03

Siegel, H. (1991). The Generalizability of Critical Thinking, *Educational Philosophy and Theory*. Vol 23(1)

Smith, P. C., & Vasquez, K. (2008). Teaching critical thinking about difficult topics. In D. S. Dunn, J. S. Halonen, & R. A. Smith (Eds.), *Teaching critical thinking in psychology: A handbook of best practices* (pp. 211–221). Wiley Blackwell.

Svanteson Wester, J. (2022). *Teaching and learning mathematics with integrated small-group discussions. A learning study about scaling geometric figures.* [Dissertation] Gothenburg University.

Swedish Research council (2017). *God forskningssed.* Vetenskapsrådet.

Tulis, M. (2018). Da ist immer noch Luft drin! Zur Notwendigkeit einer didaktischen Konzeption kognitiver Umstrukturierungsprozesse im Psychologieunterricht [There is still air in there! The need for a didactic conception of cognitive restructuring processes in psychology lessons]. In M. Krämer, S. Preiser, & K. Brusdeylins (Eds.), *Psychologiedidaktik und Evaluation XII* (pp. 27–36). Shaker Verlag.

Thorsten, A., & Tväråna, M. (2024). Focal points for teaching the notion of critical aspects. *Scandinavian Journal of Educational Research*, 68(6), 1247–1260.

Tväråna, M. (2019). *Kritiskt omdöme i samhällskunskap: Undervisningsutvecklande studier av samhällsanalytiskt resonerande i rättvisefrågor* [Doctoral dissertation, Stockholms universitet].

Yanchar, S. C., & Slife, B. D. (2004). Teaching critical thinking by examining assumptions. *Teaching of Psychology*, 31(2), 85–89. https://doi.org/10.1207/s15328023top3102_3

Wade, C. (1995). Using Writing to Develop and Assess Critical Thinking. *Teaching of Psychology*, *22*(1), 24-28. https://doi.org/10.1207/s15328023top2201_8

Ødegaard Borge, J.A. & Langø, M. (2023). *Kritisk tenkning i bærekraftundervisning: En kvalitativ analyse av ungdoms perspektiver på klimatiltak.* Nordidactica (2) 111–134